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DIMENSIONS OF INTUITION: FIRST-ROUND VALIDATION STUDIES

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by

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ABSTRACT

This study utilized confirmatory factor analysis (CFA), canonical correlation analysis (CCA), regression analysis (RA), and correlation analysis (CA) for first-round validation of the researcher's Dimensions of Intuition (DOI) instrument. The DOI examined 25 personal characteristics and situations purportedly predictive of intuition. Data was collected from 302 respondents, ages 20-79, from differing occupations and educational backgrounds nationwide. ***Hypothesis 1***: CFA disconfirmed the theorized 3- and 21-factor intuition models, finding 15 factors, accounting for 65.6% of the variance, to be the most efficient capture of intuition. ***Hypothesis 2***: CCA tested the relationship between the 15 factors and the brain quadrants, as measured by the Herrmann Brain Dominance Instrument® (HBDI®). Seven factors loaded on quadrant A; nine each on quadrants B, C and D, confirming this hypothesis. ***Hypothesis 3***: RA was used to test the relationship between the 15 factors and the HBDI® brain hemispheres. An *R*-squared value of .667 was found for the right/left hemispheres; .575 for the cerebral/ limbic hemispheres, confirming this hypothesis. Hypotheses 2 and 3 findings provided some evidence of intuition as a whole-brained functionality, with right/left scores providing the most discriminative value. ***Hypothesis 4***: CA was utilized to examine the relationship between the DOI total and variable T scores and the six subscales of the Personal Style Inventory (PSI). Expected directions were found for 47 of 54 significant correlations between the variable scores and subscales (87% hit rate). Significant correlations in expected directions were also found between the DOI total score and the Control, Vision and Insight subscales. The overall conclusion supports the DOI's validity and reliability; though additional validation studies with other populations and other statistical methods, including structural equation modeling and multi-dimensional scaling, are recommended.

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"*After a great pain, a formal feeling comes*." — Emily Dickinson

Best known for her poetry, Emily Dickinson might have been describing the dissertation process in this bit of verse. At the end of more than a decade of work on my Ph.D., at last I have a chance to reflect on the whole process and the contributions of those who have enabled and encouraged my progress along the way.

First, I must thank the teachers, co-learners, colleagues, friends, acquaintances, family members and occasional strangers whose interest in my topic helped sustain my own interest for the duration. Persistence is often more about sheer stubbornness than sheer genius, so a timely prod from someone who thought this project was worth doing often made the difference at those times that I wasn't sure I would ever finish in this lifetime.

I also want to acknowledge all whose work preceded mine and made mine possible. At the risk of including some and omitting others, my short list includes:

- *Milton Fisher:* In 2000, I stumbled onto Fisher's *Intuition: How to Use it for Success and Happiness* (1981) and found it so compelling that I sat on the floor of the library and read the entire book on the spot. Fisher's personal encouragement in the early stages assisted my ultimate decision to undertake an in-depth study of intuition.

- *Malcolm Westcott*: Westcott's seminal quantitative studies of intuition showed the rest of us what could—and should—be done to measure intuition. His profile of the "highly intuitive individual" is likely to remain the gold standard for researchers.

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- *Philip Goldberg*: In *The Intuitive Edge* (1983)—arguably the best of the best on the subject of intuition—Goldberg defined six discrete types of intuition. I especially appreciated his interest in my own premise that the six types could be placed on a continuum. Perhaps a topic for my *next* dissertation….

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- *Bill Taggart*: Taggart's PSI, which measures a preference for the rational vs. intuitive mode, provided the third tool used in my study. I'm grateful for Bill's graciousness and willingness to help me for the duration of this longer-than-anticipated process.

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- *Dr. Arthur Newcomb*, my family physician in the 1960's and early 1970's. I never learned why he did it, but on some whim (intuition?) in 1971, he took a few minutes in the middle of a busy day of clinical practice to make a phone call. That simple act of kindness literally changed the course of my life, setting me on the path to college, ultimately leading to this Ph.D. degree. (Thanks, Doc! Your kindness made all the difference.)

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Finally, to all who were overlooked here but who helped to make this work possible, my profoundest apologies and deepest gratitude. Your contributions were invaluable. Hopefully, you will derive your reward from the new knowledge emerging from this inquiry into the unique role of intuition in teaching, learning and *KNOWING.*

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CHAPTER 1

The really valuable thing is intuition. Without it, I could not see how to begin. -- Einstein

INTRODUCTION TO THE STUDY

Intuition is an elusive construct, subject to controversy and varying interpretation, even among purported experts. Intuition has been called the basis of "all our knowledge of truths" (Russell, 1959, p. 109); "one of the most compelling and obvious cognitive processes…a perfectly normal and common mental state/process" (Reber, 1989, p. 232); "an accredited route to knowledge" (Agyakwa, 1988, p. 161); and a "hidden source of learning" (Morey, 2008). In his 1988 review of the inter-relationships among intuition, knowledge and education, Agyakwa concluded that there are two ways by which human knowledge is possible. One way is *deduction/induction*. The "other way of knowing"—*intuition* (p. 169)—is the interest of this research project.

The elusive nature of intuition makes it a complex but enticing topic of study. Its elusiveness may also explain, in part, why intuition has been neglected, dismissed, even repudiated, as a tool for learners in traditional Western education. Believing intuition holds promise for adult learners, the researcher's initial interest was determining whether it is possible to teach learners how to utilize their intuitive capabilities for *knowing*. However, it is difficult to teach what cannot be explained; to explain what cannot be measured; to measure what cannot be operationalized; to operationalize what cannot be defined; and to define what cannot be seen, heard, touched, tasted, or smelled, and about which expert theorists and practitioners disagree. Accordingly, this project involves first-round validation of an instrument designed to measure a set of personal characteristics purportedly associated with and predictive of intuition.

Background of the Study

Through the centuries, important discoveries have emerged from rational empiricism, hypothesis, experimentation, and the scientific methods typically associated with deduction/induction. However, not all knowledge arrives by this means. In fact, some assert that no *new* knowledge comes by this means (Westcott, 1968, p. 16; Sloan, 1983, p. 130). Sloan (1983) cited as "flashes of insight" Einstein's comprehension of the constant speed of light, Newton's conception of gravity, and Helen Keller's sudden apprehension of the significance of words. Vaughan (1979) cited other examples of intuition: discovery and invention (in science); inspiration (in art); creative problem-solving; pattern and "possibility" recognition; extrasensory perception (ESP) and other so-called "psychic" senses; feelings of attraction or aversion, receptivity to "vibrations," "body knowing"; hunches; premonitions, etc. (p. 57). Such insights, often experienced by receptive individuals as "immediate, whole, unanticipated perceptions of novel and previously unconsidered ideas" (p. 143), are commonly attributed to intuition, which Vaughan (1979) defined in its broadest, simplest terms as "a way of knowing" (p. 3).

Based largely on his own Nobel Prize-winning brain research, Roger Sperry recognized two primary modes of thinking—the *verbal* and *nonverbal*—which he assigned to the left and right brain hemispheres, respectively. One of the most significant outcomes of Sperry's work was the recognition that the verbal, analytical, sequential left brain was *not* the dominant, or *major*, hemisphere, as was generally believed at that time. Contrary to being the subordinate, or *minor*, hemisphere, the right brain is superior to the left for tasks like holistic or integrative "thinking," idea synthesis, or pattern recognition. It also excels at emotional understanding, and the interpretation of symbols or other

nonverbal stimuli. Though the halves function differently, they should be perceived, not as rivals but, as partners that work best when they work together.

As early as 1973, Sperry had begun to lament the degree to which Western education neglected the minor, or right, brain hemisphere while lavishing attention and training on the major, or left, hemisphere. In a 1975 article, Sperry went on to decry the fact that the education system, science in general, and modern society as a whole discriminated against one half of the brain in favor of the other (p. 33).

Stepping into the traditional Western classroom, one instantly recognizes the legitimacy of Sperry's concerns. Students are taught to outline instead of mind-map, to memorize instead of imagine, to march instead of dance. Even now, they spend much of their day engaged in tasks associated with the left-brain: reading textbooks, hearing lectures, taking notes, memorizing and regurgitating facts. Listening is followed by reciting, often in unison. Competency is measured by language- or computation-based assessments. Worse, those who perform well by these measures are rewarded; while those who do not are marginalized.

Consequently, innate intuitive abilities that might be used to guide student knowing, learning and discovery are allowed to atrophy instead. Eden cited experiments showing that, while most pre-school children are highly creative, these abilities appear to decrease over time. Only 10% retain a high level of creativity to age 7, and only 2% remain highly creative into adulthood (as on http://www.viewzone.com/bicam.html, April 2003). Many noted intuition theorists and researchers have linked creativity with intuitive processes and functioning (Westcott and Ranzoni, 1963; Neisser, 1963; Westcott, 1968; Vaughan, 1979; Simonton, 1975 and 1980; Bastick, 1982; Goldberg,

1983; Rockenstein, 1988; Herrmann, 1995). The case could be made that children's creative abilities are often stifled, if not lost altogether, during their K-12 years due to the lopsided preference of Western education for left brain deductive/inductive processes over the intuitive processes typically associated with the right brain.

Vitale (1986) reported her own struggles as a right brain-oriented learner in a left brain-oriented education system. She could read whole chapters in the science text without remembering a word afterward. She never learned to use phonics to decode new words and had difficulty following directions without a picture or demonstration as a guide. Teachers labeled her *hyperactive* and reported that she: "Doesn't sit still. Plays at desk. Talks too much." On the other hand, she was exceptionally adept at a game called "Mystery"—which she mistakenly decoded as "Mr. Ree"—in which players had to discern who murdered whom and where the murder weapon was hidden. Though she never quite understood the rules of the game, somehow she always seemed to know who was guilty and where to find the weapon. Because she always won, the other children accused her of cheating and eventually refused to let her play (p. 9). It was not until adulthood that she understood that her chronic feelings of being a misfit in school were related to her pronounced preference for right brain-associated learning modalities.

The obvious "left-tilt" in traditional Western classrooms not only favors students who excel at deduction/induction but actually thwarts students who tend to learn more intuitively. Complaining that intuition is devalued by the formalism of school learning, Bruner (1961) advocated beginning in the earliest grades to develop what he termed the students' "intuitive gifts" (p. 9). Even more pointedly, Neil (1999) expressed concern about the dual shortcomings of a lopsided left-oriented learning approach that creates

academic and social disadvantages for right-dominant students while squandering the opportunity to develop the innate right-brain capacities of left-dominant students (p. 5). Worse, these negative effects are compounded when students grow into adult learners whose intuitive faculties atrophied from neglect during the K-12 years.

Western Education and Intuition

In "A Brief Note on Knowledge," Harvey (1999) distinguished between left brain-associated *rational knowledge*, concerned with facts and data, and right brain-associated *intuitive knowledge*, concerned with knowledge of self, others and one's environment. He asserted that: 1) human beings can develop both types of knowledge; 2) the two are interactive and mutually supportive if balanced (p. 5); and 3) unbalanced schooling actually teaches students *not* to learn (p. 6). In Harvey's perception, the Western emphasis on rational cognitive learning was an outgrowth of the way capitalism and social class systems thrive in societies dominated, or ruled, by the left brain.

Toffler (1980) offered another explanation. His groundbreaking book, *The Third Wave* delineated between the First Wave (Agrarian Age), the Second Wave (Industrial Age), and the (then) imminent Third Wave (Information Age). During the Second Wave, the educational emphasis shifted from field and home to preparation for factory life. Students were "pre-fitted to the industrial system" as a means of shaping them to the necessities of "industrial discipline" (p. 29). In classrooms of the day, built around the *factory model*, children were "machined" into a "pliable, regimented workforce" (p. 29) programmed to respond, obey directives and follow the leader. Mass education not only concerned itself with the *overt* curriculum—reading, writing, arithmetic, and history—but also with the *covert* (i.e., invisible) curriculum, which consisted of three major courses:

> …one in punctuality, one in obedience, and one in rote, repetitive work. Factory labor demanded workers who showed up on time, especially assembly-line hands. It demanded workers who would take orders from a management hierarchy without questioning. And it demanded men and women prepared to slave away at machines or in offices, performing brutally repetitious operations (p. 29).

This preparation for factory employment neither required nor inspired intuitive thinking. To the contrary, the assembly line approach to learning was purposely designed to be mechanistic, positivistic, reductionistic, and objectivistic. Students were taught to sit in rows, learn by rote, read from textbooks, listen to lectures, take notes, memorize facts, recite in unison, perform practice drills, answer to bells, stand in lines, and observe rigid schedules (pp. 52-53). As members of the Second Wave generation, many of yesterday's teachers and today's adult learners were educated in these factory model classrooms. While the rigid factory approach may have served the industrial society of its time, Toffler foresaw that it would be inadequate for the urgent needs of a world already moving beyond the Third Wave (p. 437).

Fortunately, many modern theorists and practitioners view the rational and intuitive modes as symbiotic—not antithetical, rival, or mutually exclusive—processes. Bruner (1962) argued that artificial separation of the two modes "cripples" the modern intellectual (p. 2). Analytic thinking proceeds in an explicit, step-by-step manner with the observer's full awareness. It typically involves deductive reasoning and logic, or induction and scientific experimentation. By contrast, intuitive thinking is based on implicit perception, by which one arrives at solutions without conscious awareness, enabling one to "leap about, skipping steps and employing short cuts" (1960, p. 58).

Bruner considered intuition a much-neglected but essential feature of productive thinking, by which one could bypass the tedious, time-consuming, analytical steps

characteristic of deduction/induction. As he explained: "…the intuitive mode…yields hypotheses quickly [and] produces interesting combinations of ideas before their worth is known. It precedes proof; indeed it is what the techniques of analysis and proof are designed to test and check" (1962, p. 102). Optimally, intuition provides solutions which may be verified through analysis but which are inaccessible through analysis alone.

Poincare' (1969) declared: "…logic is not enough; …the science of demonstration is not all science and…intuition must retain its role as complement…counterpoise or… antidote of logic" (p. 209). Vaughan (1979) proposed "unlearning"—temporarily putting aside purely intellectual, left-brain processes to promote greater awareness of the intuitive functions (p. 96). As she explained, teaching learners to process information critically, utilizing a purely rational approach is unduly limiting because, consciously, one can only grasp a small portion of what one knows or *can* know. By contrast, intuition allows individuals to "draw on a vast storehouse of unconscious knowledge that includes not only everything…one has experienced or learned…consciously or subliminally, but also the infinite reservoir of the collective or universal unconscious" (p. 4).

Bastick (1982) believed intuition was foundational to education and should be employed at all levels of teaching and learning (p. 10). Sloan (1983) advocated the "education of imagination," concerned with the whole person and involved in "other capacities and aptitudes" as well as the intellect (pp. 193, 194). Going further, Harman (1988) questioned the prestige and power consigned to science, which he considered "fundamentally inadequate, seriously incomplete, and mistaken in basic assumptions" (p. 101). He advocated greater reliance on the creative-intuitive mind, connected to the Universal Mind (pp. 88, 89) and accessible to individuals for guidance (1984, p. 16).

Goldberg (1983) divided intuitive functioning into six discrete types: discovery, creativity, evaluation, operation, prediction, and illumination (pp. 46-61). He advocated partnering the logical and intuitive faculties as a path to greater effectiveness. As he envisioned the partnership, intuition prompts scientific investigation, which can be used to validate intuition; thus, intuition provides a starting point for reason, and reason verifies intuition. He explained:

> We reason, analyze, gather facts; then there is an intuitive breakthrough; then we reason and analyze again in order to verify, elaborate, and apply the product of intuition. This is a useful division of labor, and it is a more or less accurate picture of how things generally go in protracted decision-making, problem-solving, and creative work of all kinds (p. 33).

Comparing reasoning to fission and intuition to fusion, Feuerstein (1997) distinguished between *creepers* and *leapers* (p. 88). Creepers are highly rational individuals who believe truth only comes from deduction/induction, and real knowledge emerges from correct reasoning alone (p. 89). They progress in a plodding, precise, linear, predictable, step-by-step manner from A to B to C to D. By contrast, leapers are "comfortable taking the logic stairs several steps at a time" (p. 90), omitting some steps altogether in order to reach the top most efficiently. Those who learn in this way are not only more likely to gain intuitive knowledge but more likely to trust and act on it, as well.

Relative to the value of the intuitive leap in his own experience, Einstein once observed: "The intellect has little to do on the road to discovery. There comes a leap in consciousness, call it intuition or what you will, and the solution comes to you and you don't know how or why" (as on www.theosphical.org/theosphy/questmagazine/marapr04 /nicholson, December 2005). This is a classic description of the non-conscious, non-rational way intuition seems to operate.

Adult Learning and Intuition

Describing the indispensability of the right hemisphere's gifts, neuroscientist Robert Ornstein (1997) referred to the right brain as "the seat of creativity, of the soul, and…great casserole ideas" (p. 2), Going even further, he declared it the key to human survival, the thing that is "going to save us" (p. 2). Despite decades of eminent and urgent appeals for greater recognition of the right brain and the intuitive mode, intuition researchers continue to decry the lack of quality research on the topic (Cosier and Aplin, 1982; Agor, 1989b; Bowers, Regehr, Balthazard and Parker, 1990; Epstein, Pacini, Denes-Raj and Heier, 1996; Shirley and Langan-Fox, 1996).

Studies related to intuition as a learning tool typically dealt with childhood education, or examined intuition for narrowly-defined populations or applications. A recent search of 45 issues of various education journals failed to unearth a single article with *intuition* or *intuitive* in the title. A corresponding search of more than a dozen prominent education journals spanning 1990-2005 was equally unproductive. The ERIC (Educational Resources Information Center) database search for intuition-related entries yielded 2033 items, which narrowed to 79 items when the phrase *adult learning* was added. Among the 79 items, 11 were related to childhood education; 6 dealt with areas like teacher education and school administration leadership. The remaining books, journal articles, and conference papers dealt with narrowly defined types of learning, specific curricular areas, peripheral applications, or marginal populations unrelated to this project. In the most relevant article, Garrison (1995) explored the relationship between intuitive and rational thinking, concluding that the critical thinking/learning model could help adult learners understand and integrate these two complementary modes.

While the paucity of comparable studies means no precise guide exists for this investigation, it also signifies an open, rich, relatively untapped field of study. It is encouraging, however, to find that more attention is now being focused on deliberate applications of intuition in business, management decision-making, research and development, marketing, manufacturing, entrepreneurship, consulting, hiring, sports, investments, interviewing, gambling, as well as the clinical and psychic realms (Agor, 1989b; Eisenhardt, 1989; Glaser, 1995; Weintraub, 1998; Fields, 2001, Myers, 2002).

In 1984, Noddings and Shore wrote about the connection between intuition and learning, creating, expressing, and problem-solving. Noting that no contemporary philosophy up to that time had directly linked intuition with "a practical theory of knowledge or education" (p. 41), they called for new research into the relationship between intuition and "interpersonal relations, social change, studies in creativity, intellectual activity," etc. (p. 200).

More recently, Pink (2005) has made the case that contemporary forces—especially material abundance, globalization and technology—have ushered in the "Conceptual Age" (p. 2). Just as the farm worker of Toffler's Agrarian Age was replaced by the factory worker of the Industrial Age—who was supplanted in turn by the knowledge worker of the Information Age, in the Conceptual Age, the purely reductive, analytical thinking of the past is being dismissed in favor of the creative, imaginative *high concept* and *high touch* capabilities. High concept is related to pattern and opportunity recognition; as well as creating artistic or emotional beauty; crafting a satisfying narrative; and synthesizing old, seemingly unrelated, ideas into unique, new ideas. High touch involves the capacity for empathy, understanding human interaction,

eliciting joy in self and others, and finding purpose and meaning (pp. 2-3). Pink notes that ability to utilize the once-disdained, dismissed R-directed (i.e., right brain-directed) capabilities will determine who "flourishes" or "flounders" in the Conceptual Age (p. 3).

Before launching intuition classes for the masses, however, it is necessary to arrive at a better understanding of intuition itself, as well as the individual's innate intuitive capacity. This project was designed to serve that purpose.

Purpose of the Study

More specifically, the purposes of this project were to:

1. develop the Dimensions of Intuition (DOI) instrument to measure the individual's capacity for intuitive thinking; and verify a set of three underlying dimensions (i.e., common factors) in intuitive functioning;

2. quantify the relative contributions of each brain quadrant as measured by the Herrmann Brain Dominance Instrument® (HBDI®) to each DOI factor, to determine whether intuition is right-brained, left-brained or whole-brained;

3. quantify the relative contributions of each brain hemisphere, as measured by the HBDI® to each DOI factor, to determine whether intuition is right-brained, left-brained or whole-brained; and

4. cross-validate the DOI with the Personal Style Inventory (PSI), a validated measure of preference for the rational vs. intuitive mode (i.e., intuition/not intuition).

Research Questions

Research questions asked by this project were:

1. Do the 25 variables examined in this study fit into the social/acquired, biological and situational clusters to which they were assigned by Shirley and Langan-Fox?

2. How do the intuitive factor scores, as measured by the DOI, relate to the dependent HBDI® quadrant scores?

3. How do the intuitive factor scores, as measured by the DOI, relate to the dependent HBDI® left/right and cerebral/limbic hemisphere (i.e., modal percent) scores?

4. Will intuition, as measured by the DOI, show a strong positive correlation with the PSI's intuitive mode subscales and a strong negative correlation with the PSI's rational mode subscales?

The DOI instrument used in this project was developed by the researcher to measure the most significant factors in, or dimensions of, intuition. More specifically, to determine the content and construct validity of the DOI, this study examined the relationship between: 1) intuition, as measured by the DOI; 2) brain dominance, as measured by the HBDI®; and 3) a preference for the intuitive vs. rational way of doing things, as measured by the PSI. The instruments and methods utilized to accomplish these purposes are discussed in more detail hereinafter. Operational definitions of the terms used and the constructs measured in this study are provided at the end of this chapter.

Significance of the Study

Observing how little was known about intuition at that time, Bruner (1961) had declared as early as 1960: "Research on the topic [of intuitive thinking] cannot be delayed until such a time as a pure and unambiguous definition of intuitive thinking is possible, along with precise techniques for identifying intuition when it occurs" (p. 59). In 1971, he reiterated his belief that intuition was "not only fruitful but necessary" to education (p. 96). Though much has been learned about intuition in the intervening decades, far more research is needed, especially relative to intuition as a potential tool for adult learners. If intuition provides access to information and insights inaccessible through the limited and limiting powers of deduction/induction alone, and if this relatively untapped resource can be made accessible and useful to adult learners, then an examination of the underlying dimensions of intuitions is both timely and imperative.

Overview of Methodology

This study was designed as a first step on the long journey toward a better understanding of the way intuition operates, and whether and how it can be accessed, induced, taught and learned. The project examined the relationship between intuition and brain dominance, in order to arrive at a set of underlying dimensions, or common factors, in intuitive functioning.

The three instruments utilized in the study were:

1. *Dimensions of Intuition* (DOI)
   The researcher-designed DOI instrument (Appendix A) was utilized as the primary measure of intuition in relation to a set of personal characteristics purported to be predictive of intuition. The DOI examined 25 intuition-related variables from a list of 57 identified in a 1996 review of the theoretical and empirical literature by Shirley and Langan-Fox (Appendix B). The relevant literature and its implications for this project are discussed in Chapter 2.

2. *Herrmann Brain Dominance Instrument*® (HBDI®)
   Brain dominance was measured by the HBDI® (Appendix C), a validated thinking styles assessment instrument developed by Ned Herrmann, based on his *Whole Brain Model* (1995, p. 411; also Appendix D). The model proposes an interconnected quadrant/hemisphere structure for the human brain, with the left/right hemispheres connected by the corpus collosum; and cerebral/limbic (i.e., upper/lower) hemispheres connected by the hippocampal commissure. The HBDI® instrument measures the relative strengths of the A (upper left), B (lower left), C (lower right) and D (upper right) quadrants, as well as the dichotomous left vs. right and cerebral vs. limbic brain hemispheres, as shown in the Sample HBDI® Profile (Appendix E).

3. *Personal Style Inventory* (PSI)
   The PSI (Appendix F), was developed and validated by intuition researcher Bill Taggart to measure the individual's relative preferences for the rational vs. intuitive ways of doing things. The PSI yields percent scores for three sets of dichotomous modes: planning vs. vision ways of preparing for the future; analysis vs. insight ways of solving problems; and control vs. sharing ways of approaching work (as on http://www.the-intuitive-self.org/website/introduction/framesets/frameset_psi_survey.html, April 2, 2006). Planning, analysis and control are associated with the *rational* mode; vision, insight and sharing are associated with *intuition*. A sample PSI profile is included as Appendix G.

Assumptions, Hypotheses and Rationales

Assumptions

The underlying assumptions of this project include the following:

1. Intuition exists.

2. Intuition is innate and accessible to everyone, not just the gifted few.

3. Intuition provides rapid access to new knowledge and special insights that are inaccessible by any other means.

4. Intuition can be induced or stifled, amplified or restrained and/or taught and learned.

5. Intuition is useful in the teaching/learning exercise, especially in partnership with deduction/induction.

6. Intuition is a brain-based functionality that manifests itself in overt characteristics and behavior and is, therefore, a measurable construct.

Assumptions underlying the four hypotheses of this project included:

1. The 25 intuition-related variables identified by Shirley and Langan-Fox (1996) will fit into the three factors (i.e., clusters) they proposed: social/ acquired, biological, and situational.

2. The three factors are related to the HBDI®'s brain quadrant scores and dichotomous left/right and cerebral/limbic hemisphere modal percent) scores.

3. Intuition as measured by the DOI will correlate positively to the PSI's three intuition modes (i.e., vision, insight and sharing) and negatively with its three rational modes (planning, analysis and control).

4. Comparing data from the DOI with scores on the HBDI® and PSI instruments will enable the researcher to measure intuition relative to brain functioning and the individual's characteristic use of intuition.

5. Identifying specific intuition factors (i.e., dimensions, or predictors), relative to brain functioning and the use of intuition will enable the researcher to test psychometrically the reliability and validity of the DOI as an instrument for measuring intuition.

This study's four hypotheses and rationales are discussed in more detail below.

Hypothesis 1. Absolute and associational statistics developed using confirmatory factor analysis (CFA) will confirm that the 25 variables examined in this study fit into the three-factor model (i.e., clusters), designated in the 1996 Shirley and Langan-Fox literature review: social/acquired, biological and situational (Appendix B). Table 1.1 below identifies the variables in the respective cluster designations.

Table 1.1: Variables Examined in this Study (DOI)

Social/Acquired	**Biological**	**Situational**
1. Academic aptitude	19. Age	24. Time of day
2. Cognitive style/Analytic	20. Sex	25. Amount of information available
3. Cognitive style/Intuitive	21. Handedness	
4. Experience	22. Brain hemispheres	
5. Introversion/Extraversion	23. Ethnicity	
6. Creativity		
7. Innovation		
8. Carelessness with facts/details		
9. Cooperativeness		
10. Impulsivity		
11. Flexibility		
12. Interest in arts/aesthetics		
13. Music		
14. Adventure [seeking]		
15. Unconventional[ity]		
16. Ability to visualize		
17. Imagery		
18. Emotions		

Rationale 1. Variables from the *social/acquired* cluster appear to be culturally-based, and can be developed or learned. According to the intuition literature, these characteristics are more common or pronounced among highly intuitive individuals. *Biological* cluster variables are largely fixed, predetermined traits posited to be indicative of greater or lesser intuitive ability, though their predictiveness may not be empirically supported. For instance, though conventional wisdom presumes that women are more intuitive than men, no study findings to date support this view (Valentine, 1929; Metzner,

1980; Fallik and Eliot, 1985). The *situational* cluster includes variables related to external factors typically outside the individual's direct or immediate control. These variables are not directly related to intrinsic intuitive ability; they are extrinsic conditions hypothesized to be either more conducive or less conducive to intuitive functioning.

Hypothesis 2. The intuitive functions as measured by the DOI and represented as the social/acquired, biological, and situational factor, or cluster, scores will relate to the dependent HBDI® quadrant scores, with relative weights conforming to the whole-brain view of intuition as a function of all quadrants of the brain.

Table 1.2 lists the primary characteristics of brain functioning by quadrant, as designated in Herrmann's *Whole Brain Model* (Appendix D).

Table 1.2: Brain Characteristics by Quadrant (HBDI®)

A Quadrant (Left Cerebral)	**B Quadrant (Left Limbic)**	**C Quadrant (Right Limbic)**	**D Quadrant (Right Cerebral)**
Logical	Organized	Interpersonal	Holistic
Analytical	Sequential	Feeling-Based	Intuitive
Fact-Based	Planned	Kinesthetic	Integrative
Quantitative	Detailed	Emotional	Synthesizing

Rationale 2. The 25 variables examined in this project were selected primarily because they are also related to brain dominance as measured by the HBDI®. Based on the work of Sperry, Herrmann, and other brain researchers, some of the 25 variables have been found to be associated with right (vs. left) brain hemisphere functioning, or vice versa; while others are more closely aligned with cerebral (vs. limbic) functioning, or vice versa. As indicated in his *Whole Brain Model*, Herrmann aligned the brain quadrants with the brain hemispheres, or modes, as follows: A=left cerebral; B=left limbic; C=right limbic; D=right cerebral.

The DOI measured the relative level and degree of each variable for each participant, as well as the individual's characteristic use of intuition by type (Goldberg, 1983, pp. 46-61). The HBDI® provided a numeric score showing the participants' relative preference for each of the functional areas, or quadrants, of the brain. It was theorized that analyzing data from the DOI and the HBDI® instruments would enable a better understanding of the relationship between intuitive functioning and brain dominance as measured by the HBDI®, supporting the construct validity of the DOI.

Hypothesis 3. Intuitive factor scores as measured by the DOI will relate to the dependent HBDI® left/right and cerebral/limbic modal percent scores, showing relative weights between and among the variates conforming to a whole-brain view of intuition.

Table 1.3 lists the primary characteristics of brain functioning by hemisphere, as designated in Herrmann's *Whole Brain Model*. The hemispheres are comprised of two contiguous brain quadrants: A/B=left-brain, C/D=right-brain, A/D=cerebral, and B/C=limbic. The HBDI®'s modal percents are outcome scores indicating the individual's relative preference for each of these quadrant pairs; and the dichotomous modal percents always equal 100. For instance, if the left-brain modal percent score is 40%, the right will be 60%. If the cerebral percent is 78%, the limbic will be 22%.

Table 1.3: Brain Characteristics by Hemisphere (HBDI®)

Left-Brain: A/B Quadrants	**Right-Brain: C/D Quadrants**	**Cerebral: A/D Quadrants**	**Limbic: B/C Quadrants**
Concrete	Abstract	Logical	Organized
Literal	Symbolic	Analytical	Sequential
Rational	Visual	Factual	Planning
Verbal	Spatial	Measurement-oriented	Detail-oriented
Logical	Synthesizing	Holistic	Interpersonal
Articulate	Artistic	Intuitive	Social
Sequential	Inductive	Integrative	Kinesthetic
Detailed	Global	Synthesizing	Emotional

Rationale 3. Dichotomizing intuition as a right-brained vs. left-brained or cerebral vs. limbic functionality oversimplifies a highly complex faculty. It is generally accepted that intuition is accessed through receptors associated with the right-brain hemisphere (e.g., imagery, visions, dreams, metaphors, etc.) (Vaughan, 1979, p. 87; Goldberg, 1983, p. 116). Information derived in this way is typically symbolic, imagistic, or multi-layered in nature; so the left-brain hemisphere is required for processing (i.e., translation, interpretation, decoding) in order to make the information meaningful and useful to the intuiter (Myers, 2002, p. 20). It was theorized that comparing intuitive capabilities and relative left vs. right, cerebral vs. limbic modal preferences would provide information about the relationship between intuitive functioning and brain dominance as measured by the HBDI®, supporting the construct validity of the DOI.

Hypothesis 4. A strong positive correlation exists between intuition as measured by the DOI and the PSI's three intuitive mode subscale scores; and a corresponding negative correlation exists between intuition as measured by the DOI and the PSI's three rational mode subscale scores.

Table 1.4 lists the six dichotomous and bi-polar subscales of the *rational***,** as well as the dichotomous, bi-polar *intuitive* modes measured by the PSI, as shown in the *Sample PSI Profile* (Appendix G).

Table 1.4: Rational vs. Intuitive Modes and Subscales (PSI)

Rational Mode	**Intuitive Mode**
Planning—way of preparing for the future Analysis—way of solving problems Control—way of approaching work	Vision—way of preparing for the future Insight—way of solving problems Sharing—way of approaching work

Rationale 4. The PSI is a validated measure of the rational vs. intuitive modes (Taggart and Valenzi, 1990). The PSI provides modal percent scores for the three rational modes—planning, analysis and control, and the three intuitive modes—vision, insight and sharing, as shown in Table 1.4 above. The rational and intuitive modes, as measured by the PSI, are dichotomous and bipolar; so items loading on one end of the factor are negatively related to items on the other end (Taggart and Valenzi, 1990, p. 360). It was anticipated that statistical analysis of intuition as measured by the DOI and PSI percent scores would show a positive correlation with the PSI's three intuition scores, as well as a negative correlation with its three rational scores, supporting the criterion validity of the DOI.

Limitations of the Study

The lack of a validated instrument to measure the aspects of intuition of interest to this project is a major limitation to this study, because it prevents the kind of direct construct validation typical of studies like this one. It should be noted that numerous instruments have been developed to measure discrete cognitive, affective or behavioral aspects of intuition. In his dissertation on the use of intuition in organizational decision-making, Fields (2001) identified 12 instruments purporting to measure intuition:

1. Test Your Management Style, The AIM Survey (Agor, 1989a);
2. Cappon Intuition Profile (CIP); Intuition Quotient 2 (IQ2), (Cappon, 1994);
3. PSI Game, (Dean, Mihalasky, Ostrander and Schroeder, 1974);
4. Intuitive Quotient Checklist, (Emery, 1994);
5. Are You Intuitive, (Goldberg, 1983);
6. Herrmann Brain Dominance Instrument® (HBDI®), (Herrmann, 1989);
7. The Keirsey Temperament Sorter (KBTS), (Keirsey-Bates, 1984);
8. Myers-Briggs Type Indicator (MBTI), (Myers, 1983);
9. Questionnaire, (Parikh, 1994);
10. Personal Style Inventory (PSI) (Taggart and Taggart-Hausladen, 1993);
11. Problem Solving, (Westcott, 1961); and
12. I-Opt Survey, (Salton, 1994).

Among these, the HBDI® and PSI were deemed most appropriate for this project, since other instruments are not well-known, not widely used, not readily available, or not yet validated. Others among the 12 instruments listed measure unrelated aspects of intuition, are too limited to inform this study; or were designed for irrelevant applications like business decision-making, management style, personality type, information-processing, research and development, etc. Instruments considered but rejected include Agor's AIM survey, Westcott's TIA (Test of Intuitive Ability), Goldberg's Are You Intuitive? survey, Cappon's CIP and IQ2, the MBTI, and the KBTS. The rationale for rejecting each of these instruments will be discussed in detail in Chapter 3.

Delimitations of the Study

The primary delimiter for this investigation was the selection of 25 intuition-related variables from the original list of 57 identified by Shirley and Langan-Fox (1996). The 25 variables were selected primarily because they are also measured by items on the HBDI® and PSI instruments. Multiple variables were selected from each of the three clusters to enable measurement within each category.

Another delimiter was the criteria for participation. To maximize heterogeneity in the population and variability in the data, the only criteria were age (18 years or older), and education (high school diploma, equivalent or above). The age criterion was based on the project's interest in adult learners, and the fact that the HBDI® has not been validated for individuals younger than 18. The education criterion was intended to ensure that participants have the maturity and experience, as well as the minimal language, comprehension and conceptualization skills needed to understand the instrument items.

Organization of the Study

Chapter 1 introduces the topic; explores the background and significance of the study; states the research questions, assumptions, hypotheses and rationales; presents the study's limitations and delimitations; and provides operational definitions for the constructs and terms. Chapter 2 examines an array of definitions and conceptualizations of intuition; reviews the theoretical and empirical literature related to intuition and brain dominance; and outlines the implications of the literature for this project. Chapter 3 describes the study's research design, methodology, instrumentation, population, and data collection and analysis procedures. In addition, it discusses the conduct and outcomes of the pilot studies, and outlines the plan for conduct of the main study. Chapter 4 presents and discusses the outcomes of the data analyses performed for the main study. Findings and conclusions from the main study, and their implications are presented in Chapter 5, along with the researcher's observations and recommendations for subsequent studies.

Conclusion

Agyakwa referred to intuition as "the other way of knowing" (1988, p. 169). Perhaps because it is so elusive, intuition has been largely ignored or dismissed in traditional Western education. Still, many theorists, researchers and practitioners believe intuition is an indispensable complement to deduction/induction as a tool for learners. Before it is possible to determine how adult learners can utilize this tool, however, it is necessary to arrive at a better understanding of what intuition is and how it works.

This project was designed for first-round validation of the researcher-developed DOI instrument (Appendix A), which measures a set of 25 personal characteristics purported to be related to intuition. DOI data was correlated with: 1) brain dominance, as

measured by the HBDI® (Appendix C), a validated thinking styles assessment; and 2) the intuitive mode, as measured by the PSI (Appendix F), a validated measure of preference for the rational vs. intuitive way of doing things.

The project utilized confirmatory factor analysis (CFA) to determine if the 25 intuition-related variables fit into the social/acquired, biological and situational clusters to which they were assigned by Shirley and Langan-Fox (Hypothesis 1). Canonical Correlation Analysis (CCA) and Regression Analysis (RA) were utilized to determine the relationships among the intuitive functions as measured by the DOI, and the quadrant and hemisphere (i.e., modal percent) scores produced by the HBDI® (Hypotheses 2 and 3). Correlation analysis (CA) was utilized to examine the relationship between intuition as measured by the DOI; and the PSI's six rational vs. intuitive subscales (Hypothesis 4). "Operational Definitions" for terms used in the project are provided in Table 1.5 below.

Intuition will tell the thinking mind where to look next. – Jonas Salk

Table 1.5: Operational Definition of Terms

Term	Definition	Measurement
Ability to visualize	faculty enabling realization of a visual image of a concept, function, or procedure; useful in the teaching and learning process; common characteristic of the intuitive individual	level or capacity measured by response(s) on the DOI, HBDI® and/or PSI
Adult learner	individuals 18 or older, with a high school diploma or equivalent, engaged in formal or informal learning	self-reported on DOI and HBDI®
Adventure [seeking]	active interest in pursuing new experiences, a predictive factor in intuition scores on the MBTI and a common characteristic of the intuitive individual	level measured by response(s) on the DOI, HBDI® and/or PSI
Auditory (reception of intuition)	inner hearing as a receptor for intuitive information or insights; may include mentally "hearing" voices, words, phrases, conversations or dialogues, songs, poems, etc.	frequency of use measured by response(s) on the DOI
Brain dominance	preference for or avoidance of each of the quadrants of the brain (left, right, cerebral and limbic); deals with the way humans utilize lateralized brain structures	degree measured by the HBDI® profile (quadrant and modal percent) scores.
Carelessness with facts and details	non-dependence on facts and details for decision-making, problem-solving, idea-generation, etc.; common characteristic of the intuitive individual	level measured by response(s) on the DOI, HBDI® and/or PSI
Cerebral	analytical and/or global brain functioning; mode of thinking that prefers logic, analysis, facts, and measurement and/or the holistic, intuition, integration, and synthesis	degree measured by the HBDI® A and D quadrant profile and cerebral modal score.
Cognitive style/ Analytic	pattern of thinking or knowing characterized by reliance on logic, reason, evidence, facts, sensory data, etc.	degree measured by response(s) on the DOI and HBDI®
Cognitive style/ Intuitive	pattern of thinking or knowing characterized by reliance on insight, images, hunches, awareness, gut feelings, pattern recognition, etc	degree measured by response(s) on the DOI and HBDI®

Table 1.5: Operational Definition of Terms (continued)

Term	Definition	Measurement
Cooperation	the act or practice of working with others to accomplish a common goal or mission; common characteristic of the intuitive individual	level measured by response(s) on the DOI, HBDI® and/or PSI
Creativity	faculty enabling one to create; characterized by imagination, innovation, inspiration, etc., allowing one to discover or generate new and imaginative ways of doing things; typified by the ability to conceive an array of innovative alternatives, options or solutions; common characteristic of the intuitive individual	level measured by response(s) on the DOI, HBDI® and/or PSI
Creativity intuition	One of Goldberg's six types of intuition; characterized by imagination or a flow of unusual but sound ideas; typically supplies a quantity of apt alternatives, options or possibilities; often utilized for problem-solving, decision-making, invention and innovation	frequency of use measured by response(s) on the DOI, HBDI® and/or PSI
Deduction	reasoning from the general to the particular, in which the conclusion follows necessarily from given premises	level measured by response(s) on the DOI, HBDI® and/or PSI
Discovery intuition	one of Goldberg's six types of intuition; often linked to sudden creative breakthroughs, right answers to specific problems, or insights into the true nature of a problem; typically supplies the one correct answer/best solution; often appears with sudden awareness but may be result of ideas which evolved over time; transcends logic; lies outside conscious awareness but with thought, may be traceable to its origin	frequency of use measured by response(s) on the DOI, HBDI® and/or PSI
Emotion[al]	having feelings that are easily stirred and readily expressed; common characteristic of the intuitive individual	level measured by response(s) on the DOI, HBDI® and/or PSI
Extraversion	in Jungian theory, a mode of psychological orientation characterized by the flow of energy outward, with a preferred focus on people and things external to oneself	degree measured by response(s) on the DOI, HBDI® and/or PSI

Table 1.5: Operational Definition of Terms (continued)

Term	Definition	Measurement
Evaluation intuition	one of Goldberg's six types of intuition; characterized by ability to discern with certainty, even with insufficient data, facts, or knowledge; often guides rational decision-making by narrowing the number of alternatives or strengthening the sense of the best among a number of possibilities; particularly useful where there is insufficient data for rational analysis	frequency of use measured by response(s) on the DOI, HBDI® and/or PSI
Feeling (reception of intuition)	inner emotion as a receptor for intuitive information or insights; may include unexpected emotions, gut feelings, energy "vibrations" and/or bodily sensations like "butterflies," nausea, abdominal pain, etc.	frequency of use measured by response(s) on the DOI, HBDI® and/or PSI
Flexibility	ease with which an individual changes or a system changes; common characteristic of the intuitive individual	level measured by response(s) on the DOI, HBDI® and/or PSI
Hemispheri-city	preference for or avoidance of one or the other of the lateralized hemispheres of the brain (left vs. right or cerebral vs. limbic	degree measured by the HBDI® modal scores.
Illumination intuition	one of Goldberg's six types of intuition; characterized by mystical "knowing" or awareness bypassing/transcending the ego and sensory experience; highest form of knowing, denoted by lack of separation between subject and object; unaccompanied by sensation, perception or conscious thought; limitless, formless, boundless form of pure consciousness; transformative; opens intuitive channels to other "knowing"	frequency of use measured by response(s) on the DOI, HBDI® and/or PSI
Imagery	flashes of insight, mental pictures, symbols, dreams/daydreams, visions, etc., accessed for intuitive information	level of reliance measured by response(s) on the DOI, HBDI® and/or PSI
Impulsivity	tendency to act before thinking; related to novelty and sensation-seeking; common characteristic of the intuitive individual	level measured by response(s) on the DOI, HBDI® and/or PSI

Table 1.5: Operational Definition of Terms (continued)

Term	Definition	Measurement
Induction	the drawing of a general conclusion from a number of known facts; observing many instances of a phenomenon and drawing conclusions about it	level measured by response(s) on the DOI, HBDI® and/or PSI
Innovation	faculty enabling introduction of new or novel ideas, methods, or devices	level measured by response(s) on the HBDI® and DOI
Insight	imaginative power to see into problems and immediately comprehend solutions; knowledge gained by this means; common characteristic of the intuitive individual; immediate knowledge, often unusually perceptive or discerning and particularly useful in a given application	level measured by response(s) on the DOI, HBDI® and/or PSI
Interest in arts and aesthetics	attention to or preference for the arts and aesthetics; linked to artistic expression; common characteristic of the intuitive individual	level measured by response(s) on the DOI, HBDI® and/or PSI
Introversion	in Jungian theory, a mode of psychological orientation characterized by the flow of energy inward, with a preferred focus on the internal world of emotions and ideas	degree measured by response(s) on the DOI, HBDI® and/or PSI
Intuition	faculty enabling one to know directly, without reference to conscious, rational processes; direct, immediate apprehension of facts, truths, etc., independent of reasoning and often accompanied by a sense of indisputability and certainty without proof	level measured by response(s) on the DOI, HBDI® and/or PSI
Intuitive functioning	the manner in which intuition is exercised or applied in a given situation	type or degree measured by response(s) on the DOI, HBDI® and/or PSI
Knowing	acquiring and using knowledge; typically accomplished through one or more modes (factual, intuitive, visual, verbal, kinesthetic, emotional, sequential, etc.)	level measured by response(s) on the DOI, HBDI® and/or PSI

Table 1.5: Operational Definition of Terms (continued)

Term	Definition	Measurement
Learning	act or process by which behavioral change, knowledge, skills, and attitudes are acquired; result of observation, study, experience or instruction, with or without conscious plan or direction; acquisition and mastery of what is already known, the extension and clarification of meaning of one's experience, or an organized, intentional process of testing ideas relevant to problems; adaptation of the innate potential to lived experience	academic aptitude(s) and/or preferred mode of learning measured response(s) on the DOI, HBDI® and/or PSI
Left-brained	analytical and/or implementation brain functioning; mode of thinking that is characteristically concrete, literal, rational, verbal, logical, articulate, sequential, detailed	degree measured by the HBDI® A and B quadrant profile and left-brain modal score
Limbic	implementation and/or social brain functioning; mode of thinking that prefers organization, sequence, planning, and detail and/or the interpersonal, social, kinesthetic, and emotional	degree measured by the HBDI® B and C quadrant profile and limbic modal score
Music[al]	having an interest in, appreciation of, or talent for music; common characteristic of the intuitive individual	level measured by response(s) on the DOI and HBDI®
Operation intuition	one of Goldberg's six types of intuition; characterized by a magnetic, overpowering certainty alerting one when something should/ should not be done; often experienced as a sense something is about to happen; strong force, providing guidance, or prompting without explanation, and moving one in a direction or providing an undeniable sense of calling or mission	frequency of use measured by response(s) on the DOI, HBDI® and/or PSI
Pattern recognition	act or process of making connections between two or more seemingly unrelated bits of information; may be a component of intuitive abilities, especially if exceptionally rapid; common characteristic of the intuitive individual	level measured by frequency measured by response(s) on the DOI, HBDI® and/or PSI

Table 1.5: Operational Definition of Terms (continued)

Term	Definition	Measurement
Prediction intuition	one of Goldberg's six types of intuition; characterized by a specific but unprovable premonition something is going to happen; generally provides precognitive knowing about an outcome; explicit or implicit, positive or negative; may involve hunches or warnings	level or degree of use/reliance measured by response(s) on the DOI, HBDI® and/or PSI
Prior experience	foundation of knowledge, skills or abilities gained from participation in past events/activities which is consciously or unconsciously retained for use in future applications; may form one of the bases of and/or play a role in pattern recognition	level or degree of use/reliance measured by response(s) on the DOI, HBDI® and/or PSI
Prior knowledge	foundation of information or understanding gained throughout life, which is consciously or unconsciously retained and available for future applications; may form one of the bases of and/or play a role in pattern recognition	response(s) on the DOI, HBDI® and/or PSI
Rapid inference	process of deriving information in a manner that appears to be sudden and whole but may unconsciously rely on sensory data and/or prior knowledge and experience; may be a form of extraordinarily quick pattern recognition	use measured by response(s) on the DOI, HBDI® and/or PSI
Reason	faculty by which one can think/act logically or understand, draw inferences or analyze	level measured by response(s) on the DOI, HBDI® and/or PSI
Revelation	sudden awareness which brings a shock of surprise, as with something divinely revealed; typically profound insights characterized by little or no reliance on sensory data and prior knowledge and experience	use measured by response(s) on the DOI, HBDI® and/or PSI
Right-brained	social and/or global brain functioning; mode of thinking that is characteristically abstract, symbolic, visual, spatial, synthesizing; artistic, inductive, and global	degree measured by the HBDI® C and D quadrant profile and right-brain modal score

Table 1.5: Operational Definition of Terms (continued)

Term	Definition	Measurement
Sensing (reception of intuition)	inner awareness as a receptor for intuitive information or insights; may include hunches, impressions, precognition, déjà vu; reading energy or light changes, sudden insights, knowing without external stimulus or rational support, etc.	frequency of use measured by response(s) on the DOI, HBDI® and/or PSI
Sensory data	data received by or accessed through one of the five physical senses and transmitted to the brain for processing; data received through nerve impulses carried from the sensory organs to the central nervous system; may form one of the bases of and/or play a role in pattern recognition	degree of reliance measured by response(s) on the DOI, HBDI® and/or PSI
Time of day	segment(s) during a given 24-hour period when one is more energized, receptive and/or intuitive	level of influence measured by response(s) on the DOI, HBDI® and/or PSI
Unconven-tional[ity]	unusual; not conforming to norms or accepted standards, rules, etc; common characteristic of the intuitive individual	level measured by response(s) on the DOI, HBDI® and/or PSI
Visual (reception of intuition)	inner vision as a receptor for intuitive information or insight; may include "flashes" of insight and/or pictures, images, symbols, shapes, mental "maps," drawings, colors, precognitions, night/day dreams, visions, etc.	frequency of use measured by response(s) on the DOI, HBDI® and/or PSI
Whole-brained	brain functioning characterized by the use/synthesis of and fluctuation between the left, right, cerebral, and limbic quadrants of the brain	measured by quadrant (A, B, C, and D) profile scores and hemisphere (left vs. right, cerebral vs. limbic) modal percentage scores

Chapter 2

Those who guess well are called intuitive; those who are intuitive, however, don't think they are guessing. – Philip Goldberg

LITERATURE REVIEW

Definition of Intuition

Postulations about the source and nature of intuition vary widely, even among purported experts, and descriptions of intuition tend to be theoretical, hypothetical or anecdotal. To capture the essence of this elusive faculty, philosophers, theorists and practitioners through the ages have employed an array of compelling euphemisms. In the Second Speech of Socrates, for instance, Plato recognized the existence of intuition, which he characterized as "divine madness" (Phaedrus 6 [243e-246a]). Other curious euphemisms for intuition, or aspects of the intuitive faculty, have included:

- wise ignorance (St. Thomas Aquinas and Nicolas of Cusa, as on http://www.intuition.org/sorokin.htm, September 17, 2005);
- feminine instinct—in contrast to feminine logic (Valentine, 1929, pp. 16-17);
- unreason (Stocks, 1939, p. 55);
- consciousness extended (Bergson, 1946, p. 32);
- uncertainty geared (Brunswik, 1956, p. 89);
- training of hunches (Bruner, 1961, p. 13); inarticulate genius—in contrast to articulate idiocy (1960, p. 55), knowing with the left hand (1962, p. 2); combinational playfulness (p. 102);
- understanding at an unfamiliar and significant angle (Koestler, 1964, p. 108); short circuits of reasoning (p. 211);
- taking of intuitive leaps (Westcott and Ranzoni, 1963, p. 595);
- learning without awareness (Westcott, 1968, p. 84);

- antidote of logic (Poincare', 1969, p. 209);
- heroic stuff (Ferguson, 1980, p. 295);
- perceiving across the threshold (Richards, 1981, p. 55);
- knowing from within (Harman and Rheingold, 1984, p. 7), highest common factor (p. 150); perennial wisdom (Harman, 1988, p. 84); authentic conscience (p. 88);
- highest octave (spiritual illumination) (Feuerstein, 1997, p. 102);
- body knowledge (Goldberger, 1996, p. 355);
- the zombie within (Milner, 2000, presentation to the Royal Society of Edinburgh);
- unbidden truth (Myers, 2002, p. 3); thinking lite (p. 29);
- thinking around corners (as on http://www.rps.net, July 17, 2003);
- blink[ing]; thinking without thinking (Gladwell, 2005, title); adaptive unconscious (p. 11);
- indubitable Given (from C. I. Lewis' epistemology course, Harvard, 1950, as cited by Dreyfus, 2006);
- knowledge by fusion (Nicholson, 2004, as on http://www.theosophical.org/theosophy/questmagazine/marapr04/nicholson/index.html, April 8, 2006);
- shortcuts our brains take (W. James, personal communication April 2008).

With so many singular conceptions of intuition, it is not surprising that no commonly accepted definition has been found. It is even less surprising that no adequate measure has been devised to date.

Pythagoras' sacrifice of a thousand oxen to Apollo in gratitude for receiving his theorem was prompted by the ancient Greeks' belief that intuition was a gift of the gods, emanating directly from heaven. Conceptions of intuition since Pythagoras' time have

run the gamut from mere curiosity to essential faculty, from simple guessing ability to compelling spiritual phenomenon, from occult ability to mystical gift, and from rapid inference to divine revelation.

The word *intuition* itself is derived from the Latin word *intueri*—to look upon; to see within; to consider or contemplate. The *New Webster's Dictionary and Thesaurus of the English Language* (1993) defines intuition as: 1) a perception or view; 2) immediate apprehension of truth, or supposed truth, in the absence of conscious rational processes. The *Random House Webster's College Dictionary* (1997) denotes intuition as: 1) direct perception of truth, fact, etc., independent of…reasoning; immediate apprehension; 2) a fact, truth, etc., perceived in this way; or 3) a keen and quick insight.

The *Encarta Encyclopedia* (2008) defines intuition in the philosophical context as "a form of knowledge or cognition independent of experience or reason." The two commonly recognized philosophical bases of intuition are that of: 1) a mathematical axiom—a self-evident proposition requiring no proof; and 2) a mystical revelation—truth surpassing the power of the intellect. Intuition exists, axiomatically—though this view is itself paradoxical, since the ability to perceive axiomatic truth depends on intuition in some form. That is, intuition itself is required for one to recognize an "axiom" or to experience a "revelation." As an unknown wit once declared: "Intuition is the only way for an intuitive intuiter to intuit."

In keeping with the Cartesian and Kantian concept that intuition is innate to human consciousness, many philosophers, theorists and practitioners have come to believe that intuition provides a means—perhaps the *only* means—of accessing or utilizing certain kinds of knowledge (Ayer, 1956, p. 149; Russell, 1959, p. 109;

Westcott, 1968, p. 16; Vaughan, 1979, p. 149; Sloan, 1983, p. 130; Goldberg, 1983, p. 57; Salk, 1983, p. 79; Agor, 1989b, p. 20; Mott, 1994, p. 138). Bergson's *Classical Intuitionism* conceived of intuition as a "special way of attaining special knowledge" (as in Westcott, 1968, p. 6). The *Contemporary Intuitionism* of Ewing, Stocks and Bahm posited that certain kinds of knowledge are "neither demonstrative nor empirical, but nonetheless true" (p. 7). By contrast, Bunge's *Inferential Intuitionism* held that "nothing can be known through intuition, and direct apprehension of truth is nothing more than 'rapid inference'" (p. 7).

The contrasts articulated in these views are reflected in the widely varying conceptualizations among contemporary theorists and practitioners, for whom intuition is incongruently viewed as:

1. "the act of grasping the meaning or significance or structure of a problem without explicit reliance upon the analytic apparatus of one's craft" (Bruner, 1962, p. 102);

2. "the ability to…[reach] a conclusion on the basis of less explicit information than is ordinarily required" (Westcott, 1968, p. 97);

3. "a way of knowing; a psychological function, like sensation, feeling and thinking" (Vaughan, 1979, p. 3);

4. "a preliminary perception of coherence (pattern, meaning, structure) that is at first not consciously represented, but which nevertheless guides thought and inquiry toward a hunch or hypothesis about the nature of the coherence in question" (Bowers, Regehr, Balthazard and Parker, 1990, p. 74);

5. "an awareness network that gathers and processes information that is nonverbal and…not part of the conscious awareness" (p. 5); and "direct and immediate understanding, often manifested through sensory representation, but independent of apparent reasoning and without one's conscious attention" (Mott, 1994, p. 11); and

6. "knowing things without knowing *how* we know them" (Myers, 2002, p. 17).

Intuition enables one to know directly, without reference to conscious, rational processes. It is a direct, immediate apprehension independent of reasoning, often accompanied by a sense of indisputability and certainty without proof. For this project, intuition was operationalized in terms of outcomes on the three instruments utilized for the study: the DOI, HBDI® and PSI.

Foundations of Intuition

Theoretical Foundations

In her doctoral dissertation, Mott (1994) provided a useful matrix of the theoretical and historical foundations of intuition (Appendix H) including progressive conceptualizations through the ages:

- *Pre-history*—Mysticism viewed intuition as a "direct perception of existence, reality and understanding." In Hinduism, intuition was a "multi-operational, disciplined spiritual act, part of universal consciousness."

- *500-300 B.C.*—In philosophy, Socrates, Plato and Aristotle taught that intuition was the "sensory means through which universal truths are directly perceived."

- *4th-13th Century*—St. Augustine and St. Thomas Aquinas saw intuition as a non-rational means for accessing divine knowledge or inspiration.

- *17th-18th Century*—Descartes (17th Century) perceived intuition to be a form of "direct reasoning without doubt or question"; whereas Kant (18th Century) defined it as "knowing through sensory yet non-rational means" and Russell viewed it as "*a priori* understanding through which all other knowledge is derived."

- *20th Century*—Husserl believed intuition to be the "source of primordial, experiential knowing." With the emergence of psychology, Jung came to view intuition as the "extrasensory and unconscious transmission of perception," one of the four orienting functions of consciousness. Bergson and Bruner considered intuition a "noetic, personal…conscious understanding through which holistic knowing is derived." Contemporary neuro-physiological explanations of intuition include those of Clark, Herrmann, and Restak, who saw it as a "distinct and creative cognitive function originating from the pre-frontal cortex in the brain" (Mott, 1994, pp. 14-28).

Despite the ostensible incongruity of attempting to "analyze intuition," a number of 20th Century theorists have attempted to organize intuition into functional types or levels. Ewing (1941) proposed three major theories of intuition: 1) the *Cartesian View*; 2) *Extreme Empiricism*; and 3) *Coherence Theory* (pp. 15-17). Ewing recognized four types of intuition required to verify deductive or inductive reasoning: 1) that presupposed in deduction; 2) that presupposed in induction; 3) that presupposed in ethics; and 4) that consisting in the apprehension of a whole as a whole (p. 9). Though Bahm (1960) believed there are as many kinds of intuition as there are things to be apprehended, he divided intuition into three sets of three types: 1) *Objective, Subjective, Organic*; 2) *Apparent, Real, Organic*; and 3) *Aesthetic, Incomplete, Organic* (pp. 3-16). Vaughan (1979) identified four levels of intuition: 1) *Physical*, associated with bodily sensations; 2) *Emotional*, associated with feelings; 3) *Mental*, associated with thinking; and 4) *Spiritual*, associated with mystical experiences; sometimes referred to as *pure intuition* or *illumination*. In Vaughan's conceptualization, all other forms of intuition are derived from the fourth level (pp. 66-80).

Sanders (1989), an MIT-trained scientist, hypothesized that intuitive information is perceived through the five physical senses and the four so-called *psychic* senses—*vision*, *hearing*, *feeling*, and *sensing*, as described below:

1. *Psychic vision* (inner vision) may include: flashes of insight; seeing pictures, images, symbols, shapes, mental maps, drawings, or colors; night dreams or daydreams, precognitions, visions, etc.

2. *Psychic hearing* (inner hearing) may include: hearing voices, words, phrases, conversations or mental dialogues, songs, poems, etc.

3. *Psychic feeling* (inner emotion) may include: "gut feelings," unexpected emotions, energy vibrations, bodily sensations like "butterflies," uneasiness, discomfort, nausea or abdominal pain.

4. *Psychic sensing* (i.e., inner awareness; also referred to as *psychic intuition*, or *psychic knowing*) may include: hunches; impressions; precognition; déjà vu experiences; "reading" changes in energy or light; sudden insights; knowing without external stimulus, rational support or evidence (pp 12, 20-24).

These four senses are receptors for intuitive information. Each sense is associated with a "psychic reception area," a location on or around the body, serving as a "natural antenna" to pick up and amplify intuitive signals (p. 17). Each sense carries unique advantages, disadvantages, strengths and weaknesses; and receptiveness for any can be developed and honed through focus and practice.

Other intuition theorists have attempted to differentiate among the varying applications of intuition. Wild (1938) devised 31 categories of intuition, which he later reduced to four essential ideas: 1) knowing; 2) immediacy; 3) inexplicableness; and 4) truth (pp. 211-219). Bastick (1982) found 20 common properties of insight and intuition, including suddenness; pre-consciousness; contrast with reasoning, logic and analysis; association with creativity; and subjective certainty (Table 1.3/1, p. 25). More recently, Mishlove (1996) differentiated among 17 groups of intuition: 1) a personality trait; 2) mental imagery; 3) common sense and social conditioning; 4) subliminal computation; 5) empathy; 6) intuitive software; 7) being in the flow, perfect timing, effortless humor, joy, grace; 8) extrasensory perception, clairvoyance, precognition, telepathy, etc.; 9) instinct; 10) pattern recognition; 11) understanding language; 12) apprehension of first principles; 13) grasping mathematical relations; 14) connection with one's essence, destiny, purpose, inner self; 15) mystical identification with the external world; 16) divine inspiration; and 17) intuitive balancing act (pp. 8-14). More details about each of the categorizations of intuition discussed above are provided in Appendix I.

One of the most clearly delineated descriptions of intuition was provided by Goldberg (1983), who recognized six discrete types:

1. *Discovery*—typified by logic-transcending connections outside conscious awareness;

2. *Creativity*—typified by imagination or a flow of unusual but sound ideas;

3. *Evaluation*—typified by the ability to discern with certainty without sufficient data, facts, or knowledge;

4. *Operation*—typified by a magnetic, overpowering certainty alerting one that a given thing should or should not be done;

5. *Prediction*—typified by premonitions that are specific in nature though inherently unprovable; and

6. *Illumination*—typified by a mystical "knowing," or awareness, that bypasses and transcends all sensory experience (pp. 46-61).

Goldberg distinguished between intuition—which helps people to read their own minds, and the extrasensory faculties (e.g., mental telepathy, clairvoyance, clairaudience, thought transfer, and precognition)—which help people to read others' minds, extend the range of the five senses; and provide foundational information for intuition (p. 40).

In an email to the researcher, Goldberg noted that all models of intuition carry the danger of being "too neat and clean…underplay[ing] the messy complexities"— meaning those undefined or ill-defined correlations among the many types of intuition and their varying functionalities. He also emphasized the difficulties of defining the sixth type—illumination—which "exists in the universal…realm…transcends the information stored in the collective unconscious…and [deals with] apprehending deep truths about the nature of existence and the Self" (personal communication, September 2005).

Empirical Foundations

Most attempts to measure intuition over the past four decades have proved inadequate, or inconclusive at best. In his seminal empirical study of intuition, Westcott (1968) linked intuition to "social perception, subliminal stimulation, concept formation, incidental learning, learning without awareness, and autonomic factors in problem-solving" (p. 9). His ground-breaking research dealt with intuition as an inferential tool, operationalizing intuition in behavioral terms as “the ability to [reach] a conclusion on the basis of less explicit information than is ordinarily required" (p. 97). Recognizing differing degrees of intuitiveness, Westcott believed either the quantity or explicitness of intuitive information could be “impoverished" (p. 98). He also believed mediating processes were sometimes needed to verify intuitive conclusions.

To understand how individuals "reach accurate conclusions via inexplicit steps" (p. 99), Westcott built a profile of personal characteristics common in highly intuitive individuals. He determined that they:

- are comfortable with their unconventionality
- are deeply involved emotionally in what they are doing
- are unworried about fluctuations of affect in their experiences
- are unafraid of themselves, their experiences, or their world
- accept challenge readily and eagerly
- live easily with doubt and uncertainty
- enjoy risk and seek instability
- commit themselves to causes and become absorbed in them
- are captured by abstract issues

- are willing and able to create, to commit themselves to paper, to be criticized, and to expose themselves
- take chances both willingly and eagerly
- change profoundly and accept influence from others for their own development
- assess themselves as others assess them
- are alert, independent, foresighted, confident, and spontaneous (Westcott and Ranzoni, 1963, p. 610).

The late Daniel Cappon, another eminent intuition researcher, spent nearly two decades investigating the psychometric aspects of intuitive and creative intelligence. He studied the work of Nobel Laureates Alexander Fleming, Linus Pauling, Albert Szent Gyorgyi, Lord Adrian, and Jonas Salk, some of whom he also interviewed. All of these Nobelists acknowledged their work was aided by intuition. As one stated: "Of course, we have hunches. We know the answer before we work it out" (Cappon, 1993c, p. 44).

Cappon viewed intuition as an outgrowth of all the "processed ancestral instincts of the species" (1993c, p. 42). By implication, everyone has access to intuition. Cappon believed Jung erred in relegating intuition to a mere aspect of personality type. Though certain aspects of personality (e.g., rigidity vs. openness) influence intuition, no empirical evidence confirms one personality type favors intuition more than another (1993c, p. 42).

Cappon posited that intuition ruled everyday life during millions of years of evolution before humans developed the capacity for speech. During preverbal history, defensive reflexes clustered into instincts, which became nascent intelligence, or intuition. As pre-logical memory, intuitive information was transformed into "economical iconic imagery stored in the vaults of the transpersonal or collective unconscious" (1994,

p. 36). Because it was processed in the deep unconscious, intuition could not always be traced to its origin, though it could be trained and expanded.

With the advent of speech, intuition was replaced by "logical, rational thinking, analysis…science and so-called civilization" (1994, p. 40). When the two types of intelligence—pre-verbal unconscious intuition and verbal rational thinking—merged, the rational became dominant, leading to *techno-intelligence*, derived from speech and other faculties allowing the transfer of information (p. 40). Techno-intelligence was "stimulated by the evolution of the human eye, the prehensile hand, and the…ten billion-celled…neocortex" (Cappon, 1993b, http://www.winstonbrill.com/bril001/html/article_index/articles/1-50/article26_body.html).

Cappon hypothesized two parallel systems for accessing intuition. The *fast track* system is built on instincts and distilled as intuition. This type of intuition is typically experienced as a life-saving flash (Cappon, 1993c, p. 42l; 1994. p. 36). By contrast, the *slow track* system is built on the collective unconscious, past experience and new knowledge. It is most often experienced as the answer to a previously insoluble problem (p. 36, 40).

Cappon's model also recognized four distinct parts of intuition: *anatomy*, the capacity or ability to intuit, comprised of 20 input/output skills; 2) *physiology*, the accessing variables which tap and trigger the process, making it run; 3) *process*, the silent, unconscious aspect inferred from the application of intuition and observation of the resulting action; and 4) *source*, the determinants of the individual's intuitive capacity (i.e., genetic inheritance, environmental background, personality, personal experience, and expertise (Cappon, 1993c, p. 86).

Though modern thinkers often dismiss intuition as mere myth or mystical faculty, Cappon saw it as indispensable to success in all human endeavors, and to human survival itself (1994, p. 36). Without scientific validation of a tool to measure intuition, however, he did not believe it could ever be restored to its former reputation and nobility (Cappon, 1993a, http://www.winstonbrill.com/bril001/html/article_index/ articles/1-50/article47_ body.html).

The *Cappon Intuition Profile* (CIP), developed in 1989, was a 15-page descriptive questionnaire that delineated between more-, less- and non-intuitive individuals (Cappon, 1994, p. 44). His subsequent *Intuition Quotient 2* (IQ2) instrument sorted 20 intuition anatomy characteristics hierarchically from the lower-level, latent, passive *input*, or perception, skills; to the higher-level, active *output*, or ideation, skills (p. 86).

Cappon believed any test of intuition should be totally visual, and as archetypal and primitive as possible (1994, p. 40). The IQ2 ultimately evolved into a 90-minute laser video presenting 320 pictures in four categories: inanimate objects, plants, animals, and humans. The visual nature of the test forced rapid extrapolations in order to bypass analytical thought and directly access the intuitive capacity of the examinee. Each input/ output skill and ability was assessed at four levels of difficulty. Four points were assigned for correct answers on the first try, 3 points for the second try, and so on.

Though laser disk technology offered advantages over a pen and paper instrument for testing intuition, Cappon believed virtual reality provided an even more appropriate measure. He had intended to validate his instrument and construct a "map of human intelligence" resembling the periodic table of elements (1993c, p. 94). Unfortunately, his untimely death in 2002 truncated completion and validation of the IQ2 instrument.

The IQ2 sought to measure the intuition anatomy skills and abilities that he had identified. Table 2.1 below lists and explains the 10 input and 10 output skills:

Table 2.1: Intuition Anatomy Skills and Related Abilities (Cappon)

Input Skills and Abilities	**Output Skills and Abilities**
1. *Perceptual closure on insufficient time* (quick eyes). You know what something is despite little time to see it properly. 2. *Perceptual closure on insufficient definition* (seeing through things) You can identify something you haven't seen clearly. 3. *Perceptual recognition* (finding things) You are good at finding Waldo. 4. *Perceptual discrimination* (seeing what is there). You can distinguish elements flashed before you. 5. *Negative perceptual discrimination* (seeing what is not there). You can identify what wasn't flashed before you. 6. *Cognitive synthesis, or "Gestalt" insight* (putting things together). You can see the forest through the trees. 7. *Current time flow estimation* (pretension). You can time 3-minute eggs without a clock. 8...*Retrieving of memory, "quick memory"* (quick registry and retrieval). You can take in whole scene quickly and remember details. 9. *Passive imagination* (responses to a pictureless colored background). You are good at generating images spontaneously. 10. *Psycho-osmosis* (knowing what one didn't know one knew). *You identify things you have never seen before.*	1. *Active imagination* (response to a picture or visual). You look at a cloud and many images come to mind. 2. *Anticipation, or foresight*. You can anticipate what happens next. 3. *Optimal timing of intervention*. You always know when it's the ideal time to strike. 4. *Hunch*, (seeing the problem and its solution). You're good at hunches. 5. *Choice of optimal method*. You know the best way to figure something out. 6. *Choice of optimal application* (of a discovery). You know how to apply a discovery. 7. *Hindsight* (seeing the cause of things). You divine the causes of things. 8. *Associative matching* (synthesis of cognition). You are good at detective work; you know what elements fit together. 9. *Dissociative matching*. You look at a picture and know what elements don't fit. 10. *Seeing the meaning of things* (holistic, teleological thinking skills). You see the meaning of symbols (Cappon, 1994, p. 41, 42-43; 1993a, (as on http://www.winstonbrill.com/bril001/ html/ article_index/articles/151-200/ article191_ body.html, October 25, 2008

Variables Associated with Intuition

In 1996, Shirley and Langan-Fox reviewed the theoretical and empirical literature on intuition and related concepts like tacit knowledge, insight and creativity. They attempted to define and distinguish among these constructs; hypothesized possible interrelationships; and examined various delineations of intuition, especially Vaughan's four levels and Goldberg's six types (Appendix I). Additionally, they proposed several theories to explain how intuition works, and identified 57 variables postulated to be associated with the psychological aspects of intuition (Appendix B).

Shirley and Langan-Fox divided the 57 variables into three primary clusters—social/acquired, biological and situational—though they did not explain how these designations were derived. The social/acquired cluster included personal traits that may be either innate or learned, and typically reflected in behaviors like creativity, flexibility, impulsivity, the ability to visualize, etc. The biological cluster included characteristics like sex, age, handedness, ethnicity, etc. that are generally predetermined and fixed. By contrast, the situational cluster took into account an array of external conditions generally intrinsic to the environment or activity, and beyond the individual's direct or immediate control (e.g., time of day, type of problem, presence of others, etc.) While the social/ acquired and biological clusters contain variables characteristic of *more* intuitive or *less* intuitive individuals, situational variables are related to conditions that may be *more* conducive or *less* conductive to accessing and/or using intuition.

Following the recommendation that a subset of the 57 variables be selected for subsequent testing (p. 575), this project examined 25 of the Shirley and Langan-Fox variables. The theoretical articles and empirical studies they cited, synopsized below, are

organized chronologically to show the progression of intuition research and findings. Many variables were examined in multiple studies or by multiple researchers. Many articles dealt with more than one variable, or with variables from more than one cluster. Also, a number of the empirical studies cited failed to establish a significant relationship between the examined variable(s) and intuition. For instance, despite the general belief that women are more intuitive than men, no empirical study to date has provided evidence to support this belief.

Theoretical Intuition Literature

Vaughan (1979). *Variables: Openness, Creativity, Interest in arts/aesthetics, Meditating, Imagery, Emotions, Ethnicity* — This frequently-cited seminal work deals with ways to awaken, or stimulate, intuition. Vaughan's basic steps in training the mind for optimal development of intuition are: "1) quieting the mind through physical relaxation and meditation; 2) learning to focus attention; and 3) cultivating a receptive, nonjudgmental attitude allowing intuition to come into conscious awareness without interference" (p. 34). Vaughan identified four levels of intuitive awareness—physical, emotional, mental, and spiritual (Appendix I)—and recognized an array of intuitive experiences, including:

> …discovery and invention in science, inspiration in art, creative problem-solving, perception of patterns and possibilities, extrasensory perception, clairvoyance, telepathy, precognition, retro-cognition, feelings of attraction and aversion, picking up "vibes," knowing or perceiving through the body rather than the rational mind, hunches, and premonitions (p. 57).

Vaughan defined "imagery"—including dreams, fantasies, and imagination, and aspects of memory—as "the universal language of the unconscious" (p. 87). Broadly defined, these intuitive images may be auditory, kinesthetic or olfactory, as well as

visual. As a form of *direct perception*, imagery is able to convey multiple levels of feelings or observations instantly and simultaneously. It also carries physiological effects useful for biofeedback training; for instance, visualizing warming the hands in front of a fire can raise one's actual body temperature very quickly. As Vaughan noted, research into the effects of imagery supports the view that "all mind-body processes may be voluntarily controlled" (1979, p. 87). These findings have implications for creativity, since the creative process is both nonconscious and volitional.

Significantly, Vaughan believed intuition must be valued to flourish (p. 63) and that the conscious mind (i.e., ego), anxiety, anger, and emotional upset could interfere with intuitiveness. Intuition is neither time-bound nor space-bound (p. 98), and it transcends intellect, reason, and the ordinary sensory channels (p. 111). Typically more effective for complex tasks, intuition is an essential element of problem-solving and creativity (p. 149); plays a critical role in science (p. 150); and is linked to artistic expression—not only in the images produced by the artist, but also in the artist's understanding of what is "right" or "best" in a given creative exercise (p. 152).

With Bentov, Vaughan associated all creative activity with intuition, believing that "major human achievements [involving] intuitive leaps of imagination" are accomplished through intuitive, holistic, pattern perceptions. She advocated self-awareness as a prerequisite to the awakening of intuition, and believed that intuitive capacity could be expanded through intention, time, relaxation, silence, honesty, receptivity, sensitivity, nonverbal play, trust, openness, courage, acceptance, love, nonattachment, daily practice, journal-keeping, support groups, and enjoyment (Appendix, pp. 203-205).

Simonton (1980). *Variables: Openness, Creativity, Intelligence, Tacit knowledge, Cognitive style, Interest in arts/aesthetics, Investigating, Gambling, Music, Social judgment, Attitude, Arousal, Type of problem* — Continuing his earlier work on intuition, Simonton developed a model of intuitive processes which assumed that:

1. behavior and thought can be partly viewed as conditional probabilistic associations;

2. the four probability thresholds of attention, behavior, cognition, and habituation prescribe the psychological consequences of any given association;

3. the overall probability distribution of associations provides the basis for a two-dimensional personality typology; and

4. arousal level has important relationships with both this typology and the four probability thresholds (p. 5).

Simonton noted that most of the previous empirical research on intuition dealt with problem-solving, response-learning, or concept-formation experiments that tested whether performance improves without any apparent conscious awareness. Still other studies examined intuitiveness as a personality trait or cognitive style. The goal of Simonton's research, therefore, was "to provide a theoretical perspective from which coherent research on intuition might emerge" (p. 6). He defined intuition as "behavioral adaptations to the environment which tend to be unconscious, ineffable, and essentially probabilistic in character" (p. 6). He contrasted the intuitive processes with the analytical processes, which are "definitely conscious, capable of being communicated to other human beings, and largely subject to discrete, logico-symbolic mediation" (p. 6).

Simonton further divided the mind into behavioral and cognitive components, which he saw as relatively independent psychological processes (p. 9). He associated the

four thresholds of awareness (i.e., attention, behavior, cognition, and habituation) with the four levels of psychological consequence, theorizing that the threshold level is curvilinear, "…ascending from nonconscious attention, through infra-conscious behavior, to fully conscious cognition, then descending to ultra-conscious habit" (p. 12).

Simonton's empirical propositions were:

1. Human information processing can be empirically differentiated into two levels: intuition and analysis (p. 25).

2. Verbal processes are qualitatively different in the two information-processing levels: Verbal associations below the cognition threshold are based on physical, emotional, connotative relationships among words, whereas verbal associations above the threshold are based on denotative and syntactical relationships among words (p. 26).

3. The form of knowledge acquisition curves prior to verbalization depend on the information processing mode involved: Intuition tends to yield curves of continuous and gradual improvement, whereas analysis yields curves with discrete steps (p. 28).

4. Concepts or problems are more likely to be learned or solved without conscious awareness to the extent that they are inaccessible to cognitive mediation (p. 31). Simonton offered five corollaries to this proposition.

5. Analysis is more effective at moderate arousal levels; intuition is more effective at low arousal levels (p. 37).

6. To the extent that a given problem or concept is less accessible to cognitive mediation, lower arousal levels are required for successful intuitive solution or acquisition (p. 38).

7. Problems or concepts inaccessible to cognitive mediation are more likely to be mastered by Intuitives; conversely, those accessible to cognitive mediation are more likely to be mastered by Analyticals (p. 39).

8. Problems or concepts inaccessible to cognitive mediation are more likely to be mastered by the Intuitive Genius than the Intuitive Normal; those accessible to cognitive mediation are more likely to be mastered by the Analytical Genius than the Analytical Normal (p. 41).

Simonton noted the shortcomings of this conceptualization, especially the critical distinction between the behavior and cognition thresholds. He posited that the right hemisphere of the brain is largely intuitive and the left analytical, with the threshold of cognition performing a "gate function" to determine when the subdominant right hemisphere has some information to be attended to by the dominant left hemisphere (p. 53). He considered the possibility that a "conspicuous hierarchic organization" within the human brain assigns behavioral processing to the cortex and cognitive processing to the prefrontal lobes. Thus, only the most reliable information is passed along from the lower to the higher centers of the brain. Ultimately, Simonton acknowledged that two things must be true for his model to be upheld: 1) "human information processing is divided into two or more levels according to some approximately probabilistic criterion"; and 2) "behavioral processes operate with lower probability information than do the cognitive processes" (p. 53).

Rockenstein (1988). *Variables: Openness, Creativity, Ethnicity* — Based on definitions used by Isaack, Jung, Bentov, Bruner, and others, Rockenstein defined intuition as "instantaneous or immediate learning or knowing without conscious use of reason" (p. 77). She was interested in the dynamics of the intuitive process in executive decision-making, especially where intuitive managers make successful decisions apparently without supporting data. She examined the universal accessibility of intuition and the precognitive aspect that allows intuitive individuals to see beyond the boundaries of time, space, the five senses, and the rational mind.

Rockenstein outlined a four-level "Taxonomy of Educational Objectives for the Intuitive Domain" as a method for developing intuition to be used in creative thinking

and problem-solving. The four levels were: 1) *awareness*; 2) *comprehension*, including the processes of preparation, incubation, illumination and verification; 3) *development*, including guided imagery, dream exploration, and precognition; and 4) *individuation*.

Though Western cultures have failed to legitimize intuition or recognize its relative abilities, Rockenstein considered it to be part of the "human birthright" (p. 83). Because the intuitive processes work best when integrated with nonverbal thought processes, it is important to be able to translate intuitive knowledge into language for interpersonal communication.

Reber (1989). *Variable: Tacit knowledge* — Reber described implicit learning as an unconscious process yielding abstract knowledge, and the faculty "by which knowledge about the rule-governed complexities of the stimulus environment is acquired independently of conscious attempts to do so" (p. 219). Research of implicit processes:

> …provides the opportunity to reclaim intuition for cognitive psychology. There is probably no cognitive process that suffers from such a gap between phenomenological reality and scientific understanding. Introspectively, intuition is one of the most compelling and obvious cognitive processes, empirically and theoretically, it is one of the processes least understood by the contemporary cognitive scientists (p. 232).

Reber viewed intuition as a "normal and common mental state or process," the product of implicit learning, not merely a function of personality theory as delineated by Jung (p. 232). Like implicit learning, intuition exists outside of consciousness and operates largely outside of awareness. Thus, implicit learning is a fundamental operation allowing one to pick up "critical co-variations in the stimulus environment," a form of pattern recognition (p. 233).

Kleinmuntz (1990). *Variable: Type of problem* — This article attempted to answer Meehl's 1957 query about the optimality of using intuition instead of formulas.

Kleinmuntz' main premises were that: 1) cognition is flawed; 2) the flaws are remediable with proper training and closer correspondence between intuition and task environments; 3) analytical reasoning, formulas or both can improve thinking; 4) formulas can be used as a standard for comparing cognition; 5) judgment can be aided by formulas; and 6) cost-benefit trade-offs are associated with both unaided and aided intuition (p. 296).

Some argue that a clinician is necessary to "perceive, integrate, synthesize and intuit a theory of the person being assessed" (p. 297), though little empirical evidence favors intuition over formula. Concerns about rigidity and inadequacy of formulas on one hand, and unreliability of intuition on the other, advocate for a combination of the two approaches. Kleinmuntz concluded there are no formulas for many decisions and the use of formulas is not always feasible. He noted that people may have to use intuition *instead of* or *together with* formulas as a trade-off between optimal efficiency and accuracy. He offered 12 considerations for determining whether intuition or formulas should be utilized for decision-making.

Mitchell and Beach (1990). *Variable: Emotions* — Mitchell and Beach proposed a descriptive theory of decision-making and *Image Theory* as an alternative to traditional analytical decision-making theory. A review of the literature presented an emerging view that decisions are based on the extent to which alternatives fit with one's images. Their *strategy selection model* assumed that decision-makers possess a repertoire of decision-making strategies, and that they are able to choose the best strategy in a given situation. Apparently, this is not always the case. Even those who are aware of formal analytic strategies may fail to utilize them when they run counter to intuition; and intuitive decisions are often more accurate than those resulting from an analytic process.

Image Theory provides an alternative approach, positing that decision-makers work within three sets of images: 1) the *value image*, the decision-maker's principles; 2) the trajectory image, the decision-maker's goals; and 3) the *strategic image*, the decision-maker's plans, comprised of tactics and forecasts (pp. 8-9). The decision is the *frame*; a successful past decision is a *policy*. When elements are compatible with the decision-maker's images, frames and policies, the decision-making process is rapid and smooth (i.e., intuitive), requiring little cognitive processing or conscious control. A related process, *automatic decision-making*, is based on prior success making similar decisions. Mitchell and Beach proposed Image Theory as an alternative to "high powered, very precise, maximizing models" that are often an overfit for a given situation (p. 16).

Agor (1991). *Variables: Innovation, Cooperativeness, Carelessness with facts and details* — In this article, Agor described his *Brain Skill Management* (BSM) program, consisting of a search for, and integration and development of the intuitive talent within an organization. He found that intuitive ability is most useful when: there is a high level of uncertainty, little precedent exists, variables are less predictable by scientific means, facts are limited or do not point to a clear direction, analytical data is of little use, several plausible solutions exist with no clear alternative among them, time is limited, and/or there is pressure to make the right decision (p. 12). Agor advocated structuring an organizational climate in which intuitive brain skills are allowed to thrive as a complement to traditional management approaches. He also recommended use of diagnostic instruments like the Myers-Briggs Type Indicator (MBTI) or Agor Intuitive Management (AIM) Survey to help identify the most innovative members of an organization and tap their unique abilities to give the organization a competitive edge.

Agor described the characteristics of *thinking* vs. *intuitive* style managers. The former are careful with details; strong on follow-through and implementation; good at handling routine, repetitive tasks; and able to work smoothly day-to-day. Intuitive managers, on the other hand, are good at generating new ideas; can be relied upon for creative problem-solving; are quick to spot emerging trends; and excel at making sense out of situations when data is limited or unavailable (p. 16). Agor stressed the importance of utilizing both management styles, since the most productive organizations cultivate and integrate the strengths of each (p. 13).

Empirical Intuition Literature

Valentine (1929). *Variable: Sex* — Valentine defined intuition as "the implication of a certain measure of conviction without any conscious use of evidence" (p. 214). He operationalized it as "implying (character) judgments of which the grounds are unconscious, without limiting them to either innate or experiential bases" (p. 215). Because intuition in women is "sometimes regarded as a kind of compensation for inferiority in logical reasoning" (p. 214), Valentine was convinced women would benefit by having this folk notion dispelled.

In what Westcott referred to as "the earliest effort to bring 'intuition' into the laboratory" (1968, p. 56), Valentine's research attempted to determine whether women's or men's *immediate impression* judgments about the character and intelligence of children being interviewed for enrollment in a secondary school were more reliable. The children were assessed by a committee of three female teachers whose collective judgments about the applicants provided the criterion for comparison with judgments of the 15 male and eight female subjects of the study. If women are more intuitive than

men, hypothetically the female subjects' inferential judgments should be more sound (i.e., closer to the normative group's opinions) than judgments of their male counterparts.

For the first experiment, the male and female subjects briefly interviewed a group of male and female students. Points were assigned for the degree of closeness to the criterion judgments of the teacher committee. Average scores of all the participants proved very similar, with points assigned to the men ranging from 41 to 26, compared to 45-22 for the women. There were no significant differences attributable to the sex of the judges, though the participants scored better on their judgments about the female students overall. Interestingly, the judges reported a sense that it was easier to make judgments about the boys than about the girls.

In a second experiment, the participants' judgments were compared to those of a committee of male teachers. Again, the subjects' scores were very similar, with a slight superiority for the women. In a third experiment, each participant was asked to judge ten students instead of six, and interview time was reduced to six minutes. Results showed a slight superiority in the men's average scores, though only slightly higher than might result from chance alone. Valentine cautioned that the small number of subjects prevented generalization, but concluded that the relative intuitive judgments of the men in the study were the same as those of the women; that is, both were relatively unreliable.

In addition, he concluded:

1. The feeling of great confidence in one's judgment does not necessarily correlate with its actual reliability.

2. The female participants were appreciably quicker than their male counterparts when making their judgments, and appeared to rely more on their judgments.

3. The differences among individuals of the same sex were far greater than the differences between the sexes.

4. Women tend to pay more attention to certain qualities in those whom they meet, and it may be this characteristic which leads to the appearance that women's intuitions are superior to those of men.

Westcott (1961). *Variable: Amount of information available* — Westcott defined intuition as the ability to "reach a conclusion on the basis of less explicit information than is ordinarily required" (p. 97). Though he acknowledged this was a purely behavioral definition, he believed it represented the measurable element of intuition. Beginning in the 1950's and spanning more than a decade, Westcott's seminal quantitative research on intuition was among the earliest and most extensive. Westcott's Test of Intuitive Ability (TIA), developed to measure "intuitive leaps," has been utilized in numerous subsequent studies.

Westcott asked subjects to solve verbal and numerical problems involving series and analogies. No specialized knowledge was required, each problem was presented in a sequence of steps, and subjects were instructed to arrive at the single correct answer with the fewest clues possible. For instance: Given the ratio 16:___, subjects were to fill in the missing number after seeing one or more clues, revealed in order upon request: 4:2, 9:3, 25:5, 100:10, and 64:8. Westcott's analysis looked at two variables: 1) *information demand*—the number of clues the subject required before making the "intuitive leap"; and 2) *success*—the accuracy of the subject's conclusions. This approach looked at the ways intuitive people are judged—that is, how rapidly they arrive at conclusions, how much information they require to do so, and how successful their conclusions prove to be.

Westcott conducted eleven samples involving a total of 1097 male and female college students who were given the same 20 sets of problems. Average time required for completion of the problems ranged from 25.7 to 46.1 minutes, and the mean solved

correctly among the eleven samples varied from 13.1 to 16.0. Based on their respective results, subjects were placed into one of four discrete groups:

1. *Intuitive thinkers*—those who demand little information and reach correct conclusions;
2. *Wild guessers*—those who demand little information and reach incorrect solutions;
3. *Cautious successes*—those who demand much information and reach correct solutions;
4. *Cautious failures*—those who demand much information and reach incorrect conclusions (Westcott, 1968, p. 273).

Performance of the eleven samples was similar across the groups, with some differentiation among individuals but no significant differences between male and female subjects. Additional studies with smaller groups established internal consistency.

Ultimately, Westcott found that the information demand and success dimensions were uncorrelated, lending weight to his assertion that "intuitive thinking is an identifiable capacity or tendency" and "the amount of information taken is usually no predictor of the degree of success an individual will have in solving problems" (1968, p. 111). Being exposed to information is not equivalent to having information available, or knowing what to do with it. Moreover, individuals differ in their ability to use implicit information, just as they do with explicit information. Westcott ultimately concluded from his experiments that "…some subjects can and do extract and use accurately more information than others can or do. These subjects…are said to be intuitive" (p. 112).

Westcott and Ranzoni (1963). *Variables: Academic aptitude, Impulsivity, Flexibility, Openness, Creativity, Adventure/Liking high places/Unconventionality —* Westcott's 1961 studies had established that intuition was a "measurable and stable

behavior which appears to different degrees in different individuals" (p. 595). In 1963, he and Ranzoni conducted five additional studies with a total of 267 female college students, to gather data about the relationships between three problem-solving variables (i.e., information demand, success, and efficiency) and other relevant traits. In a search for significant correlations, problem-solving scores were compared with other scales, including academic grade point average (GPA) and the verbal and mathematical instruments of the Scholastic Aptitude Tests (SAT).

In the first study, Westcott and Ranzoni found that a tendency for low information demand and high success were related to a high SAT mathematical score and to the SAT verbal score, to a lesser degree. Noting the absence of a significant relationship between problem-solving scores and GPA, the researchers originally hypothesized that problem-solving was numerically loaded; however, this hypothesis failed subsequent tests. They concluded the clearest relationships were between SAT mathematical score and success and efficiency on verbal problems; that intuitive thinking was unrelated to GPA; and that it was slightly, but not profoundly, related to academic aptitude.

Their second study showed little relationship between measures of intuitive thinking and measures of personality, including the Vassar College attitude inventory and the Taylor Manifest Anxiety Scale (TMAS). They concluded that information demand, impulse expression and flexibility may be negatively related; and flexibility may be related to efficiency, operationalized as a ratio between success (output) and information demand (input). The formula for the ratio is: E=Success/Information Demand.

The third study attempted to differentiate between low/high information demand and low/high success subjects. The researchers concluded that individuals from the

respective groups (i.e., intuitive thinkers, wild guessers, cautious successes, and cautious failures) viewed the world and themselves very differently. High information demand subjects were typically more cautious, conservative and compliant than their low information demand counterparts. The most successful intuitive thinkers showed much greater confidence than the wild guessers, who appeared more desperate and anxious. Further, the most successful intuitive thinkers tend to be unconventional, involved, confident and comfortable (p. 603).

In the fourth study, individual subjects were interviewed for approximately an hour to gather data about their reaction to the tests; their interests and significant changes therein; consuming passions; feelings about risk-taking; and significant influences from others. The most intuitive thinkers showed far greater interest in reading and music; spent a good deal of time working creatively, especially in writing; were interested in and concerned with abstract questions; acknowledged involvement in consuming passions (i.e., love and sharing, analysis and criticism, etc.); enjoyed risk-taking; and were profoundly influenced by others, especially those with marked degrees of enthusiasm, commitment, or intensity.

The fifth study asked subjects to select from a list of 307 terms all that they considered descriptive of themselves. The low information demand groups tended to select terms like alert, demanding, sharp-witted and quick. The high information demand group selected the terms anxious, cautious, kind and modest. The high success groups chose confident, foresighted, informal, resourceful and spontaneous. Characteristics selected across the groups included independent, cynical and headstrong. From these outcomes, the researchers concluded that the most intuitive thinkers:

- are unconventional and comfortable in their unconventionality;
- are deeply involved emotionally in what they are doing, and tend to experience fluctuations of affect which do not worry them;
- are not afraid of themselves, their experiences, or their world;
- tend to accept challenge readily and eagerly;
- can live with doubt and uncertainty;
- enjoy risk and seeking out instabilities in the world;
- commit themselves to causes and become wrapped up in them—especially causes and concerns which capture their imagination [and]…sweepingly abstract issues, either at the level of academic-intellectual problems or problems in human values);
- are willing and able to create, commit themselves to paper, be criticized, and expose themselves;
- take chances both willingly and eagerly;
- can and do change profoundly;
- accept influence from others as it may further their own development; and
- assess themselves much the way an observer might assess them: alert, independent, foresighted, confident and spontaneous (p. 610).

Neisser (1963). *Variable: Type of problem* — Neisser distinguished between the *sequential* and *multiple* mental processes utilized discriminately for different types of problems, including human thinking and organizing computer programs for pattern recognition. While sequential processing is more efficient and better adapted in predictable situations, multiple processing is superior for dealing with "novel or irregular input" (p. 1). Neisser analogized this to cognitive processes like productive vs. blind thinking, creativity vs. constraint, intuition vs. reason, autistic vs. realistic thinking, primary vs. secondary processes; and the unconscious, preconscious, and conscious.

Neisser formulated two alternative modes for problem-solving: *sequential logic* and *parallel processing* (p. 6). Though the main sequence, step-by-step, sequential process also operates in human thinking, Neisser viewed cognitive activity as primarily parallel, or multiple, the latter exemplified by intuitive, creative, and productive thinking. He posited that such concurrent operations are necessarily nonconscious, since the conscious mind can only hold one thought at a time. Admitting that his assumptions were theoretical, not empirical, Neisser cited support from studies by Woodworth and Scholsberg in 1954 and Broadbent in 1958; as well as the universal human experience of being unable to focus consciously on two things at once.

Neisser's subjects were asked to scan a list of consonant strings for a given letter of the alphabet or some other critical property. Subjects took comparatively less time-per-word to identify a single letter (i.e., Z) than to identify either of two letters (i.e., Z or Q). The subjects' time-per-word was reduced appreciably with practice. Additional experiments showed that it takes no longer to scan for one of ten letters than for a single letter. Neisser concluded that multiple processing can and does occur, at least at the perceptual level.

Westcott (1968). *Variables: Academic aptitude, Amount of information available* — Westcott distinguished between the *intuitive leap* and *ordinary inference* by the size of the gap between evidence and conclusion. Where most inferences arise as an outgrowth of evidence, evidence in the intuitive leap is typically either obscure or absent altogether. Westcott's study examined two problem-solving dimensions presumed to be connected to intuitive leaps: 1) *information demand*, the subject's willingness to make inferences or conclusions based on little information; and 2) *success*, the correctness of

those conclusions. He hypothesized that "the propensity for making intuitive leaps is measurable, stable, and appears in degrees of magnitude" and that individuals "can be ordered along the dimensions which comprise this propensity" (pp. 268-269).

The 243 college students who participated in the 1968 study were aged 18 to 25. They were instructed to solve as many problems as possible with as few clues as possible, and to rate their level of confidence in each solution. Completion times ranged from 37.2 to 46.1 minutes. Lack of correlation in the results indicated amount of information required does not predict the likelihood of success, which is not the same as saying that clues are irrelevant to the solution of test problems. The subjects' confidence levels were clearly related to success in solving problems, thus establishing a relationship between increased confidence and decreased information demand. Study results supported the hypotheses of variation among individuals and consistency within individuals. Subjects who made successful intuitive leaps were predictably the most confident, establishing two workable dimensions of problem-solving behavior: *creativity* and *inventiveness*.

Peters, Hammond and Summers (1974). *Variables: Type of problem, Amount of information available* — The researchers attempted to confirm Brunswik's study of the intuitive vs. analytic thinking modes, and provide evidence that the type of problem determines which mode is used. In this study, 15 subjects aged 18 to 29 worked at their own pace to predict the location of an object in 50 trials of a three-cue inference task. Analysis found correlations between the subjects' responses and correct answers (i.e., achievement) over blocks of 10 trials; and the distribution of errors in judgment (p. 128). Subjects learned quickly, and predictive accuracy was virtually identical across the trials, confirming Brunswik's findings that: 1) Condition I subjects, given only perceptual cues,

typically utilized intuitive thinking, with a preponderance of *approximately correct* responses; 2) Condition II subjects, given only numerical cues, exhibited more analytic thinking, with a preponderance of *precisely correct* responses and occasional extreme errors; and 3) error rates of Condition III subjects, functioning in either the intuitive or analytic mode, were similar to the intuitive group.

Peters et al concluded that the cognitive processes evoked for Condition II were quite distinct from those for Conditions I and III. Findings suggested that use of the cognitive mode might not be solely a matter of individual differences (p. 130), which concurred with Westcott's 1968 conclusions. Moreover, whether the intuitive or analytic cognitive mode was used may be determined by the nature of the task to be performed. For those tasks in which *either* mode was appropriate, subjects tended to use the intuitive mode. Further, the precision of the analytic decision-making strategy might be offset by the danger of "extreme error." Ultimately, where some error is tolerable but extreme errors can be disastrous, a blended intuitive-analytic approach is best (p. 131).

Simonton (1975). *Variables: Openness, Creativity, Type of problem* — Simonton distinguished between the intuitive (i.e., unconscious and behavioral) and analytical (i.e., conscious and logico-symbolic) (p. 351). His experiments examined the relative effectiveness of intuitive vs. analytical problem-solving as a function of creativity and task complexity. He asked: 1) Is intuitive thinking more accessible to highly creative individuals than to [the] less creative? and 2) Is intuitive thinking more effective for complex problems and analytical thinking more effective for simple problems? (p. 351).

Simonton assumed the effectiveness of the intuitive vs. analytical approach might be a function of both individual creativity and the nature of the task, hypothesizing that

creative individuals are more prone to relying on intuition because they are more likely to deal with complex or ambiguous problems. To test this, Simonton utilized 40 subjects, who completed the Barron-Welsh Art Scale. Scores above 32 were considered *high creativity*; below 32 *low creativity*. Subjects were then given two sets of problems to solve. The simple set consisted of 135 geometrical figures which either did or did not contain right angles. Subjects were asked to determine if a given figure illustrated concept *A* (right angles) or *not-A* (no right angles). The complex problem set consisted of 135 art prints depicting a variety of indoor and outdoor scenes. Subjects were to predict *A/not-A*, *B/not-B* for each print. Half of the subjects from the high creativity and low creativity groups were asked to utilize intuition for their predictions; the other half was asked to analyze.

The three-way ANOVA showed no significant main effects. High creative subjects did not improve more than the low creative. No significant differences were found between the intuitive and analytical groups, or between outcomes on the complex vs. simple tasks. The two-way interactions among the variables examined were statistically nonsignificant, as well. When instructed to utilize intuition, however, the high creative subjects improved more on the complex task; while the less creative improved on the complex task when instructed to analyze (p. 353). These results supported the conclusion that "intuition and analysis may be distinctive modes of thought" and the relative effectiveness of each mode may be related to the nature of the problem, and the cognitive style of the individual (p. 353).

Westman and Canter (1979). *Variable: Time of day* — Westman and Canter hypothesized that the time of day may affect characteristic response modes (i.e., the

Jungian orientations). If so, knowing how one is affected by the time of day may make it easier to understand and predict behavior. In this study, 24 adults—7 males and 17 females, aged 18 to 53—were asked to track what they consumed during each two-hour segment of the day, and to rate themselves on specific behavioral dimensions every two hours during the waking day for five consecutive days. Their response modes, as measured by the Myers-Briggs Type Indicator (MBTI), were correlated with their experiences at differing times during the day. The 10-point scale used 5 as a neutral point on each of seven dimensions: 1) desire to be physically inactive vs. active; 2) depressed vs. happy; 3) inability vs. ability to concentrate; 4) relaxed vs. tense; 5) being alone vs. being with people; 6) avoiding vs. tackling a difficult task; and 7) clumsy vs. coordinated.

Two ANOVAs were conducted, one by day of the week, the other by time of day. Subjects differed by time of day on the dimensions of physical activity, concentration, and ability to tackle difficult tasks. Differing MBTI profiles reflected markedly different behaviors, as well as differences during specific times of day. Westman and Canter concluded that differences in Jungian modes of orientation "correlated with different dimensions on which daily variations were experienced, or with different times of day [when] correlations were significant" (p. 1203). Though the data was self-reported and not balanced with external observations, the results supported the hypothesis that knowing one's own or others' Jungian type and temporal patterning would enable planning of activities at optimal times of natural readiness. These findings could also have implications for improving relationships and increasing individual effectiveness.

Metzner (1980). *Variables: Extraversion, Introversion* — This correlational study examined the inter-relationships among the typologies proposed by Jung, Eysenck,

and Sheldon. Though the three typologies are derived from very different theoretical assumptions, Metzner noted a degree of overlap among the types represented. Eysenck's theory dealt with extraversion-introversion and neuroticism-stability as dimensions on orthogonal axes measured by the Eysenck Personality Inventory (EPI). Jung's theory dealt with extraversion-introversion and the opposing functions of thinking-feeling and intuition-sensation, as measured by the Myers-Briggs Type Indicator (MBTI), the Gray-Wheelwrights Jungian Type (GWJT) survey, and other scales. Sheldon's theory looked at three independent dimensions of physique/somatotype—endomorphy, mesomorphy and ectomorphy. He also addressed the correlated temperaments/character elements—viscerotonia/gut-dominance; somatotonia/muscle-dominance; and cerebrotonia/brain-dominance, as measured by the Cortes-Gatti (CG) instrument (p. 343, 344).

The EPI, GWJT, and CG instruments were administered to 60 males and 96 females with a mean age of 42 and similar social backgrounds—white, middle-class, from various professions. Researchers found evidence of:

1) high inter-correlation between the extraversion scales of the EPI and GWJT;
2) positive correlation between extraversion and somatotonia, and a negative correlation with cerebrotonia;
3) correlation between neuroticism and cerebrotonia;
4) positive correlation between extraversion and intuition, and negative correlation with sensation;
5) positive correlation between neuroticism and feeling—in women only; and
6) positive correlation between intuition and somatotonia, and negative correlation with cerebrotonia—in men only.

The researchers concluded that extraversion from the Jungian and Eysenck frameworks were positively correlated and overlapping. They were unclear about the

reasons for the differences between the sexes on the GWJT feeling scale and the EPI neuroticism scale. They also did not anticipate the correlation between extraversion and intuition, since intuitives can be either introverted or extraverted, according to Jung. Some of the other positive and negative correlations revealed in the study were less surprising. The researchers criticized the hypothesized but unproved presumption of bi-polarity between the Jungian functions. They suggested that the four functions are not dichotomous but independent of each other, though no valid test currently exists to verify this hypothesis.

Cosier and Aplin (1982). *Variable: Amount of information available* — Cosier and Aplin were interested in the role of intuition in decision-making. Accepting Isaack's definition of intuition as "the ability to arrive at knowledge without conscious awareness of rational thinking" (p. 275), they recognized the operation of a so-called *sixth sense* and other right hemisphere-oriented functionalities associated with intuition.

Their study focused on intuition relative to "perception outside of...traditional channels" (p. 275). They divided a group of 111 upper-division business students (74 males, 37 females) at a Midwestern university into *high intuition* and *low intuition* groups based on their ability to identify a series of cards before seeing them. Subjects were to consider themselves in the role of financial managers for an electronics firm as they utilized the information (i.e., cues) provided, in order to forecast key financial outcomes for three divisions of the company. Subjects were unaware that the Multiple-cue Probability Learning Paradigm (MPLP) was being used to facilitate the study.

Ultimately, decisions made by the highly intuitive group were far more accurate than those made by the low intuitive group, though all subjects' decisions improved

significantly during the study. Ruling out luck and cheating, Cosier and Aplin concluded that highly intuitive individuals made better decisions in the simulated managerial environment. Though the study fell far short of proving the existence of intuition, the outcomes indicated the existence of some intuitive ability beyond the five senses. The researchers recommended that organizations attempt to identify employees with unusually high intuition that could prove invaluable in strategic planning applications.

Fallik and Eliot (1985). *Variables: Field-dependence/independence, Sex, Brain hemispheres* — Controlling for handedness and sex, this study assessed the relationships among "intuition, two dimensions of cognitive style, and aural and visual dominance" (p. 683). They hypothesized a relationship between the left visual field, aural dominance, and an imaginal cognitive style with intuitive performance. They also anticipated lower scores on the Group Embedded Figures Test (GEFT) used to measure field-dependence, or synthetic thinking, hypothesized to be associated with better intuitive performance.

The researchers utilized a sample of 200 undergraduates (79 males, 121 females) with a mean age of 25.3 years, who completed all the tests used in the study. Intuition was measured by Westcott's Test of Intuitive Ability Test (TIA). The two dimensions of cognitive style, field-dependence and field-independence, were measured by the Group Embedded Figures Test (GEFT). The Revised Individual Differences Questionnaire (RIDQ) measured the degree to which the subjects used imagery and verbal processes in thinking, studying, and problem-solving. Aural and visual hemispheric dominance were measured using a dichotic listening device and a tachistoscope (pp. 684, 685).

Forced hierarchical and stepwise multiple regression analyses were used to assess the relative association of intuition with field-dependence/field-independence, visual and

auditory dominance, and gender. Regressions allowed determination of the amount of variance in intuition contributed by each variable, and assessment of potential interaction effects. Ultimately, Fallik and Eliot found few relationships in their study. The only variables showing a consistent relationship were performance on the GEFT and TIA. Neither field-dependence nor field-independence showed any clear association with dominance by brain hemisphere; and no sex-specific differences were found for intuition, embedded figures, Paivio's questionnaire, or dominance scores. However, variance in intuition, as explained by cognitive style and dominance, differed by sex and handedness, suggesting differences in cognitive organization on those two dimensions (p. 695).

None of the study's hypotheses were supported, including the common belief that intuitive performance is a singularly right-brain function. On the other hand, the findings did not preclude this relationship, since TIA intuition tasks are designed to reflect logic and sequencing—functions commonly associated with the left brain. Lack of association between imaginal style and intuitive performance could be related to the instruments employed if neither actually measured the imagery component of intuition. The lack of relationship between field-dependence/field-independence and intuition may indicate that over-emphasis on cognitive style restrains intuitive performance as measured by the TIA.

The findings failed to support differences in intuitive performance and cognitive style by sex, which may merely indicate that the TIA is simply too narrow to provide an adequate measure of many intuitive characteristics. In an obvious understatement, Fallik and Eliot ultimately concluded: "the relationship among…intuition, different dimensions of cognitive style, aural and visual hemispheric dominance, handedness, and sex are very complicated" (p. 696).

Denes-Raj and Epstein (1994). *Variable: Emotions* — Denes-Raj and Epstein examined the traditional view that people make rational decisions based on "maximizing pleasure or gain, and minimizing pain or loss" (p. 819). Recent studies have shown that people process information either in a "rational, analytical, deliberative, propositional… extensional" or "experiential, automatic, intuitive, narrative…natural" manner (p. 819).

The study utilized Cognitive-Experiential Self-Theory (CEST), which proposes: 1) reality is apprehended through both rational and experiential (i.e., intuitive) systems; 2) behavior is guided by their joint operation; and 3) the nature of the situation and the individual's degree of emotional involvement serve as arbiter of the relative influence of the two systems. The greater the emotional involvement, the greater the "shift in the balance of influence from the rational to the experiential system" (p. 819).

In the first study, 79 undergraduates (30 males, 49 females) could choose to draw from a small bowl containing one red and nine white jelly beans (10% chance of drawing a red bean), or from a larger bowl (5-9% chance of drawing a red bean). On some trials, they could win but not lose; on others, they could lose but not win. The researchers found two different and potentially conflicting information processing systems—the *experientia*l and *rational*. The rational system can be overridden by the experiential, which is more responsive to concrete representations and past experience (p. 823).

The second study involved 96 undergraduates (24 males, 72 females). Half were assigned to a *low incentive* condition with the potential of winning or losing 10 cents per trial; the rest were assigned to a *high incentive* condition with the potential of winning or losing $5.00 per trial. The results replicated the earlier study. Subjects were unduly influenced by absolute numbers, ignored ratios, and made fewer non-optimal responses

on lose trials than win trials (p. 826). Males made more non-optimal responses, though the implications of this, if any, were not apparent.

The researchers ultimately concluded that, when the rational and experiential, or intuitive, modes conflict, the latter generally wins. Most people are only willing to follow the experiential system to a point, especially when wrong decisions bring unwelcome consequences. Contrariwise, trusting the experiential system may bring advantages in spontaneity and efficiency where potential costs do not outweigh potential gains. These conclusions concurred with the CEST assumption that the experiential system is adaptive, that behavior is determined by both the rational and experiential systems, and that circumstances influence which system exerts the greater influence.

Langan-Fox and Shirley (2003). *Variables: Interests, Personality, Experiences* — Langan-Fox and Shirley conducted a quantitative study of the nature and measurement of intuition with 53 first-year psychology students. Intuition components examined were:

1. *Cognitive*—intuitive thoughts, implicit processing, facts, knowledge and beliefs (tacit knowledge) providing a foundation for implicit processing. They used Westcott's Test of Intuitive Ability (TIA), Dyads of Triads Task (DOT), Waterloo Gestalt Closure Task (WGCS), and the Accumulated Clues Tasks (ACT) to measure nonconscious problem-solving or associative tasks.

2. *Affective*—engagement and confidence in one's intuitive abilities. The Faith in Intuition (FI) instrument was used as a self-report measure of confidence in one's feelings, and immediate impressions as a basis for decisions and actions.

3. *Behavioral*—readiness to respond or tendency to act intuitively. This may include perception of possibilities, meaning and relationships via insight and the unconscious; intuitions that come to consciousness suddenly, hunches; sudden perception of patterns in seemingly unrelated events, or creative discovery. Use of intuition was measured by the MBTI (pp. 208-210).

The study compared MBTI and ACT outcomes to examine intuition as aspects of interests, personality and experiences. Langan-Fox and Shirley concluded that these

measures were either unrelated, measured different dimensions, or measured different constructs altogether (p. 207). In an email to the researcher, Langan-Fox explained:

> I actually don't think that intuition—the behavior—can be measured by self report, but rather by some indirect/projective technique. It's a very difficult topic and a very difficult construct to measure, and we are only beginning to get to grips with it (personal communication, February 2003).

Implications of the Intuition Literature for this Project

Intuition is not only difficult to define, but experts still disagree about its origin, nature and functionality. Not surprisingly, devising and validating an instrument to measure intuition has been a difficult task for researchers to date. The DOI instrument designed for this study was based on an understanding of intuition garnered from the theoretical and empirical literature reviewed above. The underlying premise of the DOI is that, though intuition is nonrational and nonconscious by definition, individuals can describe and quantify their own experience of it, and identify the degree to which they possess certain personal characteristics that purportedly predict intuition.

More particularly, the DOI examined 25 of the 57 variables identified in the 1996 Shirley and Langan-Fox review of intuition-related variables. The 25 were selected because they were of particular interest, could be measured by self-report and/or were measured by the other instruments used in this study. The 10 (of 25) variables drawn from the theoretical literature were: intuitive and analytic cognitive styles, experience, innovation, carelessness with facts and details, interest in arts/aesthetics, cooperativeness, music, ability to visualize, and imagery. Seven additional variables were taken from the empirical literature: impulsivity, flexibility, adventure-seeking, unconventionality, time of day, the amount of information available, and academic aptitude. Three variables—age, emotions and ethnicity—were found in both the theoretical and empirical literature.

Four variables—introversion/extraversion, sex, handedness and brain hemispheres—were not included in the DOI, since they are measured by HBDI® items or outcomes.

Twenty-seven DOI items were related to Westcott's profile of *highly intuitive* individuals, who were characterized as: creative; alert; independent; foresightful; confident; spontaneous; unconventional; emotionally connected risk-takers who accept criticism easily, readily commit themselves to causes, take interest in abstract issues, enjoy taking chances and change profoundly with ease. These items provided an internal cross-check for DOI items related to the 25 Shirley and Langan-Fox variables.

Additional DOI items were related to Goldberg's six types of intuition, and Sanders' four receptors of intuition. Other items were included to assess respondents' personal experience of intuition, including frequency of intuitive insights, level of belief in intuition, perception of their own intuitiveness, and conditions either *more* or *less* conducive to their receptivity to intuition. Age and education items provided background data and verified that respondents met the minimum criteria for participation. Finally, ethnicity and occupation items were included as additional measures of variability and to aid in matching respondents across the three instruments utilized in the project.

Some variables examined by the DOI were included despite a lack of empirical evidence supporting a relationship to intuition. For example, no empirical study to date supports the common view that women are inherently more intuitive than men. Also, no meaningful relationship has been established between intuition and age, ethnicity or handedness. These variables were included in the DOI because failure to find a relationship would provide additional evidence of the DOI's validity. Appendix J provides a matrix of each DOI item, and the related variables and literature.

Brain Dominance, Intuition and the HBDI®

Brain dominance theory and the underlying empirical research are reviewed below. The hypothesized relationship between brain functionality and intuition, and the applicability of the HBDI® instrument used in this project are also discussed.

Brain Dominance Theory and Research

Brain dominance can be viewed as the way humans utilize bilateral brain structures. Though the origin of the term is obscure, the concept appears to have emerged after 1868, when British neurologist John Hughlings Jackson proposed that the brain is hierarchically organized (Restak, 1995, p. 87), with the left-brain serving as the leading, or dominant, hemisphere (Springer and Deutsch, 1998, pp. 14-15). Dominance, which tends to exist in all paired body structures, implies relative degrees of preference or avoidance (as on http://www.HBDI.com/Resources/Articles/index.cfm, August 1999). Bunderson observed that a preference for a subset of the brain processes available to the individual equates to *dominance*; and the tendency *not* to rely on a given set of processes can be referred to as *avoidance* (Herrmann, 1995, p. 347).

As early as 450 B.C., Hippocrates referred to the brain as “double,” recognized its dual left and right hemispheres and asserted the existence of “mental duality" (Herrmann, 1995, p. 27). During their early scientific work on *hemisphericity* with patients with brain damage in the 1860’s, Broca and Wernicke observed that speech deficits existed in patients with left-brain damage but not in those with right-brain damage (p. 8).

In the 1960's, Sperry, Bogen, Gazzaniga, Levy and colleagues at the California Institute of Technology conducted unique experiments with “split-brain” patients whose corpus collosum had been surgically severed as a seizure therapy. Despite the radical

nature of the surgery, these patients experienced little or no change in personality, temperament, speech pattern, behavior or intelligence. Asked to identify by touch a familiar object held in the right hand, patients could do so easily. Asked to identify the same object held in the left hand, however, they could describe but not name it.

Thus it appeared that the visual right brain hemisphere recognized the object but, without the corpus collosum to serve as a bridge for the information, that knowledge could not be relayed to the patient's verbal left hemisphere. From these observations, Sperry concluded that: 1) sensing and motor control are discrete lateralized functions of a given brain hemisphere; 2) left and right hemispheres are specialized by function; and 3) the corpus collosum serves as a bridge to link the two (p. 10). In 1981, Sperry earned a Nobel Prize for his delineation of the logical, verbal, sequential tasks associated with the left hemisphere of the brain, and the spatial, figural, relational tasks associated with the right hemisphere (Sperry, 1975, p 11).

Herrmann's own studies of brain functioning thereafter considered Sperry's ground-breaking brain hemisphere research, along with the work of researchers who had proposed a tripartite brain structure. As early as 1937, Papez postulated that an additional brain structure, the *limbic system*, contributed to cognitive functions of emotion, memory, and recall (Herrmann, 1995, pp. 33-34). MacLean's subsequent *Triune Brain Theory* also recognized three distinct brain structures, which he termed: 1) the *reptilian brain*, controlling muscles, balance and autonomic functions like breathing and the heartbeat; 2) the *limbic system*, controlling emotions, attention, affective memories, and value judgments; and 3) the *neocortex*, or *cerebral brain*, which controlled higher-level, rational thinking processes (MacLean, 1978, pp. 308-342). MacLean's model assumed

that, though interconnected, each of the three brains managed a distinct functionality. While the lower-order functions of the reptilian brain and limbic system were typically dominated by the neocortex, the limbic system, which controlled the emotions, could reverse the order and dominate the higher-order cerebral functions, when called upon to do so—in times of high stress or possible danger, for instance.

Taking the prior research a step further, psychologist Robert Ornstein's work with electroencephalographic (EEG) techniques in the early 1970's demonstrated that lateralization and specialization are normal attributes for everyone, not just for split-brain patients. Additional studies into specialized brain functioning led to questions related to dominance, and to the observation that humans tend to prefer one brain hemisphere over another, just as they exhibit preferences in other paired (i.e., lateralized) structures of the body.

Herrmann's own research into brain functioning as the source of creativity began in the mid-1970's when he was corporate manager of management education at General Electric. Synthesizing previous research, he concluded there are, not two or three but, four functional divisions in the brain. That is, the human brain has two sets of paired structures: the left/right hemispheres, and the cerebral/limbic hemisphere (Herrmann, 1995, pp. 32-33, 63). Based on this conceptualization, Herrmann developed his *Whole Brain Model* (Appendix D), which posited that the brain was a quadrant-based construct characterized by dominance, uniqueness, specialization, malleability, iterativeness, situationality and wholeness (Herrmann, 1997, p. 2).

Each brain quadrant—which Herrmann labeled *A*, *B*, *C*, and *D*—excels at its own specialized functionalities, as shown in Figure 2.1 below:

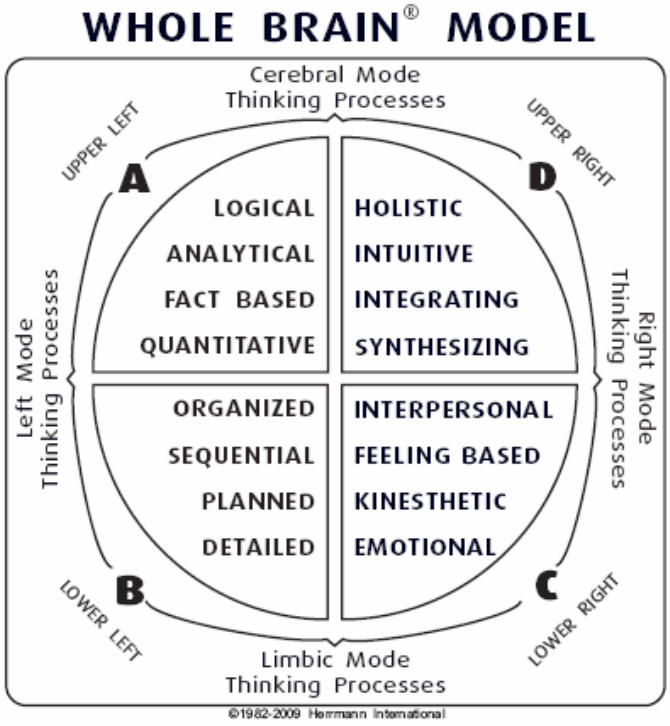

Figure 2.1: Herrmann's *Whole Brain Model* (also Appendix D)

Herrmann found that humans tend to prefer or avoid given brain quadrants in measurable degrees. Herrmann defined the degree of preference, or *dominance*, as "the condition or fact of one member of a paired organ being the one principally used to carry out a task" (p. 429). In 1982, he began development of a pen and paper instrument to replace the cumbersome EEG experiments that he had been conducting. The resulting HBDI® instrument, which evolved through numerous iterations into its current form, has been taken by more than 2,000,000 individuals worldwide, and has been utilized in more than 60 research studies to date (Appendix K). The HBDI® validation studies will be reviewed in the *Instrumentation* section of Chapter 3 of this project.

Brain Functionality and Intuition

An adverse consequence of Sperry's Nobel Prize-winning brain research was its presentation of brain functions as dichotomous *left-brained*—objective, intellectual, deductive, convergent, time-bound, realistic, scientific, linear, conscious, waking, logical,

rational, detail-conscious, analytical); or distinctly *right-brained*—subjective, emotional, inductive, divergent, timeless, imaginative, artistic, nonlinear, unconscious, dreaming, intuitive, irrational, holistic, synthesizing, Goldberg, 1983, p. 117). Thus, it is commonly assumed that intuition is right-brained, though many brain researchers, psychologists and sociologists have begun to see this as a gross over-simplification of a highly complex construct. Davidson considered the idea of intuition as a purely right-brain faculty "utterly simplistic and inaccurate, an attempt to find an easy answer to what is in all likelihood a fantastically complicated function" (as in Goldberg, 1983, p. 116). Levy, who assisted with Sperry's split-brain research, also insisted that "almost nothing a normal person [does] depends only on one hemisphere" (p. 121).

Goldberg explained that, though some qualities associated with intuition appear to be specialized functions of the right-brain, it is naïve to relegate intuition to a single hemisphere. He distinguished between intuition in *association* with the right hemisphere and intuition as a *function*, or *resident*, of the right hemisphere. One can intuitively grasp the meaning of a verbal phrase or linguistic concept. Conversely, intuitive flashes can be perceived as word forms. Thus, while the right brain may serve as the primary receptor for intuitive information, the left brain provides the mechanism for decoding information received in this manner. Like Herrmann, Goldberg believed in the value of integrated, whole-brain functioning and believed the sequential processing, language aptitudes, and reasoning abilities of the left hemisphere can and do play a significant role in processing the information that ultimately evolves into a hunch or insight (p. 117).

Feuerstein (1997) also questioned the notion that the right brain hemisphere served as the physical seat, or source, of the intuitive faculty. He declared: "There is

every indication that complex processes like intuition and reasoning involve both cerebral hemispheres" (p. 95). This view was based in part on Pribram's holographic theory of the brain, which posits that information is mirrored in every part of the brain, not merely stored in a single pinpointed area (p. 95). Theoretically, intuitive information arrives instantaneously because it does not have to travel from neuron to neuron in the linear, sequential, chain reaction manner of conscious cognition. This theory does not account for intuitive knowledge that was never learned—so-called *psychic cognitive abilities* or *super-cognitions* (p. 96), which Feuerstein assigned to "the far side of intuition" (p. 100).

The popular belief that intuition is a strictly right-brained function likely springs from the fact that it exhibits many right-brain characteristics. It is "diffuse and without linguistic content"; an "instantaneous, global experience bringing together patterns of meaning" enabling "knowledge of other people's hidden intentions and true feelings" (Goldberg, 1983, p. 117). In addition, intuitive knowledge can be derived without words; is an instantaneous, global experience able to create meaning from patterns; is processed in a simultaneous or parallel manner; and can discern hidden meanings, intentions and emotions—tasks at which the right brain is more adept (pp. 116-117). For instance, the right hemisphere of the brain is far better at accessing or receiving intuitive information, which is typically whole, immediate, and symbolic in nature.

Ornstein (1997) acknowledged a physiological justification for seating intuition in the right brain. Because the brain is malleable and adaptable, opposing hemispheres can assume each others' functions when damage or dysfunction necessitates it. Otherwise, the brain adopts a "winner-take-all" organizing principle in which an entire process is ceded to the superior hemisphere for any process at which one hemisphere is at least 20%

more efficient than the other (p. 15). Because the left hemisphere is more efficient at language, for example, it assumes the language function, though the right hemisphere can be trained to handle speech. Similarly, the left brain condescends to the right brain's superior capacity for global, multi-level, symbolic, representational functioning. As Ornstein explained the difference, the right hemisphere "matures more quickly," while the left hemisphere "runs faster" (pp. 149-150).

Herrmann (1995) defined intuition as "knowing something without thinking it out, that is, having instant understanding without need for facts or proof" (p. 431). The HBDI®, which loads intuition on the right hemisphere, distinguished between C-quadrant *people intuition* and D-quadrant *idea* or *solution intuition* (1997, pp. 10C, 10D). In response to the researcher's question about the early research into the relationship between intuition and brain dominance, Ann Herrmann-Nehdi, Ned Herrmann's daughter and the current CEO of Herrmann International, wrote:

> At the time, the left brain right brain research that existed attributed intuition to the right hemisphere. Although much of the HBDI development was done intuitively, the sources [Ned Herrmann] used for the initial brain dominance research included Robert Ornstein's *The Psychology of Consciousness*, Springer's work, etc.., as well as a multitude of scientific references that were used as part of his initial research premise (personal communication, April 2004).

Implications of the Brain Dominance Literature for this Project

Sperry's breakthrough research with split-brain patients in the 1970's fostered a rigid though unintended dichotomous left- vs. right-brain understanding of the way the brain works. Since that time, Levy, Davidson, Goldberg, Feuerstein and others have disputed the validity of the "either/or" view, especially for complex processes. The popular notion of intuition as a singularly right-brain phenomenon appears to be based on the fact that intuition exhibits many right-brain characteristics (e.g., it is whole, diffuse,

subjective, spontaneous, nonlinear, nonconscious, symbolic, imagistic, etc.) Thus, the right hemisphere appears better suited to accessing and receiving intuitive information. Further, if the brain optimizes its functioning by adopting a "winner-take-all" policy, as Ornstein has proposed, the left hemisphere may simply cede the intuitive functionality to the more adept right hemisphere as a more efficient division of labor. This may also explain why the HBDI® loads intuition in the right hemisphere—because the intuition-related items on the HBDI® tend to be associated with right-brain functionalities.

Even so, the left brain, with its sequential processing, language aptitudes, and reasoning abilities, can process information that may evolve into an intuitive insight. Further, it is likely that the left brain is required to process (i.e., translate, interpret, decode) the symbolic, representational, or multi-layered intuitive information received by the right brain. It is anticipated that correlating brain dominance as measured by the HBDI® with intuition as measured by the DOI will provide support for the researcher's hypothesis that intuition is actually a whole-brained functionality.

The development and application of the DOI instrument is described in detail in Chapter 3, which also provides more information about the development of Herrmann's *Whole Brain Model*, and development and validation of the HBDI® and PSI instruments also utilized in the project. Chapter 3 also discusses the data collection and analysis methods used and their applicability in a study of this type.

I deplore those who have only the facts but not the phosphorescence.—Emily Dickinson

Chapter 3

I simply imagine it so, then go about to prove it. – Albert Einstein

RESEARCH DESIGN AND METHODOLOGY

Background of the Study

Agyakwa (1988) has proposed that there are two ways of knowing anything: *deduction/induction* and the "other way of knowing," *intuition* (p. 169). While deduction/induction and its corollary rational-empirical mode have value for learners, the case has been made that no *new* knowledge comes by this means (Westcott, 1968, p. 16; Sloan, 1983, p. 130). As Goldberg (1983) has explained, deduction/induction works best when we: 1) "can control or predict all the variables"; 2) "can measure, quantify, and define with precision"; and 3) "have complete and adequate information"—conditions that are often impossible to meet in a complex world (p. 25). Intuition makes it possible to know that which is indiscernible and "unknowable" by any other means. Moreover, it provides the mechanism for discovery and invention, problem-solving, pattern recognition, the psychic senses, hunches, premonitions and more (Vaughan, 1979, p. 57).

Unfortunately, Western education has traditionally focused almost exclusively on deduction/induction, while ignoring, negating, even dismissing outright, the use of intuition as a tool for knowing and learning. According to Pink (2005), knowledge continues to expand exponentially in the modern "Conceptual Age" (p. 2), making the time-honored but time-worn ways of learning inadequate for complex contemporary needs. Because intuition and the corollary intuitive learning mode may prove critical for addressing the needs of an increasingly complex world, this project was designed to explore the former in order to understand the latter.

An elusive construct, intuition is typically described in terms of its functionalities, manifestations, outcomes or effects. That is, researchers often try to understand what intuition *is* by investigating what intuition *does*. All too often, attempts to measure intuition are confounded by the difficulty of separating the cognitive, affective and behavioral components of intuition into discrete functionalities. Despite a lack of prior studies to guide this project, 25 of the 57 intuition-related variables identified by Shirley and Langan-Fox (1996) were selected for examination in accordance with their recommendation (p. 575). The 25 variables selected are presented in Table 1.1 below.

Research Purposes and Hypotheses

Utilizing three instruments, this study examined the relationship between intuition, brain dominance, and a preference for the rational vs. intuitive way of doing things. The underlying purpose of the project was to determine the content and construct validity of the DOI, designed by the researcher to measure 25 personal characteristics and situations purportedly related to intuitive functioning.

The specific purposes of this study were to:

1. develop the Dimensions of Intuition (DOI) instrument to measure the individual's capacity for intuitive thinking; and verify a set of three underlying dimensions (i.e., common factors) in intuitive functioning;

2. quantify the relative contributions of each brain quadrant as measured by the Herrmann Brain Dominance Instrument® (HBDI®) to each DOI factor, to determine whether intuition is right-, left- or whole-brained;

3. quantify the relative contributions of each brain hemisphere, as measured by the HBDI® to each DOI factor, to determine whether intuition is right-, left- or whole-brained; and

4. cross-validate the DOI with the Personal Style Inventory (PSI), a validated measure of preference for the rational vs. intuitive mode.

The four hypotheses of the study were:

Hypothesis 1: Absolute and associational statistics developed using confirmatory factor analysis (CFA) will confirm that the 25 variables examined in this study fit into the three-factor model (i.e., clusters), designated in the 1996 Shirley and Langan-Fox literature review: social/acquired, biological and situational.

Hypothesis 2: The intuitive functions as measured by the DOI and represented as the social/acquired, biological, and situational factor, or cluster, scores will relate to the dependent HBDI® quadrant scores, with relative weights conforming to the whole-brain view of intuition as a function of all quadrants of the brain.

Hypothesis 3: Intuitive factor scores as measured by the DOI will relate to the dependent HBDI® left/right and cerebral/limbic modal percent scores, showing relative weights between and among the variates conforming to a whole-brain view of intuition.

Hypothesis 4: A strong positive correlation exists between intuition as measured by the DOI and the PSI's three intuitive mode scores; and a corresponding negative correlation will exist between intuition as measured by the DOI and the PSI's three rational mode scores.

The remainder of this chapter reviews population and sampling, instrumentation, and data collection and analysis methods used in the pilot and main studies.

Population and Sampling

Because 25 variables were examined in this project, a relatively large number of participants—250-300—were required. Because heterogeneity is especially important in correlational study designs (Hair, Anderson, Tatham and Black, 1998, p. 166), participation was sought from a convenience sample of adult learners with divergent ethnic, academic, professional and socio-economic backgrounds. Because the term *adult learner* encompasses both traditional and nontraditional students engaged in either formal (e.g., academic, technical) programs, or informal (i.e., lifelong, experiential) learning, participation was open to anyone fitting the minimum age and education requirements.

The initial email launch announcement (Appendix L) was sent in late January to colleagues, clients, students, friends, family members and acquaintances. Follow-up

emails (Appendices M and N) were sent in April and June; along with customized messages to individuals or small groups of potential respondents throughout the data collection process. Respondents were also secured through visits to business meetings and classrooms, and use of faculty and conference listservs. All potential respondents were encouraged to disseminate the invitation, and an indefinite number of participants were secured from these referrals.

The number of respondents needed was determined by multiplying the number of variables being investigated by the minimum number of cases recommended in the literature. According to Hair, et al (1998), factor analysis typically requires a minimum of five observations for each variable analyzed, though others recommend a minimum of 20 cases for each. Hair, et al proposed 10:1 as a better ratio to avoid overfitting—that is, "deriving factors that are sample-specific with little generalizability" beyond the sample population (pp. 98-99). For the 25 variables examined in this study, it was decided that a minimum of 300 respondents should be sought.

Since heterogeneity of the sample population is important to the generalizability of the results, background characteristics captured by the DOI included ethnicity, education level, occupation and academic aptitude. Items on the HBDI® captured age, sex, educational focus/major and handedness. Among these characteristics, only age and education level were used as inclusion/exclusion criteria for participation in this study. The age criterion was appropriate because the research focus was adult learners, and the HBDI® has not been validated for individuals under 18. The education requirement was established to ensure that respondents possessed the maturity, life experience, language and conceptual skills needed to understand the instrument items.

All participants were asked to complete all three instruments. The DOI was available at the online site developed by the researcher. The HBDI®, originally a pen and paper instrument, is now only administered online at the Herrmann International website: www.HBDI.com. The PSI was available online at The Intuitive Self website: http://www.the-intuitive-self.org.

There was no cost for completion of the online DOI and PSI instruments, and in an effort to encourage research, Herrmann International waived the normal costs associated with the HBDI®. At the end of the data collection process, the researcher received the participants' HBDI® raw data and outcome scores. For a modest optional fee, interested participants were also provided the option of receiving an individualized HBDI® packet and attending a debrief workshop to help them understand their profiles. Participants who completed the PSI automatically received an immediate online profile.

Pre-trials by several colleagues prior to launch of the main study indicated that completion of all three instruments should take 60 minutes or less for most respondents. The three instruments utilized different measurement approaches to measure different constructs, so no confounding effects were anticipated due to the length of the process, or the order of completion. The study invitations provided weblinks to the DOI, HBDI® and PSI, in that order. More participants completed the DOI than the other two instruments (DOI n=295, HBDI® n=258, PSI n=122). Most participants completed the DOI first; which was desirable, because the cover page of the DOI served as the consent form, explained the purpose of the study, indicated how the data would be used, and informed participants that submission of the completed DOI conferred permission for the researcher to collect data and report results from all three instruments (Appendix A).

Instrumentation

Intuition was measured by the researcher-designed DOI instrument (Appendix A). Brain dominance, strength of preference by brain quadrant and hemisphere, was measured by the HBDI® (Appendix C). Preference for the rational vs. intuitive mode was measured by the PSI (Appendix F). Data collected from these instruments was analyzed using confirmatory factor analysis (CFA), canonical correlation analysis (CCA), regression analysis (RA), and correlation analysis (CA). By this means, the researcher proposed to identify the most potent predictors of intuition, confirm the hypothesized relationships between intuition and brain dominance, and provide first-round validation of the DOI. The section which follows will discuss the development, design and validation of the three instruments utilized, the applicability of each for this study, and reasons for rejecting a number of other instruments purported to measure intuition.

Dimensions of Intuition (DOI)

The researcher-designed, 100-item DOI was used to collect data related to a set of intuition-related variables. More specifically, the DOI examined 25 of the 57 intuition-related variables identified by Shirley and Langan-Fox (1996). The other 32 variables were not included in the study for one or more of the following reasons:

1. The variable was postulated to be associated with intuition, but the purported relationship was tenuous or not empirically supported.

2. The variable was related to the nature or source of intuition—what it is, where it originates—rather than to its operation and functionality—what it does, how it works. The former was neither observable nor measurable by the methods employed in this project.

3. Design of the empirical studies cited was unrelated to this inquiry and/or they examined extraneous dimensions (e.g., personality) or applications (e.g., business).

4. The construct was examined in an unrelated or irrelevant context (e.g., intuition in children; intuition in business); so outcomes were not relevant to this study.

5. Previous empirical studies had failed to establish a significant relationship between the variable and intuition.

6. The variable lacked comparability because it was not measured by the HBDI® or PSI.

7. The variable—especially from the situational cluster—was too subjective, complex or extrinsic to be assessed by the DOI.

Conversely, the 25 variables examined in this project were selected because:

1. They dealt with operational aspects of intuition studied in related contexts.

2. The interests of the empirical studies cited by Shirley and Langan-Fox (1996) were comparable to the interests of this inquiry.

3. One or more previous empirical studies established a significant relationship between the given variable and intuition.

4. A comparable construct is measured by the HBDI® instrument in relation to brain dominance, providing a basis for analysis.

5. The variable—especially from the biological cluster—related to a participant descriptor which provides potentially useful comparison data, and for which data is easy to collect.

6. The variable could be adequately, appropriately assessed by items in the DOI.

Shirley and Langan-Fox described their division of the 57 variables into three clusters as "potentially useful" but offered no rationale for the cluster designations beyond the ambiguous assertion that: "…the variables [are] thought to comprise these groupings" (p. 575). Despite this apparent arbitrariness, the clusters appear to be logically organized into:

1. *Social/acquired*—These variables were cultural characteristics or learned traits, cognitions or behaviors that can be enhanced or inhibited, developed or retarded, thus magnifying or mitigating their potential impact on intuition. For example, one can develop creativity or resist impulsivity. Even traits like introversion/extraversion—typically considered established "orientations"—can be altered, at least briefly or in exigent situations.

2. *Biological*—These variables were descriptors relating to generally fixed personal characteristics (i.e., one is/is not male or female; is of a certain age and ethnicity, tends to prefer the right or left hand, etc.) Such traits, though not necessarily manipulable, can be identified or measured.

3. *Situational*—These variables are extrinsic conditions generally beyond one's direct or immediate control, but which may play a role in the individual's intuitive functioning. Among these variables, *time of day* was selected because the HBDI® has a comparable item. *Amount of information available* was selected because it is central to many of the earliest and most relevant quantitative studies of intuition, especially those utilizing Westcott's Test of Intuitive Ability (TIA). Other variables from the situational cluster were excluded because they were either too complex or elusive to be measured by a pen and paper instrument or the methods utilized in this investigation.

The DOI instrument (Appendix A) included the following sections:

- *Instructions and Consent*—The cover page introduced the study, discussed participant criteria, described the instruments to be used, provided consent and data use information, including steps taken to ensure respondent anonymity. Finally, it included survey instructions and researcher contact information.

- *Background Characteristics* (7 items)—*Name*, *Age* and *Occupation* were completion items included to enable the researcher to match the DOI, HBDI® and PSI instruments completed by the same respondent. Item 4, *Ethnicity*, used standard IRS (Internal Revenue Service) designations: African-American/Black, Asian, Euro-American/White, Hispanic or Latino, Middle-Eastern or Arabic, Native American or Alaskan Native, Native Hawaiian or other Pacific Islander, and Other/Specify. Item 5 asked for *Highest Level of Education/Degree Completed* among: High School or equivalent, Some college credit, Associate's, Bachelor's, Master's, Ph.D./Ed.D., and Other/ Specify. For Item 6, respondents selected one of three choices for the SAT-based *Academic Aptitude* preference: Verbal, Mathematical, or Both equally. Item 7, *School Subjects*, asked for a 1-5 ranking of preference among English, History/Social studies, Math, Science, and Foreign languages.

- *Intuition Experience* (5 items)—Items 8-12 were designed to extract additional information about the respondents' personal experience of intuition. Item 8 used a 6-point ordinal checklist for the frequency of their intuitive

experiences. Item 9 asked for relative percentages of intuitive insights received in various forms identified by Sanders (1989): Visual, Auditory, Feeling, and Sensing. Other and None responses were also added to Item 9 to cover all possible responses. For Item 10, respondents checked all the conditions (i.e., times, places, etc.) under which they experience intuition. For Items 11 and 12, participants utilized a 0-100% ratio scale to indicate their level of belief in intuition and the perceived strength of their intuitiveness.

- *Types of Intuition* (6 items)—For Items 13-18, respondents indicated their relative use of each of Goldberg's six types of intuition: Discovery, Creativity, Evaluation, Operation, Prediction, and Illumination. In addition to the Never and Not Sure responses, operational definitions were provided for the Frequently, Regularly, Periodically, and Infrequently choices.

- *Personality Traits* (21 items)—Items 19-39 were related to traits fitting the Westcott and Ranzoni (1963) profile of highly intuitive individuals. Respondents indicated on a 0-100% ratio scale the level to which each characteristic described them.

- *Personal Characteristics* (6 items)—Items 40-45, also related to Westcott and Ranzoni's (1963) profile of highly intuitive individuals, utilized a 0-100% ratio scale to indicate the degree to which each statement was true of the respondent.

- *General Characteristics* (54 items)—Items 46-99 were related to 18 of the 25 Shirley and Langan-Fox (1996) variables selected for examination in this project. All items were based on the theoretical and/or empirical literature, on hypothesized relationships or operational definitions for the variables under examination. Three items were provided for each of the 18 variables; and one of each set of the three items was designed to test the absence or lack of the characteristic. Responses were made on a 0-100% ratio scale.

- *Wrap-Up/Optional* (1 Item)—The final narrative item allowed respondents to explain their responses or share any final comments to inform the research.

All DOI items were based on the theoretical and empirical literature as described in Chapter 2 (Appendix J). While some items had a nominal or ordinal scale, most utilized a 0-100% ratio scale to maximize variability during data analysis. The 0-100% scale was divided into 11 categories (i.e., 0-4, 5-14, 15-24, 25-34, 35-44, 45-55, 56-65, 66-75, 76-85, 86-95 and 96-100). Because the study design required data for *all* DOI items, the survey site was designed to require a response to all except optional item 100.

Herrmann Brain Dominance Instrument® (HBDI®)

The HBDI®, a validated and widely-utilized thinking styles tool, measures brain dominance, as well as some cognitive aspects of intuition relative to brain functioning. Based on 20 years of research, the HBDI® was finalized in the mid-1980's by the late brain researcher Ned Herrmann. As head of Management Education at General Electric's Management Development Institute in 1976, he began researching the source of creativity. He studied the pioneering brain research conducted by Sperry, MacLean, Bogen, Gazzanaga, and others. Ultimately, Herrmann conducted his own EEG scans; and these experiments formed the basis of his subsequent pen-and-paper instrument, designed to identify and measure respective thinking styles of the brain quadrants, which he labeled *A*, *B*, *C* and *D*. In 1979, Herrmann formulated his *Whole Brain Model* (Appendix D) and began the process of validating the HBDI® instrument.

The HBDI® has been rigorously tested for face, content, criterion, and construct validity. The earliest HBDI® validity studies, conducted in Berkeley, California, were the first in the U.S. to utilize the *Mind Mirror*, a dual left/right brain EEG apparatus designed by Dr. Maxwell Cade to measure the frequency and amplitude (i.e., speed and strength) of the alpha, beta, theta and delta brainwaves in both right and left brain hemispheres during different states of consciousness (Jurka, 1996, p. 27). Additional HBDI® validation studies supervised by Bunderson were summarized in Appendix A of Herrmann's first book, *The Creative Brain* (1995, pp. 373-374).

Study 1: In 1979 Olsen and Bunderson reviewed literature related to cognitive aptitudes, personality, and thinking styles, as well as learning styles and strategies. Their review was published in 1980.

Study 2: The second study, conducted in 1979 for external construct validation, provided the first HBDI® factor analysis. Measures selected from the first study were applied to scores from Herrmann's preliminary *Participant Survey* and *Twenty Questions Instrument*. Because it pre-dated the quadrant-based *Whole Brain Model*, this study examined only left- and right-brain scores. Six of the 31 scores from the 15 instruments used in the study were derived from Herrmann's Participant Survey and Twenty Questions Instrument. The Intuition/Sensing, Thinking/Feeling, Judging/ Perceiving, and Introversion/Extraversion (i.e., NS, TF, JP, and I/E) scores from the MBTI were also utilized (Briggs and Myers, 1977); as were various tests of cognitive ability and style, learning styles and strategies. Of the 143 participants who completed all 15 instruments in the battery, 52 were managers or business people; 90 were college students or graduates with a variety of majors. From the 31 profile scores derived, confirmatory factor analysis extracted 10 factors with a loading greater than .29 or .30:

Factor A: innovative vs. safe-keeping preference;
Factor B: speeded cognitive ability;
Factor C: use of learning strategies to capture information;
Factor D: feeling vs. thinking preference;
Factor E: verbal quantitative thinking style;
Factor F: holistic non-verbal thinking style;
Factor G: visual vs. verbal learning preference;
Factor H: learning expansion strategies; and
Factor I: dominant intellectual preference.
The tenth factor was not analyzed.

Factor A indicated that the right- and left-brain scores were polar opposites. The former reflected the MBTI's N and P scales, along with imagery and a preference for personal learning strategies. The latter aligned with the verbal quantitative learning style and other characteristics hypothesized to be associated with the left-brain hemisphere. Factors E and F showed that a left/right dichotomy accounts for different kinds of

cognitive ability. Learning strategies factors C, G and H were clearly discriminated from the brain construct scores. Extraversion on the MBTI measure was strongly related to Factor C and with the C quadrant. Subsequent studies verified that Introversion was somewhat correlated with the A quadrant. Ultimately, the second study found promise in the brain dominance scores and recommended an item-by-item analysis, as well as improved scoring procedures (Bunderson and Olsen, 1980).

Study 3: Concerned with internal construct validation, this study analyzed 439 cases—business managers and engineers, and other professionals with an array of college majors. Holistic scores from Herrmann's measures were validated, scoring procedures were revised, and a set of subscores were subjected to factor analysis—resulting in construct validation of the four preference clusters. Nine factors were extracted:

Factor 1: safekeeping preferences vs. creative synthesis;
Factor 2: analytical problem-solving vs. interpersonal/empathetic;
Factor 3: creative making of things;
Factor 4: active outdoor pastimes vs. reflective introversion;
Factor 5: intuitive preferences vs. orderliness;
Factor 6: hobbies preferred by the non-mathematical;
Factor 7: dominance management;
Factor 8: preference for English over math; and
Factor 9: creative writing.

Factors 1, 2, and 4 were found to be bi-polar; that is, items loading on one end of the factor were negatively related to items loading on the other end (Herrmann, 1995, p. 360). The nine factors from the third study were used to develop item parcels of 5-15 items with a possible score of 0-15. The bi-polar factors were scored separately, so a total of twelve possible subscores were derived. Factor analysis produced two factors: 1) the upper (cerebral) right D quadrant vs. lower (limbic) left B quadrant; and 2) the upper (cerebral) left A quadrant vs. lower (limbic) right C quadrant. The A and B (left) and C

and D (right) quadrants were found to be more strongly connected than the A and D (cerebral) or B and C (limbic) quadrants. The left-center and right-center of the model indicated opposing preferences and avoidances.

Based on the outcomes of this unpublished study, the Participant Survey and Twenty Questions Instrument were combined; the adjectives and work elements items were refined; adjective pairs were added; and the circular quadrant graph was introduced. Study 3 provided evidence of the HBDI®'s internal construct validity, supporting Herrmann's *intuitive* understanding of brain dominance.

Study 4: The fourth study re-examined the dataset from the 143 cases of the second study but utilized the new scoring procedure developed from an improved understanding of the four item quadrant clusters. The result was the first set of quadrant scores. Analysis in this study was designed "to produce a factor structure based on personality, learning strategies [and] styles, cognitive processing, and…quadrant scores" (Herrmann, 1995, p. 364) in order to determine the relationships of the quadrant scores to the other constructs listed. Factors defined in this study included:

Factor A: lower left B quadrant vs. upper right D quadrant;
Factor B: introversion vs. extraversion;
Factor C: upper left A quadrant vs. lower right C quadrant;
Factor D: visual learning preference;
Factor E: visual closure and upper right D quadrant;
Factor F: verbal learning preferences; and
Factor G: analytical, mathematical processing.

The MBTI's N and P scales were strongly related to the HBDI®'s D quadrant, and the F vs. T scales were related to the D vs. A quadrants of the HBDI®. Logical mathematical processing was related to the A quadrant, but visual closure was related to the D quadrant, indicating that these constructs are not merely aspects of personality.

The D quadrant was also strongly related to visual learning styles and strategies. Strong negative correlations were found for the A vs. C and B vs. D quadrants, though the HBDI® permits individuals with dichotomous approaches (e.g., risk-taking and risk-avoiding tendencies) to produce high scores in opposing quadrants. Additional evidence of external construct validity was established (Bunderson, Olsen and Herrmann, 1982).

Study 5: This unpublished 1982 study was the third factor analysis and the first utilizing the new 120-item instrument. Nearly 200 college students with a variety of majors completed the instrument, a series of cognitive ability and personality type tests, and instruments that measured thinking and learning styles and strategies. The analysis was designed to determine whether the updated brain dominance instrument scores had the same cross-situational applicability and convergent and discriminant validity found previously. Analysis confirmed quadrant bi-polarities; strong positive lower right C vs. strong negative upper left A quadrant correlations; a relationship between *necessary arithmetic operations* and the upper left A quadrant; and weak consistency with the upper right A vs. lower right C quadrant dichotomy and the MBTI's N and P dimensions.

Study 6: Conducted in conjunction with Ho's 1988 unpublished doctoral dissertation that examined the relationship between occupational preferences and brain dominance, this internal construct validity study analyzed items from 7,989 of the new HBD instruments completed between 1984 and 1986. Some of the 120 items were treated as dummy variables, and 127 variables were considered in the factor analysis. Tests extracted either 5 or 7 factors, and further analysis was conducted with the five factors, listed below in order of greatest common variance:

Factor 1: safekeeping vs. creative;
Factor 2: interpersonal, people-oriented vs. technical, analytical;

Factor 3: female, emotional vs. rational, logical;
Factor 4: creative, innovative; and
Factor 5: handedness.

The first three factors were bi-polar, with strong negative and strong positive loadings. Construct, or scale, scores much like the item parcel scores from the previous study were generated for each subject on each factor. Further analysis produced two bi-polar factors: A vs. C, and B vs. D. A vs. C was interpreted to be analytical/logical vs. interpersonal/emotional, indicating less "cross-quadrant" correlation. Creativity was a dual-quadrant (A/D or C/D) function; and B vs. D was interpreted to be the safekeeping vs. creative factor. Handedness did not correlate strongly with A or B. The higher order (overall right vs. left) factor accounted for 39% of the common variance; with the two primary factors, A vs. C and B vs. D, accounting for the remaining 61%. The results of this study suggested that a weighted scoring key should be utilized. Ho (1988) replicated the results from the third study, the overall outcomes, strengthening evidence for the internal construct validity of the HBDI®'s quadrant model.

Bunderson also cited replication research by Schkade and Potvin (1981) at the University of Texas, which strongly supported initial conclusions about the HBDI®'s validity. HBDI® profile data was found to be consistent with EEG results from Schkade and Potvin's study of differences in brain activity among 12 accounting and 12 art students (Herrmann, 1995, pp. 329-333).

Bunderson concluded from these results that: "The…HBDI® provides a valid, reliable measure of…mental preferences when applied in a professional way, interpreted in conformity with the…quadrant model, and scored with the approved scoring method" (p. 337). The HBDI® is *not* a test but a "preference profile derived from evidence about

the varieties of mental processes evident in the human brain" (p. 339). Some profiles may be more apt situationally, but no profile is intrinsically good or bad, and differences should be honored (p. 340). Proper uses of the HBDI® include:

1) better understanding of self and others;
2) enhanced communication;
3) enhanced productivity through teamwork;
4) work climate for creativity;
5) authenticity;
6) enhanced teaching and learning;
7) better management;
8) counseling; and
9) building composite learning groups (pp. 340-341).

Bunderson recommended further research into use of the HBDI® for teaching and learning; academic, vocational and interpersonal counseling; work redesign; and group management (p. 342). The HBDI® was *not* validated for clinical or diagnostic testing, medical or psychological classification, education or training admissions testing and placement, employment testing, professional or occupational licensure and certification, or decision-making about people relative to areas beyond their control (p. 341).

Since its validation, the HBDI® has been completed by more than 2,000,000 individuals worldwide. It has been utilized in more than 60 theses and dissertations, examining brain dominance relative to leadership styles, cognitive and learning styles, Jungian typology, personality disorders, occupational preferences, creativity, athletics, dreaming and hypnotizability, organizational effectiveness, marital satisfaction in dual-career couples, art and dance, reflective adult education practice, and more (Appendix K).

Herrmann's *Whole Brain Model* (Appendix D) divides the brain structure vertically into left-brain and right-brain hemispheres, and horizontally into cerebral and limbic structures. Brain dominance, as measured by the HBDI®, is the relative strength

(i.e., degree of preference or avoidance) for each of the constructs linked to each quadrant and hemisphere of the brain. The hemispheres, represented by any two adjoining quadrants, are designated *left*, *right*, *cerebral* and *limbic*. The resulting HBDI® profile provides a numerical score for each quadrant and a corresponding preference code, as well as a percent for each hemisphere (Appendix E).

The quadrant profile scores correspond to a 4-digit preference code designation. For example, a profile with respective A, B, C and D quadrant scores of 111, 65, 32 and 48 renders a 1-2-3-2 preference code. A sample HBDI® profile, with a 1-1-2-2 preference code, is provided in Appendix E. HBDI® profile scores for a given quadrant theoretically range from 0-150, though among the more than 2,000,000 profiles completed to date, no one has ever scored a 0 in any quadrant. Scores of more than 150 for one or more quadrants have been reported, and at least one individual has scored above 175 in the D quadrant.

The following describes the relevance of the preference codes to the profiled individual's thinking style:

> *Tertiary score*—A profile score of 0-33 in a given quadrant equates to a tertiary preference code of 3, indicating not only a lack of preference for but active avoidance of the thinking and learning processes represented by that quadrant.
>
> *Secondary score*—A profile score of 34-66 equates to a secondary preference code of 2, which indicates neither preference nor avoidance for the given quadrant(s). Secondary quadrant characteristics, while not preferred, are relatively comfortable for the individual to utilize situationally, especially if not required to do so for extended periods.
>
> *Primary score*—A profile score of 67-100 equates to a primary preference code of 1, indicating the most preferred mode(s). A 101-150 or above, also a 1, indicates a preference so marked that it would be obvious to others, who might remark: "She is so analytical." or: "He is such a risk-taker." Also, individuals with a preference score of 101-150 or above in a given quadrant tend to rely on that mode even when another mode would be more appropriate for the task at hand.

Among the general population, 7% is single-dominant (i.e., with a preference code of 1 in a single quadrant); 60% is double-dominant (i.e., preference code of 1 in two quadrants); 30% is triple-dominant (i.e., preference code of 1 in three quadrants); and 3% is quadruple dominant (i.e., preference code of 1 in all quadrants (Herrmann, 1995, p. 86). Normal quadrant distributions have been produced across gender, age, ethnicity and cultural backgrounds.

The HBDI® modal percent, or hemisphere, scores, derived from the quadrant scores, is a ratio indicating relative weights of preference across two adjacent quadrants. The left vs. right modal score always totals 100%, as does the cerebral vs. limbic score. The formulas for computing the modal percent scores are:

Left/Right Hemisphere—Modal %:
A Profile Score + B Profile Score=Total A/B Score.
C Profile Score + D Profile Score=Total C/D Score.
Total A/B Score + Total C/D Score=Grand Total Left/Right Score.
A/B Score ÷ Grand Total Left/Right Score=Left Modal %
100 - Left Modal %=Right Modal %.

Cerebral/Limbic Hemisphere Modal %:
A Profile Score + D Profile Score=Total A/D Score.
B Profile Score + C Profile Score=Total B/C Score.
Total A/D Score + Total B/C Score=Grand Total Cerebral/Limbic Score.
A/D Score ÷ Grand Total Cerebral/Limbic Score=Cerebral Modal %.
100 - Cerebral Modal %=Limbic Modal %.

Preferences evenly distributed between the left and right hemispheres would be indicated by a 50% A/B (left) and 50% C/D (right) modal score. Likewise, preferences evenly distributed between the cerebral and limbic hemispheres would be 50% A/D (cerebral) and 50% B/C (limbic). Preferences that are *not* evenly distributed would still equal 100% (e.g., left hemisphere 22%—right hemisphere 78%; or cerebral hemisphere 48%—limbic hemisphere 52%).

As with brain dominance in general, one modal score is not better than another, except situationally; and individuals are often called upon to shift between or among modalities. The modal percent is significant because it indicates the strength of a given mode, and has implications for the ease with which one shifts between and among the modes. An individual with a 50%-50% left/right modal score, for instance, would find it relatively easy to shift between left-brain and right-brain functions; whereas someone with a 75%-25% left/right modal score is likely to find the shift much more difficult.

Herrmann (1995) emphasized that the HBDI® is *not* a test; there are no right or wrong answers; and one profile is not necessarily better than another (p. 339). The HBDI® has not been validated for use in clinical or diagnostic testing, medical or psychological classification, or education and training program admissions testing and placement. It should not be used as an assessment tool for employment, licensure or certification, though it is likely to show high predictive validity in those applications. Also, the HBDI® is intended to be an inferential tool for the individual, not as an evidentiary tool for employers or others who might use it as a basis for decisions about hiring, promotion, etc. The HBDI® profile belongs to the profiled individual, even if an employer or external organization has paid for the assessment.

The HBDI® instrument consists of 120 items related to a variety of operationalized and weighted brain dominance factors. In addition to an extensive demographics section, the instrument contains items related to *Handedness*, *School Subjects*, *Energy Level*, *Motion Sickness*, and *Introversion/Extraversion*, as well as:

- *16 Work Elements*—Job-related elements numbered on a 5-point scale in accordance with degree of preference (i.e., 5=*work I do best*; 4=*work I do well*; 3=*neutral*; 2=*work I do less well*; 1=*work I do least well*);

- *25 Key Descriptors*—Trait identifiers from which eight are selected as most descriptive of the individual, and one of the eight is designated as the *most* descriptive of all;

- *22 Hobbies plus Other*—A list of possibilities from which six are selected, one of the six being marked as the *main* hobby;

- *24 sets of Adjective Pairs*—Forced-choice items, in which one of each pair (from differing brain quadrants) is selected as the MORE descriptive of the two; and

- *20 Questions*—Statements responded to on a 5-point Likert-type scale according to one's level of agreement/disagreement (i.e., 5=*strongly agree*; 4=*agree*; 3=*in between*; 2=*disagree*; 1=*strongly disagree*).

Ann Herrmann-Nehdi, daughter of the founder and current CEO of Herrmann International, indicated in an email to the researcher that the HBDI® item most directly related to intuition is the key descriptor item 46 (i.e., intuitive). As she explained:

> In some of the initial validation work done with Bunderson, it became clear that intuition was loading in both the C (interpersonal intuition) and D (idea intuition) quadrants and as such that item became one of the few that apply to more than one quadrant in the assessment. Also questions 102, 105, 106, 118 and 119 could be interpreted as intuition-related when people agree or strongly agree to them (personal communication, April 2004).

Items 102, 105, 106, 118, and 119, scored on a five-point, *strongly agree* to *strongly disagree* Likert-type scale, are:

102. Daydreaming has provided the impetus for many of my more important problems.

105. I often get my best ideas when doing nothing in particular.

106. I rely on hunches and the feeling of "rightness" and "wrongness" when moving toward the solution to a problem.

118. I can frequently anticipate the solution to my problems.

119. I tend to rely more on my first impressions and feelings when making judgments than on a careful analysis of the situation.

Herrmann defined intuition as "knowing something without thinking it out—having instant understanding without need for facts or proof" (1995, p. 431). Relative to brain dominance, the HBDI® differentiates between *people intuition* as a C-quadrant (right-limbic) function, and *idea* or *solution intuition*, as a D-quadrant (right-cerebral) function (1997, pp. 10C and 10D). Thus, intuition as measured by the HBDI® is identified as a right-brain faculty, though it was not as widely tested as other constructs in the early EEG experiments Herrmann conducted.

Administration of the HBDI® is restricted to Certified HBDI® Profilers, who must complete an intensive certification workshop. The researcher, HBDI®-certified since 1999, has utilized the HBDI® in a variety of business and academic environments. In accordance with HBDI® protocols, profile data is always treated as confidential. The requisite *Herrmann International Research Consent Form*, outlining guidelines for use of the HBDI® and establishing ownership of the data derived, was submitted and approved before data collection began (Appendix O).

Personal Style Inventory (PSI)

Bill Taggart's PSI, the third instrument utilized in this project, was inspired by his curiosity about the complementary nature of the two modes of consciousness. After attending Ornstein's workshop on the educational implications of left- vs. right-brain hemisphere processing in the 1970's, Taggart came to believe that "complete human consciousness involves the polarity and integration of the two modes" (as on http://www.the-intuitive-self.org/website/author/framesets/frameset_memoir.html, April 2006). The PSI was developed to assess the "complementary nature of the rational-intuitive styles of human information processing (HIP)" (Taggart and Valenzi, 1990, p. 149).

The HIP conceptual model underlying the PSI (Figure 4, p. 159) is grounded in innovative management studies, Eastern and Western philosophical theory, and empirical findings of modern neurophysiology. The model recognizes three modes associated with the rational style and three modes associated with the intuitive style. The six modes, plotted on a continuum from *most rational* to *most intuitive*, are: analysis, planning, control, sharing, vision and insight (pp 159-160).

From this conceptual beginning, the HIP survey was developed with scales for measuring user preference for each of the six processing modes. The HIP assessed management preferences in rational/intuitive terms by categorizing individuals as rational, intuitive, *either* rational *or* intuitive, or *both* rational *and* intuitive. The initial PSI reliability and validity study (March 1990) utilized criterion-based FA to isolate the scale items, and the HIP metaphor to predict associations among the scales. A modified multi-trait, multi-method approach was used to test and confirm the study hypotheses.

Study 1: Taggart and Valenzi originally considered using *The BrainMap* instrument (Brain Technologies Corporation, 1985) and the HBDI®. However, the former was too expensive and the latter required administrator certification. Ultimately, the study utilized four instruments: 1) the updated HIP survey; 2) the 1984 version of the HIP survey (Taggart and Torrance, 1984); 3) the Kolb Learning Style Inventory (LSI, Kolb, 1985); and 4) the Myers-Briggs Type Indicator (MBTI, Briggs and Myers, 1983).

The HIP survey provided scores for the individual's left-dominant (i.e., rational), right-dominant (i.e., intuitive), and integrated (i.e., rational/intuitive) preferences. Five hundred behavior and preference assessment items were created and sorted into the six processing modes. Items that did not fit exclusively into a single mode were eliminated,

and the remaining items were paired by contrasting mode. For instance, the *analysis* item "I prefer specific instructions" was paired with the *insight* item "I prefer instructions that leave many details optional" (Taggart and Valenzi, 1990, p. 161). The result was 34 analysis-insight pairs, 25 planning-vision pairs, and 28 control-sharing pairs. Four HIP experts reviewed the items and suggested more revisions. The 15 item pairs that resulted were disaggregated in the final 90-item survey.

A total of 378 full-time and part-time university students completed the HIP survey, which was administered in 12 group settings over a six-week period. Among the respondents, 205 were female (172 males, 1 not designated). Study participant ages ranged from 19-63 (mean age 27). Ethnicities included 29 black, 135 Caucasian, 188 Hispanic, and 24 not designated. A range of occupational backgrounds were represented; 57% of respondents were employed at least part-time; and 40% worked in management-related areas.

Taggart and Valenzi predicted:

1. *Relative to the updated HIP survey*—Scales for the three rational modes would be positively correlated with each other and negatively correlated with the intuitive modes. The converse would be found for the three intuitive modes scales.

2. *Relative to the Torrance-Taggart HIP survey*—The left hemisphere measures would correlate positively with the rational scales in decreasing order along the continuum from *analysis* to *planning* to *control*. Conversely, they would be negatively correlated with the right hemisphere in decreasing order along the continuum from *insight* to *vision* to *sharing*. Again, the converse would be found for the all correlations on the three intuitive scales.

3. *Relative to the LSI*—a) *Learning by feeling* would be positively associated with the intuitive modes and negatively associated with the rational modes; b) *learning by watching and listening* and *learning by thinking* would exhibit the opposite pattern (to *learning by feeling*); and c) *learning by doing* would be neutral (i.e., uncorrelated either to the rational or intuitive modes).

4. *Relative to the MBTI*—Introversion (I), judging (J), sensing perceiving (SP) and thinking judgment (TJ) would be positively associated with the rational mode, and negatively associated with the intuitive mode. Extraversion (E), perceiving (P), intuitive perceiving (NP) and feeling judgment (FJ) would be positively associated with the intuition mode, and negatively associated with the rational mode.

With a few minor exceptions, the outcomes of the study supported all of the researchers' predictions (p. 166):

1. *Relative to the updated HIP survey*—The corresponding rational and intuition scales of the HIP survey were shown to have the predicted correlations and consistency, indicating construct validity for the HIP measures.

2. *Relative to the Torrance-Taggart HIP survey*—All of the positive/negative and decreasing order predictions were confirmed.

3. *Relative to the LSI*—The most significant correlations on the LSI were those for the rational mode of *analysis*, which proved negative for concrete experience (CE) and positive for reflection observation (RO) as predicted. The opposite pattern predictions for the *insight* mode and the CE scale (strong positive) and RO scales (strong negative) were also confirmed. Correlations for *planning* and *sharing* were not significant. Abstract conceptualization (AC) correlated positively with *planning*, and negatively with *insight*. The predicted lack of significant correlation between any of the HIP modes and active experimentation (AE) was also confirmed.

4. *Relative to the MBTI*—The MBTI, E and I scales behaved as expected relative to *sharing* but not to *planning*. *Analysis* correlated positively with the MBTI S (sensing) scale, and negatively with the N (intuition) scale. *Vision* was associated with both the S and N dimensions. The MBTI's T and F scales behaved as predicted for *control* and *sharing*, as did the J and P scales for *planning* and *insight*.

Taggart and Valenzi recommended use of the instrument by business managers, and as a feedback tool in academic classrooms and corporate training programs.

The PSI instrument was a second-generation preference survey (Appendix F) designed to answer the question "How intuitive are you?" The PSI attempts to get at the answer to this question by asking three related questions:

1. How do you prepare for the future? (Rational *planning* by developing proposals OR intuitive *vision* by generating scenarios.)

2. How do you solve problems? (Rational *analysis* as a specialist OR intuitive *insight* as a generalist.)

3. How do you approach work? (Rational *control* procedure-oriented OR intuitive *sharing* people-centered, Taggart, 2000, p. 3).

The survey consists of four background characteristics items: 1) primary cultural heritage (with seven choices, including Other/Specify); 2) years of formal education completed (grades 1-22); 3) date of birth; and 4) gender. Responses to these items are required, and participant confidentiality is assured.

Participants begin the survey by designating a work role (e.g., manager), since responses to a given item may differ depending on the role one assumes. Explicit instructions are provided for completion of the survey, which consists of 30 items with six possible *frequency* responses for each item. The PSI example statement is: "I plan ahead realistically." Possible responses are: 1) *never*; 2) *once in a while*; 3) *sometimes*; 4) *quite often*; 5) *frequently but not always*; and 6) *always*.

Completing the PSI typically takes 10 minutes or less, and users receive an immediate online *PSI Strategy Profile*, which indicates users' *rational* vs. *intuitive* preferences by delineating relative preferences for the: 1) planning vs. vision ways of preparing for the future; 2) analysis vs. insight ways of solving problems; and 3) control vs. sharing ways of approaching work. Planning, analysis and control are associated with the *rational* mode; whereas vision, insight and sharing are associated with the *intuitive* mode. Percent scores for these dichotomous paired items do not necessarily equal 100%. For instance, percents in the *Sample PSI Profile* (Appendix G) are: planning 28% vs. vision 91%; analysis 10% vs. insight 95%; and control 49% vs. sharing 59%.

Study 2: In 2000, a second study was conducted to revise the six scales of the PSI. Confirmatory factor analysis (CFA) and structural equation modeling (SEM) were used to assess reliability, internal consistency and discriminant validity. The 15 items used to evaluate each of the six subscales included the five original items plus ten supplemental items. A convenience sample of 322 undergraduates and graduates from a large urban commuter university completed the revised 90-item survey. The sample of 164 women (155 men, 3 unknown) had a mean age of 25.5 years. The subsample population consisted of 27 women (19 men), with a mean age of 24.3 years.

Where the 1990 PSI study utilized a traditional scale development strategy; the second study utilized SEM analysis. The revised PSI was subjected to factor analysis to provide additional evidence of validity and reliability. Confidence intervals were used to assess reliability, internal consistency, and discriminant validity in test-retest analysis of the 46-subject subsample. Study outcomes provided evidence that the revised scales were an improvement over the original ones relative to model robustness, reliability, internal consistency and convergent validity. The new scales demonstrated test-retest reliability, though additional changes were made to improve discriminant validity (p. 11).

Instruments Not Selected for Use in this Study

The following outlines the rationale for rejecting six of the instruments considered but *not* selected for the current study.

Myers-Briggs Type Indicator (MBTI) and Keirsey-Bates Temperament Sorter (KBTS): Based on Jung's orientation typology, the MBTI deals with intuition as an aspect of personality, or temperament, type (as on http://www.myersbriggs.org/my-mbti-personality-type/mbti-basics, October 2008; Keirsey and Bates, 1984, p. 3). Because

outcomes from the MBTI and KBTS are so heavily weighted for introversion/ extraversion compared to their weightings on the HBDI®, scores from these three instruments are not directly comparable.

In his first validation study, Bunderson found introversion to be somewhat correlated with the left-cerebral (A) quadrant, and extraversion correlated with the right-limbic (C) quadrant (Herrmann, 1995, p. 359). Power, Kummerow and Lundsten (1999) reported similar mixed results from their MBTI/HBDI® comparison. The strongest correlations were between Introverted Thinking and the A quadrant, and Extraverted Intuition and the C quadrant. The fourth HBDI® study found another potentially confounding difference between the MBTI and HBDI® in that the MBTI characterizes individuals on one end of each of four scales, while the HBDI® allows preferences at both ends of opposing poles (Herrmann, 1995, Appendix A, p. 366).

Like the MBTI, the KBTS is built on Jungian typology. Due to the intrinsic similarities between these two instruments, it was anticipated that the comparability issues with the MBTI would apply to the KBTS, as well. Accordingly, both instruments were rejected for use in this project.

Westcott's Test of Intuitive Ability (TIA): Though Westcott's seminal research is often cited in intuition literature, the TIA merely divides individuals into the *more* vs. *less intuitive* on the basis of their inferential abilities (Westcott, 1968, p. 100). The TIA, which contains 20 verbal and numerical series and analogies problems, is not accessible online; and administration is time-intensive, making it impractical for administration to large groups of respondents. As Fallik and Eliot (1985, p. 696) noted, the TIA is too narrow to provide an adequate measure of many intuitive characteristics.

Agor's AIM Survey (AIM): Agor's 12-item AIM Survey was designed primarily to examine intuition as a tool for executive decision-making, though it has had limited use in other applications, including research and development (Glaser, 1995; as on http://www.winstonbrill.com/bril001/html/article_index/articles/151-200/article191_body.html, February 11, 2006). AIM, a proprietary instrument, is not currently accessible online. In addition, the purpose and scope of the AIM is too narrow to provide an adequate basis for comparison with the DOI outcomes.

Goldberg's Are You Intuitive? Survey: Goldberg's 32-item forced-choice intuition assessment (Goldberg, 1983, pp. 110-113) is readily available and easy to use, but not accessible online. Also, it has not been validated. In an email response to the researcher's inquiries, Goldberg emphasized that he had approached his work on intuition "as a journalist and lay scholar"—not in a scientifically rigorous way. In addition, his work was based on "observations and interviews, not an experimental model" (personal communication, September 2005).

Cappon Intuition Profile (CIP) and *Intuition Quotient Test (IQ2): The CIP is* a 15-page descriptive questionnaire that delineates between individuals who are *more intuitive*, *less intuitive*, or *non-intuitive*. It does not attempt to get at the intuitive capacity itself or the personal characteristics which may predict intuitiveness (Cappon, 1993c, p. 44). The subsequently developed IQ2 may be one of the most advanced and soundly designed instruments devised to date to measure intuition as an aspect of human intelligence. Cappon believed the best test of intuition should be visual and as "archetypal and primitive" as possible in order to bypass rational thought and access the intuitive capacity (p. 44). He spent two years designing a 90-minute, laser video-based test

utilizing 320 images and four levels of difficulty to measure the 20 intuition anatomy input/output skills he had identified. Sadly, his untimely death in 2002 truncated validation of the IQ2.

Use of the HBDI® and PSI in this Study

The HBDI® and PSI were selected for use in this study because:

1. Both are based on the same or similar theoretical and empirical foundations as the DOI.

2. Both provide alternative measures for the 25 intuition-related Shirley and Langan-Fox (1996) variables examined in this study, either as dimensions of brain dominance or as bi-polar but complementary aspects of the rational/ intuitive modes.

3. Both are validated instruments which are also accessible online.

4. Owners of both instruments granted permission for their use, and agreed to provide raw and outcome scores for respondents who participated in this project (Appendices O and P).

Data Collection Procedures

Procedures utilized in the pilot and main studies are outlined below.

Pilot Studies—DOI

To test the strengths and repair the weaknesses of the initial DOI instrument, three trials were conducted prior to the launch of the DOI pilot study. Revisions made on the basis of recommendations from these trials are outlined below:

DOI Pilot Pre-Trials

Members of the researcher's dissertation committee and several colleagues completed the initial version of the DOI. Suggestions for improving the instrument included:

- Use a sliding scale of 0-100 for responses on items requiring a numeric value.

  The first version of the DOI, requiring respondents to type in a numeric (0-100) response, proved unwieldy. After several trials, a vertical (i.e., thermometer style) arrangement of 11 radio buttons (i.e., 96-100, 86-95, 76-85, 66-75, 56-65, 45-55, 35-44, 25-34, 15-24, 5-14, and 0-4) was created to allow respondents to score those items for which a 0-100 response was required. To make completion easier and more efficient, radio buttons were used for each level of the fixed interval scale.

- Use a separate page for each item to reduce the threat of response bias. Alternatively, limit each page to no more than 10 items.

  Items ultimately fell into logical sections based on the nature of data sought and the type of response required. Accordingly, the revised instrument utilized a new page for each section: Background Characteristics (7 items); Intuition Experience (5 items); Types of Intuition (6 items); Personality Traits (21 items); Personal Characteristics (6 items); General Characteristics (54 items); and Wrap-Up (1 item, optional).

- Repeat instructions on each page.

  In subsequent versions of the instrument, instructions were provided in the heading for the respective sections, or in the header for each item, as required.

- Increase/change font when instructions change.

  The online site used to create the DOI did not provide this option. However, utilizing different pages for the sections eliminated the need for a change of font or similar cue.

- Randomize items or create different versions of the instrument to avoid response bias and decrease threats to validity.

  The survey design site allowed pages (i.e., sections) and items to be moved or copied, but had no option for automatically randomizing item order. This procedure would have to be manually manipulated through the creation of a series of non-identical instruments with different links for access. Due to the intrinsic complexity of the instrument, this would have proved unwieldy for data collection, and would have vastly complicated the data coding process, as well. Pilot respondents indicated they had not found the DOI format unduly burdensome; so this suggestion was not implemented. However, items related to respective variables were disaggregated and arranged in random sequences.

- For each section, indicate the number of items, to allow respondents to anticipate the amount of time needed for completion.

This suggestion was implemented so respondents could gauge the time requirements, set a pace for each section, and anticipate progress toward completion.

- Make it easier to distinguish among items.

  Several items that seemed too much like another were revised to extract related but slightly different information from the response.

- Require respondents to provide an open-ended *Describe/Explain* response to get a richer picture of the item's discriminating ability.

  This suggestion was not followed. Though this qualitative information would have been of considerable interest to the researcher, the survey design site did not allow this option. That is, each item with a *Describe/Explain* component would need not one but *two* items, nearly doubling the length of an already lengthy instrument. It was decided that this could damage the DOI by making it unduly ponderous and time-consuming. In addition, it could frustrate respondents who did not have, or did not wish to provide, an explanation for their numeric responses.

- Include *None* or *Both* responses for some items.

  A number of items were changed to include these options. For instance, a Both equally response was added to item 6, Academic Aptitude, which asked respondents to indicate a *verbal* vs. *mathematical* preference. Including a *Never*/*None* category was also important to cover possible responses for respondents who considered themselves to be *non-intuitive*.

- Include a ranking response on some items.

  Item 7—*School Subjects*—was changed to provide for a 1-5 ranking of the five subjects provided. Item 9—*Forms of Intuition*—was changed to a constant sum format, requiring respondents to provide 6 percents totaling 100.

- Revise items to eliminate multiple possibilities within a given item.

  Numerous revisions were made to serve this end. For instance, the item "Because I am detail-oriented, I prefer to be precise about the facts of a matter" creates a potential contradiction for a respondent who is detail-oriented but *not* precise about facts, or vice versa. Similarly, items like "I am able to recognize patterns and synthesize ideas that previously appeared unrelated" provided two potentially contradictory options. Revisions were made to eliminate these structural problems throughout the instrument.

- Eliminate the items about *belief in* and *perception of* intuition.

These items were revised but retained because they answered a question of interest to the researcher: "Do those who have a higher level of belief in intuition, or a stronger perception of their own intuitiveness, score higher on the DOI, on one or another of the HBDI® quadrants, and/or on the intuitive mode of the PSI?"

DOI Pilot Study

Pilot study involved nine undergraduates from a statistics class at a large private Midwestern university. Respondents ranged in age from 20 to 60. Though they met the minimum age criteria, their mean age of 24 was considerably lower than the mean age from the main study. Five individuals described themselves as students or full-time students; two were in retail sales; one was in management. Six were Euro-American or White; two were Hispanic or Latino; 1 was Asian. Four had acquired some college credit; three had earned an Associate's degree; one had an unspecified professional certification or licensure; and another had a high school diploma or equivalent.

Pilot respondents were asked to complete the DOI, but not the HBDI® or PSI instruments, since the purpose of the pilot study was refinement of the DOI and trial coding of the pilot data. The pilot data was not included in the main study dataset, since changes were made to the DOI instrument based on the pilot study outcomes.

In addition to completing the DOI, pilot participants responded to five additional questions designed to solicit feedback about the instrument design. The questions and responses are summarized below:

1. *How long did it take to complete the DOI survey?*
   Time ranged from 10-35 minutes, with a mean of 20 minutes.
   (Responses: 1—10 minutes; 1—10-15 minutes; 1—15-20 minutes; 3—20 minutes; 1—25 minutes; 1—25-30 minutes; 1—35 minutes).

2. *Were the instructions helpful and adequate? If no, explain.*
   8—Yes (1 participant compared them favorably to instructions for the SAT.)
   1—No (1 participant stated the definition of intuition was unclear.)

3. *Were any items in the survey unclear or confusing for you? If so, what changes should be made?*
   6—No (1—Many questions repeated themselves in different ways.)
   1—I'm not sure if I answered a question more than once, or if it was just worded very similar.
   1—Some items asking for 0-100 rating were repetitive from the section asking about frequency.
   1—Definition of intuition only becomes clear as one goes through the survey.

4. *What problems, if any, did you encounter in completing the DOI survey and what should be done to improve it?*
   1—Allow respondents to skip some items, and show items that were missed.
   4—Problems clicking on some radio buttons for some items, though this could be rectified by clicking on any button, then changing the selection.
   4—No problems

5. *Any final comments or recommendations for the researcher?*
   3—No.
   1—Good project. I wish you the best in your findings and your conclusions.
   1—Great survey! I can't wait for the results!
   1—Very nice survey. Not a question that I feel I needed to explain in words because you created questions appropriate for your research.
   1—I think this study is intriguing, to be honest. I wish you luck.

Additional refinements were made to the DOI based on pilot feedback but, based on outcomes from the pre-trials and pilot study, it was decided that subsequent pilots were not needed, Though the DOI pilot data collected was coded to test the coding procedures, there was inadequate pilot data to conduct any meaningful analysis.

HBDI® and PSI Pilots—Coding

At the researcher's request, owners of the HBDI® and PSI instruments provided a set of sample data for eight randomly-selected respondents. Because these respondents were unrelated to the current project, names and other identifying information was excised before the data was sent. These sample datasets allowed the researcher to check the coding process for the other two instruments utilized in this project. The procedure was relatively straightforward, since most of the data was provided in a numeric format.

Main Study—DOI, HBDI®, and PSI

Based on the requirements of the statistical analysis procedures, described in more detail hereinafter, it was determined that at least 300 respondents were needed for the main study. Respondents were asked to complete all three instruments, in order to acquire as many matched instruments as possible. Though the original design would have allowed for completion of the three instruments both online and on paper, the HBDI® was *only* accessible online. Accordingly, all three instruments were administered online, which offered many advantages for data collection. Specifically, it:

1. eliminated the need for most data entry, reducing the risk of coding errors;
2. allowed participants to complete the survey more easily, encouraging participation and completion;
3. reduced the cost of pen and paper administration (i.e., printing, mailing, etc.);
4. facilitated compiling and organizing data directly from the online input;
5. restricted respondents to a single completion of the survey;
6. enabled respondents who were interrupted during the HBDI® to return for later completion and submission;
7. prevented submission of the survey(s) if any (except optional) items were unanswered.

Participant consent, conferred by completion of the DOI, enabled the researcher to acquire raw data from responses to the HBDI® instrument. Though the 120 HBDI® items are weighted measures used to calculate the quadrant and modal percent scores, certain HBDI® items were directly related to the variables examined in this project:

Item 2: Sex

Item 3: Educational focus or major

Item 4: Occupation or job title

Items 5 and 6: Handedness

Items 7, 8 and 9: School subjects

Items 10-25: Work elements (ranked on a 5-point scale by strength of preference)

Items 26-50: Key descriptors (especially the 8 ranked as *most* descriptive)

Items 51-72: Hobbies (especially music, adventure-seeking/risk-taking and creativity);

Item 73: Energy level

Items 76-99: Adjective pairs (from the forced-choice item pairs)

Item 100: Introversion/Extraversion

Items 101-120: Twenty Questions.

Completion of the DOI survey also conferred permission for the researcher to acquire the respondents' PSI raw data and modal percent scores for the six rational vs. intuitive subscales. The design for the current study required correlation of responses on each of the instruments by respondent; so a master data spreadsheet was compiled. To ensure anonymity, participant names were replaced with a case numbers 1-302, assigned in alphabetic order by surname, then first name. The respective numbers were used as identifiers for all respondents' corresponding HBDI® and PSI data. The cover page of the online DOI survey assured participants that identifying information would not be used, released, or shared; and outcomes would be reported aggregately, not individually.

Data Analysis Methods

The statistical methods used to analyze the data collected for this study were confirmatory factor analysis (CFA), canonical correlation analysis (CCA); regression analysis (RA) and correlation analysis (CA). These methods and their appropriateness for use in testing the four hypotheses of this study are described in more detail below.

Confirmatory Factor Analysis (CFA)

Kim and Mueller (1978) defined FA as "a variety of statistical techniques whose common objective is to represent a set of variables in terms of a smaller number of hypothetical variables" (p. 9). Long (1983) described FA as "a statistical procedure for uncovering a (usually) smaller number of latent variables by studying the co-variation among a set of observed variables" (p. 11). This analytical method searches for patterns among variables. Each variable is predicted by all others, so there are no independent or dependent variables in FA. Instead, each factor is considered a dependent variable which is a function of the entire set of variables (Hair, Anderson, Tatham and Black, 1998, p. 91). The primary strength of FA as a research method is its ability to discern patterns among groups, or clusters, of variables under examination.

FA has numerous applications in research. Hair, et al found the FA technique especially useful in social sciences research because it is able to condense data from a large number of variables into a much smaller set of underlying dimensions, principal components, or contributing factors (p. 14). FA also makes it possible to analyze "patterns of complex, multi-dimensional relationships" (p. 88); provides an empirical basis for assessing the structure of variables, creating composite measures, or selecting variables for subsequent study (p. 95); and is useful in the validation of scales for construct measurement (p. 617).

Simonton (1980) noted that multivariate techniques like FA are especially apropos for the study of intuition; because they enable objective detection of small but "statistically significant, complex, and probabilistic relationships" (p. 52). The two primary types of FA are:

1. *Exploratory Factor Analysis (EFA)*—used when the researcher is not interested in predictions or cause-effect relationships, or has no hypothesis about the number of underlying dimensions for the data being examined (Kim and Mueller, 1978, p. 9); and

1. *Confirmatory Factor Analysis (CFA)*—used when the researcher has a hypothesis to confirm, or a hypothetical model that explains "which pairs of common factors are correlated, which observed variables are affected by which common factors, which observed variables are affected by a unique factor, and which pairs of unique factors are correlated" (Long, 1983, p. 12).

Byrne (2001) noted that CFA is uniquely appropriate for studies based on some existing knowledge of underlying latent variable structures, because it allows formulation and statistical testing of hypotheses about relationships among the observed and latent variables. Byrne called CFA the *measurement model* due to its ability to measure the strength of hypothesized relationships between observed and latent variables (p. 6).

Debate about the appropriate role of FA in research continues. Some view FA as exploratory and believe it should only be utilized as a data summarization or reduction method. Others see FA as an efficient means for testing and confirming hypotheses based on theoretical or empirical foundations (Hair, et al, 1998, p. 91). Hair, et al (1998) cautioned that FA always produces factors, since it is designed to find commonalities and patterns within a given dataset (p. 97).

FA has also been criticized because studies using this technique are often sample-dependent with limited generalizability beyond the sample population. However, this potential limitation can be thwarted or minimized by increasing the diversity and randomness of the respondent group. The extensive background characteristics collected on the DOI, HBDI® and PSI made it possible to determine the heterogeneity of this study's participants. Steps were also taken to recruit participants of varying ages, education levels, ethnicities, socio-economic backgrounds, professions, etc.

FA was appropriate for this study because it allowed the researcher to determine the best factor loadings for the intuition variables examined. In particular, CFA enabled measurement of the hypothesized relationship of the intuition-related variables to each other in order to test Hypothesis 1.

Table 3.1 below depicts the hypothesized relationships among the 25 variables by cluster as proposed by Shirley and Langan-Fox (1996), as well as the proposed relationships of the 25 variables by brain hemisphere. Analytic cognitive style was included in the matrix not because it was associated with intuition, but because of its polarity with the Intuitive cognitive style variable, and because the HBDI® assesses both of these cognitive processes as elements of brain dominance.

Table 3.1: Intuition Variables* and Hypothesized Relationship to Brain Dominance

Cluster	**Left-Brain** (A/B Quadrants)	**Right-Brain** (C/D Quadrants)	**Whole-Brain** (A/B/C/D Quadrants)
Social/Acquired	2. Cognitive style/ Analytic	3. Cognitive style/ Intuitive 8. Carelessness w/facts 9. Cooperativeness 10. Impulsivity 11. Flexibility 12. Interest in arts/aesthetics 14. Adventure-seeking 15. Unconventionality 16. Ability to visualize 17. Imagery 18. Emotions	1. Academic aptitude 4. Experience 5. Introversion/ Extraversion 6. Creativity 7. Innovation 13. Music
Biological			19. Age 20. Sex 21. Handedness 22. Brain hemispheres 23. Ethnicity
Situational			24. Time of day 25. Amount of information available

* Variables numbered according to order of presentation in Table 1.1.

Variables from the right-brain column are associated with right-brain functions and processes, as described in Herrmann's *Whole Brain Model* (Appendix D). Among the whole-brain variables in Table 3.1, academic aptitude, creativity, and music can be either left- or right-brain orientations, depending on the application. Though introversion is often associated with the left-brain and extraversion with the right-brain, the HBDI® does not load these orientations exclusively within a given quadrant or hemisphere. Variables from the biological cluster are placed in the whole-brain column because they are not correlated with specific brain quadrants or hemispheres.

Factors found in the CFA tests were utilized for subsequent analyses conducted for the remaining hypotheses. Methods used for those analyses are described below.

Canonical Correlation Analysis (CCA)

Hair, et al (1998) defined CCA as a "multivariate statistical model that facilitates the study of interrelationships among sets of multiple dependent variables and multiple independent variables" (p. 444). Because CCA is able to simultaneously predict multiple dependent variables from multiple independent variables, it is appropriate for the analysis needed for Hypothesis 2. In particular, CCA was used to determine how the factors identified in Hypothesis 1 loaded on each of the HBDI® brain quadrants.

Regression Analysis (RA)

According to Tabachnick and Fidell (2007), regression is "used to predict a score on one variable from a score on the other" (p. 57). Hypothesis 3 assumes that knowing one's brain hemisphere score will make it possible to determine the individual's capacity for intuition. RA was used to determine how the factors identified in Hypothesis 1 loaded on the HBDI® brain hemispheres.

Correlation Analysis (CA)

CA is used to evaluate the relationships between or among two or more things (e.g., variables, factors, datasets, etc., Cohen and Swerdlik, 2004, p. I-6). Correlation coefficients, represented as an *r* value, measure the "strength and…direction of a linear relationship between two variables" (Larson and Farber, 2003, p. 445). The range of the correlation coefficient is -1 to 1. Where *x* and *y* have strong positive correlations, the *r* value will be close to 1. Conversely, an *r* value of -1 indicates a strong negative correlation. The absence of, or weak, correlation produces an *r* close to 0 (p. 445).

Though many techniques measure correlation, the most widely used is the Pearson product moment correlation coefficient devised by statistician Karl Pearson (Cohen and Swerdlik, 2004, p. 115). The Pearson *r* is especially useful with test scores or other measurements relative to the mean of the distribution (p. 115).

To validate a new instrument, researchers commonly compare scores derived from the new instrument to scores from an existing, previously validated instrument that measures the same construct. A high *r* value indicates that the two instruments are measuring the same construct, providing support for the criterion-related validity of the new instrument.

For this study, the DOI total score and variable scores were compared to the ratio scores for the PSI's rational and intuitive modes to confirm Hypothesis 4, which stated: A strong positive correlation exists between intuition as measured by the DOI and the PSI's three intuitive mode subscale scores; and a corresponding negative correlation exists between intuition as measured by the DOI and the PSI's three rational mode subscale scores.

DOI, HBDI®, PSI Hypothesized Relationship Model

Figure 3.1 below depicts the hypothesized relationships between intuition as measured by the DOI, brain quadrant and hemisphere dominance as measured by the HBDI®, and the rational vs. intuitive modes as measured by the PSI. More specifically, the model depicts the relationships between and among the:

1. 25 variables from the social/acquired, biological and situational clusters (Shirley and Langan-Fox, 1996) selected for measurement by the DOI—analysis conducted for Hypothesis 1;

2. A, B, C and D quadrants and left/right, cerebral/limbic hemispheres of the HBDI® (Herrmann, 1995)—analyses conducted for Hypotheses 2 and 3;

3. Six rational and intuitive subscales (respectively: analysis, planning and control; and sharing, vision and insight), derived from the PSI (Taggart and Valenzi, 1990; Taggart, 2000)—analysis conducted for Hypothesis 4.

Not examined in this project, additional assumptions regarding relationships between HBDI® quadrants and hemispheres and the PSI subscales included:

1. PSI analysis (Rational mode) will correlate positively with the HBDI® A quadrant/left hemisphere

2. PSI planning and control (Rational mode) will correlate positively with the HBDI® B quadrant/left hemisphere

3. PSI sharing (Intuitive mode) will correlate positively with the HBDI® C quadrant/right hemisphere

4. PSI vision and insight (Intuitive mode) will correlate positively with the HBDI®'s D quadrant/right hemisphere

DOI variables are listed in the order provided in Table 1.1 and respective DOI and/or HBDI® items are included for each. Variable #22, brain hemispheres, omitted from the *DOI—Biological* cluster, is examined within the HBDI® elements of the model.

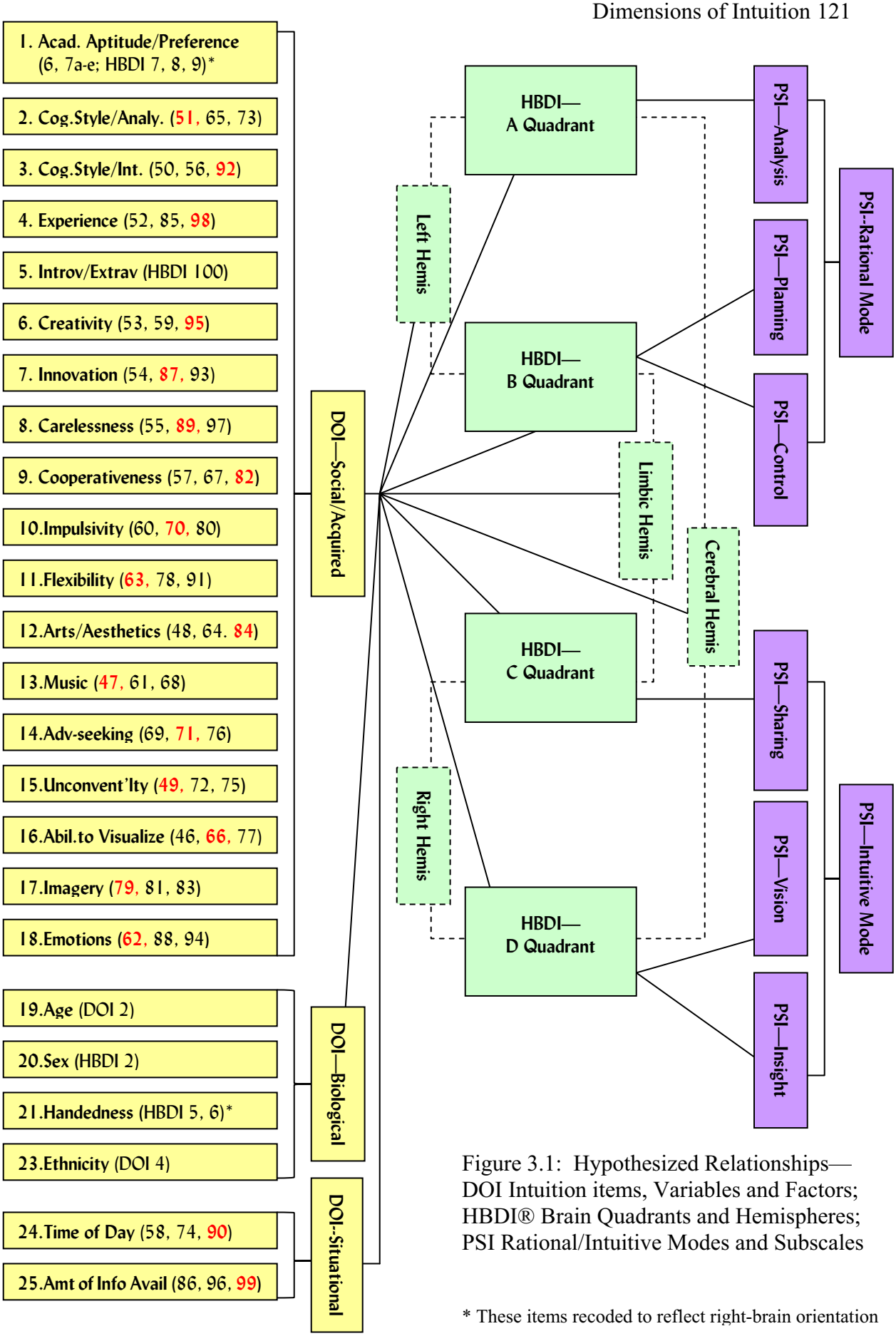

Figure 3.1: Hypothesized Relationships—DOI Intuition items, Variables and Factors; HBDI® Brain Quadrants and Hemispheres; PSI Rational/Intuitive Modes and Subscales

* These items recoded to reflect right-brain orientation

Assumptions underlying the hypothesized relationships between the Shirley and Langan-Fox (1996) intuition-related variables, brain dominance as measured by the HBDI®, and the intuitive vs. rational preferences as measured by the PSI included:

- *HBDI® Left, Right, Cerebral and Limbic Hemispheres:*
  Dotted lines in Figure 3.1 depict relationships between the HBDI® quadrants and the left, right, cerebral and limbic hemispheres (Herrmann, 1995, p. 411):
  A+B quadrants=Left C+D quadrants=Right
  A+D quadrants=Cerebral B+C quadrants=Limbic.

- *HBDI® A Quadrant and DOI Social/Acquired Variables:*
  Individuals with high A-quadrant scores tend to be logical, analytical, fact-based and quantitative (Herrmann, 1995). High A-quadrant scores and the DOI items related to the following social/acquired variables (Shirley and Langan-Fox, 1996) are correlated and mutually predictive:

  - Academic aptitude: Individuals with high A-quadrant scores will have greater or lesser aptitudes for given academic subjects (Westcott & Ranzoni, 1963; Westcott, 1968; Herrmann, 1995). Proprietary information about the relationships between specific subjects and respective HBDI® quadrants, not included here, was provided to assist the data analysis.

  - Analytic cognitive style: This thinking style is correlated with a preference for logical, analytical thinking associated with high A-quadrant scores (Simonton, 1980; Herrmann, 1995).

  - Experience: Intuition is complemented by left-brained rational analysis, common among those with high A-quadrant scores (Stocks, 1939).

  - Introversion/Extraversion: Individuals with high A-quadrant scores may be either introverted or extraverted (Westman & Canter, 1979; Metzner, 1980; Herrmann, 1995).

  - Music: Intuitive individuals tend to enjoy music, associated with the whole-brain, especially composing (Simonton, 1980; Herrmann, 1995).

- *HBDI® A Quadrant and DOI Biological Variables:*
  Empirical studies to date have failed to find correlations between intuition and the biological variables age, sex and ethnicity (Valentine, 1929; Neisser, 1963; Vaughan, 1979; Fallik & Eliot, 1985, Rockenstein, 1988; Wonder & Blake, 1992). Herrmann (1995) established normal distributions of these characteristics across all HBDI® quadrants, as well as a moderate correlation between handedness and the left/right brain hemispheres. The biological variable, brain hemispheres, was measured by HBDI® outcome scores.

- *HBDI® A Quadrant and DOI Situational Variables:*
  Relative to the time of day variable from the Shirley and Langan-Fox (1996) situational cluster, studies indicate that certain times of day may be more conducive to the reception of intuitive insights. That is, individuals are likely to be either *more* or *less* receptive to intuitive insights at one time of the day or another (Westman & Canter, 1979). Time of day is also related to the left and right hemispheres of the brain in that those with stronger left-brain preferences tend to have more energy in the morning; and those with right-brain preferences tend to have more energy at night (Herrmann, 1995).

  The amount of information available variable from the Shirley and Langan-Fox situational cluster, relates to intuition in that those who are able to make successful inferences on the basis of less information than usually required are considered highly intuitive (Westcott, 1961; Westcott & Ranzoni, 1963; Westcott, 1968; Cosier and Aplin, 1982; Nutt, 1989; Peters, et al., 1974). This variable was assigned to all four quadrants, since intuition in this context is hypothesized to be a whole-brain faculty.

- *HBDI® A Quadrant and PSI Analysis Mode:*
  The HBDI® A quadrant is correlated with analysis, one of the PSI's three *rational* modes (Taggart & Valenzi, 1990; Herrmann, 1995).

- *HBDI® B Quadrant and DOI Social/Acquired Variables:*
  Those with high B-quadrant scores tend to be organized, sequential, detail-oriented and good at planning (Herrmann, 1995). High B-quadrant scores and DOI items related to the following social/acquired variables (Shirley and Langan-Fox, 1996) are strongly correlated and mutually predictive:

  - Academic aptitude: Individuals with high B-quadrant scores will have greater or lesser aptitudes for specific academic subjects (Westcott & Ranzoni, 1963; Westcott, 1968; Herrmann, 1995).

  - Analytic cognitive style: This thinking style is correlated with the organized, sequential thinking associated with high B-quadrant scores (Simonton, 1980; Herrmann, 1995).

  - Experience: Intuition is supplemented by the left brain-oriented rational analysis common among those with high B-quadrant scores (Stocks, 1939).

  - Introversion/Extraversion: Individuals with high B-quadrant scores may be either introverted or extraverted (Westman & Canter, 1979; Metzner, 1980; Herrmann, 1995).

  - Music: Intuitive individuals tend to enjoy music, associated with the whole-brain, especially composing (Simonton, 1980; Herrmann, 1995).

- *HBDI® B Quadrant and DOI Biological and Situational Variables:* Assumptions about the hypothesized relationship between the HBDI® B quadrant and variables from the DOI biological and situational clusters are the same as for the HBDI® A quadrant.

- *HBDI® B Quadrant and PSI Planning and Control Modes:* The HBDI® B quadrant is correlated with both planning and control, two of the PSI's three *rational* modes (Taggart & Valenzi, 1990; Herrmann, 1995).

- *HBDI® C Quadrant and DOI Social/Acquired Variables:* Those with high C-quadrant scores tend to be interpersonal, feeling-based, kinesthetic and emotional (Herrmann, 1995). High C-quadrant scores and the DOI items related to the following social/acquired variables (Shirley and Langan-Fox, 1996) are strongly correlated and mutually predictive:

    - Academic aptitude: Individuals with high C-quadrant scores will have greater or lesser aptitudes for specific academic subjects (Westcott & Ranzoni, 1963; Westcott, 1968; Herrmann, 1995).

    - Intuitive cognitive style: This thinking style is correlated with emotional, feeling-based thinking associated with high C-quadrant scores (Simonton, 1980; Herrmann, 1995).

    - Experience: Relative to experience, those with high C-quadrant scores are likely to attend to and rely on their own and others' impressions and reactions. The HBDI® loads *people intuition* in the C quadrant, indicating that those with high C-quadrant scores are likely to be highly intuitive, as well (Agor, 1991; Herrmann, 1995).

    - Introversion/Extraversion: Individuals with high C-quadrant scores may be either introverted or extraverted (Westman & Canter, 1979; Metzner, 1980; Herrmann, 1995).

    - Creativity: This trait, common among intuitive individuals, is also characteristic of those with high C-quadrant scores (Westcott & Ranzoni, 1979; Herrmann, 1995).

    - Cooperativeness: Individuals with high C-quadrant scores are likely to share this characteristic (Westcott & Ranzoni, 1979; Agor, 1991; Herrmann, 1995).

    - Flexibility: This trait, common among intuitive individuals, is prevalent among those with high C-quadrant scores (Westcott & Ranzoni, 1963).

- Interest in arts/aesthetics: This characteristic of intuitive individuals is also likely to be found among those with high C-quadrant scores (Wild, 1938; Vaughan, 1979; Simonton, 1980).

- Music: Intuitive individuals tend to enjoy music, associated with the whole-brain, especially composing (Simonton, 1980; Herrmann, 1995).

- Emotions: This characteristic of intuitive individuals is also prevalent among those with high C-quadrant scores (Vaughan, 1979; Bastick, 1982; Mitchell & Beach, 1990; Denes-Raj & Epstein, 1994; Herrmann, 1995).

- *HBDI® C Quadrant and DOI Biological and Situational Variables:* Assumptions about the hypothesized relationship between the HBDI® C quadrant and variables from the biological and situational clusters are the same as for the HBDI® A quadrant.

- *HBDI® C Quadrant and PSI Sharing Mode:* The HBDI® C quadrant is correlated with sharing, one of the PSI's three *intuitive* modes (Taggart & Valenzi, 1990; Herrmann, 1995).

- *HBDI® D Quadrant and DOI Social/Acquired Variables:* Individuals with high D-quadrant scores tend to be holistic and intuitive, with strong abilities to integrate and synthesize (Herrmann, 1995). High D-quadrant scores and the DOI items related to the following social/acquired variables (Shirley and Langan-Fox, 1996) are strongly correlated and mutually predictive:

  - Academic aptitude: Individuals with high D-quadrant scores will have greater or lesser aptitudes for specific academic subjects (Westcott & Ranzoni, 1963; Westcott, 1968; Herrmann, 1995).

  - Intuitive cognitive style: This thinking style is correlated with the abstract, big picture, integrative thinking associated with high D-quadrant scores (Simonton, 1980; Herrmann, 1995).

  - Experience: Relative to experience, individuals with high D-quadrant scores tend to be holistic and integrative. The HBDI® loads *idea*/*solution intuition* in the D quadrant, indicating that those with high D-quadrant scores are likely to be highly intuitive, as well (Agor, 1991; Herrmann, 1995).

  - Introversion/Extraversion: Individuals with high D-quadrant scores may be either introverted or extraverted (Westman & Canter, 1979; Metzner, 1980; Herrmann, 1995).

- Carelessness with facts and details: This trait, common among intuitive individuals, is also characteristic of those with high D-quadrant scores (Agor, 1991; Herrmann, 1995).

- Impulsivity: This trait common among intuitive individuals is also characteristic of those with high D-quadrant scores (Westcott & Ranzoni, 1963; Herrmann, 1995).

- Music: Intuitive individuals tend to enjoy music, associated with the whole-brain, especially composing (Simonton, 1980; Herrmann, 1995).

- Adventure-seeking: This trait, common among intuitive individuals, is also characteristic of those with high D-quadrant scores (Westcott & Ranzoni, 1963; Herrmann, 1995).

- Unconventionality: This trait, common among intuitive individuals, is also characteristic of those with high D-quadrant scores (Westcott & Ranzoni, 1963; Herrmann, 1995).

- Ability to visualize: This trait, common among intuitive individuals, is characteristic of those with high D-quadrant scores (Fischbein, 1975; Herrmann, 1995).

- Imagery: This trait, common among intuitive individuals, is also characteristic of those with high D-quadrant scores (Heron, 1992; Vaughan, 1979; Herrmann, 1995).

- *HBDI® D Quadrant and DOI Biological and Situational Variables:* Assumptions about the hypothesized relationship between the HBDI® D quadrant and variables from the biological and situational clusters are the same as for the HBDI® A quadrant.

- *HBDI® D Quadrant and PSI Vision and Insight Modes:* The HBDI® D quadrant is correlated with both vision and insight, two of the PSI's three *intuitive* modes (Taggart & Valenzi, 1990; Herrmann, 1995).

Data Analysis Procedures

This section explains how data was collected for each instrument; the organization, reporting and coding of the data collected; and data analyses performed.

Dimensions of Intuition (DOI)

The DOI examined 25 of the 57 variables identified by Shirley and Langan-Fox (1996). A variety of methods were used to collect the DOI data, though most items utilized a 0-100% ratio scale that allowed participants to select one of 11 ranges: 0-4%, 5-14%, 15-24%, 25-34%, 35-44%, 45-55%, 56-65%, 66-75%, 76-85%, 86-95% or 96-100%. The top and bottom choices (0-4% and 96-100%, respectively) offered 4-point ranges, while each of the remaining nine choices offered an equidistant 10-point range. The higher the percent selected, the greater the level of agreement.

Based on the "three-indicator rule" for confirmatory factor models (Blunch, 2008, p. 129), three DOI items were created for each of the 18 social/acquired and situational variables, with one item from each set assessing the absence or lack of the characteristic. To reduce the potential for response errors due to misreading, capitalization was used as a cue for words indicating negative constructs (e.g., "I prefer NOT to rely on step-by-step directions.") DOI items from each three-item set were disaggregated and randomized to reduce the likelihood that responses would be biased by the proximity of related items.

Variables from the biological cluster utilized a nominal scale that included *Other/ Specify* to cover all possibilities. Respondents characterized their personal experience of intuition by type (Goldberg, 1983) and receptor (Sanders, 1989, Appendix I). A final, narrative item was included to elicit additional comments to inform the research.

The DOI data collected was measured, organized and reported as indicated below:

- *Background Characteristics* (items 1-7)—measured as indicated below:
    - Item 1, Name—completion item; name replaced by a numeric case identifier (1-302) to protect participant identity and ensure confidentiality.

- Item 2, Age—completion item; reported by frequency counts and central tendency.

- Item 3, Occupation/Job Title—narrative (descriptive) item; categorized by US Department of Labor designations; collected for subsequent analysis—not analyzed or reported in this project.

- Item 4, Ethnicity—determined by one of 8 nominal options including *Other/Specify*; reported by frequency counts and central tendency.

- Item 5, Education—determined by one of 8 ordinal options, including *Other/Specify*; reported by frequency counts and central tendency.

- Item 6, Academic Aptitude—determined by selection of one among three options; assigned a relative weight by HBDI® loading and combined with item 7 for a composite academic aptitude score, as explained below.

- Item 7, School Subjects—determined by ordinal ranking of five options; assigned a relative weight by HBDI® loading and combined with item 6 for a composite academic aptitude/preference score; reported by frequency counts and central tendency.

  Weighted scores for the three item 6 choices and the five item 7 rankings were assigned relative to their HBDI® quadrant and hemisphere loadings. A formula for the mean of the range between the minimum and maximum scores for DOI items 6 and 7 was utilized to combine these scores and obtain a 0-100 scale score equivalent for *academic aptitude/preference*.

- *Intuition Experience* (items 8-12)—measured as indicated below:

  - Item 8, Frequency of Intuition—determined by one of 6 ordinal options—four defined/last two *Never/Not sure*; collected for subsequent analysis—not analyzed or reported in this project.

  - Item 9, Forms of Intuition (i.e., visual, auditory, feeling, sensing)—measured on a 0-100 ratio scale, with a total distribution of 100% across the four types (if not 0 for all), or *Other* or *None*; collected for subsequent analysis—not analyzed or reported in this project.

  - Item 10, Conditions (times/places more conducive/less conducive to intuition)—25 choices, checked to indicate a Yes for all that apply; collected for subsequent analysis—not analyzed or reported in this project.

  - Item 11, Belief in Intuition—measured on a 0-100 ratio scale; collected for subsequent analysis—not analyzed or reported in this project.

  - Item 12, Perception of Intuitiveness—measured on a 0-100 ratio scale; collected for subsequent analysis—not analyzed or reported in this project.

- *Types of Intuition* (items 13-18)—determined by selecting one of 6 ordinal options indicating frequency—first 4 defined/last two *Never/Not sure*; collected for subsequent analysis—not analyzed or reported in this project.

- *Personality Traits* (items 19-39)—measured on a 0-100 ratio scale; related to Westcott's profile of highly intuitive individuals (Westcott & Ranzoni, 1963); collected for subsequent analysis—not analyzed or reported in this project.

- *Personal Characteristics* (items 40-45)—measured on a 0-100 ratio scale; related to Westcott's profile of highly intuitive individuals (Westcott & Ranzoni, 1963); collected for subsequent analysis—not analyzed or reported in this project.

- *General Characteristics* (items 46-99)—measured on a 0-100 ratio scale; related to 18 of the 25 Shirley and Langan-Fox (1996) variables; reported by dispersion and central tendency and subjected to a variety of data analyses, as discussed hereinafter.

- *Wrap-Up/Optional* (item 100)—narrative (descriptive) item; compiled, categorized, synopsized, and also reported in full text.

Herrmann Brain Dominance Instrument® (HBDI®)

The HBDI® isolates and measures the relative degree of dominance for each of the brain's interconnected thinking structures, or quadrants. Quadrant scores in the resulting HBDI® profile (Appendix E) are represented as a numeric score, typically 0-133, which indicates the relative degree of dominance by quadrant. Profile scores produce a corresponding four-digit *preference code* (e.g., 1-1-3-2, 2-1-1-1, etc.) The sequence of the preference code relates to the A, B, C and D quadrants, respectively; with a code of *1* indicating a *primary* preference for that quadrant; *2* indicating a *secondary* preference; and *3* indicating *tertiary* preference, or *avoidance*. The HBDI® also measures preferences across two adjoining quadrants (i.e., modes, or hemispheres). The

HBDI® modal percent 0-100% scores represent relative dominances for the left (A/B), right (C/D), cerebral (A/D), and limbic (B/C) brain hemispheres.

To ensure respondent anonymity, a case number (1-302), was assigned to each individual, in alphabetic order by surname then by first name. HBDI® outcome data extracted, organized, and subjected to statistical analyses for reporting in this study included:

HBDI® Quadrant Scores:

- A quadrant (left cerebral) score (numeric, 0-133 or higher)
- B quadrant (left limbic) score (numeric, 0-133 or higher)
- C quadrant (right limbic) score (numeric, 0-133 or higher)
- D quadrant (right cerebral) score (numeric, 0-133 or higher)

HBDI® Hemisphere (Modal Percent) Scores:

- Left modal score (percentage, 0-100)
- Right modal score (percentage, 0-100)
- Cerebral modal score (percentage, 0-100)
- Limbic modal score (percentage, 0-100)

Five variables were measured by items in the HBDI®, including:

1. HBDI® item 2, Sex—determined by one of two nominal options; reported by frequency counts.

2/3. HBDI® item 100, Introversion/Extraversion—degree indicated by placement on a 9-point bi-polar introversion/extraversion continuum; a formula was applied to determine 0-100 scale score equivalent, making scores consistent with and comparable to scores for the other social/acquired and situational variables examined in the study; reported by frequency counts and central tendency.

4. HBDI® items 5 and 6, Handedness—determined by one of four nominal options indicating respondent's characteristic way of holding a pencil (item 5); and one of five nominal options indicating handedness strength and direction (item 6); reported by frequency counts.

5. HBDI® items 1-120, Brain Hemispheres—determined by modal percent scores based on raw scores from HBDI® item 1-120; measured on a 0-100 ratio scale as described above; reported by dispersion and central tendency and utilized in data analyses for the study's four hypotheses.

Personal Style Inventory (PSI)

The PSI measures the individual's relative reliance on the rational vs. intuitive mode. The instrument is comprised of four background characteristics, an assumed role, and 30 survey items:

- *Background Characteristics*—measured in differing ways, as indicated below:
    - Name—unnumbered item; optional on the PSI, though respondents were asked to include a name to make it possible to match PSI responses to those from the DOI and/or HBDI®. To ensure confidentiality, identifying information was stripped from the PSI responses before analysis, and a case number (1-302) was assigned in alphabetic order by surname then first name.
    - Ethnicity—determined by one of 6 nominal options, with a final option of *Other/Specify*; utilized to cross-check responses on other instrument(s); not analyzed or reported in this project.
    - Education—determined by one of 22 ordinal options for grades 1-22; utilized to cross-check responses on other instrument(s); not analyzed or reported in this project.
    - Birth Date—indicated as month, day, year, thus enabling the researcher to determine age; utilized to cross-check responses on other instrument(s); not analyzed or reported in this project.
    - Sex—determined by one of 2 nominal options; utilized to cross-check responses on other instrument(s); not analyzed or reported in this project.
- *Role*—narrative/descriptive item, designated by the respondent; utilized to cross-check responses on other instrument(s); not analyzed or reported in this project.
- *Survey Items 1-30*—determined by one of six ordinal *frequency* options; raw scores provided basis for six PSI rational/intuitive subscale scores but were not analyzed or reported in this project.

The six PSI rational and intuitive subscale modal percent scores were organized for analysis and reporting as indicated below:

Rational Mode:
- Planning—Rational subscore (modal percent, 0-100)
- Analysis—Rational subscore (modal percent, 0-100)
- Control—Rational subscore (modal percent, 0-100)

Intuitive Mode:
- Vision—Intuition subscore (modal percent, 0-100)
- Insight—Intuition subscore (modal percent, 0-100)
- Sharing—Intuition subscore (modal percent, 0-100)

Analyses Performed

Kim and Mueller (1978) contended that it was no longer necessary for researchers to learn the algorithms involved in computing FA, since packaged computer programs like BMD, DATATEXT, OSIRIS, SAS, and SPSS capable of these computations are now readily available (pp. 9, 10). SPSS 16.0 (as on http://www.spss.com/statistics/, January 2009) was utilized for the descriptive statistics, intra-variable and inter-item correlations and reliability analyses conducted on the DOI; as well as the CFA conducted for Hypothesis 1; and the CA used to measure the relationship between the DOI total and variable T scores and the six PSI subscales for Hypothesis 4. Various univariate and multivariate programs within the SPSS 16.0 suite were used to conduct the canonical correlation analysis (CCA) tests for Hypothesis 2, and regression analysis (RA) tests for Hypothesis 3. These analyses enabled the researcher to fit the study data into the proposed theoretical model of intuitive functioning relative to brain dominance, as depicted in the hypothesized DOI, HBDI®, PSI relationship model shown in Figure 3.1 above.

The variables included in the testing of the four research hypotheses articulated in this project were subjected to both univariate and multivariate analysis to confirm their suitability for use in testing. The univariate analysis focused on determining that the distribution for each variable was approximately normal. Normalcy was determined by comparing means and medians for each variable, examining relative standard deviations and interquartile ranges, and considering skewness and Kurtosis statistics. Multivariate analysis included the steps specified by Hair et al (1998) for the test employed, including correlation matrices and scatter plots used to check co-linearity and heteroscedasticity.

It is important to establish the reliability of a new instrument like the DOI, in order to determine whether the outcomes can be replicated in subsequent tests or studies. This is particularly true for an instrument designed to measure a latent construct like intuition, which is comprised of latent variables. Cronbach's Alpha measures internal consistency reliability based on average correlations among items. As the most common form of internal consistency reliability coefficient, Cronbach's was determined to be an appropriate measurement statistic for the DOI. According to Garson (2008), an alpha coefficient of .70 is considered *adequate* for exploratory research, but at least .80 is required for a *good* scale. A related test, the Alpha if Deleted Correlation analysis, was also conducted to determine the estimated value of alpha if given items were removed from the model (Garson, 2008, as on http://faculty.chass.ncsu.edu/Garson/PA765/reliab.htm, October 19, 2008).

Tukey's Test for Nonadditivity, another reliability analysis utilized in this project, assumes that all items in an instrument are related to the total score in a linear manner. Tukey's tests the null hypotheses that there are no multiplicative interactions between the

cases and items (as on http://faculty.chass.ncsu.edu/Garson/PA765/reliab.htm, October 2008). Though a significance level of $p < 0.05$ indicates an interaction, $p < 0.01$ level was used for the Tukey analysis conducted for this project. Findings from all of these analyses are presented and discussed in detail in Chapter 4.

Conclusion

Overwhelming anecdotal, empirical and phenomenological evidence supports the existence of some faculty lying beyond the conscious mode and outside the rational mind. Paradoxically, if intuition exists axiomatically as posited, then the only way to perceive it may be through intuition itself. As an anonymous wit once observed: "Intuition is the only way for an intuitive intuiter to intuit."

Not surprisingly, intuition has defied most calibration attempts to date, since it is difficult to operationalize, isolate, test, measure and replicate a construct which cannot be directly observed; and for which experts cannot even find a definition upon which they can agree. Due to the elusive nature of intuition and the lack of comparable instruments to measure its precise functionality, this study provides a first step on the long journey toward predicting intuitiveness and measuring intuition.

Development and validation of a psychometrically sound instrument to measure the dimensions of intuition should ultimately make it possible to learn more about how intuition operates as a first step toward determining how intuition can be integrated into the teaching and learning process. If so, this research provides a unique base of new information to be added to the existing body of knowledge on this elusive but enticing and important topic.

If we knew what...we were doing, it would not be called research, would it?
– Albert Einstein

Chapter 4

I never came upon any of my discoveries through the process of rational thinking.
–Albert Einstein

RESULTS OF THE STUDY

This chapter provides a brief discussion of the instruments used in this study, along with response rates, respondent demographics by DOI section, and descriptives for the 25 variables examined. The remainder of the chapter presents and discusses the psychometric analyses performed and outcomes by hypothesis, as outlined in Table 4.1.

Table 4.1: Research Purposes, Related Hypotheses, and Analysis Methods

Purpose	Hypothesis	Method
***Purpose 1*:** To develop the DOI instrument to measure capacity for intuitive thinking; and verify a set of three underlying dimensions in intuitive functioning.	***Hypothesis 1:*** Absolute and associational statistics developed using confirmatory factor analysis (CFA) will confirm that the 25 variables examined in this study fit into the 3-factor model (clusters) designated by Shirley and Langan-Fox (1996): social/ acquired, biological and situational.	***Method 1:*** Confirmatory Factor Analysis (CFA)
Purpose 2: To quantify relative contributions of each brain quadrant, to each DOI factor, to determine whether intuition is right-, left- or whole-brained.	***Hypothesis 2:*** The intuitive functions as measured by the DOI and represented as the social/acquired, biological, and situational factor, or cluster, scores will relate to the dependent HBDI® quadrant scores, with relative weights conforming to the whole-brain view of intuition as a function of all quadrants of the brain.	***Method 2:*** Canonical Correlation Analysis (CCA)
Purpose 3: To quantify relative contributions of each brain hemisphere to each DOI factor, to determine whether intuition is right-, left- or whole-brained.	***Hypothesis 3:*** Intuitive factor scores as measured by the DOI will relate to the dependent HBDI® left/right and cerebral/ limbic modal percent scores, showing relative weights between and among the variates conforming to a whole-brain view of intuition.	***Method 3:*** Regression Analysis (RA)
Purpose 4: To cross-validate the DOI with the PSI, a validated measure of preference for the rational vs. intuitive mode (i.e., intuition/not intuition).	***Hypothesis 4:*** A strong positive correlation exists between intuition as measured by the DOI and the PSI's three intuitive mode scores; and a corresponding negative correlation exists between intuition as measured by the DOI and the PSI's three rational mode scores.	***Method 4:*** Correlation Analysis (CA)

Instruments

Three instruments, with a total of 250 items, were utilized to collect data for this project. The three instruments (Appendices A, C, and F) are described below:

1. *Dimensions of Intuition* (DOI)
   Designed by the researcher to measure intuition by examining a set of 25 social/acquired, biological and situational variables identified by Shirley and Langan-Fox (1996) (Appendix B). The 100 items of the DOI include:
   - Background Characteristics (7 items)
   - Intuition Experience (5 items)
   - Types of Intuition (6 items)
   - Personality Traits (21 items)
   - Personal Characteristics (6 items)
   - General Characteristics (54 items)
   - Wrap-Up (optional) (1 item)

2. *Herrmann Brain Dominance Instrument*® (HBDI®)
   Validated thinking styles instrument designed by Ned Herrmann to measure brain dominance. The 120 items of the HBDI® include:
   - Biographical Information (4 items)
   - Handedness (2 items)
   - School Subjects (3 items)
   - Work Elements (16 items)
   - Key Descriptors (25 items)
   - Hobbies (22 items)
   - Energy Level (1 item)
   - Motion Sickness (2 items)
   - Adjective Pairs (24 items)
   - Introversion/Extraversion (1 item)
   - 20 Questions (20 items)

   HBDI® outcomes include: A, B, C and D quadrant scores; and left/right and cerebral/limbic hemisphere (modal percent) scores

3. *Personal Style Inventory* (PSI)
   Validated instrument designed by Bill Taggart to measure the preference for a rational vs. intuitive preference.
   - Background Information (4 items)
   - Name/Email (optional)
   - Role chosen for survey (1 item)
   - Survey (30 items)

   PSI outcomes include: three *Rational* mode subscale scores (planning, analysis, control); and three *Intuitive* mode subscale scores (vision, insight, and sharing)

The theoretical and empirical foundations of the three instruments were presented and discussed in Chapter 2. Specifics about design of the DOI, and the development and psychometrics of the HBDI® and PSI instruments, are included in the *Instrumentation* section of Chapter 3.

Response Rate

Because this project required a relatively large number of participants, the main study reached adults in at least 20 states from Alaska to Florida, utilizing a respondent-driven snowball convenience sampling technique (Salganik and Heckathorn, 2004, pp. 193-239). The first invitation, sent by email to prospective participants in late January (Appendix L), encouraged the forwarding of the invitation to others who fit the study criteria. Versions of two additional email invitations (Appendices M and N), customized for other groups and individuals, were sent periodically through the end of September.

A total of 899 known individuals were invited to participate, including faculty members, students, colleagues, clients, family, friends, and referrals. Information was sent to two conference listserv groups of approximately 100 members combined, and two additional university listservs—one for faculty, the other for adult education students. Flyers were distributed at several professional meetings; and presentations were made to approximately 120-150 education, nursing and social work students in undergraduate and graduate classes on the campuses of three urban, Midwestern universities—one public, and two private.

Many participants forwarded the invitation to others, as the researcher requested; so the precise number of prospective participants reached cannot be determined. Using an approximate count of 1500 contacts, as described above, the maximum possible response

rate for the 302 participants would be 20.1%. Arbitrarily doubling the number of contacts to account for unknown prospective participants, yields a response rate of 10%, which is still a respectable return, considering the complexity of the study design and the length of time required to complete, not the usual one but, three instruments. Based on feedback, the actual response rate may have been higher than anticipated because of: 1) repeated and customized appeals to prospective participants; 2) general interest evinced in the topic of intuition; and 3) class credit given by one or more professors for students who participated in the study.

Data collection ended at 302 responses: 295 DOI's; 258 HBDI®'s; and 122 PSI's. A total of 251 individuals completed both the DOI and HBDI®; 119 of these completed the PSI, as well. Table 4.2 below shows the breakdown of respondents completing one, two or all three of the instruments:

Table 4.2: DOI, HBDI®, PSI Completions among 302 Respondents

	DOI	**HBDI®**	**PSI**
Responses to 1 of 3 Instruments	43		
		5	
Responses to 2 of 3 Instruments	132	132	
	1		1
		2	2
Responses to 3 of 3 Instruments	119	119	119
Total Responses to Each Instrument	295		
		258	
			122
Total Matched DOI/HBDI® Instruments	251	251	

Because it was important to collect responses to all items on the DOI, the online instrument was designed so that survey-takers could not proceed to the next section until they had responded to each item—except "optional" item 100. Of the 337 individuals who began the DOI, 10 individuals failed to complete the instrument but later returned to do so. Two of the 10 completed the DOI on the fourth attempt.

Based on email and phone contacts, several individuals who failed to complete the DOI at the first attempt found the instructions for item 9 (forms of intuition) confusing. They had either failed to add the required numeric value, including 0, for each choice; or they typed a % sign after the numeric value. After instructions were revised, a few respondents still reported difficulties. Item 9 was the only item that created this problem. The variable measured in item 9 was not one of the 25 examined in this study but if it is retained in future iterations of the DOI, the instructions will be revised further.

Other individuals who failed to complete the DOI may have experienced similar problems with item 9. However, the invitation to participate was forwarded to individuals unknown to the researcher, and the DOI did not capture respondent contact information. Accordingly, it was not possible to follow up on the non-completions, except with those respondents who had provided contact information when they completed the HBDI®. This oversight in the design of the DOI will be repaired in the next iteration also.

Participants were also asked to complete the HBDI®. Responses are required for all 120 HBDI® items, since the HBDI® outcome scores are based on raw data from all 120 items. The weighted algorithm used to compute the HBDI® outcome scores is proprietary and, therefore, was not available to the researcher.

The PSI also requires a response to all 30 items in order to generate the six dichotomous modal percent outcome subscores, three each for the individual's *rational* vs. *intuitive* preferences: planning vs. vision (way of preparing for the future); analysis vs. insight (way of solving problems); and control vs. sharing (way of approaching work). The weighted algorithm used to compute PSI outcomes is also proprietary, and was not available to the researcher.

Respondent Demographics

A total of 302 individuals completed at least one of the three instruments used in this project; 295 completed the DOI. Tables 4.3 and 4.4 below provide age, education and ethnicity, number and percent, for the 291 respondents for whom these demographic categories could be determined.

Table 4.3: Demographics for DOI Female Respondents by Age, Education and Ethnicity

SEX	AGE	EDUCATION	N/%	ETHNICITY				TOTAL
(N=214)	Decade			Af-Am/ Black	Euro-Am/ White	Hisp/ Latino	Other	
Female	20's	Some College	N	2	6	0	0	8
			%	25	75	0	0	100
		Associate's	N	0	6	1	1	8
			%	0	75	12.5	12.5	100
		Bachelor's	N	2	21	1	0	24
			%	8.33	87.5	4.17	0	100
		Master's	N	1	3	2	0	6
			%	16.67	50	33.33	0	100
		TOTAL	N	**5**	**36**	**4**	**1**	**46**
			%	**10.87**	**78.26**	**8.70**	**2.17**	**100**
	30's	Some College	N	0	2	0		2
			%	0	100	0		100
		Bachelor's	N	1	21	0		22
			%	4.55	95.45	0		100
		Master's	N	1	6	2		9
			%	11.11	66.67	22.22		100
		Doctoral	N	0	3	0		3
			%	0	100	0		100
		Prof Cert/Lic	N	0	0	1		1
			%	0	0	100		100
		TOTAL	N	**2**	**32**	**3**		**37**
			%	**5.41**	**86.49**	**8.11**		**100**
	40's	HS/Equiv	N	0	2	0	0	2
			%	0	100	0	0	100
		Some College	N	0	1	0	0	1
			%	0	100	0	0	100
		Associate's	N	1	3	0	0	4
			%	25	75	0	0	100
		Bachelor's	N	0	15	2	1	18
			%	0	83.33	11.11	5.56	100
		Master's	N	1	13	0	1	15
			%	6.67	86.67	0	6.67	100

Table 4.3 *(continued)*

SEX	AGE	EDUCATION	N/%	ETHNICITY				TOTAL
	Decade			Af-Am/ Black	Euro-Am/ White	Hisp/ Latino	Other	
		Doctoral	N	0	3	1	0	4
			%	0	75	25	0	100
		Prof Cert/Lic	N	0	1	0	0	1
			%	0	100	0	0	100
		TOTAL	N	**2**	**38**	**3**	**2**	**45**
			%	**4.44**	**84.44**	**6.67**	**4.44**	**100**
	50's	**Some College**	N	0	7			7
			%	0	100			100
		Associate's	N	0	3			3
			%	0	100			100
		Bachelor's	N	0	9			9
			%	0	100			100
		Master's	N	3	18			21
			%	14.29	85.71			100
		Doctoral	N	2	4			6
			%	33.33	66.67			100
		Prof Cert/Lic	N	0	6			6
			%	0	100			100
		TOTAL	N	**5**	**47**			**52**
			%	**9.62**	**90.38**			**100**
	60's	**HS/Equiv**	N	0	1			1
			%	0	100			100
		Some College	N	0	4			4
			%	0	100			100
		Associate's	N	0	2			2
			%	0	100			100
		Bachelor's	N	1	5			6
			%	16.67	83.33			100
		Master's	N	0	10			10
			%	0	100			100
		Doctoral	N	0	4			4
			%	0	100			100
		Prof Cert/Lic	N	0	3			3
			%	0	100			100
		Other	N	0	1			1
			%	0	100			100
		TOTAL	N	**1**	**30**			**31**
			%	**3.23**	**96.77**			**100**

Table 4.3 *(continued)*

	70's	**Some College**	N		2			2
			%		100			100
		Doctoral	N		1			1
			%		100			100
		TOTAL	N		**3**			**3**
			%		**100**			**100**

Af-Am/Black=African-American/Black; Euro-Am/White=Euro-American/White; Hisp/Latino=Hispanic/Latino; HS/Equiv=High School or Equivalent; Prof Cert/Lic=Professional Certification or Licensure

Table 4.4: Demographics for DOI Male Respondents by Age, Education and Ethnicity

SEX	**AGE**	**EDUCATION**	**N/%**	**ETHNICITY**				**TOTAL**
(N=77)	**Decade**			**Af-Am/ Black**	**Euro-Am/ White**	**Hisp/ Latino**	**Other**	
Male	**20's**	**HS/Equiv**	N	0	1			1
			%	0	100			100
		Some College	N	0	3			3
			%	0	100			100
		Associate's	N	1	3			4
			%	25	75			100
		Bachelor's	N	0	5			5
			%	0	100			100
		Master's	N	0	1			1
			%	0	100			100
		TOTAL	N	**1**	**13**			**14**
			%	**7.14**	**92.86**			**100**
	30's	**Associate's**	N	0	1	0		1
			%	0	100	0		100
		Bachelor's	N	1	1	1		3
			%	33.33	33.33	33.33		100
		Master's	N	0	9	1		10
			%	0	90	10		100
		Doctoral	N	0	1	0		1
			%	0	100	0		100
		Prof Cert/Lic	N	0	1	0		1
			%	0	100	0		100
		TOTAL	N	**1**	**13**	**2**		**16**
			%	**6.25**	**81.25**	**12.5**		**100**
	40's	**HS/Equiv**	N	0	1	0	0	1
			%	0	100	0	0	100
		Some College	N	0	1	0	0	1
			%	0	100	0	0	100
		Bachelor's	N	0	2	0	1	3
			%	0	66.67	0	33.33	100

Table 4.4 *(continued)*

SEX	AGE	EDUCATION	N/%	ETHNICITY				TOTAL
(N=77)	Decade			Af-Am/ Black	Euro-Am/ White	Hisp/ Latino	Other	
		Master's	N	0	1	1	0	2
			%	0	50	50	0	100
		Doctoral	N	1	0	0	0	1
			%	100	0	0	0	100
		Prof Cert/Lic	N	0	0	1	0	1
			%	0	0	100	0	100
		TOTAL	N	**1**	**5**	**2**	**1**	**9**
			%	**11.11**	**55.56**	**22.22**	**11.11**	**100**
	50's	**Bachelor's**	N		4	0		4
			%		100	0		100
		Master's	N		9	1		10
			%		90	10		100
		Doctoral	N		4	1		5
			%		80	20		100
		TOTAL	N		**17**	**2**		**19**
			%		**89.47**	**10.53**		**100**
	60's	**Associate's**	N	0	1			1
			%	0	100			100
		Bachelor's	N	0	2			2
			%	0	100			100
		Master's	N	1	2			3
			%	33.33	66.67			100
		Doctoral	N	0	6			6
			%	0	100			100
		Prof Cert/Lic	N	0	2			2
			%	0	100			100
		TOTAL	N	**1**	**13**			**14**
			%	**7.14**	**92.86**			**100**
	70's	**Some College**	N	0	1			1
			%	0	100			100
		Bachelor's	N	0	1			1
			%	0	100			100
		Master's	N	1	0			1
			%	100	0			100
		Doctoral	N	0	2			2
			%	0	100			100
		TOTAL	N	**1**	**4**			**5**
			%	**20**	**80**			**100**

Af-Am/Black=African-American/Black; Euro-Am/White=Euro-American/White; Hisp/Latino=Hispanic/ Latino; HS/Equiv=High School or Equivalent; Prof Cert/Lic=Professional Certification or Licensure

Sex. Among the 291 respondents for whom sex was known, 214 (72.5%) were female and 77 (26.1%) were male, indicating a strong skew toward females among the study respondents. According to the U.S. Census (2000), the overall population is 50.9% female and 49.1% male; and distribution by sex for those 18 years and older is 38.4% female, 35.9% male (as on http://factfinder.census.gov, October 14, 2008, Appendix Q).

Age. Age range for the 302 respondents in this study was 20 to 79, with 65 individuals (21.5%) in their 20's, 54 (17.9%) in their 30's, 54 (17.9%) in their 40's, 73 (24.2%) in their 50's, 48 (15.9%) in their 60's; and 8 (2.6%) in their 70's. According to the U.S. Census (2000), 68% of the overall population is 20 to 79 years of age (as on http://factfinder.census.gov, October 14, 2008, Appendix R). Correlations between age, from the Shirley and Langan-Fox biological cluster, and the 18 social/acquired and 2 situational variables examined in this study are presented and discussed hereinafter.

Education. Of the 294 respondents for whom education level was known, five (.02%) were in the high school or equivalent group, 30 (10.2%) had some college credit; 23 (7.8%) an Associate's, 99 (33.6%) Bachelor's; 89 (30.2%) Master's; 33 (11.2%) doctorate, including one Juris Doctorate and one Doctor of Chiropractic; 15 (5.1%) professional certification or licensure. Due to the convenience sampling used, education level for the sample population is somewhat higher than that of the overall population. According to the U.S. Census (2000), 28.6% of the population had high school diplomas; 7.1% some college credit; 6.3% an Associate's degree; 15.5% Bachelor's; 5.9% Master's, 1% doctorate; and 2% professional certification (as on http://www.census.gov/prod/2003pubs/c2kbr-24.pdf, October 14, 2008, Appendices S and T). Education level data was collected for later examination of its affirming or deleterious effect on intuitiveness.

Ethnicity. Among these 291 respondents, 20 (6.8%) selected *African-American/ Black* (hereinafter *black*) for ethnicity in item 4; 255 (86.4%) selected *Euro-American/ White* (hereinafter *white*); and 16 (5.4%) selected *Hispanic/Latino* (hereinafter *Hispanic*). The other 4 (of 295) respondents represented single cases in some other ethnic group. The U.S. Census (2000) indicated the overall population is 75.1% white, 12.3% black, and 12.5% Hispanic. Percentages for those 18 and over are 77.4% white, 11.4% black, and 11.0% Hispanic (as on http://www.census.gov/prod/2001pubs/c2kbr01-1.pdf, October 14, 2008, Appendices R and S).

Variables Measured but not Analyzed

Occupation (DOI item 3) was included to aid in the matching of the DOI, HBDI® and PSI instruments by respondent. However, occupation was not one of the Shirley and Langan-Fox (1996) variables; so this data was not analyzed and will not be reported here.

DOI items 8-18, based on the literature as described in Chapter 2, were related to the individual's personal experience of intuition, including: frequency of intuitive insights, belief in intuition, perception of intuitiveness, conditions most conducive for accessing intuition, common receptors of intuition, and types of intuition. These areas of inquiry were of interest to the researcher, and were collected for use in future analyses.

DOI items 19-45 were based on Westcott's profile of highly intuitive individuals (Westcott and Ranzoni, 1963, p. 610). Many of the variables in Westcott's profile were included in the Shirley and Langan-Fox (1996) clusters (Appendices B and J); so they were also measured by DOI items 46-99. Collected for use in subsequent analyses, these items were superfluous to the purposes and hypotheses of this study. Accordingly, this data was not analyzed and will not be reported as part of this project.

Analyses Performed

Analyses performed to determine the psychometrics of the DOI instrument were:

1. *Descriptive Statistics* for the 25 variables selected for this examination;
2. *Intra-Variable Correlations* of DOI 3-item sets (items 6-7 and 46-99), T Scores for all variables examined, and DOI Total Score T Scores;
3. *Inter-Item Correlations* among DOI items 6-7 and 46-99, variable T Scores and DOI Total Score T Scores;
4. *Reliability Analyses* for raw scores and standardized on T scores; and
5. *Wrap-Up Item/Narrative Responses* to DOI item 100.

The final DOI psychometric test, *Confirmatory Factor Analysis* of the three Shirley and Langan Fox clusters, is related to Research Hypothesis 1. Those outcomes will be presented in the *Research Purposes and Hypotheses* section hereinafter.

DOI Descriptive Statistics for the 25 Variables Examined

Descriptive statistics for the 25 Shirley and Langan-Fox (1996) variables examined in the study are presented below in the numbered sequence used in Table 1.1. Unless indicated, all descriptives below relate to the 291 of the 295 respondents for whom sex, ethnicity and education could be determined. Exceptions include descriptives for variables measured by the HBDI® but not by the DOI: introversion/extraversion, handedness and brain hemispheres (i.e., dominance).

To clarify the terminology used, Shirley and Langan-Fox devised three groupings for the intuition-related variables they identified in the literature: social/ acquired, biological and situational. They referred to these groupings as *clusters* so the term *clusters* will be used in that context throughout this project. The more specific term for the groupings in the context of confirmatory factor analyses (CFA), however, is *factors*; so that term will be used in discussions of CFA outcomes.

Descriptive tables by sex, ethnicity and education are also included for each of the social/acquired and situational variables examined in the study. The sex demographic was of special interest because of the empirically unsupported but pervasive belief that women are intrinsically more intuitive than men. Ethnicity was of interest for potential use in future studies of socio-cultural influences on intuition.

Although it was not one of the intuition-related variables examined in this study, education—especially its potential for positively or negatively impacting intuition—was of particular interest to the researcher. Accordingly, outcomes by level of education are presented below for each of the 20 social/acquired and situational variables studied.

Social/Acquired Cluster (18 Variables). The variables from the social/acquired cluster are personal characteristics purported to be more common or pronounced among highly intuitive individuals. These characteristics appear to be culturally-based, and can be learned or developed. Descriptive statistics by sex, ethnicity and education for each of the 18 social/acquired variables examined by the DOI are reported below.

Sixteen of the 18 social/acquired variables were measured by 0-100% responses on DOI items 46-99. Three items were provided for each variable examined; one item from each set of three was negatively worded to measure the lack or absence of the characteristic (indicated by asterisks below, and Appendix J). Introversion/extraversion was measured by HBDI® 100 on a nine-point continuum. The resulting scores were converted to a 0-100% scale equivalent. The academic aptitude score was derived by summing scores from DOI items 6-7 and converting to T Score equivalents (mean=50, range=0-100), as explained in Appendix U. Coding used for items in the DOI, HBDI® and PSI instruments is included as Appendices U, V and W, respectively.

1. *Academic Aptitude* (DOI items 6 and 7). Descriptive statistics for this social/ acquired variable by sex, ethnicity and education are presented in Tables 4.5, 4.6 and 4.7 below.

Table 4.5: Descriptive Statistics for Academic Aptitude by Sex—% Scale

	SEX	Female	Male
DOI—ACADEMIC APTITUDE	N	214	77
	Mean	49.78	50.43
	Median	51.91	51.91
	Std Dev	9.36	11.61
	Intqtl Range	7.60	15.19
	Minimum	21.52	21.52
	Maximum	78.49	78.49
	Skewness	-0.14	-0.42
	Kurtosis	0.90	0.44

Std Dev=Standard Deviation; Intqtl Range=Interquartile Range (throughout descriptive tables)

Table 4.6: Descriptive Statistics for Academic Aptitude by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI—ACADEMIC APTITUDE	N	20	255	16
	Mean	49.06	49.88	52.86
	Median	51.91	51.91	55.70
	Std Dev	12.50	9.97	7.00
	Intqtl Range	6.65	7.60	11.40
	Minimum	21.52	21.52	36.71
	Maximum	78.49	78.49	59.50
	Skewness	-0.47	-0.14	-1.08
	Kurtosis	2.25	0.51	0.54

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.7: Descriptive Statistics for Academic Aptitude by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI—ACADEMIC APTITUDE	N	5	30	23	99	89	33	15
	Mean	51.91	50.64	47.78	49.60	50.33	50.52	50.89
	Median	55.70	50.01	48.11	51.91	51.91	48.11	51.91
	Std Dev	7.60	11.12	9.64	8.95	11.09	9.49	11.35
	Intqtl Range	13.29	15.19	15.19	7.60	9.50	11.40	7.60
	Minimum	40.51	32.91	29.12	21.52	21.52	32.91	21.52
	Maximum	59.50	78.49	59.50	74.70	78.49	74.70	70.90
	Skewness	-0.94	0.73	-0.46	-0.43	-0.47	0.55	-1.11
	Kurtosis	-0.19	0.52	-1.04	1.09	0.64	0.56	2.66

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Academic Aptitude by Sex—Table 4.5. The number of female respondents (n=214, 72.5%) was considerably higher than the number of males (n=77, 26.1%). Minimum/maximum scores ranged from 20-80 on a 0-100% scale. The mean was 49.78 for females and 50.43 for males. The medians were identical, at 51.91. The standard deviation was 9.36 for females, 11.61 for males. Closeness of the means and medians and skewness values near zero indicated normal distributions by sex.

Academic Aptitude by Ethnicity—Table 4.6. White respondents (n=255) comprised 86.4% of the sample group, compared to 77.4% in the overall population 18 and over. Blacks (n=20) were 6.8% of the sample, compared to 11.4% in the whole population 18 and over; Hispanics (n=16) were 5.4%, compared to 11% in the whole population 18 and over. Minimum/maximum scores were 20-80 on a 0-100% scale for both blacks and whites, narrowing to 30-60 for Hispanics. Means and medians were near 50, with means ranging from 49.06 for blacks to 52.86 for Hispanics. Medians ranged from 51.91 for blacks and white to 55.70 for Hispanics. Standard deviations ranged from 7.00 for Hispanics to 12.50 for blacks. Closeness of the means and medians, and skewness values near zero indicated normal distributions except among Hispanics.

Academic Aptitude by Education—Table 4.7. Nearly 2/3 of respondents (n=188, 63.8%) had Bachelor's or Master's degrees. Minimum/maximum scores were 20-80 on a 0-100% scale, narrowing to 40-60 in the high school group, 30-60 for Associate's. Means and medians were close to 50, ranging from 47.78 for Associate's to 51.91 for high school. Standard deviations fell between 7.60 high school and 11.35 for professional certification. Skewness values were near zero for all groups except professional certification, indicating mixed normal/non-normal distributions.

2. *Cognitive Style/Analytic* (DOI items 51*, 65 and 73). Descriptive statistics for this social/acquired variable are presented in Tables 4.8, 4.9 and 4.10 below. Analytic Cognitive Style is inherently non-intuitive; so negatively-worded item 51 is positively related to intuition, and positively-worded items 65 and 73 are negatively related to it.

Table 4.8: Descriptive Statistics for Cognitive Style/Analytic by Sex—% Scale

	SEX	**Female**	**Male**
DOI--COGNITIVE STYLE/ANALYTICAL	N	214	77
	Mean	63.02	62.99
	Median	63.33	63.33
	Std Dev	18.37	18.99
	Intqtl Range	23.33	18.33
	Minimum	3.33	6.67
	Maximum	100.00	96.67
	Skewness	-0.77	-0.72
	Kurtosis	0.71	0.87

Table 4.9: Descriptive Statistics for Cognitive Style/Analytic by Ethnicity—% Scale

	ETHNICITY	**Af-Am/Blk**	**Euro/Wht**	**Hisp/Lat**
DOI--COGNITIVE STYLE/ANALYTICAL	N	20	255	16
	Mean	70.17	62.27	69.17
	Median	71.67	63.33	70.00
	Std Dev	13.18	18.76	15.71
	Intqtl Range	17.50	23.33	28.33
	Minimum	30.00	3.33	40.00
	Maximum	96.67	100.00	96.67
	Skewness	-1.17	-0.74	-0.11
	Kurtosis	4.08	0.68	-0.72

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.10: Descriptive Statistics for Cognitive Style/Analytic by Education—% Scale

	EDUCATION	**HS/Eq**	**Coll**	**Assoc**	**Bach**	**Mast**	**Doct**	**Cert**
DOI--COGNITIVE STYLE/ANALYTICAL	N	5	30	23	99	89	33	15
	Mean	70.00	61.56	54.93	65.05	62.62	62.83	63.78
	Median	63.33	60.00	56.67	66.67	63.33	63.33	63.33
	Std Dev	9.43	14.72	23.42	17.18	20.15	18.54	16.76
	Intqtl Range	16.67	15.00	30.00	23.33	25.00	25.00	23.33
	Minimum	63.33	20.00	13.33	13.33	3.33	10.00	36.67
	Maximum	83.33	90.00	100.00	93.33	96.67	90.00	93.33
	Skewness	0.88	-0.50	-0.13	-0.88	-0.84	-0.75	0.24
	Kurtosis	-1.75	1.11	-0.49	0.53	1.15	0.69	-0.46

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Cognitive Style/Analytic by Sex—Table 4.8. Minimum/maximum scores for responses to the cognitive style/analytic variables covered the entire 0-100% scoring range. Means for both females and males were similarly high but very close, ranging from 62.99 for males to 63.02 for females. Medians were identical, at 63.33 for both groups. Standard deviations were also similar—18.37 for females and 18.99 for males. The closeness of the means and medians and skewness values near zero indicated normal distributions for the analytic cognitive style variable by sex.

Cognitive Style/Analytic by Ethnicity—Table 4.9. Minimum/maximum scores ranged from 0-100% for whites, to 30-100 for blacks, and 40-100 for Hispanics. Means and medians were relatively high, but consistent across the groups. Means ranged from 62.27 for whites to 70.17 for blacks. Medians were 63.33 for whites, 70 for Hispanics, and 71.67 for blacks. Standard deviations ranged from 13.18 for blacks to 18.76 for whites, with an approximate midpoint (15.71) for Hispanics. Skewnesses near zero for whites and Hispanics indicated normal distributions. The skewness for blacks was -1.17, indicating a higher score bias distribution for analytic cognitive style by ethnicity.

Cognitive Style/Analytic by Education—Table 4.10. Minimum/maximum scores covered the range of the 0-100% scale, with a spread of 0-100 for Master's and a narrow spread of 60-80 in the high school category. Means and medians were clustered in the mid-60's. Means ranged from 54.93 for Associate's to 70 for high school. Medians ranged from 56.67 for Associate's to 66.67 for Bachelor's. Standard deviations ranged from a low of 9.43 for high school to a high of 23.42 for Associate's. The closeness of means and medians, and skewness values near zero across the groups indicated normal distributions for the analytic cognitive style by education.

3. *Cognitive Style/Intuitive* (DOI items 50, 56 and 92*). Descriptive statistics for this social/acquired variable by sex, ethnicity and education are presented in Tables 4.11, 4.12. and 4.13 below.

Table 4.11: Descriptive Statistics for Cognitive Style/Intuitive by Sex—% Scale

	SEX	Female	Male
DOI--COGNITIVE STYLE/INTUITIVE	N	214	77
	Mean	69.10	71.26
	Median	68.33	73.33
	Std Dev	15.98	14.69
	Intqtl Range	20.00	25.00
	Minimum	23.33	40.00
	Maximum	100.00	100.00
	Skewness	-0.28	-0.12
	Kurtosis	-0.09	-0.86

Table 4.12: Descriptive Statistics for Cognitive Style/Intuitive by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI--COGNITIVE STYLE/INTUITIVE	N	20	255	16
	Mean	68.50	70.04	65.83
	Median	68.33	70.00	65.00
	Std Dev	15.80	15.61	17.78
	Intqtl Range	19.17	23.33	31.67
	Minimum	23.33	26.67	40.00
	Maximum	100.00	100.00	100.00
	Skewness	-0.71	-0.24	0.20
	Kurtosis	2.88	-0.31	-0.96

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.13: Descriptive Statistics for Cognitive Style/Intuitive by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI--COGNITIVE STYLE/INTUITIVE	N	5	30	23	99	89	33	15
	Mean	65.33	73.11	69.57	65.93	70.90	74.65	73.11
	Median	63.33	75.00	70.00	66.67	70.00	76.67	70.00
	Std Dev	15.92	16.70	16.25	14.78	17.17	13.62	9.88
	Intqtl Range	28.33	24.17	26.67	16.67	23.33	23.33	16.67
	Minimum	50.00	36.67	40.00	23.33	26.67	43.33	60.00
	Maximum	90.00	100.00	93.33	96.67	100.00	96.67	86.67
	Skewness	1.01	-0.65	-0.08	-0.20	-0.28	-0.41	0.23
	Kurtosis	0.70	0.08	-0.99	0.22	-0.29	-0.77	-1.55

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Cognitive Style/Intuitive by Sex—Table 4.11. Minimum/maximum scores for this variable on a 0-100 scale ranged from 20-100 for females, and 40-100 for males. Means and medians were very close for both groups, though scores were relatively high, 69.10 for females and 71.26 for males. Medians were 68.33 for females and 73.33 for males. The standard deviations between 14.69 for males and 15.98 for females were also very close. The closeness of the means and medians, and skewness values near zero indicated normal distributions for intuitive cognitive style by sex.

Cognitive Style/Intuitive by Ethnicity—Table 4.12. Minimum/maximum scores on a 0-100% scale were 20-100 for whites and blacks, slightly closer (40-100) for Hispanics. Means and medians were relatively high but nearly identical within and across the groups. Means ranged from 65.83 for Hispanics to 70.04 for whites; and medians ranged from 65 for Hispanics to 70 for whites. Standard deviations ranged between 15.61 for whites to 17.78 for Hispanics. Skewnesses were all near zero, indicating normal distributions for intuitive cognitive style by ethnicity.

Cognitive Style/Intuitive by Education—Table 4.13. Minimum/maximum scores ranged from 20-100 on a 0-100% scale. The narrowest range of scores was for those with professional certification (60-90), and only slightly broader (50-90) for those in the high school category. Means were relatively high, ranging from 65.33 for high school to 74.65 for doctoral. Medians ranged from 63.33 for high school to 76.67 for doctoral. Standard deviations were lower for professional certification (9.88), but otherwise close across groups (13.62 for doctoral to 17.17 for Master's). The closeness of the means and medians and skewness values near zero indicated normal distributions for all except the five high school respondents, which showed a lower score bias (skew=1.01).

4. *Experience* (DOI items 52, 85 and 98*). Descriptive statistics for this social/ acquired variable by sex, ethnicity and education are presented in Tables 4.14, 4.15 and 4.16 below.

Table 4.14: Descriptive Statistics for Experience by Sex—% Scale

	SEX	Female	Male
DOI--EXPERIENCE	N	214	77
	Mean	49.77	50.09
	Median	50.00	50.00
	Std Dev	13.67	12.33
	Intqtl Range	20.00	16.67
	Minimum	16.67	16.67
	Maximum	86.67	90.00
	Skewness	-0.12	0.00
	Kurtosis	-0.12	0.77

Table 4.15: Descriptive Statistics for Experience by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI--EXPERIENCE	N	20	255	16
	Mean	45.00	50.10	51.88
	Median	43.33	50.00	50.00
	Std Dev	16.31	12.98	15.39
	Intqtl Range	25.83	20.00	18.33
	Minimum	20.00	16.67	30.00
	Maximum	76.67	86.67	90.00
	Skewness	0.24	-0.14	0.71
	Kurtosis	-0.85	0.11	1.32

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.16: Descriptive Statistics for Experience by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI--EXPERIENCE	N	5	30	23	99	89	33	15
	Mean	48.67	51.89	51.16	48.42	49.74	49.80	56.67
	Median	50.00	56.67	53.33	46.67	50.00	50.00	60.00
	Std Dev	9.01	17.15	14.13	12.85	13.07	14.02	7.97
	Intqtl Range	16.67	23.33	23.33	20.00	16.67	20.00	13.33
	Minimum	36.67	16.67	16.67	16.67	16.67	26.67	40.00
	Maximum	60.00	83.33	73.33	86.67	90.00	80.00	70.00
	Skewness	-0.18	-0.33	-0.76	0.14	0.03	0.14	-0.51
	Kurtosis	-0.68	-0.55	0.00	0.23	0.91	-0.59	-0.19

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Experience by Sex—Table 4.14. Minimum/maximum scores for this variable were 20-90 for both females and males, with means and medians at 49.77 for females and 50.09 for males. Medians for both were exactly 50. The standard deviations ranged between 12.33 for males and 13.67 for females. The closeness of the means and medians and the skewness values near zero indicated normal distributions for the experience variable by sex.

Experience by Ethnicity—Table 4.15. Minimum/maximum scores for this variable were 20-90 on a 0-100% scale. Means and medians were very close across the three groups, with a low mean of 45 for blacks and a high of 51.88 for Hispanics. Like means, medians were similarly close, at a low of 43.33 for blacks and exactly 50 for both whites and Hispanics. Standard deviations ranged between 12.98 for whites to 16.31 for blacks, with Hispanics at 15.39. Skewness values near zero for all groups and the closeness of the means and medians indicated normal distributions for experience by ethnicity.

Experience by Education—Table 4.16. Minimum/maximum scores for this variable ranged from 10-90 on a 0-100% scale. The narrowest spreads were 30 points for high school (30-60) and professional certification (40-70). Means were consistently close within each group, ranging from 48.42 for Bachelor's to 56.67 for professional certification. Medians fell between 46.67 for Bachelor's and 56.67 for those with some college. Standard deviations ranged from 7.97 for professional certification to 17.15 for those with some college credit. The closeness of the means and medians within and across the groups, as well as skewness values near zero, indicated normal distributions for this variable by education.

5. *Introversion/Extraversion* (HBDI® item 100). Descriptive statistics for this social/acquired variable by sex, ethnicity and education are presented in Tables 4.17, 4.18 and 4.19 below. N=251 represents only those individuals who completed the HBDI®.

Table 4.17: Descriptive Statistics for Introversion/Extraversion by Sex—% Scale

	SEX	Female	Male
HBDI®—INTROVSN/EXTRAVSN	N	186	65
	Mean	5.98	5.72
	Median	6.00	6.00
	Std Dev	2.03	2.12
	Intqtl Range	4.00	3.00
	Minimum	1.00	1.00
	Maximum	9.00	9.00
	Skewness	-0.38	-0.35
	Kurtosis	-0.87	-1.04

Table 4.18: Descriptive Statistics for Introversion/Extraversion by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
HBDI®—INTROVSN/EXTRAVSN	N	16	219	12
	Mean	5.31	6.00	5.00
	Median	5.00	7.00	4.50
	Std Dev	1.96	2.04	2.13
	Intqtl Range	3.00	4.00	3.50
	Minimum	2.00	1.00	2.00
	Maximum	9.00	9.00	9.00
	Skewness	0.17	-0.46	0.61
	Kurtosis	-0.66	-0.82	-0.45

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.19: Descriptive Statistics for Introversion/Extraversion by Education-% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
HBDI®—INTROVSN/EXTRAVSN	N	4	23	18	86	76	29	14
	Mean	5.00	5.65	5.39	6.01	6.17	6.14	4.64
	Median	5.00	6.00	5.00	6.50	7.00	7.00	4.00
	Std Dev	1.63	1.94	2.03	1.89	2.13	2.23	2.21
	Intqtl Range	3.00	4.00	3.00	2.25	4.00	3.50	2.75
	Minimum	3.00	3.00	2.00	2.00	1.00	1.00	2.00
	Maximum	7.00	9.00	9.00	9.00	9.00	9.00	9.00
	Skewness	0.00	-0.15	-0.03	-0.52	-0.53	-0.70	0.98
	Kurtosis	1.50	-1.23	-0.71	-0.59	-0.78	-0.47	-0.22

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Introversion/Extraversion by Sex—Table 4.17. The introversion/extraversion variable was measured by HBDI® item 100 on a 9-point continuum between 1=high introversion and 9=high extraversion, mid-point=5. Minimum/maximum scores ranged from 1-9. Means were nearly identical at slightly above the mid-point for both females (5.98) and males (5.72), indicating a sample group that identified itself as slightly more extraverted. The median for both groups was 6. Standard deviations were between 2.03 (females) and 2.12 (males). The closeness of the means and medians and the skewness values near zero indicated normal distributions for this introversion/extraversion by sex.

Introversion/Extraversion by Ethnicity—Table 4.18. Minimum/maximum scores for this variable on a 1-9 scale were 2 to 9 for blacks and Hispanics, and 1 to 9 for whites. Means and medians were within 1 point or less for each group, with means between 5 for Hispanics and 6 for whites; and medians from 4.50 for Hispanics to 7 for whites. The standard deviations ranged from 1.96 for blacks to 2.13 for Hispanics, with whites close to the mid-point between the two (2.04). Skewness values were all near zero, indicating normal distributions for introversion/extraversion by ethnicity.

Introversion/Extraversion by Education—Table 4.19. Minimum/maximum scores for this table ranged from 1-9 on a 9-point continuum, though the minimum/maximum score range for the five respondents in the high school category was 3 to 7. The means ranged from 4.64 for professional certification to 6.17 for Master's. Medians fell between 4 for professional certification and 7 for both Master's and doctoral groups. Standard deviations ranged from 1.63 for those in high school to 2.23 for the doctoral group. All skewnesses were near zero, indicating normal distributions for introversion/ extraversion by education.

6. *Creativity* (DOI items 53, 59 and 95*). Descriptive statistics for this social/ acquired variable by sex, ethnicity and education are presented in Tables 4.20, 4.21 and 4.22 below.

Table 4.20: Descriptive Statistics for Creativity by Sex—% Scale

	SEX	Female	Male
DOI--CREATIVITY	N	214	77
	Mean	69.31	66.93
	Median	70.00	66.67
	Std Dev	19.30	16.08
	Intqtl Range	33.33	26.67
	Minimum	23.33	33.33
	Maximum	100.00	93.33
	Skewness	-0.28	-0.23
	Kurtosis	-0.87	-0.89

Table 4.21: Descriptive Statistics for Creativity by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI--CREATIVITY	N	20	255	16
	Mean	62.83	69.07	70.21
	Median	63.33	70.00	71.67
	Std Dev	18.90	18.35	20.92
	Intqtl Range	35.00	26.67	40.83
	Minimum	33.33	23.33	26.67
	Maximum	90.00	100.00	93.33
	Skewness	0.01	-0.23	-0.55
	Kurtosis	-1.44	-0.78	-0.69

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.22: Descriptive Statistics for Creativity by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI--CREATIVITY	N	5	30	23	99	89	33	15
	Mean	58.00	68.78	68.84	66.67	69.14	76.16	69.33
	Median	56.67	71.67	73.33	66.67	66.67	73.33	66.67
	Std Dev	21.93	21.75	20.71	18.51	17.91	15.23	15.64
	Intqtl Range	43.33	38.33	36.67	26.67	28.33	21.67	20.00
	Minimum	33.33	23.33	26.67	26.67	36.67	33.33	43.33
	Maximum	83.33	100.00	100.00	96.67	100.00	100.00	100.00
	Skewness	0.08	-0.40	-0.35	-0.26	0.05	-0.78	0.26
	Kurtosis	-2.55	-0.92	-0.79	-0.87	-1.12	0.66	-0.43

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Creativity by Sex—Table 4.20. Minimum/maximum scores for this variable ranged from 20-80 on a 0-100% scale. Means and medians for both groups were at or near 70, indicating relatively high scores for items related to this variable. Means ranged from 66.93 for males to 69.31 for females; and medians were 66.67 (female) and 70 (male). Standard deviations ranged from 16.08 for males to 19.30 for females. The closeness of the means and medians and the skewness values near zero indicate normal distributions for the variable of creativity by sex.

Creativity by Ethnicity—Table 4.21. Minimum/maximum scores were 20-100 on a 0-100% scale. Means and medians were relatively high, in the 60-70 range, but very close within each group. Means were slightly lower for blacks (62.83) and higher for Hispanics (70.21), with whites at 69.07. Standard deviations ranged from 18.35 for whites to 20.92 for Hispanics, with blacks at 18.90. The closeness of the means and medians, and skewness values near zero indicated normal distributions for creativity by ethnicity.

Creativity by Education—Table 4.22. Minimum/maximum scores ranged from 20-100 on a 0-100% scale, narrowing to 30-90 for those in the high school category. Means and medians were closer to 50 for high school, but in the mid-70 range for those in the Associates and doctoral groups. Means ranged from 58 for high school to 76.16 for the doctoral group. Medians fell between 56.67 for high school and 73.33 for both Associate's and doctoral groups. The standard deviation was highest, 21.93, for the five high school respondents, and lowest, 15.64 for professional certification. Closeness of the means and medians and skewness values near zero indicate normal distributions for creativity by education.

7. *Innovation* (DOI items 54, 87* and 93). Descriptive statistics for this social/ acquired variable by sex, ethnicity and education are presented in Tables 4.23, 4.24 and 4.25 below.

Table 4.23: Descriptive Statistics for Innovation by Sex—% Scale

	SEX	**Female**	**Male**
DOI—INNOVATION	N	214	77
	Mean	70.92	73.79
	Median	73.33	80.00
	Std Dev	16.44	14.59
	Intqtl Range	24.17	21.67
	Minimum	30.00	36.67
	Maximum	100.00	100.00
	Skewness	-0.29	-0.50
	Kurtosis	-0.54	-0.15

Table 4.24: Descriptive Statistics for Innovation by Ethnicity—% Scale

	ETHNICITY	**Af-Am/Blk**	**Euro/Wht**	**Hisp/Lat**
DOI--INNOVATION	N	20	255	16
	Mean	68.83	74.60	76.25
	Median	73.33	76.67	76.67
	Std Dev	15.34	16.06	14.65
	Intqtl Range	13.33	23.33	19.17
	Minimum	36.67	30.00	43.33
	Maximum	100.00	100.00	100.00
	Skewness	-0.57	-0.36	-0.27
	Kurtosis	0.70	-0.53	0.48

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.25: Descriptive Statistics for Innovation by Education—% Scale

	EDUCATION	**HS/Eq**	**Coll**	**Assoc**	**Bach**	**Mast**	**Doct**	**Cert**
DOI--INNOVATION	N	5	30	23	99	89	33	15
	Mean	56.00	75.44	65.51	72.12	78.20	79.60	72.00
	Median	63.33	76.67	63.33	73.33	80.00	80.00	73.33
	Std Dev	14.41	15.15	20.66	14.90	14.89	15.06	16.17
	Intqtl Range	25.00	25.00	30.00	20.00	21.67	23.33	26.67
	Minimum	33.33	40.00	30.00	30.00	40.00	36.67	43.33
	Maximum	66.67	100.00	100.00	100.00	100.00	100.00	96.67
	Skewness	-1.26	-0.41	0.45	-0.41	-0.39	-0.85	-0.24
	Kurtosis	0.51	-0.36	-0.74	-0.25	-0.54	0.66	-1.01

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Innovation by Sex—Table 4.23. Minimum/maximum scores for this variable ranged from 30-100 on a 0-100% scale. Means and medians for both groups were very high, with means ranging from 70.92 for females to 73.79; and medians ranging from 73.33 for females to 80 for males. The standard deviation was 16.44 for females, and 14.59 for males. The closeness of the means and medians and the skewness values near zero indicate normal distributions for innovation by sex.

Innovation by Ethnicity—Table 4.24. Minimum/maximum scores were from 30-100 on a 0-100% scale. Means and medians were relatively high, in the high 60's for blacks to the mid 70's for Hispanics; however, all means and medians were very close within each group. Means ranged from 68.83 for blacks to 76.25 for Hispanics. Medians were between 73.33 (blacks) and 76.67 (Hispanics). Standard deviations ranged from the low of 14.65 for Hispanics to the high of 16.06 for whites. The closeness of the means and medians, and the skewness values indicated normal distributions for innovation by ethnicity.

Innovation by Education—Table 4.25. Minimum/maximum scores ranged from 30-100 on a 0-100% scale, narrowing to 30-60 for the five respondents in the high school category. Means ranged from a low of 56 for high school to 79.60 for the doctoral group. Medians extended from a low of 63.33 for high school to 80 for both Master's and doctoral groups. Standard deviations ranged from 14.41 for high school to 20.66 for Associate's. Skewness for high school was slightly above 1, but near zero for all other groups. Closeness of the means and medians and skewness values near zero for all groups except high school indicated normal/non-normal distributions for innovation by education.

8. *Carelessness with Facts/Details* (DOI items 55, 89* and 97). Descriptive statistics for this social/acquired variable by sex, ethnicity and education are presented in Tables 4.26, 4.27 and 4.28 below.

Table 4.26: Descriptive Statistics for Carelessness by Sex—% Scale

	SEX	**Female**	**Male**
DOI--CARELESSNESS	N	214	77
	Mean	49.11	48.96
	Median	46.67	50.00
	Std Dev	18.00	17.38
	Intqtl Range	23.33	26.67
	Minimum	3.33	6.67
	Maximum	96.67	90.00
	Skewness	0.21	0.16
	Kurtosis	-0.19	-0.01

Table 4.27: Descriptive Statistics for Carelessness by Ethnicity—% Scale

	ETHNICITY	**Af-Am/Blk**	**Euro/Wht**	**Hisp/Lat**
DOI--CARELESSNESS	N	20	255	16
	Mean	47.17	48.98	47.92
	Median	51.67	46.67	51.67
	Std Dev	13.08	17.83	17.46
	Intqtl Range	25.83	23.33	25.83
	Minimum	26.67	3.33	10.00
	Maximum	63.33	96.67	73.33
	Skewness	-0.32	0.19	-0.51
	Kurtosis	-1.46	-0.19	-0.38

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.28: Descriptive Statistics for Carelessness by Education—% Scale

	EDUCATION	**HS/Eq**	**Coll**	**Assoc**	**Bach**	**Mast**	**Doct**	**Cert**
DOI--CARELESSNESS	N	5	30	23	99	89	33	15
	Mean	46.00	50.89	52.61	46.73	48.88	50.20	56.00
	Median	46.67	53.33	50.00	46.67	46.67	46.67	53.33
	Std Dev	7.23	18.98	15.73	15.76	20.99	17.46	13.04
	Intqtl Range	11.67	27.50	23.33	20.00	28.33	23.33	16.67
	Minimum	36.67	3.33	26.67	10.00	6.67	16.67	23.33
	Maximum	56.67	90.00	80.00	90.00	96.67	86.67	76.67
	Skewness	0.42	-0.37	0.32	0.15	0.34	0.40	-0.78
	Kurtosis	1.44	0.12	-0.76	0.15	-0.52	-0.39	1.67

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Carelessness with Facts/Details by Sex—Table 4.26. Minimum/maximum scores for this variable ranged from 0-100 on a 0-100% scale. Means and medians for both groups were at or near 50, with a mean for males at 48.96 and for females at 49.11. Medians were 46.67 for females and exactly 50 for males. The standard deviation was 17.38 for males and 18 for females. The closeness of the means and medians and the skewness values near zero for both groups indicated normal distributions for carelessness with facts and details by sex.

Carelessness with Facts/Details by Ethnicity—Table 4.27. Minimum/maximum scores were 0-100 on a 0-100% scale. Means and medians were very close to 50 for all three ethnicity groups. Means ranged from 47.17 for blacks to 48.98 for whites; and medians ranged from 46.67 for whites to 51.67 for both blacks and Hispanics. The standard deviation for the black group was slightly lower (13.08) than for whites (17.83) or Hispanics (17.46). Closeness of the means and medians, and skewness values near zero indicated normal distributions for this variable by ethnicity.

Carelessness with Facts/Details by Education—Table 4.28. Minimum/maximum scores ranged from 20-100 on a 0-100% scale for this variable, though the range narrowed to 30-60 for high school. Means ranged from 46 for high school to 56.00 for professional certification. Four medians were identical (46.67) for high school, Bachelor's, Master's, and doctoral groups; the highest mean (53.33) was the same for some college and professional certification groups. Standard deviations ranged from a low of 7.23 for high school to 20.99 for the Master's group. Closeness of the means and medians and skewness values near zero across the groups indicated normal distributions for this carelessness with facts and details by education.

9. *Cooperativeness* (DOI items 57, 67 and 82*). Descriptive statistics for this social/acquired variable by sex, ethnicity and education are presented in Tables 4.29, 4.30 and 4.31 below.

Table 4.29: Descriptive Statistics for Cooperativeness by Sex—% Scale

	SEX	Female	Male
DOI--COOPERATIVENESS	N	214	77
	Mean	82.63	74.94
	Median	86.67	76.67
	Std Dev	15.87	20.03
	Intqtl Range	20.00	28.33
	Minimum	26.67	10.00
	Maximum	100.00	100.00
	Skewness	-1.12	-0.87
	Kurtosis	0.73	0.39

Table 4.30: Descriptive Statistics for Cooperativeness by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI--COOPERATIVENESS	N	20	255	16
	Mean	82.17	80.88	76.46
	Median	81.67	86.67	80.00
	Std Dev	15.15	17.19	18.68
	Intqtl Range	20.83	23.33	12.50
	Minimum	40.00	10.00	36.67
	Maximum	100.00	100.00	100.00
	Skewness	-1.02	-1.10	-1.19
	Kurtosis	1.72	0.90	1.06

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.31: Descriptive Statistics for Cooperativeness by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI--COOPERATIVENESS	N	5	30	23	99	89	33	15
	Mean	78.00	77.11	80.14	81.14	84.79	78.59	63.11
	Median	86.67	76.67	83.33	86.67	90.00	90.00	66.67
	Std Dev	20.22	17.19	15.06	16.04	14.74	20.65	24.25
	Intqtl Range	38.33	26.67	26.67	23.33	20.00	35.00	30.00
	Minimum	53.33	33.33	53.33	33.33	36.67	26.67	10.00
	Maximum	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Skewness	-0.39	-0.82	-0.33	-1.13	-1.33	-0.79	-0.52
	Kurtosis	-2.50	0.37	-1.17	0.62	1.85	-0.34	0.10

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Cooperativeness by Sex—Table 4.29. Minimum/maximum scores for this variable ranged from 10-100 on a 0-100% scale. Means and medians for both groups were close but comparatively high for both groups. The mean for males was 74.94, and 82.63 for females. Medians ranged from 76.67 for males to 86.67 for females. The standard deviation for females was 15.87 and 20.03 for males. The skewness value for males was near zero; however the value for females was -1.12, indicating a marked skew toward responses on the high end (80-100) for this variable and non-normal distribution for females.

Cooperativeness by Ethnicity—Table 4.30. Minimum/maximum scores for this variable were 10-100 on a 0-100% scale. Means and medians were relatively close within and across groups. Means fell between 76.46 for Hispanics to 82.17 for blacks. Medians were 80 for Hispanics and 86.67 for whites. Standard deviations ranged from 15.15 for blacks to 18.68 for Hispanics. Despite the closeness of the means and medians on this variable, scores tended toward the high end of the scale, resulting in skewness and non-normal distribution for all three groups on cooperativeness by ethnicity.

Cooperativeness by Education—Table 4.31. Minimum/maximum scores for this variable by education ranged from 10-100 on a 0-100% scale, narrowing to 50-100 for the high school group. Means and medians were very close within each group, though well above the mid-point of 50. Means ranged from 63.11 for professional certification to 84.79 for Master's, with medians from 66.67 for professional certification and 90 for both Master's and doctoral groups. Standard deviations ranged from 14.74 for Master's to 24.25 for professional certification. Closeness of the means and medians indicated normal distributions except for Bachelor's and Master's, with a high score bias.

10. *Impulsivity* (DOI items 60, 70* and 80). Descriptive statistics for this social/ acquired variable by sex, ethnicity and education are presented in Tables 4.32, 4.33 and 4.34 below.

Table 4.32: Descriptive Statistics for Impulsivity by Sex—% Scale

	SEX	Female	Male
DOI--IMPULSIVITY	N	214	77
	Mean	52.65	57.71
	Median	53.33	60.00
	Std Dev	22.11	20.23
	Intqtl Range	33.33	30.00
	Minimum	0.00	13.33
	Maximum	100.00	96.67
	Skewness	-0.04	-0.23
	Kurtosis	-0.71	-0.65

Table 4.33: Descriptive Statistics for Impulsivity by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI--IMPULSIVITY	N	20	255	16
	Mean	42.50	55.42	42.92
	Median	43.33	56.67	43.33
	Std Dev	18.76	21.48	22.24
	Intqtl Range	27.50	33.33	25.00
	Minimum	13.33	0.00	3.33
	Maximum	80.00	100.00	86.67
	Skewness	-0.15	-0.14	0.09
	Kurtosis	-0.55	-0.78	0.05

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.34: Descriptive Statistics for Impulsivity by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI--IMPULSIVITY	N	5	30	23	99	89	33	15
	Mean	55.33	65.78	63.19	49.66	52.81	55.66	49.78
	Median	60.00	66.67	60.00	46.67	53.33	60.00	53.33
	Std Dev	21.42	17.57	23.41	20.29	22.64	23.88	17.16
	Intqtl Range	38.33	27.50	30.00	26.67	33.33	41.67	30.00
	Minimum	26.67	26.67	3.33	10.00	0.00	10.00	20.00
	Maximum	83.33	93.33	100.00	93.33	96.67	90.00	76.67
	Skewness	-0.12	-0.47	-0.68	0.23	-0.17	-0.27	-0.18
	Kurtosis	-0.19	-0.45	0.61	-0.47	-0.70	-1.21	-1.19

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Impulsivity by Sex—Table 4.32. Minimum/maximum scores for this variable ranged from 0-100 on a 0-100% scale, with means between 52.65 (female) and 57.71 (male). Medians were 53.33 (female) and 60 (male). Standard deviation for females was 20.23 for males and 22.11 for females. The closeness of the means and medians for the groups and the skewness values near zero indicated normal distributions for impulsivity by sex.

Impulsivity by Ethnicity—Table 4.33. The minimum/maximum scores for this variable by ethnicity were 0-100 on a 0-100% scale for whites and Hispanics, and 10-80 for blacks. Means and medians were close for each of the three groups, with a low mean of 42.50 for blacks and a high mean of 55.42 for whites. Medians were 43.33 for both blacks and Hispanics, and 56.67 for whites. Standard deviations fell between 18.76 for blacks and 22.24 for Hispanics. The closeness of the means and medians, and skewness values near zero across the three groups indicated normal distributions for impulsivity by ethnicity.

Impulsivity by Education—Table 4.34. Minimum/maximum scores ranged from 0-100 on a 0-100% scale for the Associate's group, narrowing to 20-80 for those in the professional certification category. Means and medians within the groups were relatively close. The lowest mean (49.78) was for the professional certification group, and the highest mean (65.78) was for those with some college. Medians ranged from 46.67 for Bachelor's to 66.67 for those with some college. Standard deviations ranged from 17.16 for professional certification to 23.88 for the doctoral group. The closeness of the means and medians and skewness values near zero indicated normal distributions for impulsivity by education.

11. *Flexibility* (DOI items 60, 70* and 80). Descriptive statistics for this social/ acquired variable by sex, ethnicity and education are presented in Tables 4.35, 4.36 and 4.37 below.

Table 4.35: Descriptive Statistics for Flexibility by Sex—% Scale

	SEX	Female	Male
DOI--FLEXIBILITY	N	214	77
	Mean	53.46	59.39
	Median	53.33	56.67
	Std Dev	17.07	15.96
	Intqtl Range	20.00	18.33
	Minimum	6.67	23.33
	Maximum	96.67	96.67
	Skewness	-0.17	0.24
	Kurtosis	-0.15	-0.14

Table 4.36: Descriptive Statistics for Flexibility by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI--FLEXIBILITY	N	20	255	16
	Mean	52.17	55.12	56.67
	Median	53.33	56.67	60.00
	Std Dev	20.04	17.19	11.48
	Intqtl Range	15.83	23.33	18.33
	Minimum	6.67	13.33	40.00
	Maximum	93.33	96.67	80.00
	Skewness	-0.13	-0.07	-0.04
	Kurtosis	1.25	-0.30	-0.34

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.37: Descriptive Statistics for Flexibility by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI--FLEXIBILITY	N	5	30	23	99	89	33	15
	Mean	49.33	61.11	62.03	53.43	52.88	57.47	52.44
	Median	46.67	56.67	60.00	53.33	56.67	56.67	53.33
	Std Dev	10.65	16.24	20.96	15.98	17.23	18.35	11.78
	Intqtl Range	20.00	25.00	20.00	20.00	23.33	25.00	20.00
	Minimum	36.67	33.33	16.67	13.33	6.67	20.00	30.00
	Maximum	63.33	90.00	96.67	90.00	86.67	93.33	70.00
	Skewness	0.30	0.35	0.06	-0.14	-0.51	-0.17	-0.48
	Kurtosis	-1.34	-0.69	-0.12	-0.41	-0.22	-0.46	-0.43

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Flexibility by Sex—Table 4.35. Minimum/maximum scores for this variable ranged from 0-100 on a 0-100% scale, with means and medians for both groups in the low-to-high 50 range. The mean was 53.46 and 59.39 for males. Medians were very close to the means for both groups—53.33 for females and 56.67 for males. The standard deviation for females was 17.07, compared to 15.96 for males. The closeness of the means and medians and the skewness values near zero indicate normal distributions for flexibility by sex.

Flexibility by Ethnicity—Table 4.36. Minimum/maximum scores this variable ranged from 0-100 on a 0-100% scale, with the range narrowing to 40-80 for Hispanics. Means across the three groups were in the low-to-mid 50 range, with 52.17 for blacks, 55.12 for whites, and 56.67 for Hispanics. Median values were close to the mean for each group, with a low of 53.33 for blacks and a high of 60 for Hispanics. Standard deviations ranged from 11.48 for Hispanics to 20.04 for blacks. The closeness of the means and medians, and skewness values near zero for the three groups indicated normal distributions for flexibility by ethnicity.

Flexibility by Education—Table 4.37. Minimum/maximum scores ranged from 0-100 on a 0-100% scale, with the narrowest ranges at 30-70 for both high school and professional certification. Means were lowest for the high school group (49.33) and highest for those with an Associate's degree (60). Low and high medians fell to the same groups, with the high school median at 46.67, and the median for Associate's at 62.03. Standard deviations across the groups ranged from 10.65 for high school to 20.96 for Associate's. Closeness of the means and medians and skewness values near zero indicated normal distributions for flexibility by education.

12. *Interest in Arts/Aesthetics* (DOI items 48, 64 and 84*). Descriptive statistics for this social/acquired variable by sex, ethnicity and education are presented in Tables 4.38, 4.39 and 4.41 below.

Table 4.38: Descriptive Statistics for Interest in Arts/Aesthetics by Sex—% Scale

	SEX	Female	Male
DOI—INTEREST in ARTS/AESTHETICS	N	214	77
	Mean	74.95	66.06
	Median	83.33	70.00
	Std Dev	26.02	24.56
	Intqtl Range	33.33	41.67
	Minimum	0.00	3.33
	Maximum	100.00	100.00
	Skewness	-1.09	-0.49
	Kurtosis	0.22	-0.76

Table 4.39: Descriptive Statistics for Interest in Arts/Aesthetics by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI—INTEREST in ARTS/AESTHETICS	N	20	255	16
	Mean	69.83	72.34	82.50
	Median	73.33	80.00	83.33
	Std Dev	24.60	26.28	13.36
	Intqtl Range	42.50	40.00	19.17
	Minimum	20.00	0.00	56.67
	Maximum	100.00	100.00	100.00
	Skewness	-0.38	-0.90	-0.66
	Kurtosis	-0.95	-0.21	-0.37

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.40: Descriptive Statistics for Interest in Arts/Aesthetics by Education% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI—INTEREST in ARTS/AESTHETICS	N	5	30	23	99	89	33	15
	Mean	67.33	62.00	74.06	72.69	73.86	75.56	80.00
	Median	70.00	63.33	83.33	76.67	83.33	90.00	83.33
	Std Dev	25.76	29.85	23.25	24.60	27.60	24.93	16.71
	Intqtl Range	50.00	52.50	33.33	33.33	36.67	41.67	30.00
	Minimum	33.33	3.33	13.33	3.33	0.00	20.00	46.67
	Maximum	93.33	100.00	100.00	100.00	100.00	100.00	100.00
	Skewness	-0.37	-0.21	-0.98	-0.87	-1.12	-0.98	-0.56
	Kurtosis	-1.90	-1.17	0.51	0.00	0.17	-0.48	-0.72

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Interest in Arts/Aesthetics by Sex—Table 4.38. Minimum/maximum scores for this variable ranged from 0-100 on a 0-100% scale, though scores were high overall. The mean for females was 74.95; their median was somewhat higher at 83.33. Scores for males were slightly lower, at 66.06 for the mean and 70 for the median. The standard deviation was 24.56 for males, and 26.02 for females. Though skewness for males was near zero, the value of -1.09 for females indicated a non-normal distribution with a higher score bias among females for interest in the arts and aesthetics by sex.

Interest in Arts/Aesthetics by Ethnicity—Table 4.39. Minimum/maximum scores were 0-100 on a 0-100% scale for this variable, narrowing to 50-100 for Hispanics. Means and medians were relatively high across the ethnicities. The low mean was 69.83 for blacks; the high mean was 82.50 for Hispanics. The lowest median was 73.33 (blacks); the highest 83.33 (Hispanics). Standard deviations were between 13.36 for Hispanics and 26.28 for whites. The closeness of the means and medians within each group, and skewness values near zero indicated normal distributions by ethnicity.

Interest in Arts/Aesthetics by Education—Table 4.40. Minimum/maximum scores ranged from 0-100 on a 0-100% scale, narrowing to 40-100 for professional certification, 30-100 for the high school group. Again, scores were relatively high, reflected in means between 62 for some college and 80 for the professional certification category. Medians were even higher, ranging from 63.33 for those with some college credit to 90 for those in the doctoral group. Standard deviations ranged from 16.71 for the professional certification category to 29.85 for some college. The skewness values were near zero for all groups except Master's, indicating mixed normal/non-normal distributions for this variable by education.

13. *Music* (DOI items 47*, 61 and 68). Descriptive statistics for this social/ acquired variable by sex, ethnicity and education are presented in Tables 4.41, 4.42 and 4.43 below.

Table 4.41: Descriptive Statistics for Music by Sex—% Scale

	SEX	Female	Male
DOI—MUSIC	N	214	77
	Mean	68.36	57.75
	Median	71.67	56.67
	Std Dev	20.95	22.82
	Intqtl Range	30.00	26.67
	Minimum	0.00	3.33
	Maximum	100.00	100.00
	Skewness	-0.64	-0.31
	Kurtosis	0.18	-0.02

Table 4.42: Descriptive Statistics for Music by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI—MUSIC	N	20	255	16
	Mean	67.83	64.50	70.21
	Median	61.67	66.67	68.33
	Std Dev	21.56	22.39	18.60
	Intqtl Range	40.00	30.00	31.67
	Minimum	36.67	0.00	36.67
	Maximum	100.00	100.00	100.00
	Skewness	0.24	-0.62	-0.09
	Kurtosis	-1.29	0.06	-0.89

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.43: Descriptive Statistics for Music by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI—MUSIC	N	5	30	23	99	89	33	15
	Mean	63.33	64.67	61.88	65.49	62.96	72.83	70.67
	Median	60.00	71.67	66.67	66.67	66.67	76.67	73.33
	Std Dev	15.81	18.77	19.82	21.48	24.79	22.25	19.77
	Intqtl Range	25.00	30.00	30.00	33.33	30.00	38.33	33.33
	Minimum	50.00	26.67	3.33	10.00	0.00	3.33	33.33
	Maximum	90.00	93.33	90.00	100.00	100.00	100.00	100.00
	Skewness	1.64	-0.56	-1.12	-0.25	-0.73	-0.97	-0.21
	Kurtosis	2.95	-0.63	2.13	-0.59	-0.01	1.29	-0.69

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Music by Sex—Table 4.41. Minimum/maximum scores for this variable ranged from 0-100 on a 0-100% scale. Means and medians were relatively close within each group, though they were considerably higher for females (68.36 and 71.67, respectively) than for males (57.75 and 56.67, respectively). Standard deviations were 20.95 for females and 22.82 for males. The closeness of the means and medians and skewness values near zero for both groups indicated normal distributions for music by sex.

Music by Ethnicity—Table 4.42. Minimum/maximum scores for this variable ranged from 0-100 on a 0-100% scale. Means and medians were close for each group, though outcomes were slightly higher for Hispanics (mean 70.21, median 68.33). The lowest mean was 64.50 for whites, and the highest was 70.21 for Hispanics. Medians ranged from 61.67 for blacks to 68.33 for Hispanics. Standard deviations ranged from 18.60 for Hispanics to 22.39 for whites. The closeness of the means and medians, and skewness values near zero across the groups indicated normal distributions for music by ethnicity.

Music by Education—Table 4.43. Minimum/maximum scores ranged from 0-100 on a 0-100% scale, with a range of 50-90 for the high school group. Scores were relatively high for this variable, and means ranged from 61.88 for Associate's to 72.83 for the doctoral group. Medians ranged from a low of 60 for high school to a high of 76.67 for the doctoral group. Standard deviations ranged from a low of 15.81 for high school to a high of 24.79 for Master's. The skewness values were near zero for all groups except for the high school group (skew=1.64, low score bias) and Associate's group (skew=-1.12, high score bias), indicating mixed normal/non-normal distribution for music by education.

14. *Adventure-Seeking* (DOI items 69, 71* and 76). Descriptive statistics for this social/acquired variable by sex, ethnicity and education are presented in Tables 4.44, 4.45 and 4.46 below.

Table 4.44: Descriptive Statistics for Adventure-Seeking by Sex—% Scale

	SEX	Female	Male
DOI—ADVENTURE-SEEKING	N	214	77
	Mean	64.58	68.74
	Median	66.67	70.00
	Std Dev	20.93	18.91
	Intqtl Range	30.00	28.33
	Minimum	0.00	26.67
	Maximum	100.00	100.00
	Skewness	-0.48	-0.40
	Kurtosis	-0.09	-0.58

Table 4.45: Descriptive Statistics for Adventure-Seeking by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI—ADVENTURE-SEEKING	N	20	255	16
	Mean	57.67	65.93	67.71
	Median	53.33	66.67	68.33
	Std Dev	22.35	20.13	24.97
	Intqtl Range	37.50	26.67	39.17
	Minimum	6.67	0.00	6.67
	Maximum	93.33	100.00	100.00
	Skewness	-0.26	-0.46	-0.85
	Kurtosis	-0.15	-0.25	0.83

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.46: Descriptive Statistics for Adventure-Seeking by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI—ADVENTURE-SEEKING	N	5	30	23	99	89	33	15
	Mean	56.00	61.89	59.86	61.31	70.37	70.81	72.22
	Median	63.33	60.00	60.00	63.33	70.00	76.67	73.33
	Std Dev	16.73	26.23	25.20	19.66	17.87	20.31	14.24
	Intqtl Range	28.33	45.00	33.33	30.00	28.33	38.33	16.67
	Minimum	30.00	6.67	0.00	10.00	26.67	30.00	43.33
	Maximum	73.33	100.00	96.67	93.33	100.00	96.67	96.67
	Skewness	-1.05	-0.31	-0.67	-0.34	-0.31	-0.41	-0.56
	Kurtosis	0.84	-0.97	0.52	-0.44	-0.47	-1.09	0.55

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Adventure-Seeking by Sex—Table 4.44. Minimum/maximum scores for this variable ranged from 0-100 on a 0-100% scale, with means and medians for both groups well above 50. The range was a mean of 64.58 for females, 68.74 for males. Medians were 66.67 (females) and 70 (males). The standard deviations were 18.91 for males; 20.93 for females. The closeness of the means and medians for both groups and the skewness values near zero indicated normal distributions for adventure-seeking by sex.

Adventure-Seeking by Ethnicity—Table 4.45. Minimum/maximum scores were 0-100 on a 0-100% scale for all three groups. Means and medians were close within each group. The low mean was 57.67 for blacks; the high 67.71 for Hispanics. Medians ranged from 53.33 for blacks to 68.33 for Hispanics. Standard deviations were relatively close, at 20.13 for whites, 22.35 for blacks, and 24.97 for Hispanics. Closeness of the means and medians, and skewness values near zero for all three groups indicated normal distributions for adventure-seeking by ethnicity.

Adventure-Seeking by Education—Table 4.46. Minimum/maximum scores ranged from 0-100 on a 0-100% scale, with the narrowest scores (30-80) for the high school group. Scores for this variable tended to be relatively high by education, as well, as was reflected in the means and medians. Means ranged from 56 for high school to 72.22 for professional certification. Medians fell between a low of 60 for some college and Associate's, and a high of 76.67 for the doctoral group. The standard deviations ranged from 14.24 for those in the professional certification group to 26.23 for those with some college credit. The skewness values were near zero for all groups except high school, indicating mixed normal/non-normal distributions for adventure-seeking by education.

15. *Unconventionality* (DOI items 49*, 72 and 75). Descriptive statistics for this social/acquired variable by sex, ethnicity and education are presented in Tables 4.47, 4.48 and 4.49 below.

Table 4.47: Descriptive Statistics for Unconventionality by Sex—% Scale

	SEX	Female	Male
DOI—UNCONVENTIONALITY	N	214	77
	Mean	59.64	57.45
	Median	60.00	60.00
	Std Dev	17.98	19.53
	Intqtl Range	24.17	31.67
	Minimum	13.33	6.67
	Maximum	100.00	93.33
	Skewness	-0.15	-0.26
	Kurtosis	-0.28	-0.59

Table 4.48: Descriptive Statistics for Unconventionality by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI—UNCONVENTIONALITY	N	20	255	16
	Mean	55.67	58.99	60.63
	Median	56.67	60.00	60.00
	Std Dev	17.37	18.60	18.63
	Intqtl Range	28.33	23.33	35.83
	Minimum	20.00	6.67	30.00
	Maximum	83.33	100.00	86.67
	Skewness	-0.39	-0.19	0.01
	Kurtosis	-0.68	-0.32	-1.36

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.49: Descriptive Statistics for Unconventionality by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI—UNCONVENTIONALITY	N	5	30	23	99	89	33	15
	Mean	50.00	61.44	60.72	55.29	60.41	60.61	66.67
	Median	43.33	61.67	60.00	56.67	60.00	66.67	70.00
	Std Dev	16.16	17.08	24.20	18.32	17.55	18.90	14.80
	Intqtl Range	26.67	24.17	33.33	26.67	25.00	31.67	20.00
	Minimum	36.67	30.00	6.67	13.33	13.33	26.67	33.33
	Maximum	76.67	100.00	96.67	100.00	96.67	90.00	86.67
	Skewness	1.51	0.14	-0.58	-0.10	-0.17	-0.15	-0.91
	Kurtosis	2.07	-0.42	-0.07	-0.47	-0.18	-1.00	0.50

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Unconventionality by Sex—Table 4.47. Minimum/maximum scores for this variable ranged from 0-100 on a 0-100% scale, with the means and medians for both groups at or close to 60. Means ranged from 57.45 (males) to 59.64 (females); medians were 60 for both groups. The standard deviation was 17.98 for females and 19.53 for males. The closeness of the means and medians and the skewness values near zero for both females and males indicated normal distributions for the unconventionality variable by sex.

Unconventionality by Ethnicity—Table 4.48. Minimum/maximum scores for this variable ranged from 0-100 on a 0-100% scale, narrowing slightly to 20-90 for blacks and 30-90 for Hispanics. Means and medians were relatively close to 50, and relatively close within each ethnicity. Means ranged from 55.67 for blacks to 60.63 for Hispanics. Medians were 56.67 for blacks and 60 for the whites and Hispanics. The standard deviation for blacks was 17.37 and nearly identical at 18.60 and 18.63, respectively, for whites and Hispanics. The closeness of the means and medians and skewness values near zero indicated normal distributions for unconventionality by ethnicity.

Unconventionality by Education—Table 4.49. Minimum/maximum scores ranged from 0-100 on a 0-100% scale, narrowing to 30-80 for both the high school and professional certification groups. Means ranged between 50 for high school to 66.67 for professional certification. Medians were between 43.33 for those in the high school category to 70 for the professional certification group. Standard deviations ranged from 14.80 for the professional certification group to 24.20 for Associate's. The skewness values were near zero for all groups except high school (skew=1.51, lower score bias), indicating mixed normal/non-normal distributions for unconventionality by education.

16. *Ability to Visualize* (DOI items 46, 66* and 77). Descriptive statistics for this social/acquired variable by sex, ethnicity and education are presented in Tables 4.50, 4.51 and 4.52 below.

Table 4.50: Descriptive Statistics for Ability to Visualize by Sex—% Scale

	SEX	Female	Male
DOI—ABILITY TO VISUALIZE	N	214	77
	Mean	72.09	76.58
	Median	73.33	76.67
	Std Dev	18.77	14.82
	Intqtl Range	27.50	21.67
	Minimum	26.67	36.67
	Maximum	100.00	100.00
	Skewness	-0.31	-0.79
	Kurtosis	-0.78	0.18

Table 4.51: Descriptive Statistics for Ability to Visualize by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI—ABILITY TO VISUALIZE	N	20	255	16
	Mean	67.50	73.37	76.25
	Median	70.00	76.67	76.67
	Std Dev	19.43	17.86	14.40
	Intqtl Range	32.50	26.67	27.50
	Minimum	30.00	26.67	50.00
	Maximum	96.67	100.00	100.00
	Skewness	-0.30	-0.44	0.02
	Kurtosis	-0.96	-0.59	-0.91

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.52: Descriptive Statistics for Ability to Visualize by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI—ABILITY TO VISUALIZE	N	5	30	23	99	89	33	15
	Mean	56.67	71.56	68.70	68.89	78.50	80.10	71.78
	Median	50.00	68.33	66.67	73.33	80.00	86.67	70.00
	Std Dev	22.24	17.21	19.09	18.69	14.97	17.01	16.61
	Intqtl Range	40.00	30.83	33.33	30.00	26.67	25.00	16.67
	Minimum	33.33	36.67	30.00	26.67	40.00	36.67	36.67
	Maximum	90.00	100.00	100.00	100.00	100.00	100.00	100.00
	Skewness	0.86	-0.07	0.03	-0.34	-0.49	-0.90	-0.37
	Kurtosis	0.05	-1.00	-0.67	-0.69	-0.61	0.02	0.55

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Ability to Visualize by Sex—Table 4.50. Minimum/maximum scores for this variable ranged from 20-100 on a 0-100% scale, with the relatively high scores were reflected in means and medians in the 70 range for both groups. The mean for females was 72.09; 76.58 for males. Medians were 73.33 (female) and 76.67 (male). Standard deviations were 14.82 for males and 18.77 for females. Closeness of means and medians and skewness values near zero indicated normal distributions for this variable by sex.

Ability to Visualize by Ethnicity—Table 4.51. Minimum/maximum scores are 20-100 on a 0-100% scale, narrowing to 30-100 for blacks and 50-100 for Hispanics. Means and medians in the high 60 to high 70 range indicated relatively high scores for this variable overall. Means ranged from 67.50 for blacks to 76.25 for Hispanics; and medians were 70 for blacks and 76.67 for both whites and Hispanics. The standard deviations fell between 14.40 for Hispanics and 19.43 for blacks. Closeness of the means and medians, and skewness values near zero indicated normal distributions for the ability to visualize by ethnicity.

Ability to Visualize—Table 4.52. Minimum/maximum scores ranged from 20-100 on a 0-100% scale for this variable, but narrowed to 40-100 for those in the Master's group. Means and medians were mixed, ranging from the mid-50's to the high 80's. The low mean was 56.67 for high school; the high mean was 80.10 for the doctoral group. The low median was 50 for high school, and 86.67 for the doctoral group. Standard deviations ranged from 14.97 for the Master's group to 22.24 for those in the high school category. The closeness of the means and medians within each group and the skewness values near zero across the groups indicated normal distributions for the ability to visualize by education.

17. *Imagery* (DOI items 79*, 81 and 83). Descriptive statistics for this social/ acquired variable by sex, ethnicity and education are presented in Tables 4.53, 4.54 and 4.55 below.

Table 4.53: Descriptive Statistics for Imagery by Sex—% Scale

	SEX	Female	Male
DOI—IMAGERY	N	214	77
	Mean	55.73	58.74
	Median	56.67	60.00
	Std Dev	19.75	16.64
	Intqtl Range	27.50	25.00
	Minimum	3.33	16.67
	Maximum	100.00	90.00
	Skewness	-0.12	-0.29
	Kurtosis	-0.24	-0.42

Table 4.54: Descriptive Statistics for Imagery by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI—IMAGERY	N	20	255	16
	Mean	49.00	56.99	58.75
	Median	51.67	56.67	55.00
	Std Dev	21.11	19.21	9.26
	Intqtl Range	31.67	26.67	10.00
	Minimum	3.33	6.67	46.67
	Maximum	83.33	100.00	80.00
	Skewness	-0.50	-0.13	1.00
	Kurtosis	-0.32	-0.39	0.40

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.55: Descriptive Statistics for Imagery by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI—IMAGERY	N	5	30	23	99	89	33	15
	Mean	50.00	54.56	52.17	54.68	56.44	66.16	60.89
	Median	50.00	60.00	56.67	53.33	56.67	66.67	56.67
	Std Dev	11.30	21.81	24.61	16.34	19.01	19.13	17.43
	Intqtl Range	20.00	28.33	40.00	20.00	26.67	23.33	33.33
	Minimum	36.67	3.33	10.00	20.00	6.67	16.67	36.67
	Maximum	66.67	90.00	90.00	96.67	100.00	100.00	96.67
	Skewness	0.58	-0.51	-0.17	0.15	-0.19	-0.78	0.73
	Kurtosis	0.49	-0.09	-1.01	-0.21	-0.20	0.36	-0.24

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Imagery by Sex—Table 4.53. Minimum/maximum scores for this variable ranged from 1-100 on a 0-100% scale, though the range for males narrowed to 10-90. Means and medians for both groups in the mid-to-high 50's, up to 60 for males. Means were 55.73 (female) and 58.74 (male). Medians were between 56.67 for females and 60 for males. The standard deviation was 19.75 for females and 16.64 males. The closeness of the means and medians for both females and males, and the skewness values near zero for both indicated normal distributions for imagery by sex.

Imagery by Ethnicity—Table 4.54. Minimum/maximum scores for this variable were 0-100 on a 0-100% scale, though the range narrowed to 0-90 for blacks and 40-80 for Hispanics. Means and medians for the three groups fell near 50. The low mean was 49 for blacks; the high was 58.75 for Hispanics. The standard deviations ranged from 9.26 for Hispanics to 21.11 for blacks. The closeness of the means and medians for each group and the skewness values near zero indicated normal distributions for imagery by ethnicity.

Imagery by Education—Table 4.55. Minimum/maximum scores ranged from 0-100 on a 0-100% scale for this variable, but narrowed to a range of 30-70 for the high school group. Means and medians were very close within each group. Means ranged from 50 for those in the high school category to 66.16 for the doctoral group. Medians were similar: with a low of 50 for high school and a high of 66.67 for the doctoral group. The standard deviations ranged from 11.30 for high school to 24.61 for those in the Associate's category. The closeness of the means and medians for each group and skewness values near zero for all groups indicated normal distributions for imagery by education.

18. *Emotions* (DOI items 62*, 88 and 94). Descriptive statistics for this social/ acquired variable by sex, ethnicity and education are presented in Tables 4.56, 4.57 and 4.58 below.

Table 4.56: Descriptive Statistics for Emotions by Sex—% Scale

	SEX	Female	Male
DOI—EMOTIONS	N	214	77
	Mean	75.78	65.58
	Median	80.00	70.00
	Std Dev	19.76	21.06
	Intqtl Range	24.17	35.00
	Minimum	10.00	20.00
	Maximum	100.00	100.00
	Skewness	-1.10	-0.47
	Kurtosis	0.78	-0.76

Table 4.57: Descriptive Statistics for Emotions by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI—EMOTIONS	N	20	255	16
	Mean	69.33	73.20	72.50
	Median	73.33	76.67	71.67
	Std Dev	20.76	20.46	23.80
	Intqtl Range	31.67	30.00	40.00
	Minimum	23.33	10.00	13.33
	Maximum	93.33	100.00	100.00
	Skewness	-0.76	-0.89	-0.84
	Kurtosis	-0.33	0.06	0.95

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.58: Descriptive Statistics for Emotions by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI—EMOTIONS	N	5	30	23	99	89	33	15
	Mean	80.00	72.22	69.86	77.51	68.95	71.21	74.44
	Median	76.67	71.67	76.67	83.33	73.33	76.67	83.33
	Std Dev	11.55	17.86	20.90	18.09	22.99	21.05	22.98
	Intqtl Range	15.00	23.33	23.33	20.00	31.67	35.00	26.67
	Minimum	70.00	20.00	20.00	30.00	10.00	20.00	20.00
	Maximum	100.00	100.00	100.00	100.00	100.00	96.67	100.00
	Skewness	1.86	-0.94	-0.82	-1.06	-0.64	-0.77	-1.10
	Kurtosis	3.98	1.25	0.37	0.26	-0.44	-0.20	1.06

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Emotions by Sex—Table 4.56. Minimum/maximum scores for this variable ranged from 10-100 on a 0-100% scale for females and 20-100 for males. Scores were relatively high for this variable within both groups. Means ranged from 65.58 for males to 75.78 for females. The medians were 70 and 80 for males and females, respectively. Standard deviations were 19.76 for females and 21.06 for males. While the skewness value for males was near zero, the value of -1.10 indicated high score bias for females and a mixed normal/non-normal distributions for emotions by sex.

Emotions by Ethnicity—Table 4.57. Minimum/maximum scores for this variable were 10-100 on a 0-100% scale for whites, narrowing to 20-100 for blacks. Again, scores for this variable were relatively high by ethnicity, as reflected in means that ranged from 69.33 for blacks to 73.20 for whites. Medians were similarly high, ranging from 71.67 for Hispanics to 76.67 for whites. Standard deviations were 20.46 for whites, 20.76 for blacks, and 23.80 for Hispanics. Closeness of the means and medians for each group and skewness values near zero indicated normal distributions by ethnicity.

Emotions by Education—Table 4.58. Minimum/maximum scores ranged from 20-100 on a 0-100% scale, narrowing considerably (70-100) for the five respondents in the high school group. Again, scores were quite high for this variable by education, with means ranging from 68.95 for Master's to 80 for high school. Medians fell between 71.67 for some college to 83.33 for both Bachelor's and professional certification groups. Standard deviations ranged from 11.55 for high school to 22.99 for the Master's group. The skewness values of 1.86 for high school, -1.06 (low score bias) for Bachelor's, and -1.10 (high score bias) for professional certification indicated mixed normal/non-normal distributions for emotions by education.

Biological Cluster (5 variables). Variables from the biological cluster are largely fixed, predetermined traits posited to indicate greater or lesser intuitive ability. Descriptive statistics for these variables are presented and discussed below.

19. *Age* (DOI item 2). Table 4.59 presents descriptive statistics for age by decade. Age was one of the five biological variables examined in the study. Age, including comparisons of the sample population to the general population, was discussed in the *Respondent Demographics* section above. Also see Appendix X for DOI descriptive by Age/Decade.

Table 4.59: Descriptive Statistics of DOI Total % Score-T Score for Age by Decade

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—TOTAL SCORE T SCORE	N	62	53	54	71	47	8
	Mean	49.11	44.82	51.51	52.66	50.92	52.07
	Median	47.77	44.98	50.66	54.24	50.78	52.78
	Std Dev	11.44	8.44	9.34	9.24	9.69	9.47
	Intqtl Range	15.39	12.53	14.35	14.51	14.94	12.80
	Minimum	23.30	25.75	32.49	31.95	26.13	39.07
	Maximum	75.93	62.45	71.03	71.20	69.41	69.38
	Skewness	0.22	-0.35	-0.01	-0.32	-0.32	0.53
	Kurtosis	-0.16	-0.24	-0.82	-0.55	-0.27	0.46

Age—Table 4.59. Respondent ages ranged from a minimum of 20 to a maximum of 79. The means and medians for each age by decade were very close across all groups. The low mean was 44.82 for those in the 30's decade; the high mean was 52.66 for those in the 50's decade. Median lows and highs for age fell into these same categories, with a low of 44.98 for the 30's, and a high of 54.24 for the 50's. Standard deviations ranged from a low of 8.44 (30's) to a high of 11.44 (20's); with standard deviations ranging from 9.24 (50's) to 9.69 (60's) for the remaining groups. The relative closeness of the means and medians and skewness values near zero for all groups indicated normal distribution for the biological variable age.

20. *Sex* (HBDI® item 2). Table 4.60 below presents descriptive statistics for sex, one of the five biological variables examined in this study. Sex, including comparisons to the general population, was discussed in the *Respondent Demographics* section above.

Table 4.60: Descriptive Statistics of DOI Total % Score-T Score for Sex

	SEX	Female	Male
DOI—TOTAL SCORE T SCORE	N	214	77
	Mean	50.21	49.36
	Median	50.28	49.83
	Std Dev	10.52	8.22
	Intqtl Range	15.49	12.77
	Minimum	23.30	33.33
	Maximum	75.93	66.09
	Skewness	-0.09	-0.02
	Kurtosis	-0.37	-0.75

Sex—Table 4.60. Among the 291 respondents for whom sex was determined, n=214 female, n=77 male. Means and medians for both groups were nearly identical: mean 50.21 and median 50.28 for females; mean 49.36 and median 49.83 for males. Standard deviations ranged from a low of 8.22 for males to a high of 10.52 for females. The extreme closeness of the means and medians and skewness values near zero for both groups indicated normal distribution for the biological variable sex.

21. *Handedness* (HBDI® items 5 and 6). Tables 4.61 and 4.62 below present the descriptive statistics for handedness as measured by HBDI® items 5 and 6. Because handedness was measured by the HBDI® and not the DOI, data for this variable was collected only for the 258 individuals (190 female, 68 male) who completed the HBDI®. No statistics are available for comparison of the sample population with the general population. The composite items 5 and 6 handedness score, to be utilized in the data analyses conducted for Hypotheses 2 and 3, will also be discussed in that section hereinafter.

Handedness was measured by HBDI® items 5 and 6. On HBDI® item 5, respondents selected one of four diagrams indicating how they hold a pencil: A. Left crooked; B. Left straight; C. Right straight; or D. Left crooked. On HBDI® item 6 they selected one of five indicators of handedness strength and direction: A. Primary left; B. Primary left some right; C. Both hands equal; D. Primary right, some left; E. Primary right. To establish these handedness measures within the framework of intuition primarily as a right brain-oriented hemisphere function, handedness preference was recoded to reflect increasing right-dominance. First, the diagram choices in HBDI® item 5 were recoded to reflect their relationship to right-brain dominance: 1 (*least right*), 2, 3, 4 (*most right*). The five handedness preferences in HBDI® item 6 were reverse coded from *most left-* to *most right-brained*: A=5; B=4; C=3; B=2; and E=1. For the composite handedness, cross-tabulations of the recoded HBDI® items 5 and 6 were analyzed to derive a combined tri-level score reflecting the respondents' intuitive leaning based on handedness preference: 1=predominantly right hand use—left-brain hemisphere dominance; 2=combined right and left hand use—mixed brain hemisphere dominance; and 3=predominantly left hand use—right brain hemisphere dominance (Appendix U).

Table 4.61: Descriptive Statistics of DOI Total % Score-T Score for Handedness HBDI® Item 5 (Diagrams 1-4)

	HBDI® Item 5 (Diagrams 1-4) HANDEDNESS	**A. (1) Left Crooked**	**C.(2) Right Straight**	**B.(3) Left Straight**	**D.(4) Right Crooked**
DOI—TOTAL SCORE T SCORE	N	10	180	21	40
	Mean	49.75	49.90	49.47	51.81
	Median	49.38	49.94	50.61	51.29
	Std Dev	9.21	10.15	9.89	10.06
	Intqtl Range	16.98	14.39	14.33	14.81
	Minimum	34.91	25.50	34.53	29.26
	Maximum	62.13	73.58	75.93	72.35
	Skewness	-.10	-.10	.79	-.09
	Kurtosis	-.83	-.44	1.02	-.33

Handedness—Table 4.61. Among the 251 respondents who completed HBDI® item 5, the means and medians were nearly identical within and across the four groups. The mean range was a low of 49.47 (left straight) and a high of 51.81 (right crooked). The median range was a low of 49.38 (left crooked) and a high of 51.29 (right crooked). Standard deviations were also very close across the four groups, ranging from a low of 9.21 (left crooked) to a high of 10.15 (right straight). The extreme closeness of the means and medians, as well as skewness near zero for all four groups indicated normal distribution for handedness as measured by HBDI® item 5.

Table 4.62: Descriptive Statistics of DOI Total % Score-T Score for Handedness HBDI® Item 6 (Strength/Direction)

	HBDI® Item 6 (Strength/ Direction) HANDEDNESS	**E. (5) Primary Right**	**D. (4) Primary Right/ Some Left**	**C. (3) Both Hands Equal**	**B. (2) Primary Left/ Some Right**	**A. (1) Primary Left**
DOI—TOTAL SCORE T SCORE	N	145	71	8	13	14
	Mean	48.85	52.70	56.24	48.06	49.41
	Median	48.64	52.80	56.01	50.61	48.73
	Std Dev	10.23	9.47	12.21	8.81	8.04
	Intqtl Range	15.31	15.11	19.27	16.92	14.58
	Minimum	25.50	28.65	40.25	34.53	38.39
	Maximum	72.35	73.58	75.93	61.27	62.94
	Skewness	-.11	.07	.29	-.40	.26
	Kurtosis	-.54	-.35	-1.05	-1.09	-1.33

Handedness—Table 4.62. Among the 251 respondents who completed HBDI® item 6, the means and medians were very close within and across the five groups. The mean ranged from a low of 48.06 (primary left/some right) to 56.24 (both hands equal). The lowest median was 48.64 (primary right), and the highest was 56.01 (both hands equal). Standard deviations were also relatively close across the five groups, ranging from a low of 8.04 (primary left) to a high of 12.21 (both hands equal). The extreme closeness of the means and medians, and skewness values near zero for all five groups indicated normal distribution for handedness as measured by HBDI® item 6.

22. *Brain Hemispheres* (HBDI® outcome scores). Table 4.63 below presents the descriptive statistics for brain hemisphere percents, provided as HBDI® outcome scores for left hemisphere (A/B quadrants), right hemisphere (C/D quadrants), cerebral hemisphere (A/D quadrants) and limbic hemisphere (B/C quadrants), as shown in Appendix E. The proprietary weighted algorithm used to calculate hemisphere scores was not provided to the researcher. These scores, to be utilized in the data analyses conducted for Hypotheses 2 and 3, will also be discussed in that section.

HBDI® Brain Dominance Tri-level scores (i.e., left, right, and distributed), were derived through a multi-stage process. A frequency analysis confirmed the anticipated relationship between the HBDI® Right modal percent scores and HBDI® C+D quadrant scores. The central tendency (mean and median), variability (standard deviation and interquartile range), and skew statistics for the HBDI® Right modal percent score were reviewed to confirm a center of distribution near the mid-point—slightly above 50%, in this instance; and that the curve was approximately normal in shape, with a normal curve variation and skew. Cut scores were selected from the Right modal percent frequency table to divide the distribution roughly into thirds. Precise one-third scores were not used in order to ensure that the Distributed Dominance group in the center of the scale—comprised of approximately 40% of the cases—would be larger than the high and low ends of the scale—comprised of approximately 30% each. It also ensured that the Right Dominance and Left Dominance extremes of the scale would be more homogeneous measures of *Right* vs. *not Right*. The actual Right modal percent cut scores were:

Left Dominance %—47% and below, C+D Quadrant sums of 0-139
Distributed Dominance %—48%-61%, C+D Quadrant sums of 138-186
Right Dominance %—62% and above, C+D Quadrant sums of 187 and above

Table 4.63: Descriptive Statistics of DOI Total % Score-T Score for HBDI® Brain Hemisphere Dominance—Tri-Level

	BRAIN HEMISPHERES	Left-Brain Hemisphere Dominance	Distributed Brain Hemisphere Dominance	Right-Brain Hemisphere Dominance
DOI—TOTAL SCORE T SCORE	N	75	107	76
	Mean	41.40	49.97	58.62
	Median	41.85	50.40	59.48
	Std Dev	7.13	7.88	7.64
	Intqtl Range	9.31	11.09	8.67
	Minimum	25.50	32.33	34.53
	Maximum	57.89	72.35	75.93
	Skewness	-.29	.08	-.52
	Kurtosis	-.11	-.03	.84

Brain Hemispheres—Table 4.63. Among the 258 respondents who completed the HBDI® and for whom brain hemisphere scores were calculated, the means and medians were relatively close within the three dominance groups. Means across the groups ranged from a low of 41.40 for left-hemisphere dominance, to a high of 58.62 for right-hemisphere dominance. Medians followed the same pattern. A significant ANOVA of mean differences (F=94.28; df=2,248; p <.01) confirmed higher DOI scoring with right-brain dominance. Standard deviations ranged from a low of 7.13 for left-hemisphere dominance to a high of 7.88 for the middle range of scores, designated here as *distributed dominance*. The closeness of the means and medians and skewness values near zero indicated normal distributions among the three dominance groups.

23. *Ethnicity* (HBDI® item 2). Table 4.64 below presents descriptive statistics for the DOI *Background Characteristics* demographic, ethnicity, another Shirley and Langan-Fox (1996) biological variable examined here. Comparison of the sample population with the U.S. population as a whole was discussed in the *Respondent Demographics* section above.

Table 4.64: Descriptive Statistics of DOI Total % Score-T Score for Ethnicity

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI—TOTAL SCORE T SCORE	N	20	255	16
	Mean	45.66	50.22	50.39
	Median	45.12	50.24	51.84
	Std Dev	11.52	9.92	7.47
	Intqtl Range	19.45	14.29	12.67
	Minimum	23.30	25.50	37.66
	Maximum	63.69	75.93	61.30
	Skewness	-0.30	0.01	-0.16
	Kurtosis	-0.70	-0.37	-1.25

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Ethnicity—Table 4.64. Among the 291 respondents for whom ethnicity could be determined, the means and medians were very close within and across the three groups. Means ranged from a low of 45.66 for blacks to a high of 50.39 for Hispanics. Medians ranged from a low of 45.12 for blacks to a high of 51.84 for Hispanics. The standard deviations were also close across the three ethnic groups, ranging from 7.47 for Hispanics to 11.52 for black respondents. The closeness of the means and medians, and skewness values near zero indicated normal distributions for ethnicity.

Education (DOI item 5). Table 4.65 below presents the descriptive statistics for the DOI *Background Characteristics* education demographic. Due to the convenience sampling method utilized for this study, the education level for the sample population is considerably higher than for the overall U.S. population. Though education level was *not* one of the Shirley and Langan-Fox biological variables, education was of special interest to the researcher. A particular interest is determining whether higher levels of education have an obvious affirming or deleterious effect on intuitive functioning, especially as a learning tool or for other learning-related applications. Accordingly, data for this demographic characteristic was collected for use in subsequent analysis.

Table 4.65: Descriptive Statistics of DOI Total % Score-T Score for Education

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI—TOTAL SCORE T SCORE	N	5	30	23	99	89	33	15
	Mean	44.74	50.40	48.75	48.18	50.89	53.50	51.68
	Median	46.68	50.38	47.38	47.70	50.61	55.10	52.18
	Std Dev	9.55	11.62	12.74	9.08	10.33	8.41	7.48
	Intqtl Range	17.90	14.72	24.11	12.35	15.72	13.41	10.03
	Minimum	33.46	23.30	32.49	26.13	25.75	37.09	40.25
	Maximum	57.27	73.58	72.35	66.09	75.93	69.41	66.27
	Skewness	0.09	-0.42	0.35	-0.14	-0.01	-0.09	0.43
	Kurtosis	-1.31	0.35	-1.26	-0.39	-0.38	-0.76	-0.46

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Education—Table 4.65. Among the 294 respondents for whom education level was determined, the means and medians were quite close within and across the seven groups. Means ranged from a low of 44.74 for the high school group to a high of 53.50 for the group with a doctoral degree. Median low and high scores, for the same groups. ranged from a low of 46.68 for those with a high school diploma or equivalent and a high of 55.10 for the doctoral group. The standard deviations were also quite close across the groups, ranging from 9.08 for respondents with a Bachelor's degree to 12.74 for those with an Associate's. Closeness of means and medians and skewness values near zero across the groups indicated normal distribution for education level.

Situational Cluster (2 variables). The situational cluster includes variables related to conditions typically outside one's direct or immediate control but which may affect one's intuitive abilities. More specifically, these variables are not related to intrinsic intuitive ability; rather, they are extrinsic conditions hypothesized to be either *more* or *less* conducive to intuitive functioning. Because it is difficult to measure such conditions in a pen and paper or online survey instrument, the only two situational variables examined in the DOI were *time of day* and *amount of information available*.

24. *Time of Day* (DOI items 58, 74 and 90*). Descriptive statistics for this situational variable by sex, ethnicity and education are presented in Tables 4.66, 4.67 and 4.68 below.

Table 4.66 Descriptive Statistics for Time of Day by Sex—% Scale

	SEX	Female	Male
DOI—TIME OF DAY	N	214	77
	Mean	55.30	55.06
	Median	60.00	53.33
	Std Dev	25.55	24.41
	Intqtl Range	37.50	31.67
	Minimum	0.00	0.00
	Maximum	100.00	96.67
	Skewness	-0.28	-0.30
	Kurtosis	-0.64	-0.48

Table 4.67: Descriptive Statistics for Time of Day by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI—TIME OF DAY	N	20	255	16
	Mean	43.83	56.92	43.75
	Median	41.67	60.00	45.00
	Std Dev	26.58	24.90	24.06
	Intqtl Range	42.50	40.00	46.67
	Minimum	0.00	0.00	0.00
	Maximum	90.00	100.00	76.67
	Skewness	-0.08	-0.31	-0.23
	Kurtosis	-0.84	-0.57	-1.07

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.68: Descriptive Statistics for Time of Day by Education—% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI—TIME OF DAY	N	5	30	23	99	89	33	15
	Mean	63.33	55.56	48.12	55.69	55.58	56.97	53.33
	Median	73.33	55.00	50.00	60.00	60.00	63.33	53.33
	Std Dev	20.14	22.25	28.46	23.67	26.58	29.60	18.43
	Intqtl Range	38.33	30.83	33.33	36.67	43.33	51.67	36.67
	Minimum	40.00	6.67	0.00	0.00	0.00	0.00	30.00
	Maximum	83.33	93.33	100.00	100.00	100.00	100.00	86.67
	Skewness	-0.48	-0.28	0.17	-0.36	-0.34	-0.31	0.22
	Kurtosis	-3.00	-0.30	-0.42	-0.37	-0.67	-1.10	-1.12

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Time of Day by Sex—Table 4.66. Minimum/maximum scores for this variable ranged from 0-100 on a 0-100% scale, with means for males falling at 55.06 and for females at 55.30. Medians were 53.33 for males and slightly higher, at 60, for females. The standard deviation was 24.41 for males and 25.55 for females. The closeness of the means and medians for both the female and male groups, as well as the skewness values near zero for both groups indicated normal distributions for the variable time of day by sex.

Time of Day by Ethnicity—Table 4.67. Minimum/maximum scores were 0-100 on a 0-100% scale for whites, slightly narrower at 0-90 for blacks, and at 0-80 for Hispanics. Means ranged from a low of 43.75 for Hispanics to a high of 56.92 for whites. Medians fell between 41.67 for blacks and 60 for whites. Standard deviations were relatively close across the three ethnic groups, with a low of 24.06 for Hispanics and a high of 26.58 for blacks. The closeness of the means and medians, and skewness values near zero for each group indicated normal distributions for time of day by ethnicity.

Time of Day by Education—Table 4.68. Minimum/maximum scores for this variable ranged from 0-100 on a 0-100% scale, narrowing to 40-90 for those in the high school category, and to 30-90 for the professional certification group. Means and medians were mixed. The lowest mean was 48.12 for Associate's; the highest mean was 63.33 for high school. The lowest median was 50 for Associate's; the highest was 73.33 for high school. Standard deviations were relatively close across the groups, ranging from 18.43 for professional certification to 29.60 for doctoral. Skewness values for all groups were near zero, indicating normal distributions for time of day by education.

25. *Amount of Information Available* (DOI items 86, 96 and 99*). Descriptive statistics for this situational variable by sex, ethnicity and education are presented in Tables 4.69, 4.70 and 4.71 below.

Table 4.69: Descriptive Statistics for Amount of Info Available by Sex—% Scale

	SEX	Female	Male
DOI—AMOUNT OF INFO AVAILABLE	N	214	77
	Mean	64.00	64.46
	Median	63.33	63.33
	Std Dev	17.56	18.40
	Intqtl Range	23.33	25.00
	Minimum	10.00	13.33
	Maximum	100.00	100.00
	Skewness	-0.22	-0.26
	Kurtosis	-0.25	-0.24

Table 4.70: Descriptive Statistics for Amount of Info Available by Ethnicity—% Scale

	ETHNICITY	Af-Am/Blk	Euro/Wht	Hisp/Lat
DOI—AMOUNT OF INFO AVAILABLE	N	20	255	16
	Mean	59.83	64.21	66.67
	Median	61.67	63.33	65.00
	Std Dev	18.01	17.67	18.22
	Intqtl Range	27.50	23.33	25.83
	Minimum	16.67	10.00	36.67
	Maximum	83.33	100.00	100.00
	Skewness	-0.80	-0.20	0.24
	Kurtosis	0.32	-0.30	-0.46

Af-Am/Blk=African-American/Black; Euro/Wht=Euro-American/White; Hisp/Lat=Hispanic/Latino

Table 4.71: Descriptive Statistics for Amount of Info Available by Education% Scale

	EDUCATION	HS/Eq	Coll	Assoc	Bach	Mast	Doct	Cert
DOI—AMOUNT OF INFO AVAILABLE	N	5	30	23	99	89	33	15
	Mean	56.00	63.44	67.39	61.08	65.09	68.59	67.78
	Median	50.00	65.00	66.67	63.33	63.33	73.33	73.33
	Std Dev	13.42	20.33	20.32	15.96	18.98	16.69	15.31
	Intqtl Range	25.00	23.33	30.00	20.00	26.67	23.33	23.33
	Minimum	40.00	10.00	30.00	20.00	13.33	36.67	33.33
	Maximum	70.00	96.67	100.00	93.33	100.00	100.00	93.33
	Skewness	0.17	-0.75	0.01	-0.10	-0.20	-0.53	-0.68
	Kurtosis	-2.41	0.88	-0.76	-0.45	-0.43	-0.57	0.42

HS/Eq=High school or Equivalent; Coll=Some College; Assoc=Associate's; Bach=Bachelor's; Mast=Master's; Doct=Doctoral (PhD/EdD); Cert=Professional Certification/Licensure

Amount of Information Available by Sex—Table 4.69. Minimum/maximum scores for this variable ranged from 10-100 on a 0-100% scale. Means were relatively high though very close within the groups. Means ranged from 64 for females to 64.46 for males. Medians were 63.33 for both. The standard deviations were 17.56 for females and 18.40 for males. The closeness of the means and medians for both females and males and the skewness values near zero indicated normal distributions for the variable amount of information available by sex.

Amount of Information Available by Ethnicity—Table 4.70. Minimum/maximum scores for this variable were 10-100 on a 0-100% scale. The means and medians for the three groups were very consistent, and means ranged from 59.83 for blacks to 66.67 for Hispanics. Medians were similarly close: 61.67 for blacks, 63.33 for whites, and 65 for Hispanics. Standard deviations were also very close, at 17.67 for whites, 18.01 for blacks and 18.22 for Hispanics. The closeness of the means and medians and skewness values near zero across all ethnicity groups indicated normal distributions for amount o information available by ethnicity.

Amount of Information Available by Education—Table 4.71. Minimum/maximum scores ranged from 10-100 on a 0-100% scale, though the range narrowed to 40-70 for the high school group. Means and medians were disparate for this variable. Means ranged from 56 for high school to 68.59 for the doctoral group. Low median was 50 for high school; high median was 73.33 for both the doctoral and professional certification groups. Standard deviations ranged from 13.42 for high school to 18.98 for Master's. The closeness of the means and medians and skewness values near zero across the groups indicated normal distributions for amount of information by education.

DOI Intra-Variable Correlations

This section presents and discusses intra-variable correlations for DOI items measuring the social/acquired and situational variables, the variable T Scores and DOI Total Score T Scores. Correlations at 0.01 and 0.05 levels are indicated in bold. An alternative list of positive and negative intra-variable correlations in descending order from strongest to weakest is included as Appendix Y.

1. *Academic Aptitude* (DOI items 6 and 7). Table 4.72 below presents the intra-variable correlations and DOI totals for academic aptitude, a composite score comprised of DOI item 6 (aptitude) and item 7 (preference). Since academic aptitude scores were derived from two DOI items *not* reported on the same 0-100% scale as other variables measured by the DOI, academic aptitude scores were subjected to a series of calculations, as detailed below. Responses to DOI items 7a-7e are presented in the table below in the order of the most left-brained to most right-brained academic subjects.

Table 4.72: Intra-Variable Correlations and Correlations with Totals—DOI Academic Aptitude

	6. Acad Apt	**7c. Subj/ Math**	**7b. Subj/ Hist-Soc Stu**	**7d. Subj/ Sci**	**7e. Subj/ For Lang**	**7a. Subj/ Eng**	**Acad Pref/ Right-Brain**	**Acad Apt/ Pref T Score**	**DOI Total Score T Score**
6. Academic Aptitude	1.000								
7c. Subj/ Math	**.655****	1.000							
7b. Subj/ Hist-Soc Stu	**-.345****	**-.441****	1.000						
7d. Subj/ Science	**.145***	.071	**-.414****	1.000					
7e. Subj/ For Lang	-.083	**-.293****	**-.193****	**-.265****	1.000				
7a. Subj/ English	**-.440****	**-.441****	.110	**-.380****	**-.248****	1.000			
Acad Pref R-Brain	**-.651****	**-.864****	**.333****	**-.257****	.041	**.833****	**-.651****		
AcadApt/Pref T Score	**.943****	**.810****	**-.373****	**.208****	-.073	**-.655****	**.867****	1.000	
DOI Total Score T Score	**.306****	**.298****	-.108	-.017	.004	**-.210****	**.302****	**.334****	1.000

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Academic Aptitude Intra-Variable Correlation—Table 4.72. Academic aptitude scores were devised from responses to DOI items 6 and 7. For item 6, respondents indicated the academic area of *greater skill*: verbal, math, or both equally. These choices were assigned a value based on their HBDI® right-brain loading. For item 7, respondents ranked five school subjects in order of *greater preference*: English (literature, reading, writing); history/social studies; mathematics; science (biology, chemistry, physics); and foreign languages. To attain the *academic preference* score, these rankings were reversed, then weighted for right-brain loading. The formula for the recoded item 7 scores was:

1. 6 minus each preference score in item 7 to reverse the numbers (1=*LEAST preferred*; 5=*MOST preferred*);
2. multiply English by 2 (due to its double-quadrant loading on the HBDI®); and
3. add science, history/social studies and foreign languages (each with single-quadrant loading on the HBDI®).

Item 6 and 7 scores were then added to create the *Academic Aptitude/Preference* score, and converted to a T score for standardization and comparability with the 0-100% scale.

Due to the large sample size, most values were found to be significant. Among the significant values, the weakest correlation in Table 4.72 was between math and academic aptitude (.145). Very weak correlations were also found between foreign language and history-social studies (-.193); science and the academic aptitude/preference T score (.208); English and the DOI total score T score (-.210). The strongest correlations were between the academic aptitude/preference T score and both academic aptitude (.943) and academic preference/right brain (.867). Strong relationships were also found between math and both the academic aptitude/preference T score (.810) and

academic preference/right brain. The strong relationship between English and the academic preference/right-brain (.833), was as anticipated, since the DOI is designed to measure intuition, which loads within the HBDI® right brain hemisphere.

2. *Cognitive Style/Analytic* (DOI items 51*, 65 and 73). Table 4.73 below presents the intra-variable correlations and DOI totals for cognitive style/analytic.

Table 4.73. Intra-Variable Correlations and Correlations with Totals—DOI Cognitive Style/Analytical

DOI Items for COGNITIVE STYLE/ ANALYTICAL		**51. NOT step-by-step**	**65. Analyze things**	**73. Con-sider facts**	**DOI Cog Style/ Analytical T Score**	**DOI Total Score T Score**
51. NOT step-by-step	Pears. Corr.	1.000				
	Sig.(2-tailed)					
65. Analyze things	Pears. Corr.	**-.158****	1.000			
	Sig.(2-tailed)	.007				
73. Consider facts	Pears. Corr.	**-.297****	**.640****	1.000		
	Sig.(2-tailed)	.000	.000			
DOI Cognitive Style/ Analytical T Score	Pears. Corr.	**-.701****	**.752****	**.817****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**.360****	-.023	**-.198****	**-.274****	1.000
	Sig.(2-tailed)	.000	.691	.001	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Cognitive Style/Analytic Intra-Variable Correlation—Table 4.73. The weakest intra-variable correlation (-.158) was between item 51 (NOT utilizing step-by-step instructions) and item 65 (preference for analyzing things)—as expected, since these are opposing approaches. The strongest intra-variable correlation (.640) was between the two positively-worded items, 65 (analyze things) and 73 (consider facts). The overall cognitive style/analytical relationship was strongly positive with the two positively-worded items (.817 and .752, respectively); and strongly negative (-.701) with negatively-worded item 51. A moderate, positive relationship was found between the DOI total score (.360) and item 51, worded to measure a more intuitive approach.

Though drawn from the Shirley and Langan-Fox social/acquired cluster, analytic cognitive style was examined primarily for comparison with the intuitive cognitive style characteristic. Since analytic style is non-intuitive by definition, negative correlation between the cognitive style/analytical T score and DOI total score (-.274) was expected.

3. *Cognitive Style/Intuitive* (DOI items 50, 56 and 92*). Table 4.74 below presents the intra-variable correlations and DOI totals for cognitive style/intuitive.

Table 4.74: Intra-Variable Correlations and Correlations with Totals—DOI Cognitive Style/Intuitive

DOI Items for COGNITIVE STYLE/ INTUITIVE		50. Sudden ideas	56. Rely on intui-tion	92. NOT confi-dent	DOI Cog Style Intuitive T Score	DOI Total Score T Score
50. Sudden ideas	Pears Corr	1.000				
	Sig.(2-tailed)					
56. Rely on intuition	Pears. Corr.	**.360****	1.000			
	Sig.(2-tailed)	.000				
92. NOT confident	Pears. Corr.	**-.130***	**-.276****	1.000		
	Sig.(2-tailed)	.026	.000			
DOI Cognitive Style/ Intuitive T Score	Pears. Corr.	**.609****	**.722****	**-.770****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total ScoreT Score	Pears. Corr.	**.498****	**.512****	**-.463****	**.684****	1.000
	Sig.(2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

* Correlation is significant at the 0.05 level (2-tailed). N=295

Cognitive Style/Intuitive Intra-Variable Correlation—Table 4.74. The weakest intra-variable correlations (-.130 and -.276, respectively) were between the negatively-worded item 92 (NOT confident) and positively-worded items 50 (sudden ideas) and 56 (rely on intuition). The overall cognitive style/intuitive score was somewhat strongly related to item 92 (-.770); and had moderate to strong positive relationships (.609 and .722, respectively) with positively-worded items 50 and 56. The DOI total score outcomes were anticipated, with positive correlations with items 50 and 56 (.498 and .512, respectively); and a negative correlation with item 92 (-.463).

4. *Experience* (DOI items 52, 85 and 98*). Table 4.75 below presents the intra-variable correlations and DOI totals for experience.

Table 4.75: Intra-Variable Correlations and Correlations with Totals—DOI Experience

DOI Items for EXPERIENCE		52. Trace insights	85. Act on instinct	98. Prior experi-ence	DOI Experi-ence T Score	DOI Total Score T Score
52. Trace insights	Pears. Corr.	1.000				
	Sig.(2-tailed)					
85. Act on instinct	Pears. Corr.	.073	1.000			
	Sig.(2-tailed)	.212				
98. Prior experience	Pears. Corr.	**.224****	-.051	1.000		
	Sig.(2-tailed)	.000	.386			
DOI Experience T Score	Pears. Corr.	**.569****	**.749****	**-.325****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**.290****	**.386****	-.033	**.456****	1.000
	Sig.(2-tailed)	.000	.000	.569	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Experience Intra-Variable Correlation—Table 4.75. The weakest and only significant intra-variable relationship (.224) was item 52 (trace insights) with negatively-worded item 98 (reliance on prior experience). Item 98 had a relatively weak negative correlation (-.325) with the overall experience score. Relationships between positively-worded items 52 (trace insights) and 85 (act on instinct) were positive and moderate to somewhat strong (.569 and .749, respectively). Relationships between these items and the DOI total score were relatively weak but positive (.290 and .386, respectively). The relationship between the overall experience score and DOI total score was slightly stronger at .456.

5. *Introversion/Extraversion.* No intra-variable correlation table is included for the introversion/extraversion variable. Because it was measured by a single HBDI® item, comparable intra-variable correlation analysis was not possible for this variable.

6. *Creativity* (DOI items 53, 59 and 95*). Table 4.76 below presents the intra-variable correlations and DOI totals for creativity.

Table 4.76: Intra-Variable Correlations and Correlations with Totals—DOI Creativity

DOI Items for CREATIVITY		53. Multiple ways	59. Creative activities	95. NOT imagi-native	DOI Crea-tivity T Score	DOI Total Score T Score
53. Multiple ways	Pears. Corr.	1.000				
	Sig.(2-tailed)					
59. Creative activities	Pears. Corr.	**.228****	1.000			
	Sig.(2-tailed)	.000				
95. NOT imaginative	Pears. Corr.	**-.315****	**-.412****	1.000		
	Sig.(2-tailed)	.000	.000			
DOI Creativity T Score	Pears. Corr.	**.593****	**.804****	**-.798****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**.511****	**.572****	**-.605****	**.758****	1.000
	Sig.(2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Creativity Intra-Variable Correlation—Table 4.76. The weakest intra-variable correlation (.228) was between item 53 (finding multiple ways of doing things) and negatively-worded item 95 (NOT imaginative). Relationships between item 95 and the positively-worded items 53 (multiple ways) and 59 (creative activities) were somewhat weak (-.315 and -.412, respectively) but negative, as expected. A moderate to strong correlation (.593 and .804, respectively) was found between items 53 and 59 and the overall creativity score; with a relatively strong negative correlation (-.798) between item 95 and the overall creativity score—also expected. The items were moderately correlated with the DOI total score in the directions anticipated (.511, .572 and -.605, respectively); and the overall creativity score, at .758, was somewhat strongly correlated with the DOI total score.

7. *Innovation* (DOI items 54, 87* and 93). Table 4.77 below presents the intra-variable correlations and DOI totals for innovation.

Table 4.77: Intra-Variable Correlations and Correlations with Totals—DOI Innovation

DOI Items for INNOVATION		54. Recog-nize patterns	87. DIFFI-CULT/ novel ways	93. Finding alter-natives	DOI Innova-tion T Score	DOI Total Score T Score
54. Recognize patterns	Pears. Corr.	1.000				
	Sig.(2-tailed)					
87. DIFFICULT/ novel ways	Pears. Corr.	**-.220****	1.000			
	Sig.(2-tailed)	.000				
93. Finding alternatives	Pears. Corr.	**.441****	**-.531****	1.000		
	Sig.(2-tailed)	.000	.000			
DOI Innovation T Score	Pears. Corr.	**.699****	**-.794****	**.822****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**.444****	**-.496****	**.616****	**.665****	1.000
	Sig.(2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Innovation Intra-Variable Correlation—Table 4.77. The weakest intra-variable correlation (-.220) was between item 54 (recognizing patterns) and negatively-worded item 87 (DIFFICULT to find novel ways of doing things). A moderately weak but positive relationship (.441) existed between items 93 (finding alternatives) and 54 (recognizing patterns). A moderately negative relationship (-.531) was found between items 93 and 87. Moderate to strong positive relationships existed between the overall innovation score and items 54 and 93 (.699 and .822, respectively). Item 87 correlated relatively strongly and negatively (-.794) with the overall innovation score. Moderate relationships were found for the DOI total score and items 54, 93 and the overall innovation score (.444, .616 and .665, respectively). Item 87 correlated negatively (-.496) with the DOI total score.

8. *Carelessness with Facts/Detail*s (DOI items 55, 89* and 97). Table 4.78 below presents the intra-variable correlations and DOI totals for carelessness with facts and details.

Table 4.78: Intra-Variable Correlations and Correlations with Totals—DOI Carelessness with Facts/Details

DOI Items for CARELESSNESS with FACTS/DETAILS		55. NOT collect facts	89. Precise facts	97. Rely on intuition	DOI Careless-ness T Score	DOI Total Score T Score
55. NOT collect facts	Pears. Corr.	1.000				
	Sig.(2-tailed)					
89. Precise facts	Pears. Corr.	**-.327****	1.000			
	Sig.(2-tailed)	.000				
97. Rely on intuition	Pears. Corr.	**.253****	-.063	1.000		
	Sig.(2-tailed)	.000	.282			
DOI Carelessness T Score	Pears. Corr.	**.812****	**-.649****	**.604****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**.278****	**-.254****	**.582****	**.520****	1.000
	Sig.(2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Carelessness with Facts/Details Intra-Variable Correlation—Table 4.78. The weakest intra-variable correlation (.253) was between item 97 (regularly rely on intuition) and item 55 (NOT collect facts). An expected, though relatively weak (-.327) negative relationship was found between item 55 and negatively-worded item 89 (precise facts). Positively-worded items 55 and 97 had relatively strong correlations with the overall carelessness score (.812 and .604, respectively); with a moderate negative correlation (-.649) between item 89 and the overall carelessness score, as anticipated. Item 55 showed a very weak though positive relationship (.278) with the DOI total score. The relationship between item 97 and the DOI total score was positive and somewhat stronger (.582), as was the overall carelessness score and the DOI total score (.520). A weak but negative relationship (-.254) also existed between item 89 and the DOI total score.

9. *Cooperativeness* (DOI items 57, 67 and 82*). Table 4.79 below presents the intra-variable correlations and DOI totals for cooperativeness.

Table 4.79: Intra-Variable Correlations and Correlations with Totals—DOI Cooperativeness

DOI Items for COOPERATIVE-NESS		57. Coope-rative	67. Coope rate	82. NOT coope-ration	DOI Coope-rative-ness T Score	DOI Total Score T Score
57. Cooperative	Pears. Corr.	1.000				
	Sig.(2-tailed)					
67. Cooperate	Pears. Corr.	**.439****	1.000			
	Sig.(2-tailed)	.000				
82. NOT cooperation	Pears. Corr.	**-.379****	**-.354****	1.000		
	Sig.(2-tailed)	.000	.000			
DOI Cooperative ness T Score	Pears. Corr.	**.756****	**.785****	**-.768****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**.176****	.043	**-.155****	**.158****	1.000
	Sig.(2-tailed)	.002	.465	.008	.007	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Cooperativeness Intra-Variable Correlation—Table 4.79. The weakest intra-variable correlations for cooperativeness (-.379 and -.354, respectively) were between positively-worded items 57 (cooperative) and 67 (cooperate) and the negatively-worded item 82 (NOT cooperation). Both coefficients were negative, as anticipated. A relatively weak but positive correlation (.439) was found between items 57 and 67. Relationships between the three items and the overall cooperativeness score were all relatively strong (.756, .785 and -.768, respectively). Coefficients for items 57 and 67 were positive, and the coefficient for item 82 was negative, as expected. Relationships between the three items, overall cooperativeness score, and the DOI total score were very weak; all were in the anticipated direction, however. Wording for these items will be reviewed for future iterations of the DOI.

10. *Impulsivity* (DOI items 60, 70* and 80). Table 4.80 below presents the intra-variable correlations and DOI totals for impulsivity.

Table 4.80: Intra-Variable Correlations and Correlations with Totals—DOI Impulsivity

DOI Items for IMPULSIVITY		60. Sponta-neously	70. LOST w/o plan	80. Decisions impul-sive	DOI Impul-sivity T Score	DOI Total Score T Score
60. Spontaneously	Pears. Corr.	1.000				
	Sig.(2-tailed)					
70. LOST w/o plan	Pears. Corr.	**-.410****	1.000			
	Sig.(2-tailed)	.000				
80. Decisions impulsive	Pears. Corr.	**.508****	**-.213****	1.000		
	Sig.(2-tailed)	.000	.000			
DOI Impulsivity T Score	Pears. Corr.	**.826****	**-.735****	**.731****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**.501****	**-.332****	**.382****	**.527****	1.000
	Sig.(2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Impulsivity Intra-Variable Correlation—Table 4.80. The weakest intra-variable correlation found for this variable (-.213) was between item 80 (decisions impulsive) and the negatively-worded item 70 (LOST without a plan). A relatively weak but negative correlation (-.410) also existed between item 70 and item 60 (spontaneously). The correlation between items 60 and 80 was moderately strong and positive (.508). The correlations between the three items and the overall impulsivity score were relatively strong (.826, -.735 and .731, respectively), and in the directions anticipated. Relationships among the items, overall impulsivity score, and the DOI total score were mixed. Items 60, 80 and the overall impulsivity score correlated moderately and in a positive direction (.501, .382 and .527, respectively). Item 70 had a weak (-.332) but negative relationship with the DOI total score.

11. *Flexibility* (DOI items 60, 70* and 80). Table 4.81 below presents the intra-variable correlations and DOI totals for flexibility.

Table 4.81: Intra-Variable Correlations and Correlations with Totals—DOI Flexibility

DOI Items for FLEXIBILITY		63. To do lists	78. Flexible plans	91. Flexi-bility	DOI Flexi-bility T Score	DOI Total Score T Score
63. To do lists	Pears. Corr.	1.000				
	Sig.(2-tailed)					
78. Flexible plans	Pears. Corr.	**-.124***	1.000			
	Sig.(2-tailed)	.033				
91. Flexibility	Pears. Corr.	-.021	**.471****	1.000		
	Sig.(2-tailed)	.725	.000			
DOI Flexibility T Score	Pears. Corr.	**-.619****	**.733****	**.699****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	-.061	**.540****	**.445****	**.484****	1.000
	Sig.(2-tailed)	.297	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

* Correlation is significant at the 0.05 level (2-tailed). N=295

Flexibility Intra-Variable Correlation—Table 4.81. A very weak intra-variable correlation of -.124 was found for the negatively-worded item 63 (to do list) and item 78 (flexible plans). An expected, though moderate (.471) positive correlation existed between item 78 and item 91 (flexibility). Moderate to strong relationships were found between the three flexibility items and the overall flexibility score—at -.619 for item 63, .733 for item 78, and .699 for item 91. All of these coefficients ran in the positive and negative directions anticipated. The correlation between the negative item 63 and the DOI total score was not significant, indicating that this item will need to be reviewed and possibly reworded in future iterations of the DOI. The remaining correlations were moderate but positive as expected: .540 for item 78, .445 for item 91, and .484 for the overall flexibility score.

12. *Interest in Arts/Aesthetics* (DOI items 48, 64 and 84*). Table 4.82 below presents the intra-variable correlations and DOI totals for interest in arts and aesthetics.

Table 4.82: Intra-Variable Correlations and Correlations with Totals—DOI Interest in Arts/Aesthetics

DOI Items for INTEREST IN ARTS/ AESTHETICS		48. Interest in arts/ aesthetics	64. Appre-ciate art	84. NOT enjoy art	DOI Interest in Arts T Score	DOI Total Score T Score
48. Interest in art	Pears. Corr.	1.000				
	Sig.(2-tailed)					
64. Appreciate art	Pears. Corr.	**.794****	1.000			
	Sig.(2-tailed)	.000				
84. NOT enjoy art	Pears. Corr.	**-.664****	**-.721****	1.000		
	Sig.(2-tailed)	.000	.000			
DOI Interest in Arts/Aesthetics T Score	Pears. Corr.	**.896****	**.920****	**-.895****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**.512****	**.406****	**-.371****	**.472****	1.000
	Sig.(2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Interest in Arts/Aesthetics Intra-Variable Correlation—Table 4.82. The intra-variable correlations for the interest in arts/aesthetics variable were relatively strong to very strong. Item 48 (interest in art) correlated with item 64 (appreciate art) both strongly and positively, at .794. The correlations for both items 48 and 64 with the negatively-worded item 84 (NOT enjoy art) were negative, as expected, and relatively strong at -.664 and -.721, respectively). The three-item correlations with the overall interest in arts/aesthetics score were even stronger (.896, .920 and -.895, respectively). The positive and negative directions for all of these coefficients were as anticipated. The relationships between the three items and overall interest in arts/aesthetics score and the DOI total score were considerably weaker (.512 for item 48, .406 for item 64, -.371 for negative item 84, and .472 for the overall score). Again, all were in the anticipated direction.

13. *Music* DOI items 47*, 61 and 68). Table 4.83 below presents the intra-variable correlations and DOI totals for music.

Table 4.83: Intra-Variable Correlations and Correlations with Totals—DOI Music

DOI Items for MUSIC		47. NOT musical	61. Listen to music	68. Enjoy music	DOI Music T Score	DOI Total Score T Score
47. NOT musical	Pears. Corr.	1.000				
	Sig.(2-tailed)					
61. Listen to music	Pears. Corr.	**-.163****	1.000			
	Sig.(2-tailed)	.005				
68. Enjoy music	Pears. Corr.	**-.364****	**.514****	1.000		
	Sig.(2-tailed)	.000	.000			
DOI Music T Score	Pears. Corr.	**-.747****	**.730****	**.758****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**-.192****	**.354****	**.213****	**.343****	1.000
	Sig.(2-tailed)	.001	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Music Intra-Variable Correlation—Table 4.83. The weakest intra-variable correlation for this variable was -.163 for the negatively-worded item 47 (NOT musical) and item 61 (listen to music). The relatively weak correlation of .364 between item 68 (enjoy music) and item 47 (NOT musical) showed a negative relationship, as expected. The correlations between the positively-worded items 61 and 68 were moderate at .514, but positive, as anticipated. The three music variable items showed relatively strong correlations with the overall music score, at -.747 for item 47, .730 for item 61, and .758 for item 68. Again, all of these coefficients ran in the directions anticipated. Relationships of the three items and the overall music score with the DOI total score were very weak, at -.192 for negative item 47, and .354 and .213, respectively, for positively-worded items 61 and 68. The overall music score, at .343, also showed a relatively weak, though positive, correlation with the overall DOI score.

14. *Adventure-Seeking* (DOI items 69, 71* and 76). Table 4.84 below presents the intra-variable correlations and DOI totals for adventure-seeking.

Table 4.84: Intra-Variable Correlations and Correlations with Totals—DOI Adventure-Seeking

DOI Items for ADVENTURE-SEEKING		69. Take risks	71. NOT seek ad-ventures	76. Enjoy unknown	DOI Adventure-seeking T Score	DOI Total Score T Score
69. Take risks	Pears. Corr.	1.000				
	Sig.(2-tailed)					
71. NOT seek adventures	Pears. Corr.	**-.364****	1.000			
	Sig.(2-tailed)	.000				
76. Enjoy unknown	Pears. Corr.	**.488****	**-.451****	1.000		
	Sig.(2-tailed)	.000	.000			
DOI Adventure-seeking T Score	Pears. Corr.	**.800****	**-.779****	**.785****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**.481****	**-.459****	**.617****	**.649****	1.000
	Sig.(2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Adventure-Seeking Intra-Variable Correlation—Table 4.84. The weakest intra-variable correlation for this variable was -.364 between item 69 (take risks) and the negatively-worded item 71 (NOT seek adventures). The coefficient was negative, as anticipated. The correlation of item 69 with the other positively-worded item, 76 (enjoy unknown) was also negative but moderate, at -.451. Items 69 and 76 had a moderately weak but positive correlation: .488. Relationships of the three adventure-seeking items to the overall adventure-seeking score were all relatively strong: .800 for item 69, -.779 for item 71, and .785 for item 76. All of the coefficients ran in the anticipated directions. Correlations of the three items and overall adventure-seeking score were mid-range: .481 for item 69, -.459 for item 71, .617 for item 76, and .649 for the overall adventure-seeking score. The directions of these relationships were as anticipated.

15. *Unconventionality* (DOI items 49*, 72 and 75). Table 4.85 below presents the intra-variable correlations and DOI totals for unconventionality.

Table 4.85: Intra-Variable Correlations and Correlations with Totals—DOI Unconventionality

DOI Items for UNCONVEN-TIONALITY		49. NOT stand out	72. Uncon-ventional	75. Comfort-able/ different	DOI Unconven-tionality T Score	DOI Total Score T Score
49. NOT stand out	Pears. Corr.	1.000				
	Sig.(2-tailed)					
72. Unconventional	Pears. Corr.	-.096	1.000			
	Sig.(2-tailed)	.100				
75. Comfortable being different	Pears. Corr.	**-.144***	**.440****	1.000		
	Sig.(2-tailed)	.013	.000			
DOI Unconventionality T Score	Pears. Corr.	**-.647****	**.739****	**.692****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**-.209****	**.427****	**.454****	**.510****	1.000
	Sig.(2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

* Correlation is significant at the 0.05 level (2-tailed). N=295

Unconventionality Intra-Variable Correlation—Table 4.85. The weakest significant intra-variable correlation for this variable (-.144) was between negatively-worded item 49 (NOT stand out) and item 75 (comfortable being different). The only other significant intra-variable relationship was a moderate .440 between positively-worded items 75 and 72 (unconventional). All three items had a relatively strong relationship with the overall unconventionality score: -.647 for item 49; .739 for item 72; .692 for item 75. These coefficients also ran in the anticipated directions. Correlations between the items and DOI total score were mixed, with a weak -.209 for the negatively-worded item 49; .427 for item 72; .454 for item 75. Correlation between the overall unconventional score and DOI total score was a moderate but positive, .510.

Ability to Visualize (DOI items 46, 66* and 77). Table 4.86 below presents the intra-variable correlations and DOI totals for ability to visualize.

Table 4.86: Intra-Variable Correlations and Correlations with Totals—DOI Ability to Visualize

DOI Items for ABILITY TO VISUALIZE		46. Novel uses	66. DIFFI-CULT to visu-alize	77. Visua-lize solutions	DOI Ability to visua-lize T Score	DOI Total Score T Score
46. Novel uses	Pears. Corr.	1.000				
	Sig.(2-tailed)					
66. DIFFICULT to visualize	Pears. Corr.	**-.229****	1.000			
	Sig.(2-tailed)	.000				
77. Visualize solutions	Pears. Corr.	**.578****	**-.385****	1.000		
	Sig.(2-tailed)	.000	.000			
DOI Ability to Visualize T Score	Pears. Corr.	**.736****	**-.754****	**.822****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**.602****	**-.386****	**.660****	**.695****	1.000
	Sig.(2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Ability to Visualize Intra-Variable Correlation—Table 4.86. The weakest intra-variable correlation for the ability to visualize variable was -.229, between item 46 (novel uses) and the negatively-worded item 66 (DIFFICULT to visualize). Positively-worded item 77 (visualize solutions) is also negatively, though moderately, correlated with item 66, at -.385. The overall ability to visualize score shows strong relationships, in the anticipated directions, with each of the three items for this variable: .736 for item 46, -.754 for negative item 66, and .822 for item 77. Item 66 shows a relatively weak negative relationship (-.386) with the DOI total score. The remaining two items, 46 and 66, show much stronger relationships with the DOI total score, at .602 and .660, respectively. The correlation between the overall ability to visualize score and the DOI total score is a relatively strong positive .695.

16. *Imagery* (DOI items 79*, 81 and 83). Table 4.87 below presents the intra-variable correlations and DOI totals for imagery.

Table 4.87: Intra-Variable Correlations and Correlations with Totals—DOI Imagery

DOI Items for IMAGERY		79. NOT good at symbols	81. Insights/ mental images	83. Meta-phors	DOI Imagery T Score	DOI Total Score T Score
79. NOT good at symbols	Pears. Corr.	1.000				
	Sig.(2-tailed)					
81. Insights/mental images	Pears. Corr.	-.020	1.000			
	Sig.(2-tailed)	.736				
83. Metaphors	Pears. Corr.	**-.327****	**.123***	1.000		
	Sig.(2-tailed)	.000	.035			
DOI Imagery T Score	Pears. Corr.	**-.667****	**.612****	**.703****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**-.418****	**.287****	**.531****	**.617****	1.000
	Sig.(2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

* Correlation is significant at the 0.05 level (2-tailed). N=295

Imagery Intra-Variable Correlation—Table 4.87. A very weak but still significant intra-variable correlation (.123) was found between items 81 (insights and mental images) and item 83 (metaphors). A weak, but anticipated, negative relationship (-.327) existed between item 83 and negatively-worded item 79 (NOT good at symbols). The correlations of the three items with the overall imagery score were moderately strong and in the anticipated directions: -.667 for item79; .612 for item 81; .703 for item 83. The correlations between the DOI total score and the three items was mixed, though coefficients ran in the directions expected. The negatively-worded item79 showed a moderate but negative -.418 correlation with the DOI total score; item 81 had a very weak .287 correlation; and item 83 was in the moderate range at .531. The correlation between the DOI total score and the overall imagery score was .617.

17. *Emotion*s (DOI items 62*, 88 and 94). Table 4.88 below presents the intra-variable correlations and DOI totals for emotions.

Table 4.88: Intra-Variable Correlations and Correlations with Totals—DOI Emotions

DOI Items for EMOTIONS		62. NOT connect/ emotion	88. Emotion-ally involved	94. Compel-ling ideas	DOI Emo-tions T Score	DOI Total Score T Score
62. NOT connect-ed/emotion	Pears. Corr.	1.000				
	Sig.(2-tailed)					
88. Emotionally involved	Pears. Corr.	**-.432****	1.000			
	Sig.(2-tailed)	.000				
94. Compelling ideas	Pears. Corr.	**-.338****	**.546****	1.000		
	Sig.(2-tailed)	.000	.000			
DOI Emotions T Score	Pears. Corr.	**-.769****	**.825****	**.777****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**-.253****	**.237****	**.462****	**.397****	1.000
	Sig.(2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Emotions Intra-Variable Correlation—Table 4.88. The weakest intra-variable correlation for this variable was a relatively weak -.338 between the negatively-worded item 62 (NOT connect with emotions) and item 94 (compelling ideas). The negative correlation between item 62 and the other positively-worded item (88, emotionally involved), was a slightly stronger -.423. A moderate positive correlation (.546) existed between items 88 and 94. The three items correlated at a much stronger level with the overall emotions score: -.769 for item 62; .825 for item 88; .777 for item 94. All of these coefficients ran in the anticipated directions. Two of the items correlated very weakly with the DOI total score: -.253 for item 62; .237 for item 88. Item 94 correlated at a moderate .462 with the DOI total score. The correlation between the overall emotion score and the DOI total score was slightly weaker, but still positive, at .397.

18. *Time of Day* (DOI items 58, 74 and 90*). Table 4.89 below presents the intra-variable correlations and DOI totals for time of day.

Table 4.89: Intra-Variable Correlations and Correlations with Totals—DOI Time of Day

DOI Items for TIME OF DAY		58. Less receptive	74. More intuitive times	90. NOT more productive	DOI Time of Day T Score	DOI Total Score T Score
58. Less receptive	Pears. Corr.	1.000				
	Sig.(2-tailed)					
74. More intuitive times	Pears. Corr.	**.736****	1.000			
	Sig.(2-tailed)	.000				
90. NOT more productive	Pears. Corr.	**-.209****	**-.231****	1.000		
	Sig.(2-tailed)	.000	.000			
DOI Time of Day T Score	Pears. Corr.	**.843****	**.853****	**-.617****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	.111	**.227****	-.051	**.169****	1.000
	Sig.(2-tailed)	.057	.000	.381	.004	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Time of Day Intra-Variable Correlation—Table 4.89. The weakest intra-variable correlations for the time of day variable were a -.209 between items 58 (less receptive) and the negatively-worded item 90 (NOT more productive); and a -.231 for item 74 (more intuitive times) and item 90. The overall time of day score correlated very strongly and positively, as anticipated, with items 58 (.843) and 74 (.853). The overall score also correlated relatively strongly but negatively with item 90, at -.617. The DOI total score correlations across the three items and the overall time of day score were relatively weak, which was unexpected. The only significant correlations were still quite weak: .227 for item 74; and .169 for item 90. Based on these outcomes, this situational item should be reviewed for meaningfulness, and either reworded for clarity or omitted from the next iteration of the DOI instrument.

19. *Amount of Information Available* (DOI items 86, 96 and 99*). Table 4.90 below presents the intra-variable correlations and DOI totals for amount of information available.

Table 4.90: Intra-Variable Correlations and Correlations with Totals—DOI Amount of Information Available

DOI Items for AMOUNT OF INFO AVAILABLE		86. Know w/o knowing	96. Good decisions	99. MORE info	DOI Amount of Info T Score	DOI Total Score T Score
86. Know w/o knowing	Pears. Corr.	1.000				
	Sig.(2-tailed)					
96. Good decisions	Pears. Corr.	**.259****	1.000			
	Sig.(2-tailed)	.000				
99. MORE info	Pears. Corr.	**-.158****	**-.269****	1.000		
	Sig.(2-tailed)	.007	.000			
DOI Amt of Info Available T Score	Pears. Corr.	**.688****	**.681****	**-.716****	1.000	
	Sig.(2-tailed)	.000	.000	.000		
DOI Total Score T Score	Pears. Corr.	**.513****	**.499****	**-.319****	**.629****	1.000
	Sig.(2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). N=295

Amount of Information Available Intra-Variable Correlation—Table 4.90. The weakest significant intra-variable correlation for this variable was -.158, between item 86 (know without knowing how) and negatively-worded item 99 (need MORE info). Item 99 correlates with the other positive item, 96 (make good decisions rapidly) at a very weak -.269. The relationship coefficient between the two positive items, 86 and 96 (make good decisions rapidly) are positive but also very weak, at .259. Correlations between the three items and the overall amount of information score are considerably stronger: .688 for item 86; .681 for item 96; -.716 for item 99. The relationships between the three items and overall amount of information score are weak to moderate: .513 for item 86; .499 for item 96; -.319 for item 99; and .629 for the overall score.

DOI Inter-Item Correlations

This section presents the inter-item correlation analyses conducted for:

1. the overall DOI Total Score T Score;
2. academic aptitude/preference (DOI items 6 and 7a-7e);
3. DOI items 46-99 (3-item sets for social/acquired and situational variables);
4. introversion/extraversion (HBDI® item 100); and
5. three of the five biological variables: handedness, sex and age.

The inter-item analyses included items from the DOI and HBDI® related to the 20 social/acquired and situational variables, as well as three of five biological variables identified by Shirley and Langan-Fox (1996). *Ethnicity* is omitted from the inter-item analyses because it is a nominal, not ordinal, variable. As an HBDI® outcome score, the fifth biological variable, *brain hemispheres*, will be covered in the analyses conducted for Research Hypotheses 2 and 3. Outcomes for brain hemispheres by DOI item will be presented and discussed in the *Research Purposes and Hypotheses* section later in this chapter.

Due to the size and complexity of the inter-item matrix, the correlation data was divided by variable for presentation as Tables 4.91-4.101 below. Unless indicated otherwise, N=295 for items within these tables. Blank cells were omitted from the matrix for brevity and simplification. Correlations at the 0.01 and 0.05 levels for all tables are indicated in bold throughout to make them easier to identify. Asterisks in subheadings and tables below indicate negatively-worded DOI items for each set of three items comprising the given variable. Significant correlations extracted from tables in this section are arranged from highest negative to highest positive for each DOI item (Appendix Z).

Relative to the direction of correlations described in the discussions below:

1. Negatively-worded item + Negatively-worded item = Positive correlation;
2. Negatively-worded item + Positively-worded item = Negative correlation;
3. Positively-worded item + Negatively-worded item = Negative correlation;
4. Positively-worded item + Positively-worded item = Positive correlation.

DOI Total Score T Score, Academic Aptitude/Preference (DOI items 6, 7c, 7b, 7d, 7a and 7e). Table 4.91 below presents the inter-item correlations for these DOI items.

Table 4.91: Inter-Item Correlations—DOI Total Score T Score; and Academic Aptitude/Preference (DOI Items 6 and 7c, 7b, 7d, 7e, 7a)

INTER-ITEM CORRELATION MATRIX			ACADEMIC APTITUDE/PREFERENCE					
		DOI Total Score T Score	6. Acad Apt	7c. Subj/ Math	7b. Subj/ Hist SocStu	7d. Subj/ Sci	7e. Subj/ For Lang	7a. Subj/ Eng
DOI Total Score T Score	Pear Corr	1.000						
6.Academic Aptitude	Pear Corr	**.306****	1.000					
7c.Subj/Math	Pear Corr	**.298****	**.655****	1.000				
7b.Subj/HistSocStu	Pear Corr	-.108	**-.345****	**-.441****	1.000			
7d.Subj/Science	Pear Corr	-.017	**.145***	.071	**-.414****	1.000		
7e.Subj/For Lang	Pear Corr	.004	-.083	**-.293****	**-.193****	**-.265****	1.000	
7a.Subj/English	Pear Corr	**-.210****	**-.440****	**-.441****	.110	**-.380****	**-.248****	1.000
51.NOT step-by-step	Pear Corr	**.349****	.003	.001	.055	**-.114***	-.001	.059
65.Analyze things	Pear Corr	-.018	-.092	-.035	.092	-.098	.051	-.009
73.Consider facts	Pear Corr	**-.194****	-.112	-.049	.049	-.052	.011	.045
50.Sudden ideas	Pear Corr	**.500****	.057	.098	-.021	-.088	.059	-.060
56.Rely on intuition	Pear Corr	**.511****	**.120***	.100	-.061	.004	.023	-.078
92.NOT confident	Pear Corr	**-.449****	-.008	.038	.037	-.028	-.018	-.033
52.Trace insights	Pear Corr	**.299****	.079	**.119***	-.054	-.013	.036	-.102
85.Act on instinct	Pear Corr	**.385****	.048	.030	-.024	-.045	.103	-.070
98.PRIOR experience	Pear Corr	-.028	.010	.011	.012	-.005	.035	-.055
53.Multiple ways	Pear Corr	**.500****	-.038	-.025	.026	-.067	.025	.041
59.Creative activities	Pear Corr	**.581****	**.221****	**.280****	-.036	-.074	-.098	-.101
95.NOT imaginative	Pear Corr	**-.606****	**-.171****	**-.200****	.021	.090	.063	.047
54.Recognize patterns	Pear Corr	**.440****	.029	.063	.029	-.025	-.076	.005
87.DIFF'CLT/novel ways	Pear Corr	**-.485****	-.027	-.031	-.033	**.115***	-.003	-.042
93.Finding alternatives	Pear Corr	**.602****	-.031	-.001	-.022	-.093	.034	.079
55.NOT collect facts	Pear Corr	**.279****	.058	.036	-.055	.052	.029	-.066
89.Precise facts	Pear Corr	**-.259****	**-.150****	**-.174****	.098	-.070	**.117***	.045
97.Rely on intuition	Pear Corr	**.580****	.036	.018	.015	-.021	.082	-.098
57.Cooperative	Pear Corr	**.180****	**.176****	.091	-.049	.070	.016	**-.136***
67.Cooperate	Pear Corr	.043	.112	.050	.006	-.007	.000	-.054
82.NOT cooperation	Pear Corr	-.165**	-.137*	-.122*	-.010	-.033	.031	.144*
60.Spontaneously	Pear Corr	.490**	.072	.061	-.102	-.076	.055	.049
70.LOST w/o plan	Pear Corr	**-.325****	.019	.001	.096	-.056	.004	-.044

Table 4.91 *(continued)*

INTER-ITEM CORRELATION MATRIX		DOI Total Score T Score	ACADEMIC APTITUDE/PREFERENCE 6. Acad Apt	7c. Subj/ Math	7b. Subj/ Hist SocStu	7d. Subj/ Sci	7e. Subj/ For Lang	7a. Subj/ Eng
80.Decisions impulsive	Pear Corr	**.374****	.075	.022	**-.116***	-.003	.105	-.016
63.To do lists	Pear Corr	-.062	.092	.025	.114	-.092	-.017	-.031
78.Flexible plans	Pear Corr	**.526****	.062	-.001	-.028	.037	-.015	.008
91.Flexibility	Pear Corr	**.437****	**.151****	.051	-.043	.045	-.001	-.059
48.Interest in arts/aesth	Pear Corr	**.526****	**.256****	**.258****	-.083	.013	-.001	**-.214****
64.Appreciate art	Pear Corr	**.417****	**.200****	**.179****	-.035	-.013	.034	**-.184****
84.NOT enjoy art	Pear Corr	**-.384****	**-.166****	**-.197****	.007	.013	.051	**.144***
47.NOT musical	Pear Corr	**-.203****	-.036	**-.114***	-.047	.030	.072	.068
61.Listen to music	Pear Corr	**.367****	**.172****	**.230****	-.041	.004	-.094	**-.122***
68.Enjoy music	Pear Corr	**.228****	**.134***	**.205****	.046	.013	**-.169****	-.110
69.Take risks	Pear Corr	**.478****	-.014	.001	.065	**-.118***	.082	-.033
71.NOT seek adventures	Pear Corr	**-.459****	**-.123***	**-.155****	.050	.098	-.002	.028
76.Enjoy unknown	Pear Corr	**.614****	**.137***	**.138***	.023	**-.195****	.057	-.041
49.NOT stand out	Pear Corr	**-.210****	-.057	**-.119***	.069	-.034	**.130***	-.034
72.Unconventional	Pear Corr	**.420****	-.043	.016	.016	**-.166****	.065	.062
75.Comfortable/different	Pear Corr	**.451****	.037	.021	.051	-.066	.047	-.056
46.Novel uses	Pear Corr	**.601****	.055	.086	-.055	-.105	**.121***	-.062
66.DIFFICULT/visualize	Pear Corr	**-.367****	.020	.055	-.058	.095	.012	-.110
77.Visualize solutions	Pear Corr	**.654****	.030	.077	.011	**-.135***	.031	.005
79.NOT good/symbols	Pear Corr	**-.417****	**-.121***	**-.132***	.056	.078	-.015	.030
81.Insights/ment. images	Pear Corr	**.282****	.046	-.032	-.002	.077	.026	-.066
83.Metaphors	Pear Corr	**.540****	**.195****	**.230****	-.087	.012	-.049	**-.130***
62.NOT connect/emotions	Pear Corr	**-.260****	**-.152****	**-.143***	.061	-.061	.045	.112
88.Emot'ly involved	Pear Corr	**.242****	**.169****	.100	-.070	.046	.052	**-.140***
94.Compelling ideas	Pear Corr	**.464****	**.258****	**.151****	-.101	.015	.090	**-.173****
58.LESS receptive	Pear Corr	.112	.014	-.004	.057	.000	.001	-.052
74.More intuitive times	Pear Corr	**.235****	.098	.100	.052	.015	-.051	**-.123***
90.Not more productive	Pear Corr	-.059	-.038	-.081	-.002	-.007	.052	.044
86.Know w/o knowing	Pear Corr	**.522****	.079	**.117***	-.022	.017	.024	**-.149***
96.Decisions	Pear Corr	**.495****	-.051	-.056	-.022	.038	.102	-.057
99.MORE info	Pear Corr	**-.315****	**-.122***	-.038	.087	-.113	-.012	.080
HBDI® 100 Introv/Extrav	Pear Corr	**.224****	**.182****	.043	-.054	.034	-.063	.034
HBDI® 5 Handedness	Pear Corr	.061	.015	.000	-.071	.060	.058	-.048
HBDI® 6 Hand Lft/Right	Pear Corr	.055	.026	.048	-.025	.066	.041	**-.135***
HBDI® 6 Hand R-Domin	Pear Corr	.023	.062	.059	-.118	**.124***	.082	**-.155***
Sex	Pear Corr	.038	.105	**.126***	-.027	.091	-.003	**-.200****
Age	Pear Corr	**.176****	.101	.026	-.028	-.080	**.222****	**-.149***

** Correlation is significant at the 0.01 level (2-tailed) for all tables in this section.

* Correlation is significant at the 0.05 level (2-tailed) for all tables in this section.

Pear Corr=Pearson's Correlation (for all tables in this section).

DOI Total Score T Score, Academic Aptitude/Preference (DOI items 6, 7c, 7b, 7d, 7a, and *7e)—Table 4.91*. Correlation outcomes for the variables presented in the table above are discussed below.

- *DOI Total Score T Score.* Negative correlations for the DOI Total Score T Score, in descending order from strongest to weakest, were with items:

  - 95. NOT imaginative (-.606)
  - 87. DIFFICULT/novel ways (-.485)
  - 71. NOT seek adventures (-.459)
  - 92. NOT confident.(-.449)
  - 79. NOT good/symbols (-.417)
  - 84. NOT enjoy art (-.384)
  - 66. DIFFICULT/visualize (-.367)
  - 70. LOST w/o plan (-.325)
  - 99. MORE info (-.315)
  - 62. NOT connect/emotions (-.260)
  - 89. Precise facts (-.259)
  - 7a. Subject/English (-.210)
  - 49. NOT stand out (-.210)
  - 47. NOT musical (-.203)
  - 73. Consider facts (-.194)
  - 82. NOT cooperation (-.165)

  Among these 16 items, all except DOI item 7a English were negatively worded; so their negative direction of the correlations was as expected.

  Positive correlations for the DOI total score, in ascending order from weakest to strongest, were with the following items:

  - Age (.176)
  - 57. Cooperative (.180)
  - HBDI® 100 Introversion/Extraversion (.224)
  - 68. Enjoy music (.228)
  - 74. More intuitive times (.235)
  - 88. Emotionally involved (.242)
  - 55. NOT collect facts (.279)
  - 81. Insights/mental images (.282)
  - 7c. Subject/Math (.298)
  - 52. Trace insights (.299)

- 6. Academic Aptitude (.306)
- 51. NOT step-by-step (.349)
- 61. Listen to music (.367)
- 80. Decisions impulsive (.374)
- 85. Act on instinct (.385)
- 64. Appreciate art (.417)
- 72. Unconventional (.420)
- 91. Flexibility (.437)
- 54. Recognize patterns (.440)
- 75. Comfortable/different (.451)
- 94. Compelling ideas (.464)
- 69. Take risks (.478)
- 60. Spontaneously (.490)
- 96. Decisions (.495)
- 50. Sudden ideas (.500)
- 53. Multiple ways (.500)
- 56. Rely on intuition (.511)
- 86. Know w/o knowing (.522)
- 48. Interest in arts/aesthetics (.526)
- 78. Flexible plans (.526)
- 83. Metaphors (.540)
- 97. Rely on intuition (.580)
- 59. Creative activities (.581)
- 46. Novel uses (.601)
- 93. Finding alternatives (.602)
- 76. Enjoy unknown (.614)
- 77. Visualize solutions (.654)

Among these 37 items, 33 were positively-worded items related to social/acquired and situational variables, so their positive correlations with the DOI total score were as anticipated. The four remaining items—age, from the biological cluster; introversion/extraversion, a social/acquired variable measured by the HBDI®; math (DOI item 7c), and academic aptitude (DOI item 6, related to the academic aptitude/preference variable)—were positively but not strongly correlated with the overall DOI total score.

- *Academic Aptitude (DOI item 6).* Negative correlations for this item, in descending order from strongest to weakest, were with items:

- 7a. Subject/English (-.440)
- 7b. Subject/History-Social Studies (-.345)
- 95. NOT imaginative (-.171)
- 84. NOT enjoy art (-.166)
- 62. NOT connect/emotions (-.152)
- 89. Precise facts (-.150)
- 82. NOT cooperation (-.137)
- 71. NOT seek adventures (-.123)
- 99. MORE info (-.122)
- 79. NOT good/symbols (-.121)

Items 7a. English and 7b. history-social studies were moderately but negatively related to academic aptitude. The remaining 8 of these 10 items were negatively worded and weakly, but negatively, correlated with academic aptitude, as expected. Positive correlations for academic aptitude, in ascending order from weakest to strongest, were with the following items:

- 56. Rely on intuition (.120)
- 68. Enjoy music (.134)
- 76. Enjoy unknown (.137)
- 7d. Subject/Science (.145)
- 91. Flexibility (.151)
- 88. Emotionally involved (.169)
- 61. Listen to music (.172)
- 57. Cooperative (.176)
- HBDI® 100 Introversion/Extraversion (.182)
- 83. Metaphors (.195)
- 64. Appreciate art (.200)
- 59. Creative activities (.221)
- 48. Interest in arts/aesthetics (.256)
- 94. Compelling ideas (.258)
- 7c. Subject/Math (.655)

All of these 15 items are very weakly correlated with academic aptitude, except math (DOI item 7c), which had a relatively strong correlation of .655. Thirteen of the items were positively worded, so their positive correlations with academic aptitude were as expected.

- *Academic Preference (DOI items 7a-e—English, History-Social Studies, Math, Science, and Foreign Language).* Items 7a-7e were ordered from left- to right-most, relative to brain dominance. Negative correlations for these items, combined below in descending order from strongest to weakest, were:
  - *Math*—7a. Subject/English (-.441)
  - *Math*—7b. Subject/History-Social Studies (-.441)
  - *History-Social Studies*—7d. Subject/Science (-.414)
  - *Science*—7a. Subject/English (-.380)
  - *Math*—7e. Subject/Foreign Language (-.293)
  - *Science*—7e. Subject/Foreign Language (-.265)
  - *Foreign Language*—7a. Subject/English (-.248)
  - *English*—48. Interest in arts/aesthetics (-.214)
  - *Math*—95. NOT imaginative (-.200)
  - *English*—Sex (-.200)
  - *Math*—84. NOT enjoy art (-.197)
  - *Science*—76. Enjoy unknown (-.195)
  - *History-Social Studies*—7e. Subject/Foreign Language (-.193)
  - *English*—64. Appreciate art (-.184)
  - *Math*—89. Precise facts (-.174)
  - *English*—94. Compelling ideas (-.173)
  - *Foreign Language*—68. Enjoy music (-.169)
  - *Science*—72. Unconventional (-.166)
  - *Math*—71. NOT seek adventures (-.155)
  - *English*—HBDI® 6. Handedness Right Dominance (-.155)
  - *English*—86. Know w/o knowing (-.149)
  - *English*—Age (-.149)
  - *Math*—62. NOT connect/emotions (-.143)
  - *English*—88. Emotionally involved (-.140)
  - *English*—57. Cooperative (-.136)
  - *Science*—77. Visualize solutions (-.135)
  - *English*—HBDI® 6. Handedness Left/Right (-.135)
  - *Math*—79. NOT good/symbols (-.132)
  - *English*—83. Metaphors (-.130)
  - *English*—74. More intuitive times (-.123)
  - *Math*—82. NOT cooperation (-.122)
  - *English*—61. Listen to music (-.122)
  - *Math*—49. NOT stand out (-.119)
  - *Science*—69. Take risks (-.118)
  - *History-Social Studies*—80. Decisions impulsive (-.116)
  - *Math*—47. NOT musical (-.114)
  - *Science*—51. NOT step-by-step (-.114)

Eight of the 37 negative correlations above, including the seven strongest (-441 to -.248), were for subjects represented in DOI items 7a-e. Correlations for sex (-.200), age (-.149), handedness/right dominance (-.155) and left/right dominance (-.135) were all extremely weak. The remaining 16 negative correlations were for the following positively-worded DOI items:

- *English*—48. Interest in arts/aesthetics (-.214)
- *Science*—76. Enjoy unknown (-.195)
- *English*—64. Appreciate art (-.184)
- *English*—94. Compelling ideas (-.173)
- *Foreign Language*—68. Enjoy music (-.169)
- *Science*—72. Unconventional (-.166)
- *English*—86. Know w/o knowing (-.149)
- *English*—88. Emotionally involved (-.140)
- *English*—57. Cooperative (-.136)
- *Science*—77. Visualize solutions (-.135)
- *English*—83. Metaphors (-.130)
- *English*—74. More intuitive times (-.123)
- *English*—61. Listen to music (-.122)
- *Science*—69. Take risks (-.118)
- *History-Social Studies*—80. Decisions impulsive (-.116)
- *Science*—51. NOT step-by-step (-.114)

While these correlations were *not* positive, as expected, all were extremely weak (-.200 to -.114). Negatively-worded item 51 is inversely related to intuition, so these correlations should be viewed in reverse. The nine remaining negative correlations with DOI items 7a-e, also very weak (-.200 to –l14) and all related to math (DOI item 7c), included the following items:

- *Math*—95. NOT imaginative (-.200)
- *Math*—84. NOT enjoy art (-.197)
- *Math*—89. Precise facts (-.174)
- *Math*—71. NOT seek adventures (-.155)
- *Math*—62. NOT connect/emotions (-.143)
- *Math*—79. NOT good/symbols (-.132)
- *Math*—82. NOT cooperation (-.122)
- *Math*—49. NOT stand out (-.119)
- *Math*—47. NOT musical (-.114)

Positive correlations for academic preference items DOI 7a-e, combined, are presented below in descending order from the strongest to the weakest:

- *Science*—87. DIFFICULT/novel ways (.115)
- *Math*—86. Know w/o knowing (.117)
- *Foreign Language*—89. Precise facts (.117)
- *Math*—52. Trace insights (.119)
- *Foreign Language*—46. Novel uses (.121)
- *Science*—HBDI® 6 Handedness Right-Dominance (.124)
- *Math*—Sex (.126)
- *Foreign Language*—49. NOT stand out (.130)
- *Math*—76. Enjoy unknown (.138)
- *English*—82. NOT cooperation (.144)
- *English*—84. NOT enjoy art (.144)
- *Math*—94. Compelling ideas (.151)
- *Math*—64. Appreciate art (.179)
- *Math*—68. Enjoy music (.205)
- *Foreign Language*—Age (.222)
- *Math*—83. Metaphors (.230)
- *Math*—61. Listen to music (.230)
- *Math*—48. Interest in arts/aesthetics (.258)
- *Math*—59. Creative activities (.280)

All 19 of these positive correlations were extremely weak (.115 to .280). Three were for handedness/right dominance (.124), sex (.126) and age (.222). An additional 11 correlations were also very weak (.117 to .258). All but one were related to item 7c (math) and positively-worded items:

- *Math*—86. Know w/o knowing (.117)
- *Math*—52. Trace insights (.119)
- *Foreign Language*—46. Novel uses (.121)
- *Math*—76. Enjoy unknown (.138)
- *Math*—94. Compelling ideas (.151)
- *Math*—64. Appreciate art (.179)
- *Math*—68. Enjoy music (.205)
- *Math*—83. Metaphors (.230)
- *Math*—61. Listen to music (.230)
- *Math*—48. Interest in arts/aesthetics (.258)
- *Math*—59. Creative activities (.280)

The remaining five positive correlations, also extremely weak (.115 to .144) were for following negatively-worded DOI items:

- *Science*—87. DIFFICULT/novel ways (.115)
- *Foreign Language*—89. Precise facts (.117)
- *Foreign Language*—49. NOT stand out (.130)
- *English*—82. NOT cooperation (.144)
- *English*—84. NOT enjoy art (.144)

Cognitive Style/Analytic (DOI items 51, 65, 73) and Cognitive Style/Intuitive (DOI items 50, 56, 92*).* Table 4.92 below presents the inter-item correlations for these two variables.

Table 4.92: Inter-Item Correlations—Cognitive Style/Analytic (DOI Items 51*, 65, 73); and Cognitive Style/Intuitive (DOI Items 50, 56, 92*)

INTER-ITEM CORRELATION MATRIX		COG. STYLE/ANALYTIC			COG. STYLE/INTUITIVE		
		51.* NOT step-by-step	65. Ana-lyze things	73. Con-sider facts	50. Sudden ideas	56. Rely on intuition	92.* NOT confi-dent
51.NOT step-by-step	Pear Corr	1.000					
65.Analyze things	Pear Corr	**-.158****	1.000				
73.Consider facts	Pear Corr	**-.297****	**.640****	1.000			
50.Sudden ideas	Pear Corr	**.253****	-.036	**-.120***	1.000		
56.Rely on intuition	Pear Corr	**.276****	-.056	**-.161****	**.360****	1.000	
92.NOT confident	Pear Corr	**-.242****	**.219****	**.341****	**-.130***	**-.276****	1.000
52.Trace insights	Pear Corr	.087	**.150***	.076	**.129***	**.205****	.029
85.Act on instinct	Pear Corr	**.273****	**-.276****	**-.313****	**.303****	**.378****	**-.206****
98.PRIOR experience	Pear Corr	-.067	**.367****	**.412****	-.054	.019	**.236****
53.Multiple ways	Pear Corr	**.217****	**.234****	**.153****	**.329****	**.236****	**-.197****
59.Creative activities	Pear Corr	**.203****	-.019	-.077	**.305****	**.267****	-.059
95.NOT imaginative	Pear Corr	**-.228****	.063	**.177****	**-.305****	**-.190****	**.392****
54.Recognize patterns	Pear Corr	**.164****	**.235****	**.198****	**.316****	**.224****	-.070
87.Difficult/novel ways	Pear Corr	**-.218****	.080	.110	**-.171****	-.075	**.355****
93.Finding alternatives	Pear Corr	**.278****	.093	.003	**.290****	**.249****	**-.258****
55.NOT collect facts	Pear Corr	**.400****	**-.256****	**-.402****	**.219****	**.399****	**-.163****
89.Precise facts	Pear Corr	**-.262****	**.573****	**.656****	-.100	**-.183****	**.302****
97.Rely on intuition	Pear Corr	**.153****	.019	-.108	**.277****	**.583****	**-.230****
57.Cooperative	Pear Corr	.105	.084	.080	.040	**.220****	.015
67.Cooperate	Pear Corr	.020	.013	.022	.005	**.116***	.033
82.NOT cooperation	Pear Corr	.099	-.063	-.049	.042	-.032	.041
60.Spontaneously	Pear Corr	**.444****	-.046	**-.172****	**.315****	**.376****	**-.220****
70.LOST w/o plan	Pear Corr	**-.295****	**.289****	**.314****	**-.150****	-.039	**.372****
80.Decisions impulsive	Pear Corr	**.301****	**-.229****	**-.359****	**.315****	**.289****	**-.147***
63.To do lists	Pear Corr	**-.175****	**.309****	**.294****	.001	.056	**.133***
78.Flexible plans	Pear Corr	**.308****	-.037	-.082	**.298****	**.315****	**-.118***
91.Flexibility	Pear Corr	**.323****	-.039	-.072	**.146***	**.186****	**-.157****
48.Interest in arts/aesth	Pear Corr	**.122***	.110	.020	**.278****	**.272****	-.030

Table 4.92 *(continued)*

INTER-ITEM CORRELATION MATRIX		COG. STYLE/ANALYTIC			COG. STYLE/INTUITIVE		
		51.* NOT step-by-step	65. Ana-lyze things	73. Con-sider facts	50. Sudden ideas	56. Rely on intuition	92.* NOT confi-dent
64.Appreciate art	Pear Corr	**.119***	**.190****	.069	**.207****	**.181****	.038
84.NOT enjoy art	Pear Corr	-.003	-.033	-.018	-.050	-.078	.094
47.NOT musical	Pear Corr	**.135***	.006	.083	.000	.061	**.133***
61.Listen to music	Pear Corr	**.142***	.041	-.014	**.220****	**.197****	-.001
68.Enjoy music	Pear Corr	-.093	**.144***	.053	.091	.036	.018
69.Take risks	Pear Corr	**.343****	.015	**-.158****	**.242****	**.196****	**-.203****
71.NOT seek adventures	Pear Corr	**-.250****	**.117***	**.264****	-.095	-.025	**.365****
76.Enjoy unknown	Pear Corr	**.384****	.093	-.051	**.334****	**.294****	**-.217****
49.NOT stand out	Pear Corr	-.027	**.171****	**.191****	.045	.001	**.265****
72.Unconventional	Pear Corr	**.308****	.023	-.050	**.297****	**.258****	**-.128***
75.Comfortable/different	Pear Corr	**.346****	.075	.031	**.211****	**.235****	**-.203****
46.Novel uses	Pear Corr	**.265****	.112	.059	**.442****	**.279****	**-.188****
66.Difficult/visualize	Pear Corr	**-.146***	-.032	.110	-.065	.055	**.393****
77.Visualize solutions	Pear Corr	**.274****	**.144***	.083	**.338****	**.285****	**-.290****
79.NOT good/symbols	Pear Corr	-.106	.017	.068	**-.185****	-.054	**.303****
81.Insights/ment. images	Pear Corr	.031	**.217****	**.135***	**.128***	**.122***	.029
83.Metaphors	Pear Corr	**.127***	.085	.033	**.410****	**.201****	**-.136***
62.NOTconnect/emotions	Pear Corr	.111	.074	.111	-.106	-.098	**.183****
88.Emotionally involved	Pear Corr	-.039	.106	-.025	.062	**.188****	.018
94.Compelling ideas	Pear Corr	.081	.077	-.028	**.224****	**.289****	-.030
58.LESS receptive	Pear Corr	.058	.104	.076	.035	.108	**.117***
74.More intuitive times	Pear Corr	.029	.040	.011	.021	**.129***	.039
90.Not more productive	Pear Corr	**.152****	.047	.013	.000	.031	-.006
86.Know w/o knowing	Pear Corr	.097	-.020	-.085	**.368****	**.390****	**-.268****
96.Decisions	Pear Corr	**.225****	-.041	**-.129***	**.238****	**.282****	**-.358****
99.MORE info	Pear Corr	**-.154****	**.403****	**.407****	**-.121***	-.107	**.501****
HBDI® 100 Introv/Extrav	Pear Corr	.066	-.027	-.096	.079	.054	-.116
HBDI® 5 Handedness	Pear Corr	-.018	-.108	-.041	.026	.030	.024
HBDI® 6 Hand Lft/Right	Pear Corr	.062	**-.126***	-.089	.017	.015	-.056
HBDI® 6 Hand R-Domin.	Pear Corr	-.032	**-.168****	-.054	-.028	-.005	-.007
Sex	Pear Corr	-.025	.003	-.034	-.048	-.022	.055
Age	Pear Corr	.078	-.087	-.065	.094	**.139***	**-.142***

Cognitive Style/Analytic (DOI items 51, 65, 73); Cognitive Style/Intuitive (DOI items 50, 56, 92*)—Table 4.92*. Variables presented in this table are discussed below.

- Cognitive Style/Analytic (DOI item 51* NOT step-by-step). Very weak negative correlations (-.297 to -.146) were found between DOI item 51 and 11

DOI items, presented below in descending order from strongest to weakest. Since item 51 is negatively worded for the cognitive style/analytic variable, which is inversely related to intuition, a negative correlation was anticipated.

- 73. Consider facts (-.297)
- 70. LOST w/o plan (-.295)
- 89. Precise facts (-.262)
- 71. NOT seek adventures (-.250)
- 92. NOT confident (-.242)
- 95. NOT imaginative (-.228)
- 87. DIFFICULT/novel ways (-.218)
- 63. To do lists (-.175)
- 65. Analyze things (-.158)
- 99. MORE info (-.154)
- 66. DIFFICULT/visualize (-.146)

Extremely weak to moderately weak positive correlations (.119 to .444) were found between DOI item 51 and 26 DOI items. All except two of the 26 items below (47 and 90) were positively worded for cognitive style/analytic, so the positive correlations were as anticipated.

- 64. Appreciate art (.119)
- 48. Interest in arts/aesthetics (.122)
- 83. Metaphors (.127)
- 47. NOT musical (.135)
- 61. Listen to music (.142)
- 90. NOT more productive (.152)
- 97. Rely on intuition (.153)
- 54. Recognize patterns (.164)
- 59. Creative activities (.203)
- 53. Multiple ways (.217)
- 96. Decisions (.225)
- 50. Sudden ideas (.253)
- 46. Novel uses (.265)
- 85. Act on instinct (.273)
- 77. Visualize solutions (.274)
- 56. Rely on intuition (.276)
- 93. Finding alternatives (.278)
- 80. Decisions impulsive (.301)
- 72. Unconventional (.308)
- 78. Flexible plans (.308)

- 91. Flexibility (.323)
- 69. Take risks (.343)
- 75. Comfortable/different (.346)
- 76. Enjoy unknown (.384)
- 55. NOT collect facts (.400)
- 60. Spontaneously (.444)

- Cognitive Style/Analytic (DOI item 65 Analyze things). Extremely weak negative correlations (-.276 to -.126) were found between DOI item 65 and five DOI items, presented below in descending order from strongest to weakest. Two of the five negative correlations found were for handedness, as measured by HBDI® item 6; the other three were for positively-worded DOI items. Since DOI item 65 is positively worded for the cognitive style/analytic variable, which is inversely related to intuition, the negative direction of these correlations was as expected.

  - 85. Act on instinct (-.276)
  - 55. NOT collect facts (-.256)
  - 80. Decisions impulsive (-.229)
  - HBDI® 6 Handedness Right-Dominance (-.168)
  - HBDI® 6 Handedness Left/Right (-.126)

  Extremely weak to relatively strong positive correlations (.117 to .640) 126) were found between DOI item 65 and the following 16 items, presented in ascending order from weakest to strongest.

  - 71. NOT seek adventures (.117)
  - 77. Visualize solutions (.144)
  - 68. Enjoy music (.144)
  - 52. Trace insights (.150)
  - 49. NOT stand out (.171)
  - 64. Appreciate art (.190)
  - 81. Insights/mental images (.217)
  - 92. NOT confident (.219)
  - 53. Multiple ways (.234)
  - 54. Recognize patterns (.235)
  - 70. LOST w/o plan (.289)

- 63. To do lists (.309)
- 98. PRIOR experience (.367)
- 99. MORE info (.403)
- 89. Precise facts (.573)
- 73. Consider facts (.640)

Seven of these 16 positive correlations were for positively-worded DOI items; the remaining nine positive correlations, including the six strongest (.289 to .640), were for negatively-worded DOI items. Since DOI item 65 is positively worded for the cognitive style/analytic variable, which is inversely related to intuition, positive correlations with negatively-worded DOI items were expected. Correlations for the seven DOI items that were *not* as expected were all extremely weak (.144 to .235).

- Cognitive Style/Analytic (DOI item 73 Consider facts). Extremely weak negative correlations (-.402 to -.120) were found between DOI item 73 and eight positively-worded DOI items, presented below in descending order from strongest to weakest.

  - 55. NOT collect facts (-.402)
  - 80. Decisions impulsive (-.359)
  - 85. Act on instinct (-.313)
  - 60. Spontaneously (-.172)
  - 56. Rely on intuition (-.161)
  - 69. Take risks (-.158)
  - 96. Decisions (-.129)
  - 50. Sudden ideas (-.120)

  Because item 73 is positively worded for cognitive style/analytic, which is inversely related to intuition, these negative correlations were as expected.

  Extremely weak to relatively strong positive correlations (.135 to .656) were found between DOI item 73 and the following 12 items, presented in ascending order from weakest to strongest.

- 81. Insights/mental images (.135)
- 53. Multiple ways (.153)
- 95. NOT imaginative (.177)
- 49. NOT stand out (.191)
- 54. Recognize patterns (.198)
- 71. NOT seek adventures (.264)
- 63. To do lists (.294)
- 70. LOST w/o plan (.314)
- 92. NOT confident (.341)
- 99. MORE info (.407)
- 98. PRIOR experience (.412)
- 89. Precise facts (.656)

Nine of these 12 positive correlations were with negatively-worded DOI items, including the seven strongest (.264 to .656). Since DOI item 73 is positively worded for the cognitive style/analytic variable, which is inversely related to intuition, positive correlations with negatively-worded DOI items were expected. Correlations for the three items that were *not* as expected were all extremely weak (.135 to .198).

- Cognitive Style/Intuitive (DOI item 50 Sudden ideas). Somewhat weak to extremely weak negative correlations (-.305 to -.121) were found between DOI item 50 and six negatively-worded DOI items, presented below in descending order from strongest to weakest.

  - 95. NOT imaginative (-.305)
  - 79. NOT good/symbols (-.185)
  - 87. DIFFICULT/novel ways (-.171)
  - 70. LOST w/o plan (-.150)
  - 92. NOT confident (-.130)
  - 99. MORE info (-.121)

  Extremely weak to moderately strong positive correlations (.128 to .442) 126) were found between DOI item 50 and 27 items, presented below in ascending order from weakest to strongest. Though weak, all of these positive correlations were with positively-worded DOI items, as expected.

- 81. Insights/mental images (.128)
- 52. Trace insights (.129)
- 91. Flexibility (.146)
- 64. Appreciate art (.207)
- 75. Comfortable/different (.211)
- 55. NOT collect facts (.219)
- 61. Listen to music (.220)
- 94. Compelling ideas (.224)
- 96. Decisions (.238)
- 69. Take risks (.242)
- 97. Rely on intuition (.277)
- 48. Interest in arts/aesthetics (.278)
- 93. Finding alternatives (.290)
- 72. Unconventional (.297)
- 78. Flexible plans (.298)
- 85. Act on instinct (.303)
- 59. Creative activities (.305)
- 60. Spontaneously (.315)
- 80. Decisions impulsive (.315)
- 54. Recognize patterns (.316)
- 53. Multiple ways (.329)
- 76. Enjoy unknown (.334)
- 77. Visualize solutions (.338)
- 56. Rely on intuition (.360)
- 86. Know w/o knowing (.368)
- 83. Metaphors (.410)
- 46. Novel uses (.442)

- Cognitive Style/Intuitive (DOI item 56 Rely on intuition). Extremely weak negative correlations (-.276 to -.183) were found between DOI item 56 and three negatively-worded DOI items, presented below in descending order from strongest to weakest.

  - 92. NOT confident (-.276)
  - 95. NOT imaginative (-.190)
  - 89. Precise facts (-.183)

  Extremely weak to moderately strong positive correlations (.116 to .583) were found between DOI item 56 and 31 items, presented below in ascending order from weakest to strongest. Except for age (.139), a biological variable, all items are positively worded; so the correlation directions were as expected.

- 67. Cooperate (.116)
- 81. Insights/mental images (.122)
- 74. More intuitive times (.129)
- Age (.139)
- 64. Appreciate art (.181)
- 91. Flexibility (.186)
- 88. Emotionally involved (.188)
- 69. Take risks (.196)
- 61. Listen to music (.197)
- 83. Metaphors (.201)
- 52. Trace insights (.205)
- 57. Cooperative (.220)
- 54. Recognize patterns (.224)
- 75. Comfortable/different (.235)
- 53. Multiple ways (.236)
- 93. Finding alternatives (.249)
- 72. Unconventional (.258)
- 59. Creative activities (.267)
- 48. Interest in arts/aesthetics (.272)
- 46. Novel uses (.279)
- 96. Decisions (.282)
- 77. Visualize solutions (.285)
- 94. Compelling ideas (.289)
- 80. Decisions impulsive (.289)
- 76. Enjoy unknown (.294)
- 78. Flexible plans (.315)
- 60. Spontaneously (.376)
- 85. Act on instinct (.378)
- 86. Know w/o knowing (.390)
- 55. NOT collect facts (.399)
- 97. Rely on intuition (.583)

- Cognitive Style/Intuitive (DOI item 92* NOT confident). Extremely to moderately weak negative correlations (-.358 to -.118) were found between DOI item 92 and 19 items, presented below in descending order from strongest to weakest. Except for age (-.142), a biological variable, all of these items were positively worded. Since item 92 was negatively worded to measure lack or absence of the cognitive style/intuitive characteristic, the negative correlations with the items below were as anticipated.

- 96. Decisions (-.358)
- 77. Visualize solutions (-.290)
- 86. Know w/o knowing (-.268)
- 93. Finding alternatives (-.258)
- 97. Rely on intuition (-.230)
- 60. Spontaneously (-.220)
- 76. Enjoy unknown (-.217)
- 85. Act on instinct (-.206)
- 75. Comfortable/different (-.203)
- 69. Take risks (-.203)
- 53. Multiple ways (-.197)
- 46. Novel uses (-.188)
- 55. NOT collect facts (-.163)
- 91. Flexibility (-.157)
- 80. Decisions impulsive (-.147)
- Age (-.142)
- 83. Metaphors (-.136)
- 72. Unconventional (-.128)
- 78. Flexible plans (-.118)

Extremely weak to moderately strong positive correlations (.117 to .501) were found between DOI item 92 and the following 14 DOI items, presented in ascending order from weakest to strongest. Except for item 58, all of these items were negatively worded. Since item 92 is also negatively worded, the positive direction of these correlations was as expected.

- 58. LESS receptive (.117)
- 63. To do lists (.133)
- 47. NOT musical (.133)
- 62. NOT connect/emotions (.183)
- 98. PRIOR experience (.236)
- 49. NOT stand out (.265)
- 89. Precise facts (.302)
- 79. NOT good/symbols (.303)
- 87. DIFFICULT/novel ways (.355)
- 71. NOT seek adventures (.365)
- 70. LOST w/o plan (.372)
- 95. NOT imaginative (.392)
- 66. DIFFICULT/visualize (.393)
- 99. MORE info (.501)

Experience (DOI items 52, 85, 98) and Creativity (DOI items 53, 59, 95*).*

Table 4.93 below presents the inter-item correlations for these variables.

Table 4.93: Inter-Item Correlations—Experience (DOI Items 52, 85, 98*); and Creativity (DOI Items 53, 59, 95*)

INTER-ITEM CORRELATION MATRIX		EXPERIENCE			CREATIVITY		
		52. Trace insights	85. Act on instinct	98.* PRIOR experi-ence	53. Multi-ple ways	59. Creative activi-ties	95.* NOT imagi-native
52.Trace insights	Pear Corr	1.000					
85.Act on instinct	Pear Corr	.073	1.000				
98.PRIOR experience	Pear Corr	**.224****	-.051	1.000			
53.Multiple ways	Pear Corr	**.229****	.074	.112	1.000		
59.Creative activities	Pear Corr	**.259****	**.150****	.023	**.228****	1.000	
95.NOT imaginative	Pear Corr	-.097	-.065	.062	**-.315****	**-.412****	1.000
54.Recognize patterns	Pear Corr	**.303****	.033	**.145***	**.469****	**.245****	**-.270****
87.Difficult/novel ways	Pear Corr	-.045	.031	.104	**-.383****	**-.252****	**.629****
93.Finding alternatives	Pear Corr	**.188****	**.167****	.067	**.680****	**.313****	**-.457****
55.NOT collect facts	Pear Corr	.112	**.464****	-.095	.073	**.175****	.007
89.Precise facts	Pear Corr	.056	**-.244****	**.421****	.096	**-.160****	**.209****
97.Rely on intuition	Pear Corr	**.151****	**.367****	.063	**.300****	**.303****	**-.302****
57.Cooperative	Pear Corr	.090	.023	**.144***	**.120***	**.146***	.103
67.Cooperate	Pear Corr	-.017	-.008	.070	-.009	.109	.078
82.NOT cooperation	Pear Corr	.067	.112	**-.122***	.078	**-.123***	**.173****
60.Spontaneously	Pear Corr	**.134***	**.328****	.074	**.229****	**.284****	**-.227****
70.LOST w/o plan	Pear Corr	.099	**-.146***	**.148***	**-.124***	-.098	**.330****
80.Decisions impulsive	Pear Corr	.016	**.531****	-.073	.066	**.174****	-.045
63.To do lists	Pear Corr	.094	-.048	**.195****	.062	.053	.084
78.Flexible plans	Pear Corr	**.202****	**.224****	**.131***	**.310****	**.296****	**-.246****
91.Flexibility	Pear Corr	**.168****	**.182****	.106	**.267****	**.294****	**-.163****
48.Interest in arts/aesth	Pear Corr	.097	.082	.046	**.191****	**.466****	**-.278****
64.Appreciate art	Pear Corr	.037	.005	.000	**.156****	**.346****	**-.179****
84.NOT enjoy art	Pear Corr	.044	.067	.089	**-.130***	**-.267****	**.280****
47.NOT musical	Pear Corr	.107	.049	.046	.042	-.104	**.209****
61.Listen to music	Pear Corr	**.173****	**.167****	.067	.092	**.324****	-.099
68.Enjoy music	Pear Corr	.075	.006	.064	.031	**.222****	-.098
69.Take risks	Pear Corr	**.197****	**.349****	.064	**.289****	**.234****	**-.161****
71.NOT seek adventures	Pear Corr	**-.175****	**-.121***	.068	**-.206****	**-.160****	**.375****
76.Enjoy unknown	Pear Corr	**.178****	**.299****	.043	**.389****	**.309****	**-.308****
49.NOT stand out	Pear Corr	**.160****	-.055	.106	-.017	.017	**.237****
72.Unconventional	Pear Corr	.028	**.230****	-.100	**.268****	**.217****	**-.196****
75.Comfortable/different	Pear Corr	.036	**.133***	-.028	**.274****	**.183****	**-.237****
46.Novel uses	Pear Corr	**.236****	**.186****	.079	**.499****	**.474****	**-.440****
66.Difficult/visualize	Pear Corr	.034	.079	.043	**-.402****	-.070	**.450****
77.Visualize solutions	Pear Corr	**.212****	**.190****	.033	**.578****	**.326****	**-.482****

Table 4.93 *(continued)*

INTER-ITEM CORRELATION MATRIX		EXPERIENCE			CREATIVITY		
		52. Trace insights	85. Act on instinct	98.* PRIOR experience	53. Multiple ways	59. Creative activities	95.* NOT imaginative
79.NOT good/symbols	Pear Corr	.034	.056	**.134***	**-.201****	**-.148***	**.455****
81.Insights/ment. images	Pear Corr	**.196****	**.164****	.083	**.145***	**.176****	-.056
83.Metaphors	Pear Corr	**.207****	.085	.107	**.300****	**.364****	**-.409****
62.NOTconnect/emotions	Pear Corr	**-.158****	.037	.027	.047	**-.128***	**.216****
88.Emotionally involved	Pear Corr	**.206****	.097	.085	-.046	**.169****	-.034
94.Compelling ideas	Pear Corr	**.222****	**.160****	.083	**.146***	**.298****	**-.164****
58.LESS receptive	Pear Corr	**.170****	.038	**.118***	.005	.014	**.159****
74.More intuitive times	Pear Corr	**.182****	.020	.070	.046	.088	-.020
90.Not more productive	Pear Corr	.001	.094	.038	.019	.023	.033
86.Know w/o knowing	Pear Corr	.087	**.258****	-.002	**.195****	**.354****	**-.268****
96.Decisions	Pear Corr	.112	**.393****	.077	**.407****	**.187****	**-.207****
99.MORE info	Pear Corr	.007	**-.187****	**.295****	-.099	-.074	**.258****
HBDI® 100 Introv/Extrav	Pear Corr	.046	**.130***	.080	.075	.091	**-.156***
HBDI® 5 Handedness	Pear Corr	-.006	-.019	.018	-.016	.100	-.015
HBDI® 6 Hand Lft/Right	Pear Corr	.022	.015	-.081	.020	-.002	-.047
HBDI® 6 Hand R-Domin.	Pear Corr	.011	-.034	-.041	-.046	.034	.006
Sex	Pear Corr	-.009	-.044	-.060	-.075	**.123***	-.032
Age	Pear Corr	.045	**.152****	.025	**.157****	**.126***	-.088

Experience (DOI items 52, 85, 98) and Creativity (DOI items 53, 59, 95*)—Table 4.93*. The variables presented in the table above are discussed below.

- Experience (DOI item 52 Trace insights). Extremely weak negative correlations (.-.175 to -.158) were found between this item and two negatively-worded DOI items. These negative correlations were as expected.
  - 71. NOT seek adventures (-.175)
  - 62. NOT connect/emotions (-.158)

  Extremely to somewhat weak positive correlations (.134 to .303) were found between item 52 and 21 DOI items, presented below in ascending order from weakest to strongest. All except two items (49 and 98) were positively worded, so the positive direction of these correlations was as expected.

- 60. Spontaneously (.134)
- 97. Rely on intuition (.151)
- 49. NOT stand out (.160)
- 91. Flexibility (.168)
- 58. LESS receptive (.170)
- 61. Listen to music (.173)
- 76. Enjoy unknown (.178)
- 74. More intuitive times (.182)
- 93. Finding alternatives (.188)
- 81. Insights/mental images (.196)
- 69. Take risks (.197)
- 78. Flexible plans (.202)
- 88. Emotionally involved (.206)
- 83. Metaphors (.207)
- 77. Visualize solutions (.212)
- 94. Compelling ideas (.222)
- 98. PRIOR experience (.224)
- 53. Multiple ways (.229)
- 46. Novel uses (.236)
- 59. Creative activities (.259)
- 54. Recognize patterns (.303)

- Experience (DOI item 85 Act on instinct). Very weak negative correlations (-.244 to -.121) were found between DOI item 85 and four negatively-worded DOI items, presented below in descending order from strongest to weakest. The negative direction of the correlations was as anticipated.

  - 89. Precise facts (-.244)
  - 99. MORE info (-.187)
  - 70. LOST w/o plan (-.146)
  - 71. NOT seek adventures (-.121)

  Extremely weak to moderately strong positive correlations (.130 to .531) were found between item 85 and 21 DOI items, presented below in ascending order from weakest to strongest. Except for introversion/extraversion and age, all of the items were positively worded; so the positive direction of the correlations was as expected.

- HBDI® 100 Introversion/Extraversion (.130)
- 75. Comfortable/different (.133)
- 59. Creative activities (.150)
- Age (.152)
- 94. Compelling ideas (.160)
- 81. Insights/mental images (.164)
- 61. Listen to music (.167)
- 93. Finding alternatives (.167)
- 91. Flexibility (.182)
- 46. Novel uses (.186)
- 77. Visualize solutions (.190)
- 78. Flexible plans (.224)
- 72. Unconventional (.230)
- 86. Know w/o knowing (.258)
- 76. Enjoy unknown (.299)
- 60. Spontaneously (.328)
- 69. Take risks (.349)
- 97. Rely on intuition (.367)
- 96. Decisions (.393)
- 55. NOT collect facts (.464)
- 80. Decisions impulsive (.531)

- Experience (DOI item 98* Prior experience). One significant negative correlation was found between item 98 and DOI item 82 (NOT cooperation, -.122). Though *not* in the expected direction, this correlation was very weak.

  Extremely weak to moderately strong positive correlations (.118 to .421) were found between item 98 and nine items, presented below in ascending order from weakest to strongest. The four strongest correlations were with negatively-worded DOI items, as expected. Four additional items (89, 99, 63 and 70) were positively worded, though these correlations were very weak.

  - 58. LESS receptive (.118)
  - 78. Flexible plans (.131)
  - 79. NOT good/symbols (.134)
  - 57. Cooperative (.144)
  - 54. Recognize patterns (.145)
  - 70. LOST w/o plan (.148)
  - 63. To do lists (.195)
  - 99. MORE info (.295)
  - 89. Precise facts (.421)

- Creativity (DOI item 53 Multiple ways). Moderately strong to extremely weak negative correlations (-.402 to -.124) were found between item 53 and seven negatively-worded DOI items, presented below in descending order from strongest to weakest. Since DOI item 53 was positively worded, the negative direction of these correlations was as anticipated.

  - 66. DIFFICULT/visualize (-.402)
  - 87. DIFFICULT/novel ways (-.383)
  - 95. NOT imaginative (-.315)
  - 71. NOT seek adventures (-.206)
  - 79. NOT good/symbols (-.201)
  - 84. NOT enjoy art (-.130)
  - 70. LOST w/o plan (-.124)

  Extremely weak to relatively strong positive correlations (.120 to .680) were found between item 53 and 22 DOI items, presented below in ascending order from weakest to strongest. Except for the biological variable age, all 22 of the items were positively worded; so the positive direction of these correlations was as expected.

  - 57. Cooperative (.120)
  - 81. Insights/mental images (.145)
  - 94. Compelling ideas (.146)
  - 64. Appreciate art (.156)
  - Age (.157)
  - 48. Interest in arts/aesthetics (.191)
  - 86. Know w/o knowing (.195)
  - 59. Creative activities (.228)
  - 60. Spontaneously (.229)
  - 91. Flexibility (.267)
  - 72. Unconventional (.268)
  - 75. Comfortable/different (.274)
  - 69. Take risks (.289)
  - 97. Rely on intuition (.300)
  - 83. Metaphors (.300)
  - 78. Flexible plans (.310)
  - 76. Enjoy unknown (.389)
  - 96. Decisions (.407)

- 54. Recognize patterns (.469)
- 46. Novel uses (.499)
- 77. Visualize solutions (.578)
- 93. Finding alternatives (.680)

- Creativity (DOI items 59 Creative activities). Moderately to extremely weak negative correlations (-.412 to -.123) were found between item 59 and eight negatively-worded DOI items, presented below in descending order from strongest to weakest. Since DOI item 53 was positively worded, the negative direction of these correlations was as expected.

  - 95. NOT imaginative (-.412)
  - 84. NOT enjoy art (-.267)
  - 87. DIFFICULT/novel ways (-.252)
  - 89. Precise facts (-.160)
  - 71. NOT seek adventures (-.160)
  - 79. NOT good/symbols (-.148)
  - 62. NOT connect/emotions (-.128)
  - 82. NOT cooperation (-.123)

  Extremely weak to moderately strong positive correlations (.123 to .474) were found between item 59 and 27 DOI items, presented below in ascending order from weakest to strongest. Except for the biological variables age and sex, all of the items were positively worded; so the positive direction of these correlations was as expected.

  - Sex (.123)
  - Age (.126)
  - 57. Cooperative (.146)
  - 88. Emotionally involved (.169)
  - 80. Decisions impulsive (.174)
  - 55. NOT collect facts (.175)
  - 81. Insights/mental images (.176)
  - 75. Comfortable/different (.183)
  - 96. Decisions (.187)
  - 72. Unconventional (.217)
  - 68. Enjoy music (.222)
  - 69. Take risks (.234)
  - 54. Recognize patterns (.245)

- 60. Spontaneously (.284)
- 91. Flexibility (.294)
- 78. Flexible plans (.296)
- 94. Compelling ideas (.298)
- 97. Rely on intuition (.303)
- 76. Enjoy unknown (.309)
- 93. Finding alternatives (.313)
- 61. Listen to music (.324)
- 77. Visualize solutions (.326)
- 64. Appreciate art (.346)
- 86. Know w/o knowing (.354)
- 83. Metaphors (.364)
- 48. Interest in arts/aesthetics (.466)
- 46. Novel uses (.474)

- Creativity (DOI items 95* NOT imaginative). Moderately to extremely weak negative correlations (-.482 to -.156) were found between DOI item 95 and 19 items, presented below in descending order from strongest to weakest. Except for introversion/extraversion, all of these items were positively worded. Since item 95 was negatively worded, the negative direction of these correlations was as expected.

  - 77. Visualize solutions (-.482)
  - 93. Finding alternatives (-.457)
  - 46. Novel uses (-.440)
  - 83. Metaphors (-.409)
  - 76. Enjoy unknown (-.308)
  - 97. Rely on intuition (-.302)
  - 48. Interest in arts/aesthetics (-.278)
  - 54. Recognize patterns (-.270)
  - 86. Know w/o knowing (-.268)
  - 78. Flexible plans (-.246)
  - 75. Comfortable/different (-.237)
  - 60. Spontaneously (-.227)
  - 96. Decisions (-.207)
  - 72. Unconventional (-.196)
  - 64. Appreciate art (-.179)
  - 94. Compelling ideas (-.164)
  - 91. Flexibility (-.163)
  - 69. Take risks (-.161)
  - HBDI® 100 Introversion/Extraversion (-.156)

Extremely weak to relatively strong positive correlations (.159 to .629) were found between item 95 and 13 DOI items, presented below in ascending order from weakest to strongest. Except for item 58 (LESS receptive), these correlations were with negatively-worded items. Since item 95 was also negatively worded, the positive direction of the correlations was as expected.

- 58. LESS receptive (.159)
- 82. NOT cooperation (.173)
- 89. Precise facts (.209)
- 47. NOT musical (.209)
- 62. NOT connect/emotions (.216)
- 49. NOT stand out (.237)
- 99. MORE info (.258)
- 84. NOT enjoy art (.280)
- 70. LOST w/o plan (.330)
- 71. NOT seek adventures (.375)
- 66. DIFFICULT/visualize (.450)
- 79. NOT good/symbols (.455)
- 87. DIFFICULT/novel ways(.629)

Innovation (DOI items 54, 87, 93) and Carelessness with Facts/Details (DOI items 55, 89*, 97).* Table 4.94 below presents inter-item correlations for these variables.

Table 4.94: Inter-Item Correlations—Innovation (DOI Items 54, 87*, 93); and Carelessness with Facts and Details (DOI Items 55, 89*, 97)

INTER-ITEM CORRELATION MATRIX		INNOVATION			CARELESSNESS		
		54. Recog-nize patterns	87.* DIFFI-CULT/ novel ways	93. Finding alter-natives	55. NOT collect facts	89.* Precise facts	97. Rely on intui-tion
54.Recognize patterns	Pear Corr	1.000					
87.Difficult/novel ways	Pear Corr	**-.220****	1.000				
93.Finding alternatives	Pear Corr	**.441****	**-.531****	1.000			
55.NOT collect facts	Pear Corr	.079	.048	**.119***	1.000		
89.Precise facts	Pear Corr	**.123***	**.134***	-.007	**-.327****	1.000	
97.Rely on intuition	Pear Corr	**.256****	**-.217****	**.442****	**.253****	-.063	1.000
57.Cooperative	Pear Corr	.004	.042	.089	.102	.085	**.173****
67.Cooperate	Pear Corr	-.063	.086	-.067	.047	.044	.039
82.NOT cooperation	Pear Corr	.078	**.153****	.043	**.179****	-.037	.016
60.Spontaneously	Pear Corr	**.153****	**-.150****	**.259****	**.335****	**-.150****	**.314****

Table 4.93 *(continued)*

INTER-ITEM CORRELATION MATRIX		INNOVATION			CARELESSNESS		
		54. Recog-nize patterns	87.* DIFFI-CULT/ novel ways	93. Finding alter-natives	55. NOT collect facts	89.* Precise facts	97. Rely on intui-tion
70.LOST w/o plan	Pear Corr	-.016	**.350****	**-.198****	-.102	**.258****	-.098
80.Decisions impulsive	Pear Corr	.007	-.010	**.177****	**.411****	**-.264****	**.284****
63.To do lists	Pear Corr	.070	.094	-.026	-.089	**.183****	.063
78.Flexible plans	Pear Corr	**.233****	**-.193****	**.344****	**.161****	**-.122***	**.300****
91.Flexibility	Pear Corr	**.207****	**-.232****	**.331****	**.220****	**-.145***	**.219****
48.Interest in arts/aesth	Pear Corr	**.197****	**-.138***	**.154****	.066	.000	**.278****
64.Appreciate art	Pear Corr	**.158****	-.062	.089	.001	.054	**.190****
84.NOT enjoy art	Pear Corr	-.057	**.214****	**-.116***	**.130***	.061	**-.117***
47.NOT musical	Pear Corr	-.067	.112	-.011	.083	.074	-.047
61.Listen to music	Pear Corr	.054	.009	.099	.086	-.074	**.171****
68.Enjoy music	Pear Corr	.036	.025	-.023	-.052	-.066	-.011
69.Take risks	Pear Corr	**.175****	**-.186****	**.313****	**.295****	-.105	**.260****
71.NOT seek adventures	Pear Corr	**-.152****	**.350****	**-.303****	-.059	**.229****	**-.134***
76.Enjoy unknown	Pear Corr	**.351****	**-.276****	**.473****	**.164****	-.084	**.296****
49.NOT stand out	Pear Corr	.006	**.188****	**-.119***	**.116***	**.178****	**-.170****
72.Unconventional	Pear Corr	**.265****	**-.203****	**.274****	**.235****	-.104	**.268****
75.Comfortable/different	Pear Corr	**.230****	**-.274****	**.317****	**.124***	-.020	**.256****
46.Novel uses	Pear Corr	**.442****	**-.402****	**.551****	.109	.012	**.355****
66.Difficult/visualize	Pear Corr	**-.190****	**.573****	**-.456****	.092	.087	-.077
77.Visualize solutions	Pear Corr	**.548****	**-.493****	**.730****	.071	.007	**.400****
79.NOT good/symbols	Pear Corr	**-.321****	**.473****	**-.316****	.098	.100	**-.235****
81.Insights/ment. images	Pear Corr	**.185****	.026	**.168****	-.006	.096	**.197****
83.Metaphors	Pear Corr	**.413****	**-.211****	**.394****	.019	-.055	**.249****
62.NOTconnect/emotions	Pear Corr	.034	.111	.032	**.146***	**.115***	**-.170****
88.Emotionally involved	Pear Corr	.001	.030	-.060	-.031	-.016	**.206****
94.Compelling ideas	Pear Corr	**.207****	-.053	**.187****	.107	-.075	**.323****
58.LESS receptive	Pear Corr	.031	.114	.030	**.138***	.012	.050
74.More intuitive times	Pear Corr	-.001	.026	.071	**.116***	-.058	.057
90.Not more productive	Pear Corr	.007	.001	.103	.039	-.004	.056
86.Know w/o knowing	Pear Corr	**.295****	-.082	**.256****	.105	-.096	**.502****
96.Decisions	Pear Corr	**.223****	**-.232****	**.511****	**.284****	-.058	**.430****
99.MORE info	Pear Corr	.037	**.258****	**-.165****	**-.114***	**.354****	-.094
HBDI® 100 Introv/Extrav	Pear Corr	.068	-.095	**.127***	.023	-.116	.102
HBDI® 5 Handedness	Pear Corr	.019	-.030	.001	-.044	.046	.081
HBDI® 6 Hand Lft/Right	Pear Corr	.000	.029	.046	.082	-.130*	-.083
HBDI® 6 Hand R-Domin.	Pear Corr	-.013	.041	-.032	.017	-.061	-.060
Sex	Pear Corr	-.069	.045	**-.156****	-.063	-.051	.038
Age	Pear Corr	.083	-.038	**.154****	**.175****	-.010	**.160****

Innovation (DOI items 54, 87, 93); Carelessness with Facts/Details (DOI items 54, 87*, 93)—Table 4.94*. Variables presented in the table above are discussed below.

- Innovation (DOI item 54 Recognize patterns). Relatively weak to extremely weak negative correlations (-.321 to -.152) were found between item 54 and 4 negatively-worded DOI items, presented below in descending order from strongest to weakest. The negative direction of the correlations was expected.
  - 79. NOT good/symbols (-.321)
  - 87. DIFFICULT/novel ways (-.220)
  - 66. DIFFICULT/visualize (-.190)
  - 71. NOT seek adventures (-.152)

  Extremely weak to moderately strong positive correlations (.123 to .548) were found between item 54 and 19 DOI items, presented below in ascending order from weakest to strongest. Except for the weakest correlation, with item 89 (precise facts), all of the items were positively worded; and the positive direction of the correlations was as expected.
  - 89. Precise facts (.123)
  - 60. Spontaneously (.153)
  - 64. Appreciate art (.158)
  - 69. Take risks (.175)
  - 81. Insights/mental images (.185)
  - 48. Interest in arts/aesthetics (.197)
  - 91. Flexibility (.207)
  - 94. Compelling ideas (.207)
  - 96. Decisions (.223)
  - 75. Comfortable/different (.230)
  - 78. Flexible plans (.233)
  - 97. Rely on intuition (.256)
  - 72. Unconventional (.265)
  - 86. Know w/o knowing (.295)
  - 76. Enjoy unknown (.351)
  - 83. Metaphors (.413)
  - 93. Finding alternatives (.441)
  - 46. Novel uses (.442)
  - 77. Visualize solutions (.548)

- Innovation (DOI item 87* DIFFICULT/novel ways). Relatively strong to extremely weak negative correlations (-.531 to -.138) were found between item 87 and 14 DOI items, presented below in descending order from strongest to weakest. Since item 87 was negatively worded, the negative direction of the correlations with these 14 positively-worded DOI items was as expected.

  - 93. Finding alternatives (-.531)
  - 77. Visualize solutions (-.493)
  - 46. Novel uses (-.402)
  - 76. Enjoy unknown (-.276)
  - 75. Comfortable/different (-.274)
  - 91. Flexibility (-.232)
  - 96. Decisions (-.232)
  - 97. Rely on intuition (-.217)
  - 83. Metaphors (-.211)
  - 72. Unconventional (-.203)
  - 78. Flexible plans (-.193)
  - 69. Take risks (-.186)
  - 60. Spontaneously (-.150)
  - 48. Interest in arts/aesthetics (-.138)

  Extremely weak to moderately strong positive correlations (.134 to .573) were found between item 87 and nine DOI items, presented below in ascending order from weakest to strongest. Item 87 and all 14 of the correlated items were negatively worded; so the positive direction of these correlations was as expected.

  - 89. Precise facts (.134)
  - 82. NOT cooperation (.153)
  - 49. NOT stand out (.188)
  - 84. NOT enjoy art (.214)
  - 99. MORE info (.258)
  - 71. NOT seek adventures (.350)
  - 70. LOST w/o plan (.350)
  - 79. NOT good/symbols (.473)
  - 66. DIFFICULT/visualize (.573)

- Innovation (DOI item 93 Finding alternatives). Moderately weak to extremely weak negative correlations (-.456 to -.116) were found between item 93 and 8 DOI items, presented below in descending order from strongest to weakest. All of these items, except the biological variable sex, were negatively worded, so the negative direction of these correlations was as expected.
    - 66. DIFFICULT/visualize (-.456)
    - 79. NOT good/symbols (-.316)
    - 71. NOT seek adventures (-.303)
    - 70. LOST w/o plan (-.198)
    - 99. MORE info (-.165)
    - Sex (-.156)
    - 49. NOT stand out (-.119)
    - 84. NOT enjoy art (-.116)

    Extremely weak to relatively strong positive correlations (.119 to .730) were found between item 93 and 20 DOI items, presented below in ascending order from weakest to strongest. Except for the biological variable age, and introversion/extraversion, all of the items were positively worded; so the positive direction of these correlations with DOI item 93 was as expected.

    - 55. NOT collect facts (.119)
    - HBDI® 100 Introversion/Extraversion (.127)
    - 48. Interest in arts/aesthetics (.154)
    - Age (.154)
    - 81. Insights/mental images (.168)
    - 80. Decisions impulsive (.177)
    - 94. Compelling ideas (.187)
    - 86. Know w/o knowing (.256)
    - 60. Spontaneously (.259)
    - 72. Unconventional (.274)
    - 69. Take risks (.313)
    - 75. Comfortable/different (.317)
    - 91. Flexibility (.331)

- 78. Flexible plans (.344)
- 83. Metaphors (.394)
- 97. Rely on intuition (.442)
- 76. Enjoy unknown (.473)
- 96. Decisions (.511)
- 46. Novel uses (.551)
- 77. Visualize solutions (.730)

- Carelessness with Facts and Details (DOI item 55 NOT collect facts). Weak negative correlations (-.327 to -.114) were found between item 55 and two negatively-worded DOI items, presented below in descending order from strongest to weakest. Since item 55 was positively worded, the negative direction of these correlations was as expected.

  - 89. Precise facts (-.327)
  - 99. MORE info (-.114)

  Extremely weak to relatively weak positive correlations (.116 to .411) were found between item 55 and 17 DOI items, presented below in ascending order from weakest to strongest. One of the 17 items is the biological variable age, which had an extremely weak correlation of .175. The correlations with four negatively-worded items (49, 84, 62 and 82) were *not* as expected, though all four were extremely weak (.116 to .179). The remaining 12 items were all positively worded, and their positive correlations with positively-worded item 55 were as expected.

  - 49. NOT stand out (.116)
  - 74. More intuitive times (.116)
  - 75. Comfortable/different (.124)
  - 84. NOT enjoy art (.130)
  - 58. LESS receptive (.138)
  - 62. NOT connect/emotions (.146)

- 78. Flexible plans (.161)
- 76. Enjoy unknown (.164)
- Age (.175)
- 82. NOT cooperation (.179)
- 91. Flexibility (.220)
- 72. Unconventional (.235)
- 97. Rely on intuition (.253)
- 96. Decisions (.284)
- 69. Take risks (.295)
- 60. Spontaneously (.335)
- 80. Decisions impulsive (.411)

- Carelessness with Facts and Details (DOI item 89* Precise facts). Extremely weak negative correlations (-.264 to -.122) were found between item 89 and four positively-worded DOI items, presented below in descending order from strongest to weakest. Though very weak, the negative direction of these correlations with negatively-worded item 89 was as anticipated.

  - 80. Decisions impulsive (-.264)
  - 60. Spontaneously (-.150)
  - 91. Flexibility (-.145)
  - 78. Flexible plans (-.122)

  Extremely weak to moderately weak positive correlations (.115 to .354) were found between item 89 and six DOI items, presented below in ascending order from weakest to strongest. Though the correlations were very weak, all of the items were negatively worded; so the positive direction of these correlations was as expected.

  - 62. NOT connect/emotions (.115)
  - 49. NOT stand out (.178)
  - 63. To do lists (.183)
  - 71. NOT seek adventures (.229)
  - 70. LOST w/o plan (.258)
  - 99. MORE info (.354)

- Carelessness with Facts and Details (DOI item 97 Rely on intuition). Very weak negative correlations (-.235 to -.117) were found between item 97 and five negatively-worded DOI items, presented below in descending order from strongest to weakest. Since DOI item 97 was positively worded, the negative direction of these correlations was as expected.

  - 79. NOT good/symbols (-.235)
  - 62. NOT connect/emotions (-.170)
  - 49. NOT stand out (-.170)
  - 71. NOT seek adventures (-.134)
  - 84. NOT enjoy art (-.117)

  Extremely weak to moderately strong positive correlations (.160 to .502) were found between item 59 and 21 DOI items, presented below in ascending order from weakest to strongest. Except for the biological variable age, all items were positively worded; so the positive correlations were as expected.

  - Age (.160)
  - 61. Listen to music (.171)
  - 57. Cooperative (.173)
  - 64. Appreciate art (.190)
  - 81. Insights/mental images (.197)
  - 88. Emotionally involved (.206)
  - 91. Flexibility (.219)
  - 83. Metaphors (.249)
  - 75. Comfortable/different (.256)
  - 69. Take risks (.260)
  - 72. Unconventional (.268)
  - 48. Interest in arts/aesthetics (.278)
  - 80. Decisions impulsive (.284)
  - 76. Enjoy unknown (.296)
  - 78. Flexible plans (.300)
  - 60. Spontaneously (.314)
  - 94. Compelling ideas (.323)
  - 46. Novel uses (.355)
  - 77. Visualize solutions (.400)
  - 96. Decisions (.430)
  - 86. Know w/o knowing (.502)

Cooperativeness (DOI items 57, 67, 82) and Impulsivity (DOI items 60, 70*, 80).*

Table 4.95 below presents the inter-item correlations for these variables.

Table 4.95: Inter-Item Correlations—Cooperativeness (DOI Items 57, 67, 82*); and Impulsivity (DOI Items 60, 70*, 80)

INTER-ITEM CORRELATION MATRIX		COOPERATIVENESS			IMPULSIVITY		
		57. Coope-rative	67. Coope rate	82.* NOT coope-ration	60. Spon-tane-ously	70.* LOST w/o plan	80. Decisions impulsive
57.Cooperative	Pear Corr	1.000					
67.Cooperate	Pear Corr	**.439****	1.000				
82.NOT cooperation	Pear Corr	**-.379****	**-.354****	1.000			
60.Spontaneously	Pear Corr	.040	.034	.051	1.000		
70.LOST w/o plan	Pear Corr	.069	.076	.028	**-.410****	1.000	
80.Decisions impulsive	Pear Corr	.010	.038	.102	**.508****	**-.213****	1.000
63.To do lists	Pear Corr	**.193****	**.141***	-.077	**-.151****	**.448****	-.096
78.Flexible plans	Pear Corr	**.129***	.109	-.099	**.534****	**-.292****	**.298****
91.Flexibility	Pear Corr	**.230****	.074	-.094	**.334****	**-.184****	**.214****
48.Interest in arts/aesth	Pear Corr	**.129***	**.117***	**-.142***	**.223****	-.081	.107
64.Appreciate art	Pear Corr	.086	**.128***	-.101	.110	-.029	.043
84.NOT enjoy art	Pear Corr	-.050	-.048	**.254****	-.052	.113	.012
47.NOT musical	Pear Corr	.100	.070	**.159****	**.136***	.000	.076
61.Listen to music	Pear Corr	**.120***	.036	-.060	**.125***	**.125***	.069
68.Enjoy music	Pear Corr	.056	.035	-.045	-.048	.088	-.022
69.Take risks	Pear Corr	.061	-.088	.040	**.414****	-.112	**.388****
71.NOT seek adventures	Pear Corr	-.008	**.165****	.097	**-.224****	**.395****	-.096
76.Enjoy unknown	Pear Corr	.028	-.057	-.037	**.303****	**-.175****	**.243****
49.NOT stand out	Pear Corr	**.197****	**.312****	-.015	-.057	**.120***	-.098
72.Unconventional	Pear Corr	-.022	**-.125***	**.173****	**.302****	**-.125***	**.192****
75.Comfortable/different	Pear Corr	.056	-.057	-.043	**.233****	-.106	**.131***
46.Novel uses	Pear Corr	**.129***	.044	.009	**.243****	**-.173****	**.150***
66.Difficult/visualize	Pear Corr	-.055	.040	**.249****	-.081	**.348****	.059
77.Visualize solutions	Pear Corr	.024	-.056	.025	**.283****	**-.147***	**.166****
79.NOT good/symbols	Pear Corr	.091	**.143***	.091	-.065	**.220****	.104
81.Insights/ment. Images	Pear Corr	.100	.107	.019	**.140***	.099	**.143***
83.Metaphors	Pear Corr	-.020	-.106	.019	**.153****	-.078	**.133***
62.NOTconnect/emotions	Pear Corr	-.023	-.077	**.248****	.014	.010	.017
88.Emotionally involved	Pear Corr	.108	.073	-.087	.045	.103	.108
94.Compelling ideas	Pear Corr	.111	.038	-.016	**.179****	.085	**.237****
58.LESS receptive	Pear Corr	.084	.004	.066	.070	**.150****	.102
74.More intuitive times	Pear Corr	.075	-.048	-.002	.045	**.115***	.069
90.Not more productive	Pear Corr	.001	.086	.080	.088	.014	.045
86.Know w/o knowing	Pear Corr	.068	.026	.009	**.256****	-.104	**.178****
96.Decisions	Pear Corr	.015	**-.122***	.078	**.286****	**-.192****	**.348****
99.MORE info	Pear Corr	.090	.085	.025	**-.119***	**.378****	**-.151****

Table 4.95 *(continued)*

INTER-ITEM CORRELATION MATRIX		COOPERATIVENESS			IMPULSIVITY		
		57. Coope-rative	67. Coope rate	82.* NOT coope-ration	60. Spon-tane-ously	70.* LOST w/o plan	80. Decisions impulsive
HBDI® 100 Introv/Extrav	Pear Corr	.080	-.063	**-.184****	.118	.037	**.166****
HBDI® 5 Handedness	Pear Corr	.006	.009	.076	.093	-.033	.055
HBDI® 6 Hand Lft/Right	Pear Corr	.023	-.027	.003	.048	**-.196****	.027
HBDI® 6 Hand R-Domin.	Pear Corr	.054	.035	.040	.060	**-.165****	.024
Sex	Pear Corr	**.206****	**.126***	**-.131***	-.085	.089	-.060
Age	Pear Corr	.006	.043	-.002	**.155****	**-.156****	.080

Cooperativeness (DOI items 57, 67, 82) and Impulsivity (DOI items 60, 70*, 80)*—*Table 4.95*. The variables presented in the table above are discussed below.

- Cooperativeness (DOI item 57 Cooperative). A moderately weak negative correlation (-.379) was found between item 57 and the negatively-worded item 82 (NOT cooperation). This negative correlation was as expected.

  Extremely weak to moderately weak positive correlations (.120 to .439) were found between item 57 and nine DOI items, presented below in ascending order from weakest to strongest. Except for the biological variable age, all of the items were positively worded; so the positive direction of these correlations was as expected.

  - 61. Listen to music (.120)
  - 48. Interest in arts/aesthetics (.129)
  - 78. Flexible plans (.129)
  - 46. Novel uses (.129)
  - 63. To do lists (.193)
  - 49. NOT stand out (.197)
  - Sex (.206)
  - 91. Flexibility (.230)
  - 67. Cooperate (.439)

- Cooperativeness (DOI item 67 Cooperate). Moderately to extremely weak negative correlations (-.412 to -.123) were found between item 59 and three

negatively-worded DOI items, presented below in descending order from strongest to weakest. Item 67 was positively worded, so the negative direction of the correlation with item 82 (NOT cooperation) was as expected. Though items 72 and 96 were positively worded and negative correlation with item 67 was *not* as expected, the correlations were extremely weak (-.125 to -.122).

- 82. NOT cooperation (-.354)
- 72. Unconventional (-.125)
- 96. Decisions (-.122)

Extremely weak to moderately weak positive correlations (.117 to .312) were found between item 67 and seven DOI items, presented below in ascending order from weakest to strongest. Correlation with sex was very weak (.126). Correlations with positively-worded items 48 and 64 were as expected. Though the positive correlations with the four remaining items (63, 79, 71 and 49) were *not* as expected, these correlations were also very weak (.141 to .312).

- 48. Interest in arts/aesthetics (.117)
- Sex (.126)
- 64. Appreciate art (.128)
- 63. To do lists (.141)
- 79. NOT good/symbols (.143)
- 71. NOT seek adventures (.165)
- 49. NOT stand out (.312)

- Cooperativeness (DOI items 82* NOT cooperation). Extremely weak negative correlations (-.184 to -.131) were found between negatively-worded item 82 and three items, presented below in descending order from strongest to weakest. Of the three items, Interest in arts/aesthetics(item 48) was positively worded; so its negative correlation with negative DOI item 82 was

expected. The remaining correlations, both extremely weak, were with HBDI® item introversion/extraversion and the biological variable sex.

- HBDI® 100 Introversion/Extraversion (-.184)
- 48. Interest in arts/aesthetics (-.142)
- Sex (-.131)

Extremely weak positive correlations (.159 to .254) were found between item 82 and five DOI items, presented below in ascending order from weakest to strongest. Except for positively-worded item 72 (Unconventional), the positive direction of the correlations was as expected.

- 47. NOT musical (.159)
- 72. Unconventional (.173)
- 62. NOT connect/emotions (.248)
- 66. DIFFICULT/visualize (.249)
- 84. NOT enjoy art (.254)

- Impulsivity (DOI item 60 Spontaneously). Moderate to extremely weak negative correlations (-.410 to -.119) were found between item 60 and four negatively-worded DOI items, presented below in descending order from strongest to weakest. Item 60 was positively worded, so the negative direction of these correlations was as expected.

  - 70. LOST w/o plan (-.410)
  - 71. NOT seek adventures (-.224)
  - 63. To do lists (-.151)
  - 99. MORE info (-.119)

  Extremely weak to moderately strong positive correlations (.125 to .534) were found between item 60 and the 18 DOI items presented below in ascending order from weakest to strongest. Except for negatively-worded item 47 (NOT musical), all of the items were positively worded; so the positive direction of these correlations was as expected.

- 61. Listen to music (.125)
- 47. NOT musical (.136)
- 81. Insights/mental images (.140)
- 83. Metaphors (.153)
- Age (.155)
- 94. Compelling ideas (.179)
- 48. Interest in arts/aesthetics (.223)
- 75. Comfortable/different (.233)
- 46. Novel uses (.243)
- 86. Know w/o knowing (.256)
- 77. Visualize solutions (.283)
- 96. Decisions (.286)
- 72. Unconventional (.302)
- 76. Enjoy unknown (.303)
- 91. Flexibility (.334)
- 69. Take risks (.414)
- 80. Decisions impulsive (.508)
- 78. Flexible plans (.534)

- Impulsivity (DOI item 70* LOST w/o plan). Very weak negative correlations (-.292 to -.125) were found between negatively-worded item 70 and 11 positively-worded DOI items, presented below in descending order from strongest to weakest. In addition to the biological variable age, two of the correlations were with the biological variable handedness (right dominance, and distributed left/right dominance). The remaining eight correlations were with positively-worded DOI items. Though the direction of these correlations was *not* as anticipated, the correlations were quite weak.

  - 78. Flexible plans (-.292)
  - 80. Decisions impulsive (-.213)
  - HBDI® 6 Handedness Left/Right (-.196)
  - 96. Decisions (-.192)
  - 91. Flexibility (-.184)
  - 76. Enjoy unknown (-.175)
  - 46. Novel uses (-.173)
  - HBDI® 6 Handedness Right-Dominance (-.165)
  - Age (-.156)
  - 77. Visualize solutions (-.147)
  - 72. Unconventional (-.125)

Extremely weak to moderately strong positive correlations (.115 to .448) were found between item 70 and nine DOI items, presented below in ascending order from weakest to strongest. Correlations with positively-worded items 74, 61 and 58 were *not* as expected but were extremely weak.

- 74. More intuitive times (.115)
- 49. NOT stand out (.120)
- 61. Listen to music (.125)
- 58. LESS receptive (.150)
- 79. NOT good/symbols (.220)
- 66. DIFFICULT/visualize (.348)
- 99. MORE info (.378)
- 71. NOT seek adventures (.395)
- 63. To do lists (.448)

- Impulsivity (DOI item 80 Decisions impulsive). An extremely weak negative correlation was found between item 80 and negatively-worded DOI item 99 (MORE info, -.151). Though *not* as expected, this correlation was very weak.

  Extremely to moderately weak positive correlations (.131 to .388) were found between item 80 and 14 DOI items, presented below in ascending order from weakest to strongest. Except for introversion/extraversion, the items were positively worded; and the direction of the correlations was as expected.

  - 75. Comfortable/different (.131)
  - 83. Metaphors (.133)
  - 81. Insights/mental images (.143)
  - 46. Novel uses (.150)
  - 77. Visualize solutions (.166)
  - HBDI® 100 Introversion/Extraversion (.166)
  - 86. Know w/o knowing (.178)
  - 72. Unconventional (.192)
  - 91. Flexibility (.214)
  - 94. Compelling ideas (.237)
  - 76. Enjoy unknown (.243)
  - 78. Flexible plans (.298)
  - 96. Decisions (.348)
  - 69. Take risks (.388)

Flexibility (DOI items 63, 78, 91) and Interest in Arts/Aesthetics (DOI items 48, 64, 84*).* Table 4.96 below presents the inter-item correlations for these variables.

Table 4.96: Inter-Item Correlations—Flexibility (DOI Items 63*, 78, 91); and Interest in Arts/Aesthetics (DOI Items 48, 64, 84*)

INTER-ITEM CORRELATION MATRIX		FLEXIBILITY			INTEREST ARTS/AESTHETICS		
		63.* To do lists	78. Flexible plans	91. Flexi-bility	48. Interest in art	64. Appre-ciate art	84.* NOT enjoy art
63.To do lists	Pear Corr	1.000					
78.Flexible plans	Pear Corr	**-.124***	1.000				
91.Flexibility	Pear Corr	-.021	**.471****	1.000			
48.Interest in arts/aesth	Pear Corr	.061	**.264****	**.136***	1.000		
64.Appreciate art	Pear Corr	.041	**.232****	**.139***	**.794****	1.000	
84.NOT enjoy art	Pear Corr	.018	**-.178****	-.033	**-.664****	**-.721****	1.000
47.NOT musical	Pear Corr	-.110	.052	.095	-.043	-.113	**.185****
61.Listen to music	Pear Corr	.084	**.180****	**.160****	**.274****	**.252****	**-.151****
68.Enjoy music	Pear Corr	**.200****	.020	.037	**.261****	**.290****	**-.265****
69.Take risks	Pear Corr	-.025	**.350****	**.239****	**.191****	**.124***	-.051
71.NOT seek adventures	Pear Corr	**.190****	**-.135***	**-.193****	-.100	-.045	**.122***
76.Enjoy unknown	Pear Corr	-.027	**.329****	**.339****	**.302****	**.281****	**-.162****
49.NOT stand out	Pear Corr	.048	.001	-.056	.030	.067	.038
72.Unconventional	Pear Corr	.025	**.260****	**.137***	**.230****	**.241****	**-.135***
75.Comfortable/different	Pear Corr	.008	**.326****	**.256****	**.253****	**.238****	**-.132***
46.Novel uses	Pear Corr	.028	**.320****	**.257****	**.393****	**.285****	**-.173****
66.Difficult/visualize	Pear Corr	**.129***	**-.161****	**-.182****	-.060	-.017	**.212****
77.Visualize solutions	Pear Corr	.022	**.294****	**.255****	**.271****	**.153****	**-.166****
79.NOT good/symbols	Pear Corr	.022	-.052	-.031	**-.188****	**-.134***	**.217****
81.Insights/ment. images	Pear Corr	.050	**.154****	**.177****	**.175****	**.136***	-.059
83.Metaphors	Pear Corr	.016	**.215****	**.132***	**.291****	**.215****	**-.197****
62.NOTconnect/emotions	Pear Corr	-.036	-.074	-.037	**-.150****	**-.169****	**.195****
88.Emotionally involved	Pear Corr	**.198****	**.133***	.039	**.202****	**.183****	-.056
94.Compelling ideas	Pear Corr	.060	**.257****	**.198****	**.268****	**.237****	**-.137***
58.LESS receptive	Pear Corr	-.017	.041	.025	.008	-.006	.041
74.More intuitive times	Pear Corr	-.029	.092	.034	.087	.078	-.091
90.Not more productive	Pear Corr	-.017	**.177****	**.278****	-.062	-.041	**.125***
86.Know w/o knowing	Pear Corr	.031	**.288****	**.173****	**.265****	**.201****	-.096
96.Decisions	Pear Corr	-.068	**.285****	**.278****	**.165****	.081	-.104
99.MORE info	Pear Corr	**.201****	-.081	-.103	.011	.068	.029
HBDI® 100 Introv/Extrav	Pear Corr	**.175****	.117	**.185****	.023	-.021	-.085
HBDI® 5 Handedness	Pear Corr	-.056	.027	.004	.073	.008	-.043
HBDI® 6 Hand Lft/Right	Pear Corr	**-.196****	.001	-.045	-.019	-.030	.007
HBDI® 6 Hand R-Domin.	Pear Corr	**-.170****	-.018	-.045	.018	-.011	-.040
Sex	Pear Corr	**.199****	-.030	-.062	**.129***	**.162****	**-.123***
Age	Pear Corr	.057	.086	.082	.108	.055	-.025

Flexibility (DOI items 63, 78, 91) and Interest in Arts/Aesthetics (DOI items 48, 64, 84*)—Table 4.96*. The variables presented in the table above are discussed below.

- Flexibility (DOI item 63* To do lists). Extremely weak negative correlations (-.196 to -.124) were found between negatively-worded item 63 and three items, presented below in descending order from strongest to weakest. Two of the correlations were with handedness. Since DOI item 63 was negatively worded, the negative direction of these correlations was *not* as expected.

  - HBDI® 6 Handedness Left/Right (-.196)
  - HBDI® 6 Handedness Right-Dominance (-.170)
  - 78. Flexible plans (-.124)

  Extremely weak positive correlations (.129 to .201) were found between item 63 and seven DOI items, presented below in ascending order from weakest to strongest. Two of the seven items were biological variable sex, and introversion/extraversion. Two additional items (88 and 68) were positively worded, and the positive direction of their correlation with negatively-worded item 63 was *not* as anticipated.

  - 66. DIFFICULT/visualize (.129)
  - HBDI® 100 Introversion/Extraversion (.175)
  - 71. NOT seek adventures (.190)
  - 88. Emotionally involved (.198)
  - Sex (.199)
  - 68. Enjoy music (.200)
  - 99. MORE info (.201)

- Flexibility (DOI item 78 Flexible plans). Extremely weak negative correlations (-.178 to -.135) were found between item 78 and three negatively-worded DOI items, presented below in descending order from strongest to weakest. The negative direction of these correlations was as expected.

- 84. NOT enjoy art (-.178)
- 66. DIFFICULT/visualize (-.161)
- 71. NOT seek adventures (-.135)

Extremely weak to moderately strong positive correlations (.133 to .471) were found between item 78 and 17 DOI items, presented below in ascending order from weakest to strongest. Except for the negatively-worded item 90 (NOT more productive, .177), all of the items were positively worded; so the positive direction of these correlations was as expected.

- 88. Emotionally involved (.133)
- 81. Insights/mental images (.154)
- 90. NOT more productive (.177)
- 61. Listen to music (.180)
- 83. Metaphors (.215)
- 64. Appreciate art (.232)
- 94. Compelling ideas (.257)
- 72. Unconventional (.260)
- 48. Interest in arts/aesthetics (.264)
- 96. Decisions (.285)
- 86. Know w/o knowing (.288)
- 77. Visualize solutions (.294)
- 46. Novel uses (.320)
- 75. Comfortable/different (.326)
- 76. Enjoy unknown (.329)
- 69. Take risks (.350)
- 91. Flexibility (.471)

- Flexibility (DOI item 91 Flexibility). Extremely weak negative correlations (-.193 to -.182) were found between positively-worded item 91 and two negatively-worded DOI items, presented below in descending order from strongest to weakest. The negative direction of these correlations was as expected.

  - 71. NOT seek adventures (-.193)
  - 66. DIFFICULT/visualize (-.182)

Extremely to moderately weak positive correlations (.132 to .339) were found between item 91 and 16 DOI items, presented below in ascending order from weakest to strongest. Except for introversion/extraversion and item 90 (NOT more productive, .278), all items were positively worded; so the positive direction of the correlations was as expected.

- 83. Metaphors (.132)
- 48. Interest in arts/aesthetics (.136)
- 72. Unconventional (.137)
- 64. Appreciate art (.139)
- 61. Listen to music (.160)
- 86. Know w/o knowing (.173)
- 81. Insights/mental images (.177)
- HBDI® 100 Introversion/Extraversion (.185)
- 94. Compelling ideas (.198)
- 69. Take risks (.239)
- 77. Visualize solutions (.255)
- 75. Comfortable/different (.256)
- 46. Novel uses (.257)
- 90. NOT more productive (.278)
- 96. Decisions (.278)
- 76. Enjoy unknown (.339)

- Interest in Arts/Aesthetics (DOI item 48 Interest in art). Somewhat strong to extremely weak negative correlations were found between positively-worded item 48 and three negatively-worded DOI items, presented below in descending order from strongest to weakest. The negative direction of these correlations was as expected.

  - 84. NOT enjoy art (-.664)
  - 79. NOT good/symbols (-.188)
  - 62. NOT connect/emotions (-.150)

  Extremely weak to very strong positive correlations (.129 to .494) were found between item 48 and 16 DOI items, presented below in ascending order from weakest to strongest. All of the correlations were positive, as expected.

- Sex (.129)
- 96. Decisions (.165)
- 81. Insights/mental images (.175)
- 69. Take risks (.191)
- 88. Emotionally involved (.202)
- 72. Unconventional (.230)
- 75. Comfortable/different (.253)
- 68. Enjoy music (.261)
- 86. Know w/o knowing (.265)
- 94. Compelling ideas (.268)
- 77. Visualize solutions (.271)
- 61. Listen to music (.274)
- 83. Metaphors (.291)
- 76. Enjoy unknown (.302)
- 46. Novel uses (.393)
- 64. Appreciate art (.794)

- Interest in Arts/Aesthetics (DOI item 64 Appreciate art). Very strong to extremely weak negative correlations (-.721 to -.134) were found between item 64 and three negatively-worded DOI items, which are presented below in descending order from strongest to weakest. The negative direction of these correlations was as expected.

  - 84. NOT enjoy art (-.721)
  - 62. NOT connect/emotions (-.169)
  - 79. NOT good/symbols (-.134)

  Extremely weak positive correlations (.124 to .290) were found between item 64 and the 14 DOI items presented below in ascending order from weakest to strongest. Except for the biological variable age, all items were positively worded; so the positive correlations were as expected.

  - 69. Take risks (.124)
  - 81. Insights/mental images (.136)
  - 77. Visualize solutions (.153)
  - Sex (.162)
  - 88. Emotionally involved (.183)
  - 86. Know w/o knowing (.201)
  - 83. Metaphors (.215)

- 94. Compelling ideas (.237)
- 75. Comfortable/different (.238)
- 72. Unconventional (.241)
- 61. Listen to music (.252)
- 76. Enjoy unknown (.281)
- 46. Novel uses (.285)
- 68. Enjoy music (.290)

- Interest in Arts/Aesthetics (DOI item 84* NOT enjoy art). Extremely weak negative correlations (-.265 to -.123) were found between negatively-worded item 84 and 10 DOI items, presented below in descending order from strongest to weakest. Except for biological variable sex, all items were positively worded; so the negative direction of the correlations was expected.

  - 68. Enjoy music (-.265)
  - 83. Metaphors (-.197)
  - 46. Novel uses (-.173)
  - 77. Visualize solutions (-.166)
  - 76. Enjoy unknown (-.162)
  - 61. Listen to music (-.151)
  - 94. Compelling ideas (-.137)
  - 72. Unconventional (-.135)
  - 75. Comfortable/different (-.132)
  - Sex (-.123)

  Extremely weak positive correlations (.122 to .217) were found between item 84 and six DOI items, presented below in ascending order from weakest to strongest. All six of the items were negatively worded; so the positive direction of these correlations with negatively-worded item 84 was as expected.

  - 71. NOT seek adventures (.122)
  - 90. NOT more productive (.125)
  - 47. NOT musical (.185)
  - 62. NOT connect/emotions (.195)
  - 66. DIFFICULT/visualize (.212)
  - 79. NOT good/symbols (.217)

Music (DOI items 47, 61, 68) and Adventure-Seeking (DOI items 69, 71*, 76).*

Table 4.97 below presents the inter-item correlations for these variables.

Table 4.97: Inter-Item Correlations—Music (DOI Items 47*, 61, 68); and Adventure-Seeking (DOI Items 69, 71*, 76)

INTER-ITEM CORRELATION MATRIX		MUSIC			ADVENTURE-SEEKING		
		47.* NOT musical	61. Listen to music	68. Enjoy music	69. Take risks	71.* NOT seek ad-ventures	76. Enjoy Unknown
47.NOT musical	Pear Corr	1.000					
61.Listen to music	Pear Corr	**-.163****	1.000				
68.Enjoy music	Pear Corr	**-.364****	**.514****	1.000			
69.Take risks	Pear Corr	.004	**.138***	.022	1.000		
71.NOT seek adventures	Pear Corr	**.159****	-.087	-.023	**-.364****	1.000	
76.Enjoy unknown	Pear Corr	-.035	**.184****	.065	**.488****	**-.451****	1.000
49.NOT stand out	Pear Corr	**.245****	-.013	.007	**-.115***	**.266****	**-.148***
72.Unconventional	Pear Corr	-.081	**.150***	.089	**.407****	-.076	**.334****
75.Comfortable/different	Pear Corr	-.079	**.158****	.099	**.301****	**-.141***	**.463****
46.Novel uses	Pear Corr	-.107	**.141***	**.159****	**.240****	**-.230****	**.386****
66.Difficult/visualize	Pear Corr	.101	.065	.034	-.105	**.374****	**-.212****
77.Visualize solutions	Pear Corr	-.015	**.148***	-.008	**.350****	**-.317****	**.539****
79.NOT good/symbols	Pear Corr	**.220****	-.069	-.008	-.079	**.342****	**-.214****
81.Insights/ment. images	Pear Corr	.044	**.251****	.078	**.141***	.049	**.152****
83.Metaphors	Pear Corr	**-.115***	**.172****	**.145***	**.166****	**-.192****	**.341****
62.NOTconnect/emotions	Pear Corr	**.168****	-.050	**-.133***	.089	.092	-.049
88.Emotionally involved	Pear Corr	**-.121***	**.138***	**.179****	.090	-.010	.104
94.Compelling ideas	Pear Corr	-.074	**.178****	**.123***	**.185****	-.108	**.277****
58.LESS receptive	Pear Corr	**.121***	**.135***	-.064	**.118***	.088	.077
74.More intuitive times	Pear Corr	-.029	**.277****	.073	**.123***	.011	**.122***
90.Not more productive	Pear Corr	**.135***	.004	-.037	.065	.049	.036
86.Know w/o knowing	Pear Corr	**-.179****	**.190****	.086	**.130***	**-.119***	**.262****
96.Decisions	Pear Corr	.039	.092	.017	**.372****	**-.233****	**.314****
99.MORE info	Pear Corr	.051	.068	.036	-.062	**.305****	-.057
HBDI® 100 Introv/Extrav	Pear Corr	**-.184****	.059	.097	**.149***	**-.170****	.093
HBDI® 5 Handedness	Pear Corr	-.050	-.015	.067	.058	.025	-.035
HBDI® 6 Hand Lft/Right	Pear Corr	-.036	-.023	.058	.001	**-.143***	.064
HBDI® 6 Hand R-Domin.	Pear Corr	-.029	-.087	.073	-.019	-.049	-.029
Sex	Pear Corr	**-.221****	.082	**.164****	**-.116***	.047	-.042
Age	Pear Corr	.007	.018	-.090	.106	-.100	**.147***

Music (DOI items 47, 61, 68)* and *Adventure-Seeking (DOI items 69, 71*, 76)—Table 4.97*. The variables presented in the table above are discussed below.

- Music (DOI item 47* NOT musical). Relatively to extremely weak negative correlations (-.364 to -.115) were found between negatively-worded item 47 and seven items, presented below in descending order from strongest to weakest. Except for the biological variable sex and introversion/extraversion, all of the items were positively worded; so the negative direction of the correlations was as expected.
    - 68. Enjoy music (-.364)
    - Sex (-.221)
    - HBDI® 100 Introversion/Extraversion (-.184)
    - 86. Know w/o knowing (-.179)
    - 61. Listen to music (-.163)
    - 88. Emotionally involved (-.121)
    - 83. Metaphors (-.115)

    Extremely weak positive correlations (.121 to .245) were found between item 47 and six DOI items, presented below in ascending order from weakest to strongest. Except for item 58 (LESS receptive), the items were negatively worded; so the positive direction of the correlations was as expected.

    - 58. LESS receptive (.121)
    - 90. NOT more productive (.135)
    - 71. NOT seek adventures (.159)
    - 62. NOT connect/emotions (.168)
    - 79. NOT good/symbols (.220)
    - 49. NOT stand out (.245)
- Music (DOI item 61 Listen to music). No negative correlations were found with positively-worded item 61. Extremely weak to moderately strong positive correlations (.135 to .514) were found between item 61 and 14 positively-worded DOI items, presented below in ascending order from weakest to strongest. All of the items were positively worded, so the positive direction of the correlations was as expected.

- 58. LESS receptive (.135)
- 88. Emotionally involved (.138)
- 69. Take risks (.138)
- 46. Novel uses (.141)
- 77. Visualize solutions (.148)
- 72. Unconventional (.150)
- 75. Comfortable/different (.158)
- 83. Metaphors (.172)
- 94. Compelling ideas (.178)
- 76. Enjoy unknown (.184)
- 86. Know w/o knowing (.190)
- 81. Insights/mental images (.251)
- 74. More intuitive times (.277)
- 68. Enjoy music (.514)

- Music (DOI item 68 Enjoy music). An extremely weak negative correlation (-.133) was found between positively-worded item 68 and negatively-worded item 62 (NOT connect/emotions). The negative direction of the correlation was as expected. Extremely weak positive correlations (.123 to .179) were found between item 68 and five DOI items, presented below in ascending order from weakest to strongest. Except for the biological variable sex, all of the items were positively worded; and the positive direction of the correlations was as expected.

  - 94. Compelling ideas (.123)
  - 83. Metaphors (.145)
  - 46. Novel uses (.159)
  - Sex (.164)
  - 88. Emotionally involved (.179)

- Adventure-Seeking (DOI item 69 Take risks). Moderately to extremely weak correlations were found between item 69 and three items, presented below in descending order from strongest to weakest. The biological variable sex had an extremely weak correlation (-.116). The two remaining items were negatively worded, so the direction of the correlations was as expected.

- 71. NOT seek adventures (-.364)
- Sex (-.116)
- 49. NOT stand out (-.115)

Extremely to relatively weak positive correlations (.118 to .488) were found between item 69 and 13 DOI items, presented below in ascending order from weakest to strongest. Except for introversion/extraversion, these items were all positively worded; so the positive direction of the correlations was as expected.

- 58. LESS receptive (.118)
- 74. More intuitive times (.123)
- 86. Know w/o knowing (.130)
- 81. Insights/mental images (.141)
- HBDI® 100 Introversion/Extraversion (.149)
- 83. Metaphors (.166)
- 94. Compelling ideas (.185)
- 46. Novel uses (.240)
- 75. Comfortable/different (.301)
- 77. Visualize solutions (.350)
- 96. Decisions (.372)
- 72. Unconventional (.407)
- 76. Enjoy unknown (.488)

- Adventure-Seeking (DOI item 71* NOT seek adventures). Moderately to extremely weak negative correlations (-.451 to -.119) were found between negatively-worded item 71 and eight items, presented below in descending order from strongest to weakest. Except for introversion/extraversion, the items were positively worded; so the negative correlations were as expected.

  - 76. Enjoy unknown (-.451)
  - 77. Visualize solutions (-.317)
  - 96. Decisions (-.233)
  - 46. Novel uses (-.230)
  - 83. Metaphors (-.192)
  - HBDI® 100 Introversion/Extraversion (-.170)
  - 75. Comfortable/different (-.141)
  - 86. Know w/o knowing (-.119)

Moderately weak positive correlations (.266 to .374) were found between item 71 and 4 negatively-worded DOI items, presented below in ascending order from weakest to strongest. The positive direction of these correlations was as expected.

- 49. NOT stand out (.266)
- 99. MORE info (.305)
- 79. NOT good/symbols (.342)
- 66. DIFFICULT/visualize (.374)

- Adventure-Seeking (DOI item 76 Enjoy unknown). Very weak negative correlations were found between item 76 and three negatively-worded DOI items, presented below in descending order from strongest to weakest. The negative direction of these correlations was as expected.

  - 79. NOT good/symbols (-.214)
  - 66. DIFFICULT/visualize (-.212)
  - 49. NOT stand out (-.148)

  Extremely weak to moderately strong positive correlations (.122 to .539) were found between item 76 and 11 DOI items, presented below in ascending order from weakest to strongest. Except for the biological variable age, all of the items were positively worded; so the direction of the positive correlations was as expected.

  - 74. More intuitive times (.122)
  - Age (.147)
  - 81. Insights/mental images (.152)
  - 86. Know w/o knowing (.262)
  - 94. Compelling ideas (.277)
  - 96. Decisions (.314)
  - 72. Unconventional (.334)
  - 83. Metaphors (.341)
  - 46. Novel uses (.386)
  - 75. Comfortable/different (.463)
  - 77. Visualize solutions (.539)

Unconventionality (DOI items 49, 72, 75) and Ability to Visualize (DOI items 46, 66*, 77).* Table 4.98 below presents the inter-item correlations for these variables.

Table 4.98: Inter-Item Correlations—Unconventionality (DOI Items 49*, 72, 75); and Ability to Visualize (DOI Items 46, 66*, 77)

INTER-ITEM CORRELATION MATRIX		UNCONVENTIONALITY			ABILITY TO VISUALIZE		
		49.* NOT stand out	72. Uncon-ven-tional	75. Comfort-able/dif-ferent	46. Novel uses	66.* DIFFI-CULT/ visualize	77. Visualize solutions
49.NOT stand out	Pear Corr	1.000					
72.Unconventional	Pear Corr	-.096	1.000				
75.Comfortable/different	Pear Corr	**-.144***	**.440****	1.000			
46.Novel uses	Pear Corr	.061	**.287****	**.333****	1.000		
66.Difficult/visualize	Pear Corr	.104	-.042	**-.138***	**-.229****	1.000	
77.Visualize solutions	Pear Corr	**-.136***	**.319****	**.362****	**.578****	**-.385****	1.000
79.NOT good/symbols	Pear Corr	**.222****	**-.166****	-.073	**-.243****	**.371****	**-.382****
81.Insights/ment. images	Pear Corr	.098	.070	.063	**.216****	-.012	**.280****
83.Metaphors	Pear Corr	-.089	**.218****	**.217****	**.429****	**-.211****	**.508****
62.NOTconnect/emotions	Pear Corr	.029	.079	-.011	-.002	.058	-.006
88.Emotionally involved	Pear Corr	-.102	.051	.035	.028	**.181****	-.024
94.Compelling ideas	Pear Corr	**-.123***	**.139***	.095	**.221****	.006	**.208****
58.LESS receptive	Pear Corr	.031	.035	.009	-.040	**.146***	.043
74.More intuitive times	Pear Corr	-.046	-.013	.101	.005	.015	.110
90.Not more productive	Pear Corr	.062	-.005	.056	**.131***	.026	.086
86.Know w/o knowing	Pear Corr	-.079	**.262****	**.236****	**.370****	-.024	**.312****
96.Decisions	Pear Corr	**-.167****	**.231****	**.251****	**.347****	**-.247****	**.370****
99.MORE info	Pear Corr	**.205****	.013	-.111	-.079	**.269****	**-.158****
HBDI® 100 Introv/Extrav	Pear Corr	**-.312****	-.047	.048	.057	-.119	.106
HBDI® 5 Handedness	Pear Corr	.008	.090	.052	.022	.096	-.016
HBDI® 6 Hand Lft/Right	Pear Corr	-.004	-.085	.028	.022	-.014	-.034
HBDI® 6 Hand R-Domin.	Pear Corr	.056	-.037	-.001	-.037	.069	-.089
Sex	Pear Corr	-.028	.020	.071	-.081	.035	**-.154****
Age	Pear Corr	.049	.063	.040	**.201****	-.085	**.159****

Unconventionality (DOI items 49, 72, 75) and Ability to Visualize (DOI items 46, 66*, 77)—Table 4.98*. Variables presented in the table above are discussed below.

- Unconventionality (DOI item 49* NOT stand out). Very weak negative correlations (-.312 to -.123) were found between negatively-worded item 49 and the five items below, in descending order from strongest to weakest.

Except for introversion/extraversion, the items were positively worded, and the negative direction of the correlations was as expected.

- HBDI® 100 Introversion/Extraversion (-.312)
- 96. Decisions (-.167)
- 75. Comfortable/different (-.144)
- 77. Visualize solutions (-.136)
- 94. Compelling ideas (-.123)

Very weak correlations (.205 and .222) were found between item 49 and two negatively-worded items (99 and 79). The positive direction of these two correlations was as expected.

- 99. MORE info (.205)
- 79. NOT good/symbols (.222)

- Unconventionality (DOI item 72 Unconventional). Extremely to moderately weak negative correlations (.139 to .440) were found between item 72 and one negatively-worded item (79 NOT good/symbols), in the direction anticipated. Extremely to moderately weak positive correlations (.139 to .440) were found between item 72 and the seven positively-worded DOI items presented below in ascending order, weakest to strongest. The direction of these correlations was also as anticipated.

  - 94. Compelling ideas (.139)
  - 83. Metaphors (.218)
  - 96. Decisions (.231)
  - 86. Know w/o knowing (.262)
  - 46. Novel uses (.287)
  - 77. Visualize solutions (.319)
  - 75. Comfortable/different (.440)

- Unconventionality (DOI item 75 Comfortable/different). An extremely weak correlation (-.138) was found between item 75 and negatively-worded item 66 (DIFFICULT/visualize). Moderately weak positive correlations (.217 to .362)

were found between item 75 and five positively-worded DOI items, presented below in ascending order from weakest to strongest. The positive direction of these correlations was as expected.

- 83. Metaphors (.217)
- 86. Know w/o knowing (.236)
- 96. Decisions (.251)
- 46. Novel uses (.333)
- 77. Visualize solutions (.362)

- Ability to Visualize (DOI item 46 Novel uses). Extremely weak negative correlations were found between item 46 and three DOI items, presented below in descending order from strongest to weakest. The negative direction of these correlations was as expected.

  - 79. NOT good/symbols (-.243)
  - 66. DIFFICULT/visualize (-.229)
  - 90. NOT more productive (.131)

  Very weak to moderately strong positive correlations (.201 to .578) were found between item 46 and seven DOI items, presented below in ascending order from weakest to strongest. Except for the biological variable age, the items were positively worded, and the positive correlations were as expected.

  - Age (.201)
  - 81. Insights/mental images (.216)
  - 94. Compelling ideas (.221)
  - 96. Decisions (.347)
  - 86. Know w/o knowing (.370)
  - 83. Metaphors (.429)
  - 77. Visualize solutions (.578)

- Ability to Visualize (DOI item66* DIFFICULT/visualize). Very weak negative correlations (-.385 to -.211) were found between item 66 and three DOI items, presented below in descending order from strongest to weakest. The negative direction of the correlations was as expected.

- 77. Visualize solutions (-.385)
- 96. Decisions (-.247)
- 83. Metaphors (-.211)

Extremely to moderately weak positive correlations (.146 to .371) were found between negatively-worded item 66 and four DOI items, presented below in ascending order from weakest to strongest. Two of these items (99 and 79) were negatively worded, so the positive direction of the correlations was as expected. Correlations with items 58 and 88 were *not* as anticipated, though both were extremely weak (.146 and .181, respectively).

- 58. LESS receptive (.146)
- 88. Emotionally involved (.181)
- 99. MORE info (.269)
- 79. NOT good/symbols (.371)

- Ability to Visualize (DOI item 77 Visualize solutions). Very weak negative correlations (-.382 and -.154) were found between item 77 and three items, presented below in descending order from strongest to weakest. Except for the biological variable sex, the items were negatively worded; and the negative direction of the correlations was as expected.

  - 79. NOT good/symbols (-.382)
  - 99. MORE info (-.158)
  - Sex (-.154)

  Very weak to moderately strong positive correlations (.159 to .508) were found between item 77 and six items, presented below in ascending order from weakest to strongest. Except for the biological variable age, which had the weakest correlation among the six items (.159), all of the items were positively worded; so the positive direction of these correlations was as anticipated.

- Age (.159)
- 94. Compelling ideas (.208)
- 81. Insights/mental images (.280)
- 86. Know w/o knowing (.312)
- 96. Decisions (.370)
- 83. Metaphors (.508)

Imagery (DOI items 79, 81, 83) and Emotions (DOI items 62*, 88, 94).* Table 4.99 below presents the inter-item correlations for these variables.

Table 4.99: Inter-Item Correlations—Imagery (DOI Items 79*, 81, 83); and Emotions (DOI Items 62*, 88, 94)

INTER-ITEM CORRELATION MATRIX		IMAGERY			EMOTIONS		
		79.* NOT good/ symbols	81. Insights /mental images	83. Meta-phors	62.* NOT connect/ emotion	88. Emotion-ally involved	94. Compel-ling ideas
79.NOT good/symbols	Pear Corr	1.000					
81.Insights/ment. images	Pear Corr	-.020	1.000				
83.Metaphors	Pear Corr	**-.327****	**.123***	1.000			
62.NOTconnect/emotions	Pear Corr	**.178****	.051	**-.146***	1.000		
88.Emotionally involved	Pear Corr	-.005	.049	.034	**-.432****	1.000	
94.Compelling ideas	Pear Corr	**-.149***	**.122***	**.295****	**-.338****	**.546****	1.000
58.LESS receptive	Pear Corr	.097	**.168****	.062	.078	.095	**.117***
74.More intuitive times	Pear Corr	.012	**.205****	.092	.026	.037	**.164****
90.Not more productive	Pear Corr	.028	**.149***	-.069	**.190****	**-.120***	-.061
86.Know w/o knowing	Pear Corr	**-.210****	**.245****	**.301****	**-.136***	.113	**.204****
96.Decisions	Pear Corr	**-.126***	.094	**.300****	.053	-.052	**.156****
99.MORE info	Pear Corr	**.205****	.096	**-.120***	**.181****	.053	-.001
HBDI® 100 Introv/Extrav	Pear Corr	-.038	-.021	.032	**-.182****	**.202****	**.318****
HBDI® 5 Handedness	Pear Corr	**-.174****	.013	.040	-.091	.044	.055
HBDI® 6 Hand Lft/Right	Pear Corr	.043	.027	.008	.013	-.095	.025
HBDI® 6 Hand R-Domin.	Pear Corr	-.058	-.013	-.008	-.046	-.061	.055
Sex	Pear Corr	.021	.002	**-.130***	**-.188****	**.206****	**.123***
Age	Pear Corr	.014	.019	**.152****	.078	**-.117***	.023

Imagery (DOI items 79, 81, 83) and Emotions (DOI items 62*, 88, 94)*—Table 4.99. The variables presented in the table above are discussed below.

- Imagery (DOI item 79* NOT good/symbols). Extremely weak negative correlations (-.327 to -.126) were found between negatively-worded item 79

and five items, presented below in descending order from strongest to weakest. Except for handedness, which had an extremely weak correlation (-.174), the items were all positively worded. The negative direction of the correlations was as expected.

- 83. Metaphors (-.327)
- 86. Know w/o knowing (-.210)
- HBDI® 5 Handedness (-.174)
- 94. Compelling ideas (-.149)
- 96. Decisions (-.126)

Extremely weak positive correlations (.178 to .205) were found between item 79 and two negatively-worded DOI items, presented below in ascending order from weakest to strongest. The positive direction of these correlations was as expected.

- 62. NOT connect/emotions (.178)
- 99. MORE info (.205)

- Imagery (DOI item 81 Insights/mental images). No negative correlations were found with item 81. Extremely weak positive correlations (.122 to .245) were found between item 81 and six DOI items, presented below in ascending order from weakest to strongest. Except for the negatively-worded item 90 (NOT more productive), all of the items were positively worded; so the positive direction of these correlations was as expected.

  - 94. Compelling ideas (.122)
  - 83. Metaphors (.123)
  - 90. NOT more productive (.149)
  - 58. LESS receptive (.168)
  - 74. More intuitive times (.205)
  - 86. Know w/o knowing (.245)

- Imagery (DOI item 83 Metaphors). Extremely weak negative correlations (-.146 to -.130) were found between item 83 and three items, presented below in descending order from strongest to weakest. Except for the biological variable sex, with a correlation of -.130, the items were negatively worded. The negative direction of these correlations with positively-worded item 83 was as expected.
  - 62. NOT connect/emotions (-.146)
  - Sex (-.130)
  - 99. MORE info (-.120)

  Very weak positive correlations (.152 to .301) were found between item 83 and four items, presented below in ascending order from weakest to strongest. Except for the biological variable age, the items were positively worded; so the positive direction of these correlations was as expected.
  - Age (.152)
  - 94. Compelling ideas (.295)
  - 96. Decisions (.300)
  - 86. Know w/o knowing (.301)
- Emotions (DOI item 62* NOT connect emotions). Moderately to extremely weak negative correlations (-.432 to -.136) were found between negatively-worded item 62 and five items, presented below in descending order from strongest to weakest. Two items were the biological variable sex and introversion/extraversion. The remaining items were positively worded, so the negative direction of their correlations with item 62 was as expected.
  - 88. Emotionally involved (-.432)
  - 94. Compelling ideas (-.338)
  - Sex (-.188)
  - HBDI® 100 Introversion/Extraversion (-.182)
  - 86. Know w/o knowing (-.136)

Extremely weak positive correlations (.181 and .190) were found between item 62 and two negatively-worded DOI items, presented below in ascending order from weakest to strongest. The positive direction of these correlations with negatively-worded item 62 was as expected.

- 99. MORE info (.181)
- 90. NOT more productive (.190)

- Emotions (DOI item 88 Emotionally involved). Extremely weak negative correlations (-.120 and -.117) were found between item 88 and two items, presented below in descending order from strongest to weakest. One of the items was the biological variable age; the other was negatively-worded DOI item 90 (NOT more productive). The negative direction of the correlation for the latter was as expected.

  - 90. NOT more productive (-.120)
  - Age (-.117)

  Extremely weak to moderately strong positive correlations (.202 to .546) were found between item 88 and three items, presented below in ascending order from weakest to strongest. Correlations with introversion/extraversion and the biological variable sex were very weak, but the positive direction of the correlation with item 94 (Compelling ideas) was as expected.

  - HBDI® 100 Introversion/Extraversion (.202)
  - Sex (.206)
  - 94. Compelling ideas (.546)

- Emotions (DOI item 94 Compelling ideas). No negative correlations were found with item 94. Very weak positive correlations (.117 to .318) were found between item 94 and six items, presented below in ascending order

from weakest to strongest. Except for the biological variable sex and introversion/extraversion, the positive correlations were as expected.

- 58. LESS receptive (.117)
- Sex (.123)
- 96. Decisions (.156)
- 74. More intuitive times (.164)
- 86. Know w/o knowing (.204)
- HBDI® 100 Introversion/Extraversion (.318)

Time of Day (DOI items 58, 74, 90)* and *Amount of Information Available (DOI items 86, 96, 99*).* Table 4.100 below presents the inter-item correlations for these variables.

Table 4.100: Inter-Item Correlations—Time of Day (DOI Items 58, 74, 90*); and Amount of Information Available (DOI Items 86, 96, 99*)

INTER-ITEM CORRELATION MATRIX		TIME OF DAY			AMT OF INFO AVAILABLE		
		58. LESS recep-tive	**74. More intuitive times**	**90.* Not more productive**	**86. Know w/o knowing**	**96. Deci-sions**	**99.* MORE info**
58.LESS receptive	Pear Corr	1.000					
74.More intuitive times	Pear Corr	**.736****	1.000				
90.Not more productive	Pear Corr	**-.209****	**-.231****	1.000			
86.Know w/o knowing	Pear Corr	-.023	.038	-.017	1.000		
96.Decisions	Pear Corr	.018	.028	**.131***	**.259****	1.000	
99.MORE info	Pear Corr	**.147***	.044	.077	**-.158****	**-.269****	1.000
HBDI® 100 Introv/Extrav	Pear Corr	.012	.113	.049	.044	**.137***	-.084
HBDI® 5 Handedness	Pear Corr	.009	-.001	-.119	.094	.041	-.001
HBDI® 6 Hand Lft/Right	Pear Corr	-.068	.037	-.034	.101	.025	-.078
HBDI® 6 Hand R-Domin.	Pear Corr	-.051	.010	-.109	.093	-.003	-.052
Sex	Pear Corr	-.064	-.022	-.097	**.146***	**-.137***	.052
Age	Pear Corr	-.037	.004	.044	.104	**.199****	**-.117***

Time of Day (DOI items 58, 74, 90); Amount of Information Available (DOI items 86, 96, 99*)*—Table 4.100. Variables presented in this table are discussed below.

- Time of Day (DOI item 58 LESS receptive). The very weak negative correlation (-.209) found between item 58 and negatively-worded DOI item 90 (NOT more productive) was as anticipated. Two disparate positive

correlations, presented below, were also found. The positive correlation with negatively-worded DOI item 99 (MORE info, .147) was as expected, along with the very strong positive correlation (.736) with positively-worded item 74 (More intuitive times).

- 99. MORE info (.147)
- 74. More intuitive times (.736)

- Time of Day (DOI item 74 More intuitive times). One very weak negative correlation (-.231) was found with item 74 and negatively-worded item 90 (NOT more productive). The direction of this correlation was as expected. No positive correlations were found with item 74.

- Time of Day (DOI item 90* NOT more productive). No negative correlations were found with negatively-worded DOI item 90. A positive correlation was found with positively-worded DOI item 96. This correlation, though *not* in the direction anticipated, was extremely weak (.131).

- Amount of Information Available (DOI item 86 Know w/o knowing). One extremely weak negative correlation (-.158) was found between positively-worded item 86 and negatively-worded DOI item 99 (MORE info). The direction of this correlation was as expected.

  Extremely weak positive correlations (.146 to .259) were found between item 86 and two items, presented below in ascending order from weakest to strongest. One of the two items was the biological variable age; the positive direction of the correlation with item 96 (Decisions) was as expected.

  - Sex (.146)
  - 96. Decisions (.259)

- Amount of Information Available (DOI item 96 Decisions). Very weak negative correlations were found between positively-worded item 96 and negatively-worded item 99 (MORE info, -.269); and the biological variable sex (-.137). Extremely weak positive correlations were found between item 96 and introversion/extraversion (.137), as well as the biological variable age (.199).
- Amount of Information Available (DOI item 99* MORE info). One extremely weak negative correlation (-.117) was found between negatively-worded DOI item 99 and the biological variable age. No positive correlations were found with item 99.

Introversion/Extraversion (HBDI® item 100); and Handedness (HBDI® item 5—Handedness; HBDI® item 6—Handedness Left/Right Dominance and Handedness/Right-Brain Dominance; Sex; and Age). Table 4.101 below presents the inter-item correlations for these variables.

Table 4.101: Inter-Item Correlations—Introversion/Extraversion (HBDI® Item 100); Handedness/Tri-Level (HBDI® Items 5, 6 and Recodes); Sex; and Age

INTER-ITEM CORRELATION MATRIX		**INTVN/ EXTVN**	**HANDEDNESS/ Tri-Level**			**SEX**	**AGE**
		Intro-version/ Extra-version	**Handed-ness** (Item 5)	**Handed-ness Left/Right Dominance**	**Handed-ness R-Brain Dominance**	**Sex**	**Age**
HBDI® 100 Introv/Extrav	Pear Corr	1.000					
HBDI® 5 Handedness	Pear Corr	-.111	1.000				
HBDI® 6 Hand Lft/Right	Pear Corr	-.110	-.044	1.000			
HBDI® 6 Hand R-Domin.	Pear Corr	**-.175****	**.633****	**.668****	1.000		
Sex	Pear Corr	.040	.091	-.041	.041	1.000	
Age	Pear Corr	.091	**-.245****	**.134***	-.051	-.086	1.000

HBDI® 100. Introversion/Extraversion (N=251)
HBDI® 5. Handedness (N=251)
HBDI® 6. Handedness Left/Right Dominance (N=251)
HBDI® 6 Handedness R-Brain Dominance (N=251)
Sex (N=291)
Age (N=295)

Introversion/Extraversion (HBDI® item 100); and Handedness (HBDI® item 5—Handedness; and HBDI® item 6—Handedness Left/Right Dominance and Handedness/ Right-Brain Dominance; Sex; and Age)—Table 4.101. The variables presented in the table above are discussed below.

- Introversion/Extraversion *(HBDI® item 100).* The only significant correlation found for this variable was an extremely weak negative relationship with HBDI® item 6, handedness/right-dominance (-.175).
- Handedness *(HBDI® item 5—Handedness; HBDI® item 6—Handedness Left/Right Dominance and Handedness/Right-Brain Dominance).* An extremely weak negative correlation (-.245) was found between HBDI® item 5 handedness and the biological variable age. A relatively strong positive correlation (.633) was found between HBDI® item 5 handedness and HBDI® item 6 handedness/right-dominance. No significant correlations were found for the biological variable handedness/right-brain dominance.
- Sex *(HBDI® item 2).* No significant correlations were found for the biological variable sex.
- Age *(HBDI® item 2).* No significant correlations were found for the biological variable age.

The inter-item analysis outcomes described in Tables 4.91-4.101 above will be synopsized in Chapter 5 hereinafter. The inter-item correlations provided in this section are also presented as Appendix AA in an alternative, item-by-item format.

DOI Reliability Analyses

Tables 4.102 and 4.103 below present the outcomes for the two DOI reliability analyses conducted for this project: the Cronbach's Alpha tests, and Tukey's Test for Non-additivity.

Cronbach's Alpha. Table 4.102 below presents the results of the Cronbach's Alpha tests conducted for the DOI by *Full Sample*, *Sex*, *Age/Decade*, *Ethnicity*, and *Education*.

Table 4.102: DOI Reliability Study—Reliability Statistics/Cronbach's Alpha

Cases			Reliability Statistics	
Demographic Variable	**Level**	**Valid N**	**Cronbach's Alpha**	**Cronbach's Alpha Based on Standardized Items**
Full Sample	All	295	0.796	0.814
Sex	Female	214	0.809	0.825
	Male	77	0.745	0.772
Age/Decade	20s	62	0.826	0.843
	30s	53	0.815	0.829
	40s	54	0.751	0.772
	50s	71	0.727	0.763
	60s	47	0.839	0.849
	70s	8	0.650	0.763
Ethnicity	Af-Am/ Black	20	0.881	0.890
	Euro-Am/ White	255	0.792	0.810
	Hispanic/ Latino	16	0.682	0.656
	Other	4	0.837	0.866
Education	HS/Equiv	5	0.864	0.894
	Some Coll.	30	0.851	0.858
	Associate's	23	0.868	0.881
	Bachelor's	99	0.792	0.803
	Master's	89	0.753	0.779
	Doctoral	33	0.770	0.799
	Prof. Certif./ Licensure	15	0.725	0.765

Af-Am/Black=African-American/Black; Euro-Am/White=Euro-American/White;
Hisp/Latino=Hispanic/Latino; HS or Equivalent=High School or Equivalent;
Prof. Certif./Licensure=Professional Certification/Licensure

As explained in Chapter 3, reliability testing of a new instrument like the DOI is important because it determines whether outcomes can be replicated in subsequent tests or studies. Reliability is particularly important for robust constructs like intuition, which cannot be measured directly. The most common test of internal consistency reliability coefficient is Cronbach's Alpha, which measures average correlations among items on the instrument. According to Garson (2008), a coefficient of .70 is considered an *adequate* scale for exploratory research, but .80 is required for a *good* scale (as on http://faculty.chass.ncsu.edu/Garson/PA765/reliab.htm, October 19, 2008).

Based on the outcomes of the Cronbach's analysis conducted for this project, the DOI performed very well for reliability and consistency. The alpha for the full sample was .796, and alphas for breakdowns of other groups were clustered around that value. More specifically, the alphas ranged from .650 for the eight cases in their 70's from the *Age/Decade* category, to .881 for the 20 black cases in the *Ethnicity* grouping. Alphas based on standardized items ranged from .656 for the 16 Hispanic cases in the *Ethnicity category*, to .894 for the five high school or equivalent cases in *Education*. Outcomes from the Alpha if Deleted analysis, conducted to determine the estimated value of alpha if given items are removed from the model, are included as Appendix AB.

Tukey's Test for Non-additivity. As explained in Chapter 3, Tukey's reliability test assumes that all items in an instrument are related to the total score in a linear manner, and that there are no multiplicative interactions between the cases and the items (as on http://faculty.chass.ncsu.edu/Garson/PA765/reliab.htm, October 19, 2008). A significance of <0.05 indicates an interaction on this test; the Tukey analysis for this project utilized a significance level of <0.01.

Table 4.103 below presents the results of the Tukey's Test for Non-additivity analyses conducted for the DOI.

Table 4.103: DOI Reliability Study—Tukey's Test for Non-Additivity

Cases			Tukey's Test for Non-Additivity		
Demographic Variable	**Level**	**Valid N**	**Grand Mean**	**Estimate of Power to Achieve Additivity**	**F Test* (df=54,1)**
Full Sample	All	295	61.041	0.407	129.925
Sex	Female	214	60.943	0.296	101.716
	Male	77	61.239	1.136	31.473
Age/Decade	20s	62	60.478	0.179	25.274
	30s	53	58.731	1.011	23.772
	40s	54	61.159	0.929	28.076
	50s	71	62.715	0.470	38.547
	60s	47	61.174	0.266	19.927
	70s	8	64.254	0.653	3.939
Ethnicity	Af-Am/ Black	20	61.170	1.597	8.314
	Euro-Am/ White	255	60.982	0.281	114.977
	Hisp/ Latino	16	62.551	2.016	8.085
	Other	4	58.775	2.909	3.982
Education	HS or Equivalent	5	60.332	-1.377	2.510
	Some College	30	63.029	0.595	11.581
	Associate's Degree	23	58.729	0.148	8.191
	Bachelor's Degree	99	60.444	0.617	45.309
	Master's Degree	89	60.798	0.767	45.781
	Doctoral Degree	33	62.268	0.069	19.499
	Prof. Certif./ Licensure	15	62.824	1.799	7.693

* All F tests are significant at the $p < 0.01$ level.

Af-Am/Black=African-American/Black; Euro-Am/White=Euro-American/White;
Hisp/Latino= Hispanic/Latino; HS or Equivalent=High School or Equivalent;
Prof. Certif./Licensure=Professional Certification/Licensure

Using the DOI item scores as originally coded for this study, the score created by the analysis closely approximates the DOI Total Score/T Score. The Grand Means—equivalent to the DOI Total Score-T-Score—show that the spread across demographic groups is relatively narrow (i.e., has little variability), supporting the analytic option of combining the cases. Outliers included: 1) the 30's and 70's category in the *Age/Decade* category; 2) the four Other cases in the *Ethnicity* category; and 3) the Associate's cases in the *Education* category.

The Tukey's *F* Test was significant for all group levels, which was anticipated due to the large number of items under analysis. The Estimate of Power to Achieve Additivity outcomes indicated only a few groups for which additivity was a potential problem: 1) Males in the *Sex* category; 2) Blacks, Hispanics, and Other in the *Ethnicity* category; and 3) Professional Certification/Licensure in the *Education* category. These cases are all under-estimated; that is, they would have higher scores after the Tukey adjustment and would be evaluated as more intuitive than their actual scores indicate. By contrast, total scores for the High School or Equivalent cases in the *Education* category are over-estimated by the straight addition method; that is, they would have lower scores after the Tukey adjustment and would be evaluated as less intuitive than their actual scores indicate. These effects are likely a result of under-representation for these groups.

Wrap-Up Item—Narrative Responses

DOI item 100 invited respondents to add any final thoughts or comments they would like to share about the DOI instrument, their responses and/or intuition in general. The qualitative responses from 78 of the 302 respondents were compiled and categorized into five general categories: *DOI Instrument/Study*; *Nature of Intuition*, *Applications of*

Intuition, *General Comments re Intuition* and *Miscellaneous Comments*. The following synopsizes responses in each category. Quotation marks indicate direct excerpts.

DOI Instrument/Study: Several individuals found the survey "a bit lengthy," and one respondent became "less responsive/alert" near the end of the survey. One person noted the items had an "extremely high literacy," which was very "distracting," because it required careful thinking. Another acknowledged "evaluating" the statements before answering, though the DOI instructions recommended going with one's first impulse. The same respondent questioned the vagueness of the term "fine art"; and acknowledged a response bias toward the 95-100% response for *always*, 85-95% for *frequently*, and 25% for scoring at the low end of the range. Another found the Likert-type scale questions problematic because they assumed a belief in intuition or clairvoyance.

Several respondents remarked about the apparent repetitiveness of the items, though the DOI instructions alerted them to this phenomenon. Two individuals commented about the "yes, but," situational nature of their responses. Yet another commented that those individuals likely to spend time completing the DOI are also likely to be skewed to "those of us who believe in and rely on out intuition."

Other general comments included one individual who wondered what it meant that the "opinion of this tool was important to me." Several respondents remarked that they had found the study or the process very interesting, and one added that "perhaps there is more intuition than I permit myself to feel or absorb." Another admitted the questions "made me think about how intuitive flashes come to me on a regular basis, and that I trust and rely on them." A final comment "sent prosperity" and noted that "life is all about being open to new thoughts, ideas and adventures."

Nature of Intuition: Though the DOI was not designed to resolve questions about the nature and/or source of intuition, many respondents shared their conceptualizations along these lines. Respondents described intuition as:

1. divinely-originated and outside one's own power;
2. based on past experiences and gut feelings;
3. not always "there to guide," but reliable when available;
4. a sudden "knowing," flash of insight or profundity causing one to act with great confidence;
5. a faculty from childhood that provides an understanding of the others' motivations;
6. a "minor" aid, possibly the outgrowth of prior knowledge or experience;
7. most accurate in times of high stress or emotion;
8. clairvoyance; just knowing things without reference to decision-making style or ability;
9. revelation developing from data and correlations, especially helpful when data or time are minimal, but best when coupled with "good sound data";
10. "strictly learned behavior," possibly from prior reading;
11. a first impulse later confirmed by "facts" before it is trusted;
12. a "spiritual matter" not taught in school, church, college or life;
13. a lifelong faculty—of which the individual was not aware until age 30;
14. foresight and visions—abilities valued in ethnic heritage and attributable to "spiritual guidance";
15. creativity, outspokenness and uniqueness, especially "away from work";
16. the "flow" that is talked about in sports, a way of DOING without knowing how one is doing it;
17. "verbal, nonverbal, vocal, facial and physical impressions from others;

18. "part of whom I am" without realizing or thinking about it;

19. a faculty that only exists when one believes in it;

20. "real," a capacity used frequently to "move through my day and my work," one part of decision-making;

21. a faculty that "plays a larger role in our lives than we are…aware;

22. an insight that increases—is "cracked open"—with the experience of loss and trauma in life;

23. the ability to "ask the right questions" in order to get at the "hard data" needed to support legal, procedural or policy decisions;

24. "visions out of the clear blue" of accidents, injury or death) 2-3 days in advance of the event;

25. "repeated visuals, actions, symbols, nature actions, visual or audio signs and events" out of one's control that aid with decision-making;

26. *from a male*—"cycles throughout the month" that sometimes bring greater intuitiveness;

27. "thinking time periods" without conscious thought that prompts immediate action, or "realizing something…by getting lost in my mind";

28. insight that comes periodically, either when the mind continues to dwell on something or "out of the blue";

29. *from a female*—different at different times of the day or month, bringing more or less "creativity and connectedness" depending on hormone level;

30. an outgrowth not of time of day but of context or situation;

31. something everyone has—especially with meditation—though belief, trust and desire to connect are factors in its use;

32. something that "just hits me"; and

33. a gut instinct that is almost always correct, allowing one to "see things before they happen."

A final individual expressed dependence on God and the Bible to form thoughts and intuitions.

Applications of Intuition: Responses included applications of intuition in diverse areas, including:

1. redirection of one's thinking;
2. decision-making—sometimes with emotions providing additional "facts" to consider;
3. finding general vs. specific solutions to problems;
4. guidance from "insights," especially after "sleeping on it";
5. use at home vs. at work;
6. "reading" people and situations; and
7. impulse for making decisions or taking actions—later confirmed by some "tangible" means.

Two individuals expressed concern that their education and job training have emphasized "fact-based" decision-making and reliance on "scientific evidence" to the detriment or exclusion of intuition. For example, one respondent, who is a healthcare practitioner, described consciously minimizing the use of intuition when working with patients.

General Comments re Intuition: One individual, a 49-year-old female, declared that "women's intuition is real." Another respondent mentioned having had a "very bad childhood and past." Another expressed happiness that this research is being done, because intuition is "an important part of humanity that gets squelched in early childhood." Another had the strongest intuition where people were involved. Yet another noted that intuition is not an either/or situation, and that some people are *both* analytical and intuitive.

Miscellaneous Comments: Some wrap-up comments did not fit into the categories above and appeared to be *non sequiturs* to the survey, making them of particular interest. For instance, one individual has a *high D* score on the DISC profile system—indicating one who is decisive, direct, results-oriented, and quick to take action (as on http://www.discprofile.com/whatisdisc.htm, October 2008). An individual with "undifferentiated schizophrenia" acknowledged: "my brain just works differently." One respondent, who is an identical twin, noted that she often shares her sister's opinions and views of problems. Yet another individual indicated that she is "ambidextrous, has dyslexia, and teach[es] creative arts classes." These characteristics are related to brain functionality and, as such, may have interesting implications for this project. The final respondent in this category noted philosophically, that: "all we 'know' is already 'here."

The DOI *Wrap Up* item 100 provided participants with an opportunity to include any additional information, thoughts or comments that they wanted to share with the researcher. The complete text of all 78 narrative responses to item 100 is included in Appendix AC. These comments will be examined again in Chapter 5 and possible interpretations will be proposed.

Research Purposes and Hypotheses

The CFA conducted for Hypothesis 1 was the final process in the internal analysis of the DOI. Canonical correlation analysis (CCA) and regression analysis (RA) were utilized for Hypotheses 2 and 3, respectively. These tests were related to analysis of the DOI in relation to the HBDI® brain quadrants and hemispheres. Hypothesis 4 involved CA of the DOI Total and variable T Scores and the six subscales of the PSI. The conduct and outcomes of these analyses are discussed in the sections that follow.

Research Hypothesis 1—Confirmatory Factor Analysis (CFA)

CFA was utilized to test Research Hypothesis 1, which proposed that the intuition-related items and associated variables examined in this project would fit into the social/acquired, biological and situational clusters to which they had been assigned by Shirley and Langan-Fox (1996; Appendix B). This analysis utilized 21 variables:

1-18: 16 of the 18 social/acquired variables, and the two situational variables derived from DOI items score 46-99;

19: academic aptitude/preference scores recoded from DOI items 6 and 7 and HBDI® items 7-9;

20: introversion/extraversion score recoded from HBDI® item 100; and

21: the biological variable consisting of age; sex (female); ethnicity (white); and recoded handedness scores from HBDI® items 5 and 6.

The remaining biological variable, brain dominance, is examined in the analyses conducted for Hypotheses 2 and 3.

SPSS 16.0 FA was first run with the restriction to a three-factor solution as a confirmatory analysis to determine if the variables fit into the social/acquired, biological and situational clusters (Shirley and Langan-Fox, 1996). Only loadings of .30 or higher are displayed, in keeping with a long-standing *practical significance* guideline (Harman, 1967). This guideline, reiterated in other statistical texts including Gorsuch (1974) and Hair et al (1998) is unrefuted by volumes of monte carlo studies into the effects of sample size, rotation method or standard error calculations on various output matrices.

Varimax Rotation Sums of Squared Loadings was used to determine how well the related sets of DOI items measured the same aspect of intuition. The Varimax analysis for the three-factor solution, accounting for only 29.3% of the variance, did little more than sort positively-worded items from negatively-worded items. Varimax, Quartimax

and Oblimin matrices for the three-factor solution are included as Appendix AD, which shows no loadings on any of the three factors for the following variables and items:

- Biological (age, sex/female, Euro-American/white, handedness/right dominance, and handedness/left-right dominance);
- Introversion/extraversion,
- Academic aptitude/preference,
- Cooperativeness;
- Emotions (items 62 and 88); and
- Time of day (items 74 and 90).

Failure to confirm the Shirley and Langan-Fox (1996) cluster (i.e., factor) model prompted a second CFA run with the alternative restriction to 21 factors, to determine if distinctive factor loadings would be found for the 21 variables. The Varimax Rotation for this solution, presented in Appendix AE, accounted for slightly more than 73% of the variance.

This analysis identified several unique factors with single variables predominantly accounting for the factor variance. The three-item sets for 10 variables loaded on a single factor: introversion/extraversion, academic aptitude/preference, cognitive style/intuitive, creativity, innovation, cooperativeness, impulsivity, adventure-seeking, ability to visualize and time of day. For interest in arts/aesthetics, all three items loaded on three factors. No items loaded on factor 21.

The scattered findings from the 21-factor analysis failed to confirm the Shirley and Langan-Fox variable model, prompting another factor solution to reduce the underlying dimensions (i.e., independent explanations, or factors) to the smallest meaningful number accounting for the greatest percentage of the variance.

Based on the examination of the 21-factor cumulative variance table and scree plot chart (Appendices AF and AG), additional CFA runs were conducted to extract 9, 11, 12, 13, 14, 15, 16, 17 and 19 factors. As indicated in Table 4.104 below, the 15-factor analysis provided the optimal variable fit. That is, the 15 factors provided the greatest percent of variance accounted for with meaningful factors relative to the other solutions.

Among the 21 variables, 10 loaded cleanly on a single factor. That is, all three of the DOI items related to a given variable loaded on the same factor. The 10 variables with single-factor loadings were:

- Factor 1: Creativity, Innovation, Ability to Visualize;
- Factor 2: Cognitive Style/Analytic;
- Factor 5: Interest in Arts/Aesthetics;
- Factor 6: Emotions;
- Factor 8: Cooperativeness;
- Factor 9: Time of Day;
- Factor 10: Music;
- Factor 12: Academic Aptitude/Preference.

In addition to these 10 variable loadings, two items from the 3-item sets of 13 other (9 non-duplicated) DOI variables loaded on a single factor:

- Factor 1: Cognitive Style/Intuitive, Adventure-Seeking, Imagery;
- Factor 2: Carelessness;
- Factor 3: Cognitive Style/Intuitive, Carelessness, Impulsivity, Amount of Information Available;
- Factor 4: Adventure-Seeking, Unconventionality;
- Factor 7: Impulsivity, Flexibility;
- Factor 14: Age and Handedness (from the biological cluster).

These factor loadings are significant in that they suggest that the two- and three-item sets in the DOI measure the same aspect of intuition. By extrapolation, the total number of items in future versions of the DOI may be reduced accordingly.

Table 4.104: Confirmatory Factor Analysis—Research Hypothesis 1
15 Factors—Varimax Rotated Component Matrix*

VARIABLES		Component														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Biological	Age														.594	
	Sex (Female)								.378							
	Euro-American (White)															.755
	Handedness (Right Dom)														-.721	
	Handedness (L/R Dom.)													-.666		
Extra-version	Introversion/ Extraversion						.332					-.504				
Acad Apt/Pref	Academic Aptitude (R-Brain)												.824			
	Academic Preference (R-Brain)			7									.831			
Cog Style/ Analy	51.NOT step-by-step		-.301		.595											
	65.Analyze things		.766													
	73.Consider facts		.828													
Cog Style/ Intuit	50.Sudden ideas	.318		.367												.368
	56.Rely on intuition			.639												
	92.NOT confident	-.405	.417													
Experi-ence	52.Trace insights						.469					.391				
	85.Act on instinct			.578												
	98.PRIOR experience		.645													
Crea-tivity	53.Multiple ways	.633														
	59.Creative activities	.329									.307					
	95.NOT imaginative	-.691														
Inno-vation	54.Recognize patterns	.557														
	87.DIFFCLT/novel ways	-.745														
	93.Finding alternatives	.740														

Table 4.104 *(continued)*

VARIABLES		Component														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Care-lessness	55.Not collect facts		-.397	.363	.407											
	89.PRECISE facts		.799													
	97.Rely on intuition			.715												
Cooper-at'vness	57.Cooperative								.752							
	67.Cooperate								.682							
	82.NOT cooperation								-.684							
Impul-sivity	60.Spontaneously			.332	.371			.442								
	70.LOST without plan		.331											.558		
	80.Decisions impulsive			.445				.346								.375
Flexi-bility	63.TO DO lists		.316											.528		
	78.Flexible plans							.534								
	91.Flexibility							.615								
Int . in Arts/ Aesth	48.Interest in art					.800										
	64.Appreciate art					.859										
	84.NOT enjoy art					-.849										
Music	47.NOT musical										-.602	.353				
	61.Listen to music										.656					
	68.Enjoy music										.795					
Adven-ture-seekng	69.Take risks				.604											
	71.NOT seek adventures	-.408												.439		
	76.Enjoy unknown	.388			.567											
Unconv ention-ality	49.NOT stand out											.722				
	72.Unconventional				.634											
	75.Comfortable/different				.615											
Ability/ Vis'lize	46.Novel uses	.595														
	66.DIFFICULT/visualize	-.672														
	77.Visualize solutions	.755														

Table 4.104 *(continued)*

VARIABLES		Component														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Imag-ery	79.NOT good/symbols	-.619														
	81.Insights/ment. images							.322								
	83.Metaphors	.527														
Emo-tions	62.NOT connect/emotion						-.691									
	88.Emotionally involved						.779									
	94.Compelling ideas						.670									
Time of Day	58.LESS receptive									.870						
	74.More intuitive times									.897						
	90.NOT more productive							.606		-.312						
Amt of Info Avail.	86.Know w/o knowing			.655												
	96.Decisions	.323		.503												
	99.MORE info		.530													

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. * Rotation converged in 21 iterations

Factor Designations: Based on the variable loadings shown above, the 15 factors might be designated:

Factor 1: Creativity (creativity, innovation, ability to visualize, imagery)
Factor 2: Analytical Cog. Style (cognitive style/analytical—non-intuitive)
Factor 3: Intuitive Cog. Style (cognitive style/intuitive, carelessness, impulsivity, amount of info available)
Factor 4: Risk-Taking (adventure-seeking, unconventionality)
Factor 5: Arts/Aesthetics (interest in arts/aesthetics)
Factor 6: Emotions (emotions)
Factor 7: Impulsivity (impulsivity, flexibility)
Factor 8: Cooperativeness (cooperativeness)
Factor 9: Time of Day (time of day)
Factor 10: Music (music)
Factor 11: Conventionality (conventionality, other/mixed)
Factor 12: Academic Aptitude (academic aptitude/preference)
Factor 13: Planning (non-impulsive, non-flexible, non-adventure-seeking, other/mixed)
Factor 14: Biological (age, handedness/non-right, other/mixed)
Factor 15: Miscellaneous (ethnicity/white, cognitive style/intuitive, impulsivity, other/mixed)

Mixed = weak or scattered loadings of multiple variables on a given factor

As shown in Table 4.105 below, the 15-factor solution accounted for a cumulative variance of 65.6%.

Table 4.105: Confirmatory Factor Analysis—Research Hypothesis 1
15 Factors—Total Variance Explained

COM-PO-NENT	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
1	9.692	16.71	16.71	6.056	10.442	10.442
2	4.604	7.937	24.647	3.900	6.723	17.166
3	3.700	6.380	31.027	2.808	4.841	22.007
4	3.296	5.684	36.710	2.783	4.799	26.805
5	2.241	3.863	40.574	2.766	4.769	31.575
6	1.984	3.420	43.994	2.471	4.260	35.835
7	1.927	3.323	47.317	2.407	4.150	39.985
8	1.636	2.821	50.138	2.382	4.107	44.091
9	1.554	2.679	52.817	2.191	3.778	47.869
10	1.426	2.459	55.276	2.109	3.637	51.506
11	1.330	2.293	57.568	2.071	3.571	55.077
12	1.269	2.189	59.757	1.891	3.260	58.337
13	1.225	2.111	61.868	1.572	2.711	61.048
14	1.160	2.000	63.868	1.364	2.352	63.399
15	1.008	1.738	**65.606**	1.280	2.207	**65.606**
16	0.971	1.674	67.281			
17	0.952	1.642	68.922			
18	0.943	1.625	70.547			
19	0.892	1.539	72.086			
20	0.814	1.403	73.489			
21	0.783	1.350	74.839			
22	0.764	1.318	76.156			
23	0.731	1.260	77.417			
24	0.703	1.212	78.629			
25	0.658	1.135	79.764			
26	0.637	1.099	80.863			
27	0.623	1.074	81.937			
28	0.596	1.028	82.965			
29	0.584	1.007	83.972			
30	0.563	0.971	84.944			
31	0.534	0.920	85.864			
32	0.529	0.913	86.777			
33	0.497	0.858	87.635			
34	0.489	0.843	88.477			
35	0.446	0.768	89.246			
36	0.425	0.733	89.979			
37	0.409	0.705	90.684			

Table 4.105 *(continued)*

COM-PO-NENT	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
38	0.385	0.664	91.348			
39	0.370	0.639	91.987			
40	0.364	0.627	92.613			
41	0.350	0.604	93.217			
42	0.333	0.575	93.792			
43	0.322	0.556	94.348			
44	0.311	0.536	94.884			
45	0.284	0.490	95.374			
46	0.281	0.484	95.858			
47	0.274	0.472	96.330			
48	0.259	0.447	96.776			
49	0.242	0.418	97.194			
50	0.229	0.395	97.589			
51	0.225	0.388	97.977			
52	0.207	0.356	98.333			
53	0.194	0.334	98.668			
54	0.187	0.323	98.991			
55	0.169	0.291	99.282			
56	0.159	0.274	99.556			
57	0.134	0.231	99.787			
58	0.124	0.213	100			

Extraction Method: Principal Component Analysis. % of Var.=% of Variance; Cum. %=Cumulative %

Hypothesis 1 proposed that the intuition-related variables examined in this study would fit into the three-factor model (i.e., clusters) designated by Shirley and Langan-Fox (1996). The 21 intuition-related variables outlined above provided an alternative theoretical model. Based on analyses conducted for both models, Hypothesis 1 is rejected. As the most theoretically consistent structure of intuition, the 15-factor model was used in the testing of Hypotheses 2 and 3, as presented and discussed below.

Research Hypothesis 2—Canonical Correlation Analysis (CCA)

CCA was utilized to quantify the relative contributions of the 15 factors from Hypothesis 1 for each brain quadrant, as measured by the HBDI®. Hypothesis 2 proposed a whole-brained relationship between the DOI factor scores and the HBDI®

A, B, C and D quadrant scores (i.e., the 15 intuition factors identified in the Hypothesis 1 analyses would load across the HBDI® quadrants, not necessarily in equal proportions).

Hypothesis 2 tests included data only for the respondents who completed both the DOI and HBDI® (*N*=251). Appendix AH shows descriptive statistics for the 20 social/ acquired and situational clusters, and the DOI scores by brain dominance.

Table 4.106 below shows the outcomes of the Pillai's trace, Hotelling's trace and Wilks' lamba tests of the CCA, which tested the best set of weights (i.e., a set of weights producing the highest possible canonical R values) for the factor and quadrant scores. For this analysis, the 15 factor scores are the independent variables, and the HBDI® quadrant scores are the dependent variables. Because the smaller set of variables is the four HBDI® dependent variables, CCA produced four solutions.

The first solution tested was root 1/factor 1/function 1. Variance not accounted for by this solution was subjected to the same exercise, yielding root2/factor2/function2; and so on for solutions three and four. The *Significance of F* outcomes for the Pillai, Hotelling and Wilks tests, all significant at the .01 level, indicated that the canonical R values were not equal to zero, providing evidence of significant overall relationship between the 15-factor model of DOI variables and the HBDI® quadrant dominance measures. This outcome supports the construct validity of the DOI.

Table 4.106: Canonical Correlation Analysis—Research Hypothesis 2
Multivariate Tests of Significance *(S=4, M=5, N=115)*

Test	Value	Approx. F	Hypoth. df	Error df	Sig. of F
Pillai's*	1.618	10.648	60	940	**.000**
Hotelling's*	4.139	15.902	60	922	**.000**
Wilks'*	0.085	13.244	60	907	**.000**

*Intervals for all tests computed by approximating percentage pts. with percentage pts. of F distribution.
Approx. F=Approximate F; Hypoth. df=Hypothesis df; Sig. of F=Significance of F

Table 4.107 below presents the Eigenvalues and canonical correlation outcomes for roots 1-4. It is desirable to redistribute variance in order to consolidate it into fewer composite variates accounting for a greater percentage of variance (Tabachnick & Fidell, 2007, p. 573). In this analysis, root 1/function 1 accounts for 69% of the overall variance between the 15 factor and four HBDI® quadrant scores. Root 2/function 2 accounts for .599% of the residual variance after the root 1 extraction; root 3/function 3 accounts for 24% of the residual variance after the root 1 and 2 extractions; root 4/function 4 accounts for a mere 9% of the residual variance after the root 1, 2, and 3 extractions.

Table 4.107: Canonical Correlation Analysis—Research Hypothesis 2
Eigenvalues and Canonical Correlations

Root No.	Eigenvalue	Pct.	Cum. Pct.	Canon. Cor.	Sq. Cor.
1	2.229	53.85	53.85	.830	.690
2	1.498	36.19	90.05	.774	.599
3	.312	7.53	97.59	.487	.237
4	.099	2.40	100.00	.301	.090

Pct.=Percent; Cum. Pct.=Cumulative Percent; Canon. Cor.=Canonical Correlation (Canonical R); Sq. Cor.=Square Correlation (Canonical R-Squared)

Table 4.108 below presents the univariate *F* tests for the A, B, C and D quadrants of the HBDI®. The *Significance of F* values at less than .01 show that the 15 factors are strong predictors for all quadrants. The *R* values indicated that the strongest predictability is for the highly intuitive D quadrant (651); then for the highly non-intuitive A quadrant (.631). Predictability for the C quadrant was slightly better than chance (.564); and less than chance for the B quadrant (.448).

Table 4.108: Canonical Correlation Analysis—Research Hypothesis 2
Univariate F-tests with 15,235 DF

Variable	Sq. Mul. R	Adj. R-Sq.	Hyp. MS	Error MS	F	Sig. of F
HBDI® A	.631	.608	6019.177	223.734	26.903	**.000**
HBDI® B	.448	.413	3446.641	270.265	12.752	**.000**
HBDI® C	.564	.536	5478.517	269.834	20.303	**.000**
HBDI® D	.651	.628	7262.616	248.308	29.248	**.000**

Sq. Mul. R=Square Multiple R; Adj. R-Sq.=Adjusted R-Square; Hyp. MS=Means Squares; Error MS=Error Means Squares; Sig. of F=Significance of F

Table 4.109 below provides the standardized coefficients for each of the dependent variables (i.e., HBDI® quadrants). This test shows which quadrant measures are influencing the canonical function, or root. Function 1, the right-brain hemisphere, correlates very strongly (.657) with the D quadrant, and moderately (.416) with the C quadrant. This finding was expected, since the right hemisphere is comprised of the C and D quadrants. Function 2, the cerebral hemisphere, correlates extremely strongly both the A and D quadrants (.949 and 1.095, respectively). This finding was also expected, since the cerebral hemisphere is comprised of the A and D quadrants. Coefficients for functions 3 and 4 are too mixed to be meaningful.

Table 4.109: Canonical Correlation Analysis—Research Hypothesis 2
Standardized Canonical Coefficients for Dependent Variables

Dependent Variable	**Function**			
	1	**2**	**3**	**4**
HBDI® Quadrant A	.194	.949	-1.651	1.737
HBDI® Quadrant B	.061	.100	-1.985	.243
HBDI® Quadrant C	.416	-.089	-1.190	1.699
HBDI® Quadrant D	.657	1.095	-1.795	.375

Table 4.110 below presents the correlations between the dependent variables (i.e., HBDI® quadrant scores) and the canonical function/factor scores. In this table, canonical function 1 equates to the HBDI® right-brain hemisphere (C and D quadrants), 2 to the cerebral hemisphere (A and D quadrants), and 3 to the (left/limbic) B quadrant. Function 4 could not be identified due to its indistinguishable, uninterpretable pattern.

The right-brain hemisphere correlated extremely strongly and negatively with (left/cerebral) quadrant A (-.846); and negatively, though moderately, with (left/limbic) quadrant B (-.508). By contrast, the right hemisphere correlated extremely strongly and positively with (right/cerebral) quadrant D (.842); and very strongly and positively with (right/limbic) quadrant C (.751). All of these outcomes were as expected.

The cerebral hemisphere (function 2) correlated strongly and positively with both the (left/cerebral) quadrant A (.468), and (right/cerebral) quadrant D (.514). By contrast, the cerebral hemisphere correlated strongly and negatively with both the (left/cerebral) quadrant B (-.547), and (right/limbic) quadrant C (-.514). All outcomes were as expected.

Table 4.110: Canonical Correlation Analysis—Research Hypothesis 2
Correlations between Dependent and Canonical Variables

Dependent Variable	Function			
	1	2	3	4
HBDI® Quadrant A	-.846	.468	.028	.252
HBDI® Quadrant B	-.508	-.547	-.585	-.314
HBDI® Quadrant C	.751	-.514	.047	.410
HBDI® Quadrant D	.842	.514	.032	-.156

Table 4.111 below shows the percentage of variance within the dependent and independent variable sets accounted for by the four dependent (HBDI® quadrant score) canonical variables. Within the dependent set, canonical variable 1 accounted for slightly more than 56% of the variance; variable 2 more than 26%, and variables 3 and 4 slightly less than 9% each (100% of the cumulative total variance accounted for). Within the independent set (i.e., covariates), canonical variable 1 accounts for slightly less than 39% of the variance; variable 2 almost 16%; variable 3 almost 2%; and variable 4 a negligible .8%. Covariate analysis showed a 57% cumulative total variance accounted for, leaving some 43% of the variance accounted for by unidentified independent variables.

Table 4.111: Canonical Correlation Analysis—Research Hypothesis 2
Variance in Dependent Variables Explained by Canonical Variables

Canonical Variable	Pct. Var. Dependent	Cum. Pct. Dependent	Pct. Var. Covariate	Cum. Pct. Covariate
1	56.23	56.23	38.81	38.81
2	26.21	82.44	15.72	54.54
3	8.67	91.12	2.06	56.60
4	8.87	100.00	.80	57.40

Pct. Var. Dependent=Percent Variance Dependent; Cum. Pct. Dependent=Cumulative Percent Dependent; Pct. Var. Covariate=Percent Variance Covariate; Cum. Pct. Covariate= Cumulative Percent Covariate

Table 4.112 below shows the percentage of variance within the dependent and independent variable sets accounted for by the four independent canonical variables (15 factor scores). Within the dependent set, canonical variable 1 accounted for less than 5% of the variance; variable 2 about 4%, variable 3 1.5%, variable 4 under 1% (10.87% of cumulative total variance accounted for). Within the independent set canonical variables (i.e., covariates), 1-4 account for nearly the same variance—6.7%-6.8%. Covariate analysis showed a 27% cumulative total variance accounted for, leaving 73% of the variance accounted for by unidentified independent variables. The low percentages derived from this analysis were indicative of the divergence and mixed loadings of the 15 factor scores.

Table 4.112: Canonical Correlation Analysis—Research Hypothesis 2
Variance in Covariates Explained by Canonical Variables

Canonical Variable	Pct. Var. Dependent	Cum. Pct. Dependent	Pct. Var. Covariate	Cum. Pct. Covariate
1	4.58	4.58	6.64	6.64
2	4.08	8.67	6.81	13.45
3	1.58	10.26	6.68	20.14
4	.60	10.87	6.70	26.85

Pct. Var. Dependent=Percent Variance Dependent; Cum. Pct. Dependent=Cumulative Percent Dependent; Pct. Var. Covariate=Percent Variance Covariate; Cum. Pct. Covariate=Cumulative Percent Covariate

Tables 4.113-4.116 below present the outcomes of the RA conducted for each HBDI® quadrant by each of the 15 factors, as defined in Table 4.104. If intuition is primarily allied with the right-brain hemisphere as commonly believed, the strongest positive predictability should be with the C and D quadrants. By contrast, the strongest negative predictability should be with the A quadrant. Factors 3 (analytical cognitive style); 11 (conventionality); and 13 (planning) are non-intuitive; so they should be considered to have an inverse relationship with intuition.

Table 4.113: Canonical Correlation Analysis—Research Hypothesis 2
Regression Analysis for Within Cells Error Term for HBDI® Quadrant A

HBDI® Quadrant A Score					
Covariate	**B**	**Beta**	**Std.Err.**	**t-Value**	**Sig. of t**
Factor 1: Creativity	-.417	-.017	.942	-.443	.658
Factor 2: Analytical Cog. Style	7.351	.305	.955	7.696	**.000**
Factor 3: Intuitive Cog. Style	-3.397	-.143	.938	-3.620	**.000**
Factor 4: Risk-Taking	-.592	-.025	.928	-.638	.524
Factor 5: Arts/Aesthetics	-5.164	-.218	.936	-5.512	**.000**
Factor 6: Emotions	-7.539	-.308	.971	-7.758	**.000**
Factor 7: Impulsivity	-2.966	-.125	.934	-3.173	**.002**
Factor 8: Cooperativeness	-1.743	-.071	.968	-1.799	.073
Factor 9: Time of Day	-.035	-.001	.956	-.037	.970
Factor 10: Music	-5.616	-.237	.939	-5.977	**.000**
Factor 11: Conventionality	1.259	.052	.954	1.319	.188
Factor 12: Academic Aptitude	-12.897	-.528	.970	-13.285	**.000**
Factor 13: Planning	-1.176	-.049	.951	-1.236	.217
Factor 14: Biological	1.822	.076	.947	1.923	.056
Factor 15: Miscellaneous	-.121	-.005	.964	-.126	.900

Based on the *Significance of t* values in Table 4.113 above, the seven factors found to be the strongest predictors of the HBDI® A quadrant score were:

- Factor 2: Analytical Cognitive Style
- Factor 3: Intuitive Cognitive Style
- Factor 5: Arts/Aesthetics
- Factor 6: Emotions
- Factor 7: Impulsivity
- Factor 10: Music
- Factor 12: Academic Aptitude

Table 4.114: Canonical Correlation Analysis—Research Hypothesis 2
Regression Analysis for Within Cells Error Term for HBDI® Quadrant B

HBDI® Quadrant B Score					
Covariate	**B**	**Beta**	**Std.Err.**	**t-Value**	**Sig. of t**
Factor 1: Creativity	-7.395	-.347	1.035	-7.140	**.000**
Factor 2: Analytical Cog. Style	6.503	.301	1.049	6.196	**.000**
Factor 3: Intuitive Cog. Style	-1.470	-.069	1.031	-1.426	.155
Factor 4: Risk-Taking	-6.758	-.321	1.020	-6.623	**.000**
Factor 5: Arts/Aesthetics	-4.697	-.221	1.029	-4.561	**.000**
Factor 6: Emotions	-.746	-.034	1.067	-.699	.485
Factor 7: Impulsivity	-2.196	-.103	1.027	-2.138	**.034**
Factor 8: Cooperativeness	-1.684	-.077	1.064	-1.581	.115
Factor 9: Time of Day	.450	.020	1.050	.429	.668

Table 4.114 *(continued)*

HBDI® Quadrant B Score					
Covariate	**B**	**Beta**	**Std.Err.**	**t-Value**	**Sig. of t**
Factor 10: Music	-1.106	-.052	1.032	-1.071	.285
Factor 11: Conventionality	.174	.008	1.049	.166	.868
Factor 12: Academic Aptitude	2.736	.124	1.067	2.565	**.011**
Factor 13: Planning	2.630	.122	1.045	2.516	**.013**
Factor 14: Biological	2.133	.099	1.041	2.049	**.041**
Factor 15: Miscellaneous	-2.436	-.111	1.060	-2.298	**.022**

Based on the *Significance of t* values in Table 4.114 above, the nine factors found to be the strongest predictors of the HBDI® B quadrant score were:

- Factor 1: Creativity
- Factor 2: Analytical Cognitive Style
- Factor 4: Risk-Taking
- Factor 5: Arts/Aesthetics
- Factor 7: Impulsivity
- Factor 12: Academic Aptitude
- Factor 13: Planning
- Factor 14: Biological
- Factor 15: Miscellaneous

Table 4.115: Canonical Correlation Analysis—Research Hypothesis 2
Regression Analysis for Within Cells Error Term for HBDI® Quadrant C

HBDI® Quadrant C Score					
Covariate	**B**	**Beta**	**Std.Err.**	**t-Value**	**Sig. of t**
Factor 1: Creativity	-1.423	-.059	1.034	-1.375	.170
Factor 2: Analytical Cog. Style	-6.147	-.253	1.048	-5.861	**.000**
Factor 3: Intuitive Cog. Style	3.468	.145	1.030	3.365	**.001**
Factor 4: Risk-Taking	.814	.034	1.019	.799	.425
Factor 5: Arts/Aesthetics	5.191	.218	1.028	5.045	**.000**
Factor 6: Emotions	8.534	.346	1.067	7.997	**.000**
Factor 7: Impulsivity	1.802	.075	1.026	1.755	.080
Factor 8: Cooperativeness	4.645	.189	1.063	4.366	**.000**
Factor 9: Time of Day	.855	.035	1.049	.815	.416
Factor 10: Music	6.654	.278	1.031	6.448	**.000**
Factor 11: Conventionality	-2.012	-.082	1.048	-1.920	**.056**
Factor 12: Academic Aptitude	9.728	.395	1.066	9.125	**.000**
Factor 13: Planning	2.193	.090	1.044	2.099	**.037**
Factor 14: Biological	-1.424	-.059	1.040	-1.369	.172
Factor 15: Miscellaneous	.552	.022	1.059	.521	.603

Based on the *Significance of t* values in Table 4.115 above, the nine factors found to be the strongest predictors of the HBDI® C quadrant score were:

- Factor 2: Analytical Cognitive Style
- Factor 3: Intuitive Cognitive Style
- Factor 5: Arts/Aesthetics
- Factor 6: Emotions
- Factor 8: Cooperativeness
- Factor 10: Music
- Factor 11: Conventionality
- Factor 12: Academic Aptitude
- Factor 13: Planning

Table 4.116: Canonical Correlation Analysis—Research Hypothesis 2
Regression Analysis for Within Cells Error Term for HBDI® Quadrant D

HBDI® Quadrant D Score					
Covariate	**B**	**Beta**	**Std.Err.**	**t-Value**	**Sig. of t**
Factor 1: Creativity	12.782	.498	.992	12.875	**.000**
Factor 2: Analytical Cog. Style	-9.079	-.349	1.006	-9.023	**.000**
Factor 3: Intuitive Cog. Style	5.963	.233	.988	6.032	**.000**
Factor 4: Risk-Taking	7.586	.299	.978	7.757	**.000**
Factor 5: Arts/Aesthetics	6.248	.244	.986	6.330	**.000**
Factor 6: Emotions	1.976	.074	1.023	1.930	**.055**
Factor 7: Impulsivity	3.420	.134	.984	3.473	**.001**
Factor 8: Cooperativeness	-.579	-.021	1.020	-.567	.571
Factor 9: Time of Day	.156	.006	1.007	.155	.877
Factor 10: Music	.580	.022	.989	.586	.558
Factor 11: Conventionality	-1.397	-.053	1.005	-1.389	.166
Factor 12: Academic Aptitude	5.146	.195	1.022	5.032	**.000**
Factor 13: Planning	-1.793	-.069	1.002	-1.789	.075
Factor 14: Biological	-1.592	-.061	.997	-1.596	.112
Factor 15: Miscellaneous	3.701	.140	1.016	3.642	**.000**

Based on the *Significance of t* values in Table 4.116 above, the nine factors found to be the strongest predictors of the HBDI® D quadrant score were:

- Factor 1: Creativity
- Factor 2: Analytical Cognitive Style
- Factor 3: Intuitive Cognitive Style
- Factor 4: Risk-Taking

- Factor 5: Arts/Aesthetics
- Factor 6: Emotions
- Factor 7: Impulsivity
- Factor 12: Academic Aptitude
- Factor 15: Miscellaneous

Hypothesis 2 proposed that the 15 intuition factors identified in the Hypothesis 1 analysis would be found to load across the HBDI® quadrants, though not necessarily in equal proportions. The outcomes of the CCA analyses presented in Tables 4.106-4.116 above support this hypothesis and the whole-brained functionality of the 15 intuition factors. Accordingly, Hypothesis 2 is retained.

Research Hypothesis 3—Regression Analysis (RA)

RA was utilized to quantify the relative contributions of the 15 factors from Hypothesis 1 for each brain hemisphere, as measured by the HBDI®. Research Hypothesis 3 proposed a whole-brained relationship between the DOI factor scores and the HBDI® left/right and cerebral/limbic hemisphere scores.

Hypothesis 3 tests included data only for those respondents who had completed both the DOI and HBDI® (n=251). Appendix AG shows descriptive statistics for the 20 DOI social/acquired and situational variables, and the DOI scores by brain dominance.

Table 4.117 below shows the loadings for each of the 15 factors for the HBDI® right hemisphere %. Based on the *Significance of t* values, the following 12 factors were found to be the strongest predictors of the right-hemisphere score:

- Factor 1: Creativity
- Factor 2: Analytical Cognitive Style
- Factor 3: Intuitive Cognitive Style
- Factor 4: Risk-Taking
- Factor 5: Arts/Aesthetics
- Factor 6: Emotions

- Factor 7: Impulsivity
- Factor 8: Cooperativeness
- Factor 10: Music
- Factor 12: Academic Aptitude
- Factor 14: Biological
- Factor 15: Miscellaneous

Based on the extremely strong R-squared value of .667 (67% of variance accounted for), the 15 intuition factors are strong predictors of the HBDI® right-brain hemisphere score.

The right hemisphere is comprised of the HBDI® C and D quadrants (Appendix D). Additional tests (Tables 4.118 and 4.119 below) were conducted to determine the degree of difference between the factor loadings on the two right-brain quadrants.

Table 4.118 below shows the loadings for each of the 15 factors for the HBDI® C quadrant (right/limbic hemisphere) score. Based on the *Significance of t* values, the following nine factors were found to be the strongest predictors of the C quadrant score:

- Factor 2: Analytical Cognitive Style
- Factor 3: Intuitive Cognitive Style
- Factor 5: Arts/Aesthetics
- Factor 6: Emotions
- Factor 8: Cooperativeness
- Factor 10: Music
- Factor 11: Conventionality
- Factor 12: Academic Aptitude
- Factor 13: Planning

Based on the very strong R-squared value of .564 (56% of variance accounted for), the 15 intuition factors were found to be strong predictors of the HBDI® C quadrant scores.

Table 4.119 below shows the loadings for each of the 15 factors for the HBDI® C quadrant (right/cerebral hemisphere) score. Based on the *Significance of t* values, the following nine factors were found to be the strongest predictors of the D quadrant score:

- Factor 1: Creativity
- Factor 2: Analytical Cognitive Style
- Factor 3: Intuitive Cognitive Style
- Factor 4: Risk-Taking
- Factor 5: Arts/Aesthetics
- Factor 6: Emotions
- Factor 7: Impulsivity
- Factor 12: Academic Aptitude
- Factor 15: Miscellaneous

Based on the extremely strong R-squared value of .651 (65% of the variance accounted for), the 15 intuition factors were found to be strong predictors of the HBDI® D quadrant score. Based on the relative R-square values for the C and D quadrants, the D quadrant score provides considerably stronger discriminative value. That is, intuition is more strongly allied with the D (right/cerebral) quadrant than with the C (right/limbic) quadrant.

A separate RA was not conducted for the left hemisphere (A and B quadrants), because the HBDI® left and right hemisphere scores are summative to 100%, reflecting the dichotomous and bilateral nature of these two brain hemispheres. That is, the R-squared value of the left hemisphere would be identical to that of the right, but the relationship would be negative instead of positive.

The RA conducted for the cerebral hemisphere (A and D quadrants) produced an R-squared value of .575. Because the cerebral and limbic hemispheres are also dichotomous and bilateral, a separate RA was not conducted for the limbic hemisphere. Again, outcomes would be identical to that of the cerebral analysis, through the relationship would be negative instead of positive. Finding a relatively high R-squared value for the cerebral hemisphere is another indication that intuition is a whole-brain faculty. Accordingly, Hypothesis 3 is retained.

Table 4.117: Regression Analysis—Research Hypothesis 3
Regression of HBDI® Right Hemisphere % on 15 Factor Scores

Correlation Coefficients[b]

	HBDI® RIGHT % (N=251)	
	Pearson's Corr.	**Sig. (1-tail)**
HBDI® RIGHT %	1.000	
Factor 1: Creativity	.274	.000
Factor 2: Analytical Cog. Style	-.386	.000
Factor 3: Intuitive Cog. Style	.171	.003
Factor 4: Risk-Taking	.227	.000
Factor 5: Arts/Aesthetics	.269	.000
Factor 6: Emotions	.287	.000
Factor 7: Impulsivity	.134	.017
Factor 8: Cooperativeness	.144	.011
Factor 9: Time of Day	.010	.439
Factor 10: Music	.175	.003
Factor 11: Conventionality	-.064	.158
Factor 12: Academic Aptitude	.346	.000
Factor 13: Planning	-.009	.441
Factor 14: Biological	-.102	.053
Factor 15: Miscellaneous	.067	.146

Regression Coefficients[b]

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Err.**	**Beta**	**t**	**Sig.**
(Constant)	54.343	.456		119.066	**.000**
Factor 1	3.230	.454	.269	7.109	**.000**
Factor 2	-4.835	.461	-.397	-10.498	**.000**
Factor 3	2.336	.452	.195	5.163	**.000**
Factor 4	2.571	.448	.217	5.744	**.000**
Factor 5	3.527	.452	.295	7.807	**.000**
Factor 6	3.224	.469	.260	6.881	**.000**
Factor 7	1.659	.451	.139	3.680	**.000**
Factor 8	1.227	.467	.099	2.627	**.009**
Factor 9	.137	.461	.011	.297	.767
Factor 10	2.309	.453	.192	5.096	**.000**
Factor 11	-.775	.460	-.064	-1.685	.093
Factor 12	4.210	.468	.340	8.992	**.000**
Factor 13	-.183	.459	-.015	-.398	.691
Factor 14	-1.172	.457	-.097	-2.567	**.011**
Factor 15	1.052	.465	.085	2.262	**.025**

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.817[a]	**.667**	.646	7.213

ANOVA[b]

Model 1	Sum of Squares	df	Mean Square	F	Sig.
Regression	24528.791	15	1635.253	31.432	.000[a]
Residual	12225.950	235	52.025		
Total	36754.741	250			

a. Predictors: (Constant), REGR factor score 15 for analysis 1, REGR factor score 1 for analysis 1, REGR factor score 7 for analysis 1, REGR factor score 13 for analysis 1, REGR factor score 9 for analysis 1, REGR factor score 3 for analysis 1, REGR factor score 14 for analysis 1, REGR factor score 4 for analysis 1, REGR factor score 11 for analysis 1, REGR factor score 12 for analysis 1, REGR factor score 5 for analysis 1, REGR factor score 10 for analysis 1, REGR factor score 2 for analysis 1, REGR factor score 8 for analysis 1, REGR factor score 6 for analysis 1

b. Dependent Variable: HBDI® Right Hemisphere %

Table 4.118: Regression Analysis—Research Hypothesis 3
Regression of HBDI® C Quadrant Score on 15 Factor Scores

Correlation Coefficients[b]

	HBDI® C Quadrant Score (N=251)	
	Pearson's Corr.	**Sig. (1-tail)**
HBDI® C Quadrant Score	1.000	.
Factor 1: Creativity	-.054	.196
Factor 2: Analytical Cog. Style	-.245	.000
Factor 3: Intuitive Cog. Style	.139	.014
Factor 4: Risk-Taking	.029	.327
Factor 5: Arts/Aesthetics	.214	.000
Factor 6: Emotions	.376	.000
Factor 7: Impulsivity	.074	.122
Factor 8: Cooperativeness	.220	.000
Factor 9: Time of Day	.032	.304
Factor 10: Music	.249	.000
Factor 11: Conventionality	-.094	.068
Factor 12: Academic Aptitude	.412	.000
Factor 13: Planning	.104	.050
Factor 14: Biological	-.058	.180
Factor 15: Miscellaneous	.003	.483

Regression Coefficients[b]

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Err.**	**Beta**	**t**	**Sig.**
(Constant)	84.011	1.039		80.824	**.000**
Factor 1	-1.424	1.035	-.060	-1.376	.170
Factor 2	-6.148	1.049	-.253	-5.862	**.000**
Factor 3	3.468	1.031	.145	3.366	**.001**
Factor 4	.815	1.020	.034	.799	.425
Factor 5	5.191	1.029	.218	5.046	**.000**
Factor 6	8.534	1.067	.346	7.997	**.000**
Factor 7	1.803	1.027	.076	1.756	.080
Factor 8	4.646	1.064	.189	4.366	**.000**
Factor 9	.856	1.050	.035	.815	.416
Factor 10	6.654	1.032	.279	6.448	**.000**
Factor 11	-2.013	1.048	-.083	-1.920	**.056**
Factor 12	9.729	1.066	.395	9.125	**.000**
Factor 13	2.194	1.045	.091	2.100	**.037**
Factor 14	-1.425	1.040	-.059	-1.370	.172
Factor 15	.552	1.059	.023	.521	.603

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.751a	**.564**	.537	16.427

ANOVA[b]

	Sum of Squares	df	Mean Square	F	Sig.
Regression	82177.756	15	5478.517	20.303	.000a
Residual	63411.192	235	269.835		
Total	145588.948	250			

a. Predictors: (Constant), REGR factor score 15 for analysis 1, REGR factor score 1 for analysis 1, REGR factor score 7 for analysis 1, REGR factor score 13 for analysis 1, REGR factor score 9 for analysis 1, REGR factor score 3 for analysis 1, REGR factor score 14 for analysis 1, REGR factor score 4 for analysis 1, REGR factor score 11 for analysis 1, REGR factor score 12 for analysis 1, REGR factor score 5 for analysis 1, REGR factor score 10 for analysis 1, REGR factor score 2 for analysis 1, REGR factor score 8 for analysis 1, REGR factor score 6 for analysis 1
b. Dependent Variable: HBDI® C Quadrant Score

Table 4.119: Regression Analysis—Research Hypothesis 3
Regression of HBDI® D Quadrant Score on 15 Factor Scores

Correlation Coefficients[b]

	HBDI® D Quadrant Score (N=251)	
	Pearson's Corr.	**Sig. (1-tail)**
HBDI® D Quadrant Score	1.000	.
Factor 1: Creativity	.500	.000
Factor 2: Analytical Cog. Style	-.340	.000
Factor 3: Intuitive Cog. Style	.203	.001
Factor 4: Risk-Taking	.317	.000
Factor 5: Arts/Aesthetics	.208	.000
Factor 6: Emotions	.089	.079
Factor 7: Impulsivity	.129	.021
Factor 8: Cooperativeness	.026	.343
Factor 9: Time of Day	.007	.456
Factor 10: Music	.023	.357
Factor 11: Conventionality	-.042	.255
Factor 12: Academic Aptitude	.187	.001
Factor 13: Planning	-.070	.133
Factor 14: Biological	-.072	.129
Factor 15: Miscellaneous	.128	.021

Regression Coefficients[b]

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Err.**	**Beta**	**t**	**Sig.**
(Constant)	78.451	.997		78.679	**.000**
Factor 1	12.782	.993	.498	12.875	**.000**
Factor 2	-9.079	1.006	-.349	-9.024	**.000**
Factor 3	5.964	.989	.233	6.033	**.000**
Factor 4	7.587	.978	.299	7.757	**.000**
Factor 5	6.249	.987	.245	6.331	**.000**
Factor 6	1.977	1.024	.075	1.931	**.055**
Factor 7	3.421	.985	.134	3.473	**.001**
Factor 8	-.579	1.021	-.022	-.567	.571
Factor 9	.157	1.007	.006	.156	.877
Factor 10	.580	.990	.023	.586	.558
Factor 11	-1.397	1.006	-.054	-1.389	.166
Factor 12	5.147	1.023	.195	5.032	**.000**
Factor 13	-1.793	1.002	-.069	-1.789	.075
Factor 14	-1.593	.998	-.062	-1.596	.112
Factor 15	3.701	1.016	.141	3.642	**.000**

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.807a	**.651**	.629	15.758

ANOVA[b]

Model 1	Sum of Squares	d	Mean Square	F	Sig.
Regression	108939.249	15	7262.617	29.248	.000a
Residual	58352.560	235	248.309		
Total	167291.809	250			

a. Predictors: (Constant), REGR factor score 15 for analysis 1, REGR factor score 1 for analysis 1, REGR factor score 7 for analysis 1, REGR factor score 13 for analysis 1, REGR factor score 9 for analysis 1, REGR factor score 3 for analysis 1, REGR factor score 14 for analysis 1, REGR factor score 4 for analysis 1, REGR factor score 11 for analysis 1, REGR factor score 12 for analysis 1, REGR factor score 5 for analysis 1, REGR factor score 10 for analysis 1, REGR factor score 2 for analysis 1, REGR factor score 8 for analysis 1, REGR factor score 6 for analysis 1

b. Dependent Variable: HBDI® D Quadrant Score

Research Hypothesis 4—Correlation Analysis (CA)

CA was utilized to cross-validate the DOI with the PSI, a validated measure of the dichotomous Rational and Intuitive approaches to differing tasks: preparing for the future; solving problems; and approaching work (Appendix G). Research Hypothesis 4 proposed that a positive relationship would be found with the three PSI Intuitive mode subscale scores and a negative relationship would be found with the three Rational mode subscale scores. More specifically, the DOI Total Score T Score should correlate strongly and positively with the three PSI Intuitive subscales (i.e., Vision, Insight and Sharing); and negatively with the three PSI Rational subscales (i.e., Planning, Analysis and Control).

Table 4.120 below provides descriptive statistics for the DOI Total Score-T Scores by each of the PSI's six subscales. Outcomes are included only for the 122 respondents who completed both DOI and PSI.

Table 4.120: Descriptive Statistics—DOI Total Score T Score and PSI Subscales

DESCRIPTIVE STATISTICS and PERCENTILES			RATIONAL MODE			INTUITIVE MODE		
		DOI Total Score T Score	PSI Plan-ning %	PSI Analy-sis %	PSI Con-trol %	PSI Vis-ion %	PSI In-sight %	PSI Shar-ing %
N	Valid	120	122	122	122	122	122	122
	Missing	2	0	0	0	0	0	0
Mean		51.56	19.45	18.27	18.19	18.44	20.61	22.05
Median		51.54	20.00	18.00	18.00	18.50	20.00	22.00
Std. Dev.		9.78	4.82	4.40	4.87	4.74	4.08	4.39
Minimum		31.24	7.00	7.00	8.00	9.00	12.00	10.00
Maximum		73.58	30.00	30.00	30.00	29.00	30.00	30.00
Skewness		-.07	-.09	.28	.40	.07	.24	-.30
Kurtosis		-.85	-.38	-.14	-.27	-.68	-.49	-.23
Percentiles	25	43.43	16.00	15.00	15.00	14.00	17.75	19.00
	50	51.54	20.00	18.00	18.00	18.50	20.00	22.00
	75	59.65	23.00	21.00	21.00	22.00	23.25	25.00

Std Dev=Standard Deviation

Table 4.120 above shows minimum/maximum mean and median scores for the DOI Total Score T Score across the six PSI subscales ranging from a low of 18.00 for Analysis and Control to a high of 22.05 for Sharing. The standard deviations were between 4.08 for Insight and 4.82 for Planning. The closeness of the means and medians and the skewness values near zero indicated normal distributions for the DOI Total Score T Score across the PSI subscales.

Table 4.121 below provides the correlation analysis for the DOI T Scores and six PSI subscales. Though correlations between the DOI Total Score T Score and Planning, Analysis and Sharing were not significant, the correlation with Control was negative, and correlations with Vision and Insight were positive. All of the significant outcomes were as expected.

Table 4.121: Correlation Analysis—Research Hypothesis 4
DOI Total Score T Score and 6 PSI Subscales

VARIABLE	Correlated with	Pearson's Correlation	Sig. (2-tailed)	N
DOI Total Score T Score	DOI Total Score-T score	1.000		
	PSI Planning %	-.106	.251	120
	PSI Analysis %	-.091	.324	120
	PSI Control %	**-.240****	.009	120
	PSI Vision %	**.560****	.000	120
	PSI Insight %	**.330****	.000	120
	PSI Sharing %	.030	.744	120

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix AI provides additional correlations among the DOI Total Score-T Score and each of the six subscales of the PSI Rational vs. Intuitive modes.

Table 4.122 below presents the correlations between the six PSI subscales and the T scores for each of the 20 DOI variables from the social/acquired and situational clusters. Outcomes are included only for those respondents who completed both the DOI and PSI.

Table 4.122: Correlation Analysis—Research Hypothesis 4
DOI Variable T Scores and 6 PSI Subscales

CORRELATION MATRIX		RATIONAL MODE			INTUITIVE MODE		
		PSI Planning %	PSI Analysis %	PSI Control %	PSI Vision %	PSI Insight %	PSI Sharing %
PSI Planning %	Pear Corr	1.000					
	Sig.(2-tail)						
	N	122					
PSI Analysis %	Pear Corr	**.727****	1.000				
	Sig.(2-tail)	.000					
	N	122	122				
PSI Control %	Pear Corr	**.617****	**.555****	1.000			
	Sig.(2-tail)	.000	.000				
	N	122	122	122			
PSI Vision %	Pear Corr	-.092	.124	**-.242****	1.000		
	Sig.(2-tail)	.313	.172	.007			
	N	122	122	122	122		
PSI Insight %	Pear Corr	**.321****	**.344****	-.012	**.367****	1.000	
	Sig.(2-tail)	.000	.000	.894	.000		
	N	122	122	122	122	122	
PSI Sharing %	Pear Corr	**.284****	**.316****	**.247****	.145	**.274****	1.000
	Sig.(2-tail)	.002	.000	.006	.112	.002	
	N	122	122	122	122	122	122
HBDI® 100 Introvsn/Extravsn T score	Pear Corr	.105	.087	-.017	.124	.090	.044
	Sig.(2-tail)	.252	.344	.850	.176	.329	.629
	N	121	121	121	121	121	121
DOI Academic Aptitude/Preference T score	Pear Corr	.007	-.094	.078	.049	-.014	.036
	Sig.(2-tail)	.940	.308	.395	.595	.876	.696
	N	120	120	120	120	120	120
DOI Cognitive Style/ Analytic T score	Pear Corr	**.395****	**.432****	**.608****	**-.300****	-.112	.029
	Sig.(2-tail)	.000	.000	.000	.001	.222	.750
	N	120	120	120	120	120	120
DOI Experience T score	Pear Corr	-.097	-.033	-.073	**.324****	.111	-.024
	Sig.(2-tail)	.291	.718	.426	.000	.226	.794
	N	120	120	120	120	120	120
DOI Music T score	Pear Corr	.063	.009	.027	-.104	-.094	-.102
	Sig.(2-tail)	.493	.923	.771	.258	.309	.270
	N	120	120	120	120	120	120
DOI Cognitive Style/ Intuitive T score	Pear Corr	-.177	**-.188***	**-.325****	**.443****	**.241****	.005
	Sig.(2-tail)	.053	.040	.000	.000	.008	.959
	N	120	120	120	120	120	120
DOI Cooperativeness T score	Pear Corr	.028	.004	.096	-.083	.103	**.408****
	Sig.(2-tail)	.760	.967	.297	.369	.262	.000
	N	120	120	120	120	120	120
DOI Interest in Arts/Aesthetics T score	Pear Corr	.150	.071	.073	.097	.141	.142
	Sig.(2-tail)	.102	.439	.426	.290	.124	.122
	N	120	120	120	120	120	120

Table 4.122 *(continued)*

CORRELATION MATRIX		RATIONAL MODE			INTUITIVE MODE		
		PSI Planning %	PSI Analysis %	PSI Control %	PSI Vision %	PSI Insight %	PSI Sharing %
DOI Creativity T score	Pear Corr	-.048	.052	-.165	**.612****	**.271****	-.033
	Sig.(2-tail)	.602	.576	.072	.000	.003	.724
	N	120	120	120	120	120	120
DOI Emotions T score	Pear Corr	.114	.012	.118	.021	-.038	.013
	Sig.(2-tail)	.215	.894	.200	.816	.678	.890
	N	120	120	120	120	120	120
DOI Flexibility T score	Pear Corr	**-.287****	**-.212***	**-.297****	**.474****	**.280****	.023
	Sig.(2-tail)	.001	.020	.001	.000	.002	.800
	N	120	120	120	120	120	120
DOI Impulsivity T score	Pear Corr	**-.321****	-.170	**-.361****	**.440****	.174	.069
	Sig.(2-tail)	.000	.063	.000	.000	.058	.451
	N	120	120	120	120	120	120
DOI Carelessness T score	Pear Corr	**-.298****	**-.389****	**-.374****	**.333****	.042	.048
	Sig.(2-tail)	.001	.000	.000	.000	.648	.601
	N	120	120	120	120	120	120
DOI Adventure-seeking T score	Pear Corr	-.098	-.026	**-.352****	**.542****	**.320****	-.016
	Sig.(2-tail)	.288	.780	.000	.000	.000	.866
	N	120	120	120	120	120	120
DOI Unconven-tionality T score	Pear Corr	-.082	-.016	**-.292****	**.373****	**.297****	-.011
	Sig.(2-tail)	.373	.863	.001	.000	.001	.907
	N	120	120	120	120	120	120
DOI Innovation T score	Pear Corr	-.085	-.014	**-.240****	**.534****	**.349****	-.062
	Sig.(2-tail)	.358	.879	.008	.000	.000	.504
	N	120	120	120	120	120	120
DOI Ability to Visualize T score	Pear Corr	-.012	.095	**-.184***	**.560****	**.328****	-.041
	Sig.(2-tail)	.897	.304	.045	.000	.000	.658
	N	120	120	120	120	120	120
DOI Imagery T score	Pear Corr	-.028	.005	-.054	**.367****	**.240****	-.105
	Sig.(2-tail)	.761	.956	.556	.000	.008	.254
	N	120	120	120	120	120	120
DOI Time of Day T score	Pear Corr	-.052	-.166	-.073	**-.221***	-.035	**-.217***
	Sig.(2-tail)	.575	.070	.428	.015	.708	.018
	N	120	120	120	120	120	120
DOI Amount of Info Available T score	Pear Corr	-.038	-.110	**-.257****	**.457****	**.256****	.047
	Sig.(2-tail)	.681	.231	.005	.000	.005	.607
	N	120	120	120	120	120	120

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The positive correlations from Table 4.122 ranged from .240 to .727; the negative correlations ranged from -.184 to -389. Forty-seven of the 54 significant correlations ran

in the expected positive or negative direction. The seven exceptions, all relatively weak, were:

- Sharing and Control (.247)
- Sharing and Planning (.284)
- Sharing and Analysis (.316)
- Insight and Planning (.321)
- Insight and Analysis (.344)
- Time of Day and Vision (-.221)
- Time of Day and Sharing (-.217)

A list of the significant positive and negative correlations between the DOI variable T scores and PSI subscales, in descending order from strongest to weakest, is included as Appendix AJ.

Research Hypothesis 4 proposed that a positive relationship would be found between intuition as measured by the DOI and the three Intuitive mode subscales of the PSI (i.e., Vision, Insight and Sharing). In addition, a negative relationship would be found with the three Rational mode subscales of the PSI (i.e., Planning, Analysis and Control). No significant correlations were found between the DOI Total Score T Score and the PSI Rational mode subscales Planning and Analysis and the Intuitive mode subscale Sharing. However, the correlation with the PSI Rational mode Control was significant and negative as expected. The correlations with the PSI Intuitive mode subscales Vision and Insight were also significant and positive, as expected.

In addition to the DOI Total Score T Score analyses, the relationship between the 20 DOI variable T scores and the six PSI subscales were analyzed. Among these, 47 of the 54 significant correlations were found to be in the anticipated directions. These findings, though mixed, still provided strong support for Hypothesis 4. Accordingly, Hypothesis 4 is retained.

Summary

Findings, conclusions and implications of the outcomes of this study will be synopsized and discussed in Chapter 5. The researcher's personal observations will also be presented, along with recommendations for further study of this important topic.

I shall not commit the fashionable stupidity of regarding everything I cannot explain as a fraud. – Carl Jung

Chapter 5

There are two ways to be fooled. One is to believe what isn't so; the other is to refuse to believe what is so. — Soren Kierkegaard

FINDINGS, CONCLUSIONS AND IMPLICATIONS

This chapter provides an overview of each section of the study, including research questions, literature, DOI instrument design and data collection, and the findings of the statistical data analyses. It also presents the theoretical implications of the study, and researcher's conclusions based on the study's findings. Subsequent research, expanding the body of knowledge on the topic of intuition, especially its practical role in teaching and learning, is also recommended.

Overview of the Study

Agyakwa (1988) proposed that there are two ways of knowing anything: 1) deduction/induction; and 2) intuition, the *other* way of knowing (p. 169). Properly understood, these two modes are not mutually exclusive but complementary, synergistic processes. Unfortunately, traditional Western education promotes the former while neglecting, dismissing, even repudiating, the latter. Thus, innate intuitive abilities that might be useful in teaching and learning are allowed to atrophy during the K-12 years. The impact is magnified for adult learners, whose innate intuitive capacity may be extinguished altogether as a result of the early neglect.

The purposes of this study were to:

1. develop the DOI instrument to measure the individual's capacity for intuitive thinking; and verify a set of three underlying dimensions (i.e., common factors) in intuitive functioning;

2. quantify the relative contributions of each brain quadrant as measured by the HBDI® to each DOI factor, to determine whether intuition is right-, left- or whole-brained;

3. quantify the relative contributions of each brain hemisphere, as measured by the HBDI® to each DOI factor, to determine whether intuition is right-, left- or whole-brained; and

4. cross-validate the DOI with the PSI, a validated measure of preference for the rational vs. intuitive mode (i.e., intuition/not intuition).

Methodologies utilized in the study were:

1. confirmatory factor analysis (CFA) to determine the underlying factor structure of the 25 variables (Hypothesis 1);

2. canonical correlation analysis (CCA) to quantify the relative contributions of the 15 factors from the CFA for each HBDI® brain quadrant (Hypothesis 2);

3. regression analysis (RA) to determine the relationship between intuition and the HBDI® brain hemispheres (Hypothesis 3); and

4. correlation analysis (CA) to correlate DOI scores with outcomes for the six subscales scores of the PSI (Hypothesis 4).

Research Questions

Research questions asked by the project were related to the study's hypotheses:

1. Do the 25 variables examined in this study fit into the three-factor model (i.e., social/acquired, biological and situational clusters) to which they were assigned by Shirley and Langan-Fox? (Hypothesis 1)

2. How do the intuitive factor scores, as measured by the DOI, relate to the dependent HBDI® quadrant scores? (Hypothesis 2)

3. How do the intuitive factor scores, as measured by the DOI, relate to the dependent HBDI® left/right and cerebral/limbic hemisphere (i.e., modal percent) scores? (Hypothesis 3)

4. Will intuition, as measured by the DOI, show a strong positive correlation with the PSI's three intuitive mode subscales and a strong negative correlation with the PSI's three rational mode subscales? (Hypothesis 4)

Relevant Literature

The following section synopsizes the theoretical and empirical literature related to intuition and brain dominance, as presented in Chapter 2.

Intuition Literature—Synopsis

Generally defined as a keen and quick but non-conscious, non-rational insight or the faculty by which such insights are perceived, intuition has been regarded disparately as psychic phenomenon, mystical faculty, and occult gift. It has also been viewed as the axiomatic truth that makes it possible for one to apprehend axiomatic truths. For this project, intuition was operationalized in terms of DOI, HBDI® and PSI outcomes.

The theoretical foundations of intuition differ across fields of inquiry. For philosophers, intuition is a sensory capacity enabling one to perceive universal truth. For psychologists, it is one of the orienting functions of consciousness, an aspect of personality or temperament. For neuroscientists, it is a cognitive function originating in the pre-frontal cortex of the brain. For practitioners, it is a faculty enabling rapid inference and the recognition of obscure but meaningful patterns. To reconcile such conflicting views, Ewing, Bahm, Vaughan, Sanders, Wild, Bastick, Mishlove, Goldberg and others have organized intuition by type or functional category (Appendix I).

A handful of researchers have attempted to operationalize and analyze intuition, despite the apparent incongruity of doing so. The empirical foundations of intuition include Westcott's (1968) seminal investigations into intuition as an inferential tool. He operationalized intuition behaviorally as "the ability to [reach] a conclusion on the basis of less explicit information than is ordinarily required" (p. 97). Based on his empirical findings, he built a much-referenced profile of highly intuitive individuals (Appendix J).

The personal characteristics from Westcott's profile, and variables examined by other intuition theorists and researchers, were included in the intuition literature review conducted by Shirley and Langan-Fox in 1996. The 57 intuition-related variables they

identified were assigned to one of three clusters: social/acquired, biological and situational. Among the 57 variables presented in their matrix (Appendix B). 25 were selected for examination in the researcher-designed DOI instrument utilized in this project (Appendix A).

Brain Dominance Literature—Synopsis

Dominance, which tends to exist in all paired structures, implies relative degrees of preference or avoidance for one of the structures. Brain dominance, the way humans utilize the bilateral brain structures, is related to the individual's preference for a given set of brain faculties associated with the A, B, C and D brain quadrants, as well as the left/right and cerebral/limbic brain hemispheres (Herrmann, 1995).

The modern understanding of brain functionality relies heavily on the ground-breaking split-brain experiments conducted by Nobelist Roger Sperry and his colleagues in the 1970's. Sperry concluded that the left and right hemispheres of the brain have discrete functions. Further, his work delineated the tasks performed by the logical, verbal, sequential left hemisphere and the spatial, figural, relational right hemisphere.

Taking Sperry's findings a step further, Ornstein (1997) demonstrated that lateralization and specialization are normal attributes for *everyone*, not just split-brain patients. He proposed a "winner take all" policy which dictates that, if a given brain hemisphere is even 20% more efficient at a given function, that hemisphere acquires the entire function (p. 15). Thus, though intuition appears to be seated in the right-brain hemisphere, its full functionality may actually be whole brained.

Herrmann's studies of brain functionality considered Sperry's research, along with those of Papez, MacLean and others who had proposed a tripartite brain structure (i.e.,

the reptilian brain; limbic system; and neocortex, or cerebral, brain). In the tripartite model, the cerebral brain dominates the two lower-order functions. Synthesizing the prior research, Herrmann proposed that the brain had four functional divisions: the dichotomous and bilateral left/right and cerebral/limbic hemispheres. Based on this understanding, Herrmann formed his *Whole Brain Model* (Appendix D), which presents the theoretical architecture of the brain. Each brain hemisphere is comprised of two contiguous quadrants: left hemisphere=A and B quadrants; right hemisphere=C and D quadrants; cerebral hemisphere=A and D quadrants; limbic hemisphere=B and C quadrants (Herrmann, 1995, pp. 32-33, 63). On the basis of research by Sperry, Levy, Papez, McLean and others, as well as his own early EEG experiments, Herrmann ultimately developed a pen and paper instrument, the Herrmann Brain Dominance Instrument® (HBDI®, Appendix C). A validated thinking styles instrument, the HBDI® measures the individual's degree of preference for each brain quadrant and hemisphere.

Herrmann defined intuition as "knowing something without thinking it out; that is, having instant understanding without the need for facts or proof" (1995, p. 431). The HBDI® loads intuition in the right hemisphere's C and D quadrants. The right brain is particularly adept at accessing and receiving intuitive information, which is typically whole, diffuse, subjective, spontaneous, non-linear, non-conscious, symbolic and imagistic in nature. Assigning intuition to the right hemisphere also fits Ornstein's optimal functioning, "winner take all" theory (1997, p. 15). Conversely, the left brain's superior sequential processing, language and reasoning abilities enable the decoding (i.e., translation, or interpretation) of intuitive information. Based on these foundational theories, the researcher proposed that intuition is, in fact, a faculty of the whole-brain.

DOI Instrument Design

The theoretical and empirical literature reviewed for this project served as the basis of the items included in the researcher-designed DOI instrument. Though intuition is nonrational and nonconscious by definition, the underlying premise of the DOI was that individuals can: 1) identify the degree to which they possess given personal characteristics that may be predictive of intuition; and 2) quantify their own perception and experience of intuition.

The 25 intuition-related variables examined by the DOI were selected primarily because they could be measured by self-report, and were also measured by one or both of the other instruments employed in this study. Ten of the 25 variables were drawn from the theoretical literature: intuitive and analytic cognitive styles, experience, innovation, carelessness with facts and details, interest in arts/aesthetics, cooperativeness, music, ability to visualize, and imagery. Seven variables emerged from the empirical literature: academic aptitude, impulsivity, flexibility, unconventionality, adventure-seeking, time of day, and amount of information available. Three variables—age, emotions, and ethnicity—were found in both the theoretical and empirical literature. Among the four remaining variables, three—introversion/extraversion, sex, and handedness—were measured by items on the HBDI®. The final variable, brain hemispheres, was represented by the HBDI® quadrant and hemisphere outcome scores.

The DOI also contained 27 items that measured characteristics from Westcott's profile, which described highly intuitive individuals as creative, alert, independent, foresightful, confident, spontaneous, unconventional, emotionally connected risk-takers who accept criticism easily, readily commit to causes, take interest in abstract issues, and

change profoundly with ease. Five DOI items assessed the respondents' personal experience of intuition, including frequency; receptors (i.e., visual, auditory, feeling and sensing; Sanders, 1989); and the conditions (i.e., times, places, etc.) most conducive to intuition. Respondents were also asked to quantify their level of belief in intuition, as well as their perception of their own level of intuitiveness. Six additional items were related to the respondents' customary use of the six types of intuition identified by Goldberg (1983): discovery, creativity, evaluation, operation, prediction and illumination. Data from these items, collected for later review; was not analyzed or presented in this project.

The age and education items in the background section of the instrument served two primary purposes: 1) to verify that study respondents met the minimum criteria for participation in the study; and 2) to provide background information for evaluating the heterogeneity of the sample population. Ethnicity and occupation items provided additional measures of heterogeneity and assisted with the matching of DOI, HBDI® and PSI data by respondent.

A few of the 25 variables examined by the DOI were included despite a lack of empirical evidence showing a relationship to intuition. For example, despite the prevailing myth, no study to date has shown that women are inherently more intuitive than men. In addition, no meaningful relationship has been established between intuition and biological variables age, ethnicity or handedness. These variables were included because failure to find a relationship with intuition would confirm the outcomes of previous studies, providing additional evidence of the DOI's validity. Appendix J provides a matrix of each DOI item, the related variable and the supporting literature.

Data Collected

A series of email invitations were sent to prospective participants over a nine-month period. Potential respondents were encouraged to forward the invitation to other individuals and groups that met the minimum age and education criteria. The 899 known individuals invited to participate included faculty members; students; colleagues; clients; family; friends; referrals; faculty, adult learner, and conference listserv groups. About 120-150 business professionals and undergraduate and graduate education, nursing and social work students were also reached through flyers and in-person presentations.

Data was ultimately collected from 302 respondents (295 DOI's, 258 HBDI®'s, 122 PSI's), ages 20-79, with diverse occupations and educational backgrounds, in at least 20 states from Alaska to Florida. Assuming 1500 individuals were invited to participate in the study, the response rate for the 302 respondents would be 20.1%. It is likely that the response rate was somewhat lower, though the actual rate cannot be precisely determined because there is no way to know how many referrals were forwarded to individuals unknown to the researcher.

Among the respondents who designated sex, nearly three-fourths (72.5%) were female and 26.1% male, compared to 50.9% and 49.1%, respectively, for the overall population. Though women are not necessarily more intuitive than men, socio-cultural influences and the pervasive myth of *women's intuition* may have contributed to the lower participation rate for men. Women may also have a greater interest in the topic of intuition. In addition, it is likely that women were disproportionately represented in the study's convenience population, which included large numbers of educators, nurses, social work students, higher education faculty, conference attendees, etc.

Respondent ages ranged from 20 to 79, matching 68% of the U.S. population (Appendix R). The sample population included 65 individuals (21.5%) in their 20's; 54 (17.9%) in their 30's; 54 (17.9%) in their 40's; 73 (24.2%) in their 50's; 48 (15.9%) in their 60's; and 8 (2.6%) in their 70's. Except for the group in their 70's, age ranges were well-distributed, and the representations by decade were as expected.

Education levels among the respondent population tended to be higher than for the U.S. population as a whole: .02% high school or equivalent; 10.2% some college credit; 7.8% an Associate's degree; 33.6% Bachelor's; 30.2% Master's; 11.2% doctorate; and 5.1% professional certification/licensure. By comparison, education levels for the overall U.S. population are 28.6% high school; 7.1% some college; 6.3% Associate's; 15.5% Bachelor's; 5.9% Master's; 1% doctorate; and 2% professional degree (Appendix T). The higher levels of education are also over-represented among study respondents, because the study utilized a convenience population with a preponderance of teachers and professors, as well as professionals and adult learners enrolled in undergraduate and graduate programs at colleges and universities around the country.

Respondent ethnicity was 86.4% white; 6.8% black; and 5.4% Hispanic. White respondents were disproportionately represented compared to their proportion in the general U.S. population (77.4%, 11.4%, and 11.0%, respectively, among those 18 and over). Again, the over-representation of whites and under-representation of blacks and Hispanics in the sample population were probably related to their respective levels of representation in the convenience population reached. It may also be related to varying degrees of interest in the topic of the study, though this would have to be confirmed through follow-up interviews or surveys with potential and actual respondents.

Findings of the Study

This section synopsizes the findings of the study, including the: 1) hypothesized relationships among the DOI, HBDI® and PSI instruments; 2) DOI reliability and validity analyses; and 3) CFA, CCA, RA and CA tests conducted for Hypotheses 1-4.

Hypothesized DOI, HBDI® and PSI Relationships—Synopsis

Table 5.1 below presents the hypothesized relationships among the DOI variables, HBDI® quadrants and hemispheres, and PSI rational and intuitive modes and subscales.

Table 5.1: Hypothesized Relationships between DOI Variables, HBDI® Quadrants/Hemispheres, and PSI Rational/Intuitive Modes and Subscales

DOI Variables		HBDI® Quadrants				HBDI® Hemispheres				PSI Rational			PSI Intuitive		
		A	B	C	D	Lt	Rt	Ce	Li	P	A	C	V	I	S
SOCIAL/ACQUIRED	Academic aptitude	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Cog.Style/Analytic	X	X			X		X	X	X	X	X			
	Cog.Style/Intuitive			X	X		X	X	X				X	X	X
	Experience	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Introvsn/Extravsn	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Creativity	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Innovation	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Carelessness				X		X						X	X	
	Cooperativeness			X			X								X
	Impulsivity				X		X						X	X	
	Flexibility				X		X						X	X	
	Interest arts/aesth.			X			X								X
	Music	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Adventure-seeking				X		X						X	X	
	Unconventionality				X		X						X	X	
	Ability to visualize				X		X						X	X	
	Imagery				X		X						X	X	
	Emotions			X			X								X
BIOLOG.	Age	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Sex	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Handedness	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Brain hemispheres*														
	Ethnicity	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SIT.	Time of day	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Amt/info available	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Sit.=Situational; Biolog.=Biological; Lt=Left; Rt=Right; Ce=Cerebral; Li=Limbic; P=Planning; A=Analysis; C=Control; V=Vision; I=Insight; S=Sharing.

As shown in Table 5.1 above, 12 of the 25 variables examined in this study were hypothesized to be whole-brained and related to all six PSI subscales. By definition, cognitive style/analytic is related to the left-brain hemisphere, and cognitive style/ intuitive to the right. Ten of the remaining variables are primarily right-oriented but more closely related either to the HBDI® C quadrant or D quadrant. Among the six PSI subscales, A(nalysis) is related to the A quadrant; P(lanning) and C(ontrol) to the B quadrant; S(haring) to the C quadrant; and V(ision) and I(nsight) to the D quadrant. Brain hemisphere relationships are depicted in the HBDI® quadrant and hemisphere columns.

DOI Validity and Reliability Analyses—Synopsis

The DOI instrument was found to be reliable based on accepted standards of the discipline: descriptive statistics, intra-variable correlations, inter-item correlations, reliability testing, and review of the DOI Wrap-Up item 100.

Descriptive Statistics. As shown in descriptives Tables 4.5 through 4.71, normal distributions were established for the 25 variables across the demographic groups, with the following exceptions:

1. *Sex* (females)—cooperativeness, interest in arts/aesthetics, emotions;
2. *Ethnicity* (Hispanics)—academic aptitude;
3. *Education*—academic aptitude (professional certification);
   —interest in arts/aesthetics (Master's);
   —emotions (high school, Bachelor's, professional certification);
   —innovation, music, adventure-seeking, unconventionality (high school).

Non-normal distributions for these demographic groups, especially high school and professional certification, were due to their under-representation among the sample population. Additional studies with larger numbers of participants across these categories are needed in order to establish normal distributions.

Intra-Variable Correlations. Intra-item correlation analyses were conducted for the academic aptitude/preference T score and the18 three-item sets included as DOI items 46-99, as shown in Tables 4.72 through 4.90. Positive and negative correlations, in descending order from strongest to weakest, are also presented in Appendix Y.

Due to the large sample size utilized in this study, most of the intra-variable values were found to be significant. Though a few of the intra-variable correlations were weaker than expected, nearly all of the positive and negative relationships were in the hypothesized directions. Exceptions to the anticipated outcomes were:

1. *Cooperativeness—Table 4.79*: Correlations among items 57 (cooperative), 67 (cooperate) and 82 (NOT cooperation), the overall cooperativeness score and the DOI total score were in the expected directions but weaker than anticipated. If the cooperativeness variable is retained in future iterations of the DOI instrument, these items may need to be revised for clarity.

2. *Impulsivity—Table 4.80*: Correlations among the three impulsivity items—60 (spontaneously), 70 (LOST without plan) and 80 (decisions impulsive)—overall impulsivity score, and DOI total score were mixed. Though the correlations were weaker than expected, items 60, 80 and the overall impulsivity score were positive, as anticipated. Item 70 and the DOI total score were negative but weaker than anticipated.

3. *Flexibility—Table 4.81*: Negatively-worded item 63 (to do lists) and the DOI total score were not significant as anticipated. If retained in future iterations of the DOI instrument, this item may need to be revised.

4. *Time of Day—Table 4.89*: Correlations among the three items related to time of day—58 (less receptive), 74 (more intuitive times) and 90 (NOT more productive)—and the DOI total score were significant but weaker than expected. Due to the difficulty of measuring situational variables with a pen and paper instrument, this variable should be reviewed for appropriateness and revised for clarity if retained in future iterations of the DOI instrument.

As shown, a preponderance of the intra-variable correlations examined fit the anticipated outcomes of the project, supporting the construct validity of the DOI instrument.

Inter-Item Correlations. As shown in Tables 4.91 through 4.101, inter-item correlation analyses were conducted for all pair-wise combinations of the overall DOI Total Score T Score; academic aptitude/preference, DOI items 46-99; introversion/ extraversion and three of the five biological variables: handedness, sex and age. Table 5.2 below presents: 1) the percent of correlations (among 66 possible) that were found to be as expected for each of the 67 items and variables; 2) the percent of correlations found to be significant at the 0.01 level; and 3) the percent of significant correlations that were *not as expected.*

As expected vs. *not as expected* determinations were made on the basis of the anticipated direction of the correlations for all except the following:

School Subjects/History-Social Studies, Science and Foreign Language. These variables have mixed HBDI® loadings; that is, they load on more than one quadrant across the hemispheres. Expected direction and strength of correlations with intuition for these variables could not be determined. Accordingly, items in these categories at the 0.01 level were assigned to the *not as expected* category based on unexpected significance levels.

Introversion/Extraversion, Handedness, Sex and Age. Previous studies have not shown significant HBDI® quadrant/hemisphere loadings for these variables. That is, they have little or no predictive value, or have equal loadings across the quadrants and hemispheres. Expected direction and strength of correlation with intuition for these variables could not be determined. Accordingly, items in these categories at the 0.01 level were assigned to the *not as expected* category based on unexpected significance levels.

Table 5.2: Inter-Item Correlations—% of Correlations As Expected;
% of Possible Correlations Significant at **=0.01 Level";
and % of Significant Correlations Not As Expected

INTER-ITEM VARIABLES		% of Correlations As Expected (66 Total)	% of Correlations Significant at **=0.01 Level	% of Significant Correlations NOT As Expected
DOI TTOTAL SCORE T SCORE	DOI Total Score T Score	94	85	8
ACADEMIC APTITUDE/ PREFERENCE	6.Academic Aptitude	82	31	24
	7c.Subj/Math*	29	84	6
	7b.Subj/History-Soc.Stu.**	94	6	0
	7d.Subj/Science**	94	8	20
	7e.Subj/For. Language**	92	10	17
	7a.Subj/English	38	36	33
COGN STYLE/ ANALYTIC	51.NOT step-by-step	89	54	3
	65.Analyze things*	59	41	31
	73.Consider facts*	67	41	11
COG STYLE/ INTUITIVE	50.Sudden ideas	85	52	0
	56.Rely on intuition	88	59	0
	92.NOT confident*	85	54	0
EXPERIENCE	52.Trace insights	73	50	8
	85.Act on instinct	82	52	4
	98.PRIOR experience*	55	19	14
CREATIVITY	53.Multiple ways	79	62	9
	59.Creative activities	91	63	3
	95.NOT imaginative*	89	69	5
INNOVATION	54.Recognize patterns	80	60	6
	87.DIFF'CLT/novel ways*	83	53	0
	93.Finding alternatives	82	67	6

Table 5.2 *(continued)*

INTER-ITEM VARIABLES		# Correlations As Expected	% Correlations Significant at **=0.01 Level	% Significant Correlations NOT As Expected
CARELESS-NESS w/FACTS	**55.NOT collect facts**	76	42	10
	89.Precise facts*	77	39	5
	97.Rely on intuition	86	67	3
COOPERA-TIVENESS	**57.Cooperative**	71	21	30
	67.Cooperate	53	14	60
	82.NOT cooperation*	58	32	25
IMPULSIVITY	**60.Spontaneously**	85	61	3
	70.LOST w/o plan*	77	51	15
	80.Decisions impulsive	83	45	4
FLEXIBILITY	**63.To do lists***	53	46	44
	78.Flexible plans	94	56	3
	91.Flexibility	91	57	6
INTEREST in ARTS/AESTH.	**48.Interest in art**	86	56	6
	64.Appreciate art	82	52	14
	84.NOT enjoy art*	86	37	10
MUSIC	**47.NOT musical***	67	30	15
	61.Listen to music	85	43	4
	68.Enjoy music	67	30	31
ADVENTURE-SEEKING	**69.Take risks**	85	54	0
	71.NOT seek adventures*	88	48	7
	76.Enjoy unknown	89	64	3
UNCONVEN-TIONALITY	**49.NOT stand out***	73	35	24
	72.Unconventional	83	53	7
	75.Comfortable/different	89	44	0

Table 5.2 *(continued)*

INTER-ITEM VARIABLES		% Correlations As Expected (66 Possible)	% Correlations Significant at **=0.01 Level	% Significant Correlations NOT As Expected
ABILITY TO VISUALIZE	**46.Novel uses**	80	68	6
	66.DIFFICULT/visualize*	77	43	9
	77.Visualize solutions	80	70	5
IMAGERY	**79.NOT good/symbols***	83	45	4
	81.Insights/ment. images	74	37	6
	83.Metaphors	85	55	3
EMOTIONS	**62.NOT connect/emotions***	71	26	17
	88.Emotionally involved	73	31	27
	94.Compelling ideas	88	53	10
TIME OF DAY	**58.LESS receptive**	67	14	33
	74.More intuitive times	76	14	0
	90.NOT more productive*	55	17	50
AMT OF INFO AVAILABLE	**86.Know w/o knowing**	92	49	0
	96.Decisions	85	61	6
	99.MORE info*	77	43	0
INTROV/ EXTRAV	**HBDI®100 Introv/Extrav****	80	25	100
HANDEDNESS	**HBDI®5 Handedness****	95	5	100
	HBDI®6 Hand Left/Right**	97	3	100
	HBDI®6 Hand R-Domin.**	91	10	100
SEX	**Sex****	85	18	100
AGE	**Age****	79	27	100

* = Negatively-worded items, or items negatively correlated with intuition

** = Items either non-correlated or with mixed left-/right-brain correlation; were assigned to *Not as Expected* category if significant at the 0.01 level

Though a few inter-item correlations were weaker than expected, a preponderance of the relationships shown in Table 5.2 above were in the hypothesized directions.

1. *% Correlations As Expected*: These calculations provided a baseline showing the percentage of correlations found to be in the expected positive or negative direction among the 66 inter-item correlations possible for each item in Table 5.2. Correlations *as expected* ranged from 29-97%. More specifically:
   1 item: 29% of the 66 possible correlations in the anticipated direction;
   1 item: 38%
   6 items: 53-59%
   4 items: 67%
   14 items: 71-79%
   30 items: 80-89%
   11 items: 91-97%
   Overall: 53-97% of the possible correlations were as expected for 65 of the 67 items; and 80-97% were as expected for 41 of 67items.

2. *% Correlations Significant at **=0.01 Level*: Significant correlations ranged from 3-85% of the 66 possible correlations for each item. More specifically:
   4 items: 3-8%
   8 items: 10-19%
   4 items: 21-26%
   10 items: 30-39%
   12 items: 41-49%
   16 items: 50-59%
   10 items: 60-69%
   1 item: 70%
   2 items: 84-85%
   Overall: 50-85% of the possible correlations were significant at the 0.01 level for 29 of the 67 items.

3. *% Significant Correlations NOT As Expected*: Among the significant correlations, the preponderance were as expected.
   10 items: 0% *NOT as expected* (of 66 possible correlations, all as expected; included: more intuitive times, more info, difficult/novel ways, sudden ideas, not confident, take risks, rely on intuition, know w/o knowing, comfortable/different and history/social studies)
   28 items: 3-9% *NOT as expected*
   10 items: 10-17%
   5 items: 20-27%
   5 items: 30-33%
   1 item: 44%
   1 item: 50%
   1 item: 60%
   6 items: 100% (included: introversion/extraversion, handedness, age, sex)

> Overall: All of the significant correlations were as expected for 10 of 67 items; all but 3-33% as expected for 48 items; and all but 44%, 50% and 60% as expected for three items. Five of the six items for which none of the correlations were as expected were from the *biological* cluster, which previous studies have not shown to have a strong relationship with intuition.

As shown above and in Appendix AA, a preponderance of the inter-item correlations examined fit the study's expectations, providing support for the DOI's construct validity.

DOI Reliability Analyses. Cronbach's and Tukey's tests were conducted for the DOI by full sample, sex, age by decade, ethnicity, and education, as shown in Tables 4.102 and 4.103. The Cronbach's analysis measured average correlations among items on the DOI as a test of internal consistency. The .796 alpha coefficient for the DOI full sample, and alphas for various groups clustered around the same value, reflected the .80 standard for a *good* measure scale.

The second reliability analysis conducted, Tukey's Test for Non-additivity, assumes that all DOI items are related to the total score in a linear manner, with no multiplicative interactions between the cases and the items. Though the <0.05 level indicates an interaction, the more rigorous <0.01 significance level was utilized for this study. The Tukey's *F* test found significance for all demographic groups, and a Grand Means score approximating the DOI total score, indicating little variability across the groups. Additivity was a potential problem for males by *Sex;* blacks, Hispanics and other by *Ethnicity*, and professional certification/licensure by *Education*. These were under-estimated (i.e., would be evaluated as more intuitive than actual scores indicate), likely due to under-representation in the sample. Scores for high school or equivalent by *Education*, also under-represented, were over-estimated (i.e., would be evaluated as less intuitive than actual scores indicate). These outcomes supported the DOI's reliability.

Wrap-Up—DOI Item 100. A total of 78 respondents added narrative comments to DOI item 100 (Appendix AC). As explained below, these responses tended to support the theoretical assumptions underlying the DOI. Specifically:

Comments related to DOI Instrument/Study: These responses indicated that participants took the study and their participation seriously. Some individuals complained about the length of the instrument and the repetitiveness of some items. To make future iterations of the DOI more accessible, the reading level might be reduced; and a list of term definitions included. Retaining a wrap-up narrative item in the next version will make it possible for participants to explain any ambivalent (i.e., *yes, but*) responses. Completing the DOI may have prompted some respondents to think more deeply about their own use of intuition. However, the impact of this phenomenon, if any, cannot be gauged without follow-up interviews.

Nature of Intuition: Thirty-four of the 78 narrative responses were related to the individuals' personal conceptualizations of intuition. Some perceived intuition as a spiritual or divine faculty; others believed it emanated from prior knowledge or experience. These conceptualizations fit with the researcher's personal theory of intuition as *rapid inference* at one end of the continuum, and as *revelation* at the other. Some discussed the availability and reliability of their intuitive insights. While some access intuition situationally (e.g., during loss, trauma or meditation), others experience it as verbal, non-verbal, facial, or physical impressions. Still others receive intuition as actions, symbols, or repeated visual or audio signs and events. The characterizations varied widely, including intuition as sudden knowing, flash of insight, clairvoyance, creativity, outspokenness, uniqueness, flow, an aspect of decision-making, premonition,

connectedness, an outgrowth of a given context or situation, an innate faculty available to everyone, gut instinct; seeing things before they happen, and first impulse later confirmed by facts. One person viewed intuition as a faculty that only exists for those who believe in it. The disparity of these conceptualizations mirrors the complexity of intuition and reflects the elusiveness of a construct that has intrigued theorists, researchers and practitioners through the ages.

Applications of Intuition: Respondents discussed the use of intuition at home and at work, to redirect thinking, to assist with decision-making and problem-solving, to provide guidance (especially after "sleeping on it"), and to aid the "reading" of people and situations. A healthcare practitioner consciously minimized reliance on intuition with her patients. Her reluctance was presumably related to fear that use of intuition in the life-critical, science-based medical field might be repudiated or, at least, frowned upon—though nursing and healthcare literature is filled with references to intuition. Concern was also expressed that formal education and training focus on facts and scientific evidence to the detriment of intuition; echoing the views of numerous experts cited in Chapters 1 and 2 of this project, as well as the views of the researcher.

General Comments re Intuition: Some comments were too general to fit precisely into one of the categories above. One person declared, simply and without context or explanation, that "women's intuition is real." Another saw intuition as a part of humanity that gets squelched in childhood; another mentioned, incongruously, having a very bad childhood and past. Though the respondent did not elaborate, the theoretical connection may be that risky or violent situations tend to promote development of and reliance on intuition as a protective or life-saving measure. One individual recognized her strong

"people intuition," which the HBDI® loads in the C quadrant. In agreement with the respondent who emphasized that people can be *both* analytical and intuitive, a major premise of this study is that these modes are discrete functionalities that work best as complements.

Miscellaneous Comments: Additional comments did not fit into the categories above but were of interest, nonetheless. One individual noted her *high D* DISC profile score—indicating one who is decisive, direct, results-oriented, and quick to take action (as on http://www.discprofile.com/whatisdisc.htm, October 2008). An intuitive person is more likely to take immediate action, instead of waiting to analyze a situation. Another individual noted that she is ambidextrous, has dyslexia, and teaches creative arts classes. Relative to these three points: ambidexterity relates to handedness, one of the biological variables examined in this project; and it is unknown what relationship, if any, exists between dyslexia and intuition; however, Goldberg (1983) identifies creativity as one of the six types of intuition (Appendix I). A respondent with an identical twin noted that she often shares her sister's opinions and views, though this may be less related to intuition and more a product of the unique relationship between twins. Another individual, with what she termed "undifferentiated schizophrenia," stated without elaboration that her brain "works differently." Again, the connection between schizophrenia and intuition is unknown, though it is unclear whether the respondent intended to imply a connection.

Research Hypotheses 1-4—Synopses. The findings of the analyses conducted for the hypotheses of the study are synopsized in the following section. Hypothesis 1 was the final internal test of DOI validity; Hypotheses 2-4 provided external analysis of the DOI's validity against the two other instruments utilized, the HBDI® and the PSI.

Research Purposes and Hypotheses

The CFA conducted for Hypothesis 1 was the final process in the internal, psychometric analysis of the DOI. The CCA and RA analyses conducted for Hypotheses 2 and 3 comprised the external analyses of the DOI in relation to the HBDI®'s brain quadrants and hemispheres. Hypothesis 4 involved CA of the DOI total and variable T scores and the six subscales of the PSI, the other external instrument utilized in this project. Conduct and outcomes of these analyses are synopsized below.

Research Hypothesis 1—Synopsis

Research Hypothesis 1 proposed that the 25 intuition variables examined by the DOI would fit into the Shirley and Langan-Fox three-factor model. CFA was also utilized to test 21 of the 25 variables, as explained in Chapter 4. The three-factor solution accounted for a mere 29.3% of the variance (Appendix AD), failing to support the hypothesized fit into the three-factor model. The alternative 21-factor solution accounted for 73% of the variance but produced mixed factor loadings (Appendices AE-AG).

Additional runs, utilizing 9-19 factors, showed the 15-factor solution to be the best fit, accounting for the greatest variance (65.5%) with the fewest factors. Ten of the 15 factors loaded cleanly on a single factor (i.e., all three of the DOI items related to a given variable loaded on a single factor): creativity, innovation, ability to visualize, cognitive style/analytic, interest in arts/aesthetics, emotions, cooperativeness, time of day, music, and academic aptitude/preference. Additional variables loaded primarily on one factor (i.e., two of the three DOI items related to a given variable loaded on a single factor): cognitive style/intuitive, adventure-seeking, imagery, carelessness, impulsivity, amount of information available, flexibility, unconventionality, age and handedness.

On the basis of these results, Hypothesis 1 was rejected. However, the many factor loadings suggested that the multi-item sets in the DOI measure the same aspect of intuition, so the number of items may be reduced in future versions of the DOI.

Research Hypothesis 2— Synopsis

Research Hypothesis 2 proposed a relationship between the 15 factors identified in Hypothesis 1 and the A, B, C and D quadrant scores of the HBDI®. CCA was utilized to quantify the relative contributions of each factor for each quadrant.

The primary analyses conducted for Hypothesis 2, as presented in Tables 4.113-4.116, indicated the following factors were most predictive for each HBDI® quadrant:

> *HBDI® A Quadrant*—7 factors: analytical cognitive style, intuitive cognitive style, arts/aesthetics, emotions, impulsivity, music and academic aptitude.
>
> *HBDI® B Quadrant*—9 factors: creativity, analytical cognitive style, risk-taking, arts/aesthetics, impulsivity, academic aptitude, planning, biological and miscellaneous.
>
> *HBDI® C Quadrant*—9 factors: analytical cognitive style, intuitive cognitive style, arts/aesthetics, emotions, cooperativeness, music, conventionality, academic aptitude and planning.
>
> *HBDI® D Quadrant*—9 factors: creativity, analytical cognitive style, intuitive cognitive style, risk-taking, arts/aesthetics, emotions, impulsivity, academic aptitude and miscellaneous.

As hypothesized, the 15 intuition factors loaded across the HBDI® quadrants, though not in equal proportions. Outcomes of the CCA analyses provided evidence that intuition is a whole-brained faculty; so Hypothesis 2 was retained.

Research Hypothesis 3— Synopsis

Research Hypothesis 3 proposed a relationship between the 15 DOI factors from Hypothesis 1 and the modal percent scores of the HBDI® brain hemispheres. RA was utilized to quantify the relative contributions of each factor for each hemisphere.

The primary analyses conducted for Hypothesis 3, as presented in Tables 4.117-4.119, provided the R-squared values and factor loadings for the HBDI® right hemisphere %, as well as for the C and D quadrants, which comprise the right-brain hemisphere. The most predictive factor loadings from these analyses were:

HBDI® Right Hemisphere %—11 factors: creativity, analytical cognitive style, intuitive cognitive style, risk-taking, arts/aesthetics, emotions, cooperativeness, music, impulsivity, academic aptitude, biological and miscellaneous.

- R-squared value: .667 (67% of variance accounted for), indicating the 15 factors are very strong predictors of the HBDI® right hemisphere %

HBDI® C Quadrant—9 factors: analytical cognitive style, intuitive cognitive style, arts/aesthetics, emotions, cooperativeness, music, conventionality, academic aptitude and planning.

- R-squared value: .564 (56% of variance accounted for), indicating the 15 factors are very strong predictors of the HBDI® C quadrant score.

HBDI® D Quadrant—9 factors: creativity, analytical cognitive style, intuitive cognitive style, risk-taking, arts/aesthetics, emotions, impulsivity, academic aptitude and miscellaneous.

- R-squared value: .651 (65% of variance accounted for), indicating the 15 factors are very strong predictors of the HBDI® D quadrant score.

Between the C and D quadrants, which comprise the HBDI® right hemisphere, the (right/cerebral) D quadrant provides considerably stronger discriminative value than the (right/limbic) C quadrant. By this measure, intuition is more strongly allied with the D quadrant. Because the left and right hemispheres are dichotomous and bilateral, the R-squared values would be the same for each, but negative for the left, positive for the right. An R-squared value of .575 was found for the cerebral hemisphere (A and D quadrants), providing more evidence that intuition is whole-brained, though the right hemisphere provides greater discriminative value. Accordingly, Hypothesis 3 was retained.

Research Hypothesis 4—Synopsis

CA was utilized to test Hypothesis 4, which proposed a positive relationship between the DOI and the PSI Intuitive mode subscales Vision, Insight and Sharing; as well as a negative relationship with the PSI Rational mode subscales Planning, Analysis and Control. Normal distributions were found for the DOI total score T score and the six subscales. Though correlations of the DOI total score with the Planning, Analysis and Sharing subscales were not significant, the correlation with Control was negative; and the correlations with Vision and Insight were positive, as expected. Among the outcomes for the 20 DOI variable T scores and the six subscales, 47 of the 54 significant correlations ran in the expected positive or negative direction; and the seven exceptions were all very weak. These findings supported Hypothesis 4, which was retained.

Summary of Findings

Validity and reliability testing of a new instrument requires a series of internal psychometric analyses, as well as external comparisons with outcomes on one or more previously validated instruments measuring the same or related constructs. The four research questions posed by this study and the related hypotheses were:

Research Question 1 (Hypothesis 1): This question asked if the 25 variables examined by the DOI fit into the social/acquired, biological and situational clusters to which they had been assigned by Shirley and Langan-Fox (1996). Failure of the CFA to support this three-factor model was not particularly surprising or disturbing. By their own declaration, Shirley and Langan-Fox had arbitrarily assigned the 57 intuition-related variables in their original list to the three "potentially useful" clusters merely because the variables were "thought to comprise these groupings" (1996, p. 575).

The alternative 21-factor model subjected to CFA included these variables:

1. 16 of the 18 social/acquired variables, from scores on DOI items 46-99;
2. the 2 situational variables, from scores on DOI items 46-99;
3. the recoded academic aptitude/preference score, from DOI items 6 and 7 and HBDI® items 7-9;
4. the recoded introversion/extraversion score, from HBDI® item 100;
5. the composite biological variable comprised of age, sex/female, and ethnicity/white; and the recoded handedness scores, from HBDI® items 5 and 6.

Varimax rotation for the 21-factor solution accounted for 73% of the variance; however the loadings were too scattered and ambiguous to be meaningful. After a series of additional rotations, the 15-factor solution was determined to provide the best fit, with 65.6% of variance accounted for, unambiguous loadings for 10 of the 21 variables, and strong loadings for 13 of the 21 variables. Outcomes of the analyses conducted for Hypothesis 1 provided evidence of the DOI's internal validity.

Research Question (Hypothesis 2): This question asked how the intuitive factor scores produced by the DOI related to the dependent HBDI® A, B, C and D quadrant scores. Among the 15 factors identified in analyses conducted for Hypothesis 1, seven factors loaded on quadrant A; nine factors each loaded on quadrants B, C and D.

These results supported the researcher's premise that intuition, a complex faculty, is not merely right-brained as commonly believed. Rather, it is whole-brained, since aspects of intuition were found across the four HBDI® brain quadrants, though not in equal proportions. The findings of the analyses conducted for Hypothesis 2 showed a strong relationship between intuition as measured by the DOI and the HBDI® brain quadrants, providing external evidence of the DOI's construct validity.

Research Question 3 (Hypothesis 3): This question asked how the independent DOI intuition factor scores related to the dependent HBDI® left/right and cerebral/limbic hemisphere scores. Twelve of the 15 factors identified in the Hypothesis 1 analyses loaded on the right hemisphere, for 67% of the variance. Relative to C and D quadrants, a stronger relationship was found between DOI intuition and the D quadrant. Nine of 15 intuition factors loaded on the C quadrant, accounting for 56% of the variance; compared to nine factors on the D quadrant, for 65% of the variance. The cerebral hemisphere (A/D quadrants) accounted for 57.5% of the variance, indicating that intuition is whole-brained, though the right hemisphere provides the greater discriminative value.

These findings showed a strong relationship between intuition as measured by the DOI and the HBDI® brain hemispheres. Outcomes of the analyses conducted for Hypothesis 3 also provided external evidence of the DOI's construct validity.

Research Question 4 (Hypothesis 4): This question asked if intuition, as measured by the DOI total score T score, would positively correlate with the PSI's Intuitive mode subscales (i.e., Vision, Insight and Sharing); and negatively correlate with the Rational mode subscales (i.e., Planning, Analysis and Control). Though significant correlations were not found with Planning, Analysis or Sharing subscales, correlations with Control, Vision and Insight were significant and in the anticipated directions. Relationships were also as expected for 47 of the 54 significant correlations between the 20 DOI variable T scores and the PSI subscales, as shown in Appendix AJ.

These findings showed a strong relationship between intuition as measured by the DOI and three of the six rational vs. intuitive preferences as measured by the PSI. These outcomes provided additional external evidence of the DOI's construct validity.

Quantitative methods were utilized in this project because: 1) they were deemed most appropriate for addressing the research questions and hypotheses; and 2) strong quantitative evidence should make a more compelling case that intuition exists and is, indeed, measurable. The study's outcomes were especially gratifying because they not only supported the researcher's initial hypotheses about the nature of intuition, but also provided evidence that the DOI is a valid measure of the capacity for intuition.

Theoretical and Practice Implications

This study provided a mere first step in what promises to be a long journey toward the researcher's ultimate goal of finding practical applications of intuition for teaching and learning. Though long, the journey is worthwhile because the potential implications for the use of intuition in education are profound. Consider:

1. What if intuition can provide information inaccessible through deduction/ induction alone? Intuition may provide quick and ready guidance not available by any other means.

2. What if intuition can reveal the right or best approach when pedagogy fails and no alternative presents itself? Intuition may supply insights about ways to help students who are struggling and will not or cannot explain why.

3. What if intuition has the power to ignite creative thinking and bring insight to scientific experimentation and analysis? Intuition may suggest a new direction for inquiry, or provide the nudge needed for rethinking the solution to a problem.

4. What if intuition enables one to bypass left-oriented learning disorders like dyslexia, dysnomia, dyscalculia, language or memory challenges, attention deficit or distractability issues, sequencing or spatial difficulties, motor weaknesses, and higher order thinking deficiencies? Intuition may offer an alternative, right-brained means of accessing and decoding information, transcending these and other learning challenges.

5. What if discovery, creativity, evaluation, operation, prediction and illumination are, indeed, varying types of intuition? By learning to induce, access, recognize and trust their own intuition, both educators and students may be able to unleash their highest potential in and out of the classroom.

Of course, the severe *left-tilt* of traditional Western classrooms pervades not only the classrooms themselves but the schools of education that prepare teachers for those classrooms. Unfortunately, the idea of relying on the intuitive capacity as a learning tool runs counter to the pedagogy of pedagogy. As Clinchy (1975) pointed out, barriers to the use of intuition in formal education is prompted by the nature of the formal education exercise itself, including:

1. the emphasis on verbal skills in the classroom (at variance with the non-verbal, non-conscious nature of intuitive information);

2. the student's inability to explain an intuitive insight to the teacher's satisfaction;

3. the lack of evidence to support or justify an intuitive insight;

4. the focus on the rational first and last stages of the creative process (preparation and verification) and failure to allow adequate time for the two interim intuitive stages (incubation and illumination);

5. the tendency of teachers to dismiss the non-rational as irrational and, therefore, inappropriate to the scholarly exercise;

6. the nature of intuitive judgments which often precede logical analysis—contrary to the order of processes taught in the classroom;

7. the tendency—often learned in the classroom—for students to distrust their own intuition;

8. the likelihood that disapproving teachers will mistake a student's intuitive answer for "guessing," or, worse, cheating;

9. the implicit risk that an intuitive idea will be misconstrued or wrong—though the risks also exist with so-called "rational" ideas (pp. 49-51).

Hopefully, the knowledge gained from this study will inspire others to consider ways to overcome these barriers and find meaningful, useful applications for intuition in education. If this project lays a foundation for more research into the connection between intuition and learning, it may be possible to turn the *what ifs* above into *what nows*.

Recommendations for Future Research

Possibly because intuition is such an elusive and mystifying phenomenon, most of the research into intuition to date, including this study, has yielded more questions than answers. What is intuition? What is its nature and source? Does everyone have access to intuition? How does one distinguish between intuition and mere guessing, fantasy, or wishful thinking? Can intuition be wrong? How do differing capacities for intuition impel and impact its use in common applications? What are its limitations, if any? Can intuition be induced and how? Can it be taught and learned, and how? Most important, how can teachers and learner use intuition to improve the teaching and learning exercise? Though these questions are important, this study does not attempt to provide answers.

Additional validation studies with larger groups of broader populations should be conducted to make it possible to generalize the study's findings beyond the initial sample. Other quantitative analyses, including structural equation modeling should be undertaken to provide more support for use of the DOI as a tool for predicting and measuring intuitive capacity. A multi-dimensional scaling comparison of the responses to items on the DOI, HBDI® and PSI instruments would provide additional internal and external construct validation, as well.

Because the development of practical classroom applications for intuition is crucial, it is hoped that this study will encourage others to continue the investigation into the use of intuition as a learning tool. Qualitative methods, including interviews of adult teachers and learners, should be used to determine whether and in what situations intuition is used; how, how often and under what conditions intuitive ideas are accessed; which types and receptors of intuition are most common and most useful; etc.

Conclusion

The researcher's original goal in undertaking this study was to learn more about the use of intuition as a potential tool for adult learners. The first challenge was finding a way to measure intuition. How does one investigate what cannot be explained; explain what cannot be measured; measure what cannot be operationalized; operationalize what cannot be defined; or define what cannot be experienced directly, and about which experts have disagreed through the ages?

The second challenge was finding a way to define intuition. Intuition has been disparately regarded as psychic phenomenon, mystical faculty and occult gift; as sensory capacity enabling the perception of universal truth; as one of the orienting functions of consciousness; as an aspect of personality or temperament; or as a cognitive function originating in the pre-frontal cortex of the brain. Alternatively, intuition is seen as the best—possibly *only*—path to new knowledge, as well as the surest route to discovery, creativity, imagination, rapid inference, pattern recognition, idea synthesis, knowledge transformation, and other critical faculties. The researcher ultimately defined intuition as "knowing without knowing how you know (the *intuitive leap*) but knowing for a certainty (the *intuitive thud*)—sometimes even in the face of evidence to the contrary." Appendix AK provides a list of favorite quotes, collected from various sources and genres, that attempt to capture the essence of this elusive phenomenon.

The third challenge was finding a way to operationalize a latent construct comprised of other latent constructs. After several approaches were undertaken, the solution was provided by the 1996 Shirley and Langan-Fox literature review, which identified 57 personal characteristics and situations purportedly predictive of intuition.

Twenty-five of the 57 variables were selected for examination in the researcher-designed DOI instrument. The DOI was developed to measure intuition or, more specifically, the capacity for intuition based on the degree to which individuals possess characteristics associated with intuition.

The study's findings provide strong support for the construct validity of the DOI and evidence of the whole-brain nature of intuition. This is an important finding, because it establishes a connection between the left brain-oriented deductive/inductive processes and the intuitive processes generally associated with the right brain. In short, the findings support the premise that these two different modes are complementary and synergistic.

Based on the brain hemisphere processing theories of Sperry, Ornstein and others, deduction/induction is characterized by logic, reason, analysis, and the linear-sequential-concrete processing associated with the left hemisphere. By contrast, intuition is typified by creativity, imagination, synthesis and pattern recognition, allied with the holistic-random-symbolic processing of the right hemisphere. Though tempting to view the two as rival, mutually exclusive, functionalities, this study has established that they are inter-related. While the right brain allows one to access intuitive information, the left brain enables the interpretation of that information. Intuition allows one to bypass the tedious, time-consuming steps typically required by analysis; and analysis provides a means for verifying intuition. Thus, the two modes support and inform each other.

There is a difference, however. Though the deductive/inductive mode is useful in the learning exercise, it has been said that no *new* knowledge comes by this means (Westcott, 1968; Sloan, 1983). Further, the deductive/inductive processes work best when we: 1) can control or predict all variables; 2) can measure and define precisely; and

3) have complete and adequate information—conditions that are often impossible to meet in a complex, fast-paced world (Goldberg, 1983). By contrast, the intuitive mode allows receptive individuals to know—often immediately without the interference of rational "filters" and barriers, that which is unknowable by any other means. Some decisions must be made quickly, leaving no time to hypothesize, experiment or analyze. Thus, intuition is a critical faculty with a proper role both in and out of the classroom.

Because the formalism of school learning devalues intuition, theorists and practitioners through the decades have called for an investigation into intuition as a feature of the education process. Bruner advocated beginning to develop students' "intuitive gifts" in the earliest grades. As early as 1960, he urged research into intuition, which he saw as a "neglected but essential feature of productive thinking," both "fruitful" and "necessary to education" (1962. p. 102).

Noddings and Shore (1984) added a call for research into the relationship between intuition and learning, creativity, interpersonal relations, social change, problem-solving and intellectual activity. Poincare' (1969) declared that logic was inadequate, so intuition must serve as the "complement" or "antidote" to logic. By 1973, Sperry was already lamenting the flagrant discrimination against the right brain by education, by science, and by modern society in general. Bastick (1982) believed that intuition was "foundational to education" and should be utilized at all levels of teaching and learning. Goldberg (1983) insisted it was time to acknowledge the importance of intuition, understand and nurture it, in order to foster "better decisions, more creative ideas, deeper insight, and a smoother, more direct route from desire to fulfillment" (p. 27). Sloan (1983) advocated "education of imagination" to assist development of intellectual and interpersonal capabilities.

Unfortunately, five decades after Bruner's first call for investigation into the intuitive learning mode, quality research remains scarce (Cosier and Aplin, 1982; Agor, 1989b; Bowers, Regehr, Balthazard and Parker, 1990; Epstein, Pacini, Denes-Raj and Heier, 1996; Shirley and Langan-Fox, 1996). In traditional Western classrooms, students still spend much of the day engaged in left-brain tasks. Worse, competency is still measured by left-oriented language- or computation-based assessments; so those who perform well by these measures are rewarded and those who do not are marginalized.

Rischin (2002) found that intuitive learners have an affinity for the activity at hand; are motivated by challenge; persist despite setbacks; perceive syntax, structure and mechanics effortlessly; are emotionally self-supporting; require less intensive, detailed, sequenced instruction; progress rapidly with less practice and review; and retain material more easily. Of course, these abilities also have life applications beyond learning alone.

In an increasingly complex world where time continues to contract as knowledge expands exponentially, time-honored but time-worn learning modalities are no longer adequate. Intuition is now being applied in areas as diverse as business, R&D, clinical work, decision-making, marketing, hiring, entrepreneurship, manufacturing, coaching, consulting, investment, sports, interviewing, investigation and more (Agor, 1989a; Eisenhardt, 1989; Glaser, 1995; Weintraub, 1998; Fields, 2001; Myers, 2002). The most crucial application, however, is education, which informs all other endeavors.

According to former Secretary of Education Richard Riley: "The top 10 jobs that will be in demand in 2010 didn't exist in 2004. We are…preparing students for jobs that don't yet exist, using technologies that haven't yet been invented in order to solve problems we don't even know are problems yet" (Frish, 2006). Clearly, the entrenched

pedagogies that originated in the "Industrial Age" (Toffler, 1980) are inadequate for the critical needs of the "Conceptual Age" (Pink, 2005). Because the intuitive mode offers access to unique capabilities, research into its use in education and other endeavors, is more urgent now than when Bruner (1961) first proposed it. If intuition can provide insights inaccessible through logic alone; if intuition is accessible to everyone; and if a "new mind" is crucial to our survival (Pink, 2005); then further investigation into the intuitive mode as a tool for teaching and learning in the 21st Century and beyond is both timely and imperative.

…and between your knowledge and your understanding, there is a secret path…
—Kahlil Gibran

CHAPTER 6

It's what you learn after you know it all that counts. – Ethel Barrymore

EPILOGUE

Final Reflections of the Researcher

When one finishes a monumental project like this after ten years of grueling work, the first question is: "What was I thinking?" My answer to that question is complex, but in short, I found the topic compelling and the need for research urgent. Though the appropriate role of intuition in areas like business and healthcare has been well-developed and well-documented over the past 40 years or more, the education literature is almost silent about the potential role of intuition for teaching and learning. My search revealed *no* articles related to intuition in major education journals over a 15-year period, and only one book specifically related to the use of intuition by teachers. Unfortunately, the latter provided no new insights and no practical guidance at all. The lack of literature related to the use of intuition in the classroom seems particularly egregious since, education informs all other endeavors.

The second question one asks after completing a project like this is: "Now what?" Beyond additional rounds of DOI validation, more research into the practical application of intuition by teachers and learners is needed. Many questions remain unanswered relative to intuition and learning: How can/do teachers and students use intuition? How can intuition be induced and accessed in the classroom? What is the best way to utilize the deductive/inductive and intuitive learning modes synergistically? What is the best approach for developing the six types of intuition (i.e., discovery, creativity, evaluation, operation, prediction and illumination) as aids in the classroom and beyond?

I have proposed undertaking a three-stage investigation process to continue to broaden the body of new knowledge gained from this project:

Stage One: Administer the DOI instrument to a large group of teachers and adult students, including graduate education students, to establish a baseline for the use of intuition by learners, as well as current and future teachers.

Stage Two: With input from intuition and teaching/learning experts, develop a DOI Survey (DOI-S) for follow-up, in-depth interviews with Stage One participants. The qualitative data collected would then be parsed to determine whether, how and to what degree participants use the intuitive learning mode, as well as whether, how and to what degree they promote development of this mode among their students.

Stage Three: Encourage individuals from Stages One and Two to participate in a series of professional development workshops designed to explore practical uses of intuition in the classroom. Information gained from these workshops would be codified and published to inform educational practice and encourage expanded use of the intuitive mode in appropriate ways by teachers and learners.

Of course, these possibilities represent just a few of the many useful next steps that could and should be taken to learn more about learning more. I would welcome communication from others who believe, with me, that intuition exists; and that it should be promoted in the education exercise. The possibilities are not only endless but the need for innovative thinking on this topic is critical.

As Westcott pointed out more than 40 years ago, as a result of his seminal research in 1968…

The last word on intuition is as far in the future as the first word on intuition is in the past. – Malcolm Westcott

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Appendix A
DIMENSIONS OF INTUITION
Instructions and Consent

PURPOSE OF DOI SURVEY The purpose of this survey is to collect data about intuition for use in dissertation research for a Ph.D. in Adult Education at the University of MO-St. Louis. Participants must be 18 or over and must have a high school diploma or equivalent.

INSTRUMENTS Three instruments will be used in this project:
1) the Dimensions of Intuition (DOI)--100 items, 20-30 minutes for completion;
2) the Herrmann Brain Dominance Instrument® (HBDI®)-- items, 20-30 minutes for completion; and
3) the Personal Style Inventory (PSI)--30 items, approx. 10 minutes for completion.

Data from these instruments will be compiled and subjected to a variety of statistical analyses.

CONFIDENTIALITY Respondents will remain anonymous, and individual responses will be treated confidentially. All identifying information will be eliminated and replaced by a numbered code after an adequate number of the three surveys have been collected and matched. General background characteristics will be reported aggregately, not individually. The study's findings will be reported in a dissertation, and possibly other scholarly works.

CONSENT Submission of the completed surveys will:
1) acknowledge that you are giving “Informed Consent” to participate in this project;
2) verify that you meet the study criteria relative to age and education;
3) indicate your voluntary participation;
4) confer permission for the owners of the HBDI® and PSI instruments to share your responses with the researcher; and
5) allow the researcher to use your DOI, HBDI® and PSI data in the manner described.

SURVEY INSTRUCTIONS Most items in this instrument will be answered on a percentage scale. The HIGHER the percentage, the GREATER your level of agreement. Other items will be answered by checklist or completion (fill-in-the-blank).

OPTIONAL: Most survey items provide an OPTIONAL opportunity to “Describe or Explain” your numeric response. The final item in the survey, also OPTIONAL, is included to allow you to share any final comments with the researcher.

Please respond to ALL (except "optional") survey items. Though some items may seem similar, all are different. Read carefully but work quickly without “over-thinking” your answers, since spontaneous responses are usually the most authentic.

If you have any questions before beginning, email the researcher at: vrugtmanr@umsl.edu. If not, please proceed to the survey by clicking "Next."

Appendix A *(continued)*

DIMENSIONS OF INTUITION
SURVEY

BACKGROUND CHARACTERISTICS (7 items)
Follow the instructions for responding to each of these items.

1. **Name** (First, Middle, Last)**:**_____

2. **Current Age** (Years)**:**_____

3. **Occupation/Job Title:**_____

4. **Ethnicity** *(Select one of the following responses)***:**
   _____African-American or Black
   _____Asian
   _____Euro-American or White
   _____Hispanic or Latino
   _____Middle-Eastern or Arabic
   _____Native American or Alaskan Native
   _____Native Hawaiian or other Pacific Islander
   _____Other (specify)_____

5. **Highest Level of Education or Degree Completed**
   *(Select one of the following responses)***:**
   _____High school or equivalent
   _____Some college credit
   _____Associate's degree
   _____Bachelor's degree
   _____Master's degree
   _____PhD/EdD degree
   _____Professional certification or licensure
   _____Other (specify)_____

6. **Academic Aptitude** *(Select the academic area in which you have GREATER skills)***:**
   _____Verbal (reading, writing, and speaking)
   _____Mathematical (numbers and computation)
   _____Both equally

7. **School Subjects** *(Rank these subjects 1, 2, 3, 4 and 5 in order of your preference for each of these school subjects. 1 = MOST Preferred, 5 = LEAST Preferred.)*
   _____English (literature, reading and writing)
   _____History/Social Studies
   _____Mathematics
   _____Science (biology, chemistry, physics)
   _____Foreign Languages

Appendix A *(continued)*

INTUITION EXPERIENCE (5 items)
INTUITION can be defined as "KNOWING SOMETHING WITHOUT KNOWING HOW YOU KNOW." With this definition in mind, respond to each of the following items as indicated.

8. **Select one of the following responses to indicate how OFTEN you experience intuition (i.e., have intuitive insights).**
   _____Frequently (one or more times a day)
   _____Regularly (one or more times a week, but not daily)
   _____Periodically (one or more times a month, but not weekly)
   _____Infrequently (one or more times a year, but not monthly)
   _____Never
   _____Not sure

9. **Consider the FORMS by which you typically receive your intuitive insights. Indicate the % of those insights that comes in each of the forms described below.** *Total distribution among the six items must equal 100. If you never experience intuition, indicate 0 for items 1-5 and 100 for item 5.*

   _____**Visual** (inner vision: may include flashes of insight and/or seeing pictures, images, symbols, shapes, mental maps, drawings, colors, night/day dreams, precognitions, visions, etc.
   _____**Auditory** (inner hearing: may include hearing voices, words, phrases, conversations or mental dialogues, songs, poems, etc.
   _____**Feeling** (inner emotion: may include unexpected emotions, gut feelings, energy vibrations and/or bodily sensations like “butterflies,” nausea, abdominal pain, etc.
   _____**Sensing** (inner awareness: may include hunches, impressions, precognition, déjà vu experiences, reading changes in energy or light, sudden insights and/or knowing without external stimulus or rational support or evidence
   _____**Other** (Describe or explain)_____
   _____**None** (I never experience intuitive insights.)

10. **From the following list, select the CONDITIONS (times, places, etc.) under which you commonly experience intuition.**
    _____At home
    _____At work
    _____During free time (play, leisure, relaxation, etc.)
    _____In or around water (showering, bathing, swimming, etc.)
    _____Outdoors or in nature
    _____When I'm alone
    _____When I’m with others
    _____During or after physical exertion
    _____Just before going to sleep

Appendix A *(continued)*

_____Just before or upon waking
_____During the daytime
_____In daydreams
_____During the nighttime
_____In night dreams
_____During or after a nap
_____While driving or commuting
_____During long trips
_____While doing routine chores
_____During or after meditation
_____During or after prayer
_____In crisis situations
_____Under time pressure
_____After reflection (contemplation, mental processing, etc.)
_____While listening to music
_____In response to a specific inquiry
_____Other

11. Select the response that characterizes your level of BELIEF in intuition.
The HIGHER the %, the STRONGER your belief. 0=NOT AT ALL; 100=ABSOLUTELY.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

12. Select the response that characterizes how intuitive you PERCEIVE yourself to be.
The HIGHER the %, the STRONGER your belief. 0=NOT AT ALL; 100=ABSOLUTELY.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

TYPES OF INTUITION (6 items)
Read each description below, then indicate how frequently you experience each of these six TYPES of intuition.

13. Discovery Intuition: *Linked to sudden creative breakthroughs, right answers to specific problems, or insights into the true nature of a problem. Typically supplies the one correct answer or best solution. Often appears with sudden awareness as if out of the blue, but may be the result of ideas that evolved unconsciously over time. Transcends logic and exists outside conscious awareness; but with afterthought one may be able to trace this type of intuitive idea back to its origin in some prior knowledge or experience.*

I experience discovery intuition *(check one)***:**
_____frequently (one or more times a day)
_____regularly (one or more times a week, but not daily)
_____periodically (one or more times a month, but not weekly)
_____infrequently (one or more times a year, but not monthly)
_____never
_____not sure

Appendix A *(continued)*

14. Creativity Intuition: *Characterized by imagination or a flow of unusual but sound ideas. Similar to discovery intuition but, instead of providing the one BEST answer, creativity intuition supplies a quantity of apt alternatives, options or possibilities. Often utilized for problem-solving, decision-making, invention and innovation.*

I experience creativity intuition *(check one)***:**

_____frequently (one or more times a day)
_____regularly (one or more times a week, but not daily)
_____periodically (one or more times a month, but not weekly)
_____infrequently (one or more times a year, but not monthly)
_____never
_____not sure

15. Evaluation Intuition: *Allows one to discern with certainty, even with insufficient data, facts, or knowledge. Often guides rational decision-making by narrowing the number of alternatives, or strengthening one's sense of the best choice among a number of possibilities. Particularly useful where there is insufficient data or too little time for rational analyses.*

I experience evaluation intuition *(check one)***:**

_____frequently (one or more times a day)
_____regularly (one or more times a week, but not daily)
_____periodically (one or more times a month, but not weekly)
_____infrequently (one or more times a year, but not monthly)
_____never
_____not sure

16. Operation Intuition: *Characterized by a magnetic, overpowering certainty alerting one when a thing should or should not be done. Often experienced as a sense that something is about to happen. A strong force, providing guidance, prompting without explanation, and moving one in a given direction or providing an undeniable sense of calling or mission.*

I experience operation intuition *(check one)***:**

_____frequently (one or more times a day)
_____regularly (one or more times a week, but not daily)
_____periodically (one or more times a month, but not weekly)
_____infrequently (one or more times a year, but not monthly)
_____never
_____not sure

Appendix A *(continued)*

17. Prediction Intuition: *Characterized by specific but unprovable premonition that something is going to happen. Similar to operation intuition but generally provides more precognitive knowing about a given outcome. May be explicit or implicit, positive or negative. May involve hunches, including warnings and may be mistaken for guessing by others, though intuitive individuals do not think they are guessing.*

I experience prediction intuition *(check one)***:**

_____frequently (one or more times a day)
_____regularly (one or more times a week, but not daily)
_____periodically (one or more times a month, but not weekly)
_____infrequently (one or more times a year, but not monthly)
_____never
_____not sure

18. Illumination Intuition: *Characterized by a mystical "knowing" or awareness which bypasses and transcends all sensory experience. Considered by some to be the highest form of "knowing," illumination is denoted by lack of separation between subject and object and is unaccompanied by sensation, perception or conscious thought. As a kind of pure consciousness, it is limitless, formless and without boundaries. Because it transcends the ego, it is transformative and opens the intuitive channels to other forms of "knowing."*

I experience illumination intuition *(check one)***:**

_____frequently (one or more times a day)
_____regularly (one or more times a week, but not daily)
_____periodically (one or more times a month, but not weekly)
_____infrequently (one or more times a year, but not monthly)
_____never
_____not sure

PERSONALITY TRAITS (21 items)
Select the level to which each of these CHARACTERISTICS describes you. (The HIGHER the %, the GREATER your level of agreement. 0=NOT AT ALL; 100=ABSOLUTELY.)

I would describe myself as:

19. Able to accept challenges easily.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

20. Able to accept criticism easily.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

Appendix A *(continued)*

21. Able to change profoundly with ease.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

22. Alert.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

23. Committed to causes.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

24. Concerned with abstract issues (truth, beauty, human values, etc.)
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

25. Confident.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

26. Creative.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

27. Demanding.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

28. Foresightful.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

29. Independent.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

30. Informal.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

31. Open.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

32. Readily influenced by others (especially to aid personal development).
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

33. Resourceful.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

34. Risk-taker.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

35. Self-reliant.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

Appendix A *(continued)*

36. Spontaneous.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

37. Unafraid (of myself, my experiences, my world).
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

38. Unconventional.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

39. Unworried (about the ups and downs of my feelings and experiences).
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

PERSONAL CHARACTERISTICS (6 items)
Indicate the degree to which this statement is true of you. The HIGHER the %, the GREATER your level of agreement. 0=NOT AT ALL; 100=ABSOLUTELY.

40. I accept ambiguity (doubt and uncertainty) easily.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

41. I act on my beliefs.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

42. I become emotionally involved in things I do.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

43. I enjoy reading.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

44. I have a strong belief in myself.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

45. I welcome change.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

GENERAL CHARACTERISTICS (54 items)
Select your level of agreement for each statement. The HIGHER the %, the GREATER your level of agreement. 0=NOT AT ALL; 100=ABSOLUTELY.

46. It is easy for me to envision unique or novel uses for things (objects, space, etc.)
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

47. I am NOT musically oriented.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

Appendix A *(continued)*

48. I am interested in art.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

49. I prefer NOT to stand out from the crowd.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

50. My best ideas often come to me suddenly.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

51. I prefer NOT to rely on step-by-step directions.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

52. After reflection, I can often trace my intuitive insights to something I have known or experienced in the past.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

53. I am good at finding multiple ways of solving problems.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

54. It is easy for me to recognize patterns among seemingly unrelated ideas, elements, etc.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

55. I do NOT try to collect all the facts before making decisions.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

56. I tend to rely on intuition when I have limited information (facts, evidence, etc.)
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

57. I prefer to work in a cooperative environment.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

58. I am LESS receptive to intuition at certain times of day.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

59. I regularly make time for creative activities.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

60. I prefer to do things spontaneously (without much pre-planning).
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

61. Listening to music aids my intuitive awareness.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

Appendix A *(continued)*

62. I am NOT very connected to emotions (my own or others').
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

63. I rely on "To Do" lists, appointment books, etc., to help me stay organized.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

64. I appreciate art in many forms.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

65. I tend to analyze carefully in order to understand things or situations.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

66. It is DIFFICULT for me to visualize alternatives (different ways of doing things, solving problems, making decisions, etc.)
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

67. I prefer to cooperate, rather than compete, with others.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

68. I enjoy music (listening or performing).
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

69. I sometimes take risks--even when I don't have to do so.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

70. I feel lost without a plan or agenda.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

71. I do NOT actively seek out new adventures.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

72. I am unconventional (in my thoughts, actions, dress, etc.)
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

73. I arrive at correct conclusions by carefully considering the facts.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

74. I tend to be MORE intuitive at certain times of day.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

75. I feel comfortable with the idea of being different from other people.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

Appendix A *(continued)*

76. I enjoy exploring the unknown.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

77. I am good at visualizing unique solutions to problems.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

78. I prefer plans that are flexible (tentative, easily changed, etc.)
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

79. I am NOT good at interpreting symbols, hidden meanings, etc.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

80. I tend to make decisions impulsively.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

81. My insights often come in the form of mental images (pictures, visions, flashes, etc.)
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

82. I do NOT consider cooperation to be particularly important.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

83. I am good at creating metaphors.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

84. I do NOT particularly enjoy fine art.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

85. I tend to act on my first instinct, rather than analyzing situations too carefully.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

86. Sometimes I know things that I have no obvious way of knowing.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

87. It is DIFFICULT for me to find novel ways of doing things.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

88. I tend to become emotionally involved (with people, situations, causes, etc.)
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

89. I prefer to be precise about the facts of a matter.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

Appendix A *(continued)*

90. At certain times of day, it is easier for me to work productively.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

91. My flexibility makes it easy for me to change profoundly.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

92. I am NOT very confident about my decisions without supporting evidence.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

93. I am good at finding alternative solutions to problems.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

94. My ideas are often emotionally compelling.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

95. I am NOT very imaginative.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

96. I am able to make good decisions rapidly, even without much evidence.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

97. I regularly rely on my intuition (to answer questions, solve problems, make decisions, discern truth, "read" situations and people, etc.)
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

98. I tend to rely on prior experience to guide my decisions.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

99. When I'm making decisions, I tend to need MORE information than other people do.
0-4 5-14 15-24 25-34 35-44 45-55 56-65 66-75 76-85 86-95 96-100

WRAP-UP – Optional (1 item)
Include here any final thoughts, ideas, comments, explanations, etc., that might aid this research.

100. OPTIONAL: What additional comments would you like to share with the researcher about INTUITION? _____

Thank you for assisting this research by completing the DOI survey!

Appendix B
VARIABLES* POSTULATED TO BE ASSOCIATED WITH INTUITION

Social/Acquired Variables

1. Intelligence *(Fischbein, 1975; Simonton, 1980; Wild, 1938)*
2. **Academic Aptitude** *(Westcott, 1968; Westcott & Ranzoni,1963)*
3. Tacit knowledge *(Bowers, 1984; Finke, Ward & Smith, 1992; Reber, 1989; Simonton, 1980)*
4. **Cognitive Style—Analytic** *(Simonton, 1980)*
5. **Cognitive Style—Intuitive** *(Simonton, 1980)*
6. Field-dependence *(Fallik & Eliot, 1985)*
7. Field-independence *(Fallik & Eliot, 1985)*
8. Tenure
9. **Experience** *(Rehm & Gadenne, 1990; Stocks, 1939)*
10. Sensation seeking *(Goldsmith, 1985)*
11. **Introversion/Extraversion** *(Metzner, 1980)*
12. Openness *(Bastick, 1982; Finke, et al., 1992; Rockenstein, 1988; Simonton, 1980; Simonton, 1975; Vaughan, 1979; Westcott & Ranzoni, 1963)*
13. **Creativity** *(Bastick, 1982; Finke, et al., 1992; Rockenstein, 1988; Simonton, 1980; Simonton, 1975; Vaughan, 1979; Westcott & Ranzoni, 1963)*
14. **Innovation** *(Agor, 1991)*
15. **Carelessness with Facts and Details** *(Agor, 1991)*
16. **Cooperativeness** *(Agor, 1991)*
17. **Impulsivity** *(Westcott & Ranzoni, 1963)*
18. **Flexibility** *(Westcott & Ranzoni, 1963)*
19. **Interests (in arts and aesthetics)** *(Simonton, 1980; Vaughan, 1979; Wild, 1938)*
20. Investigating *(Simonton, 1980)*
21. Gambling *(Simonton, 1980)*
22. **Music** *(Simonton, 1980)*
23. Meditating *(O'Haire & Marcia, 1980; Vaughan, 1979)*
24. **Adventure [Seeking]** *(Westcott & Ranzoni, 1963)*
25. Liking high places *(Westcott & Ranzoni, 1963)*
26. **Unconventional[ity]** *(Westcott & Ranzoni, 1963)*
27. Social judgment *(Simonton, 1980)*
28. Attitudes *(Simonton, 1980)*
29. **Ability to Visualize** *(Fischbein, 1975)*
30. **Imagery** *(Heron, 1992; Vaughan, 1979)*
31. **Emotions** *(Bastick, 1982; Denes-Raj & Epstein, 1994; Mitchell & Beach, 1990; Vaughan, 1979)*
32. Arousal *(Simonton, 1980)*
33. Religion *(Wild, 1938)*
34. Superstition
35. Nationality
36. Lifestyle

Appendix B *(continued)*

37. [Use of] Alcohol/Smoking/Mind-altering drugs
38. Alternative remedies

Biological Variables

39. Age *(Fallik & Eliot, 1985)*
40. Sex *(Fallik & Eliot, 1985; Neisser, 1963; Valentine, 1929)*
41. Handedness *(Fallik & Eliot, 1975)*
42. Brain Hemispheres *(Fallik & Eliot, 1985)*
43. Physiological effects *(Wonder & Blake, 1992)*
44. Ethnicity *(Vaughan, 1979; Rockenstein, 1988; Wonder & Blake, 1992)*

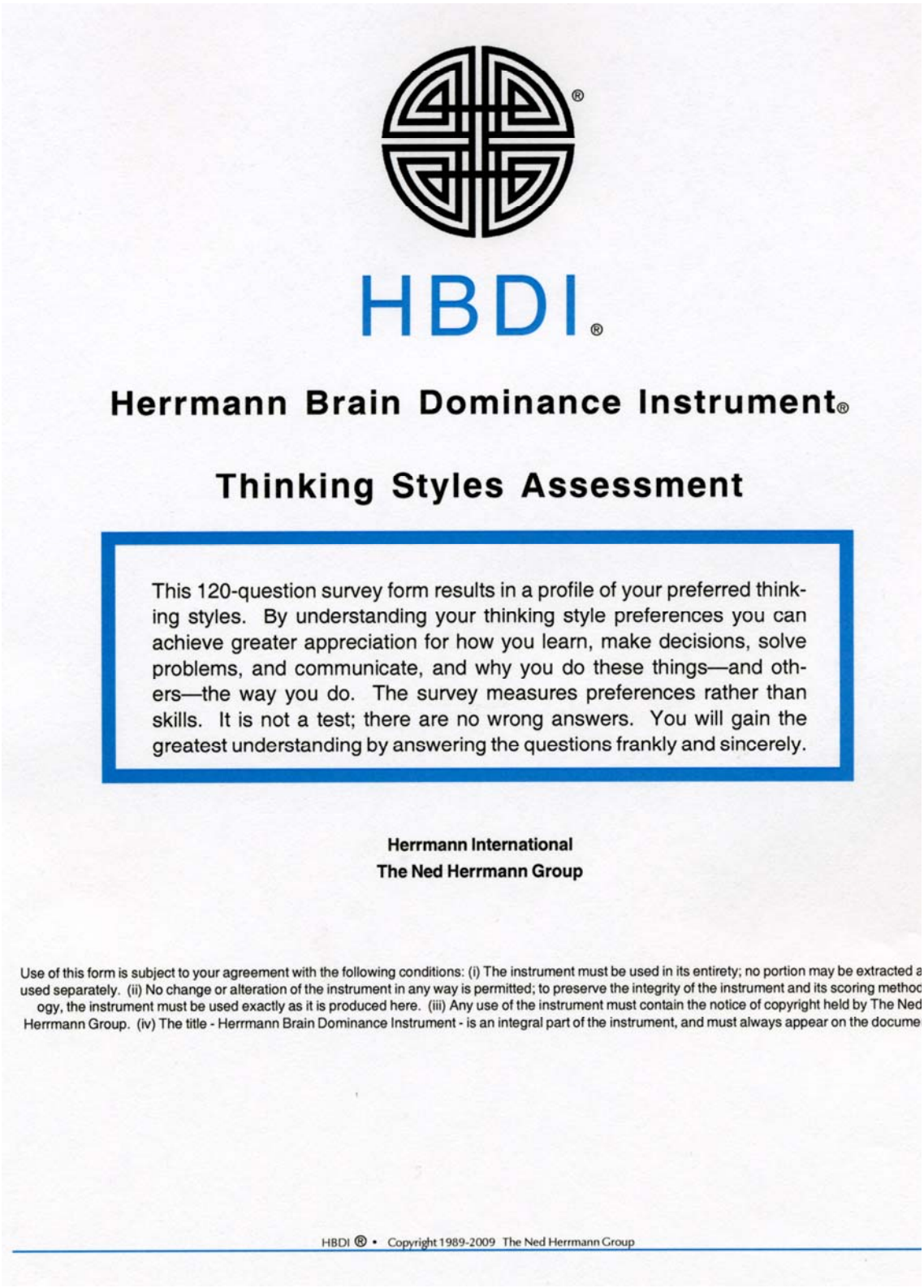
Situational Variables

45. Time of Day *(Westmann & Canter, 1979)*
46. Context
47. Type of problem *(Kleinmuntz, 1990; Neisser, 1963; Peters, Hammond & Summers, 1974; Simonton, 1975; Simonton, 1980)*
48. Importance of decision
49. Complexity of problem
50. Amount of Information Available *(Westcott, 1961; Westcott, 1968; Cosier & Aplin, 1982; Nutt, 1979; Peters, et al., 1974)*
51. Relevance of information at hand *(Griffin & Tversky, 1992)*
52. Time limit *(Fischbein, 1975)*
53. Level of uncertainty
54. Amount of responsibility or accountability *(Tetlock & Kim, 1987)*
55. Environment
56. Presence of others
57. Presence of certain objects, smells, or textures

* **Bold** type indicates variables selected for examination in this study.

Source: Shirley, D. & Langan-Fox, J. "Intuition: A Review of the Literature." *Psychological Reports.* Vol 79(2), Oct. 1996, 563-584.

Appendix C
HERRMANN'S BRAIN DOMINANCE INSTRUMENT® (HBDI®)



HBDI®

Herrmann Brain Dominance Instrument®

Thinking Styles Assessment

This 120-question survey form results in a profile of your preferred thinking styles. By understanding your thinking style preferences you can achieve greater appreciation for how you learn, make decisions, solve problems, and communicate, and why you do these things—and others—the way you do. The survey measures preferences rather than skills. It is not a test; there are no wrong answers. You will gain the greatest understanding by answering the questions frankly and sincerely.

Herrmann International
The Ned Herrmann Group

Use of this form is subject to your agreement with the following conditions: (i) The instrument must be used in its entirety; no portion may be extracted a used separately. (ii) No change or alteration of the instrument in any way is permitted; to preserve the integrity of the instrument and its scoring method ogy, the instrument must be used exactly as it is produced here. (iii) Any use of the instrument must contain the notice of copyright held by The Ned Herrmann Group. (iv) The title - Herrmann Brain Dominance Instrument - is an integral part of the instrument, and must always appear on the docume

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Appendix C *(continued)*

Page 1

INSTRUCTIONS

A profile of your mental preferences will be determined by your responses to the following 120 questions. Answer each question by writing in the appropriate words or numbers, or checking the boxes provided. **This is not a test**, and there are no right or wrong answers. You are only indicating your preferences. Please respond to questions as authentically as possible, keeping in mind your **total self, at work and at home**. When you have completed the survey form, confirm that you have answered every question. Then complete the name and address information on the back of the form, and send or fax pages 2 through 5 to the Ned Herrmann Group at the address on the cover.

Refer to the glossary of terms for clarification of the terms used. Save the glossary page for reference when you receive your profile results.

GLOSSARY OF TERMS

analytic • Breaking up things or ideas into parts and examining them to see how they fit together.

artistic • Taking enjoyment from or skillful in painting, drawing, music, or sculpture. Able to coordinate color, design, and texture for pleasing effects.

conceptual • Able to conceive thoughts and ideas; to generalize abstract ideas from specific instances.

controlled • Restrained, holding back, in charge of one's emotions.

conservative • Tending toward maintaining traditional and proven views, conditions, and institutions.

creative • Having unusual ideas and innovative thoughts. Able to put things together in new and imaginative ways.

critical • Exercising or involving careful judgement or evaluation, e.g., judging the feasibility of an idea or product.

detailed • Paying attention to the small items or parts of an idea or project.

dominant • Ruling or controlling; having strong impact on others.

emotional • Having feelings that are easily stirred; displaying those feelings.

empathetic • Able to understand how another person feels, and able to communicate that feeling.

extrovert • More interested in people and things outside of self than internal thoughts and feelings. Quickly and easily exposes thoughts, reactions, feelings, etc. to others.

financial • Competent in monitoring and handling of quantitative issues related to costs, budgets, and investments.

holistic • Able to perceive and understand the "big picture" without dwelling on individual elements of an idea, concepts, or situation. Can see the forest as contrasted with the trees.

imaginative • Able to form mental images of things not immediately available to the senses or never wholly perceived in reality; able to confront and deal with a problem in a new way.

implementation • Able to carry out an activity and ensure fulfillment by concrete measures and results.

innovating • Able to introduce new or novel ideas, methods, or devices.

integration • The ability to combine pieces, parts and elements of ideas, concepts and situations into a unified whole.

intellectual • Having superior reasoning powers; able to acquire and retain knowledge.

interpersonal • Easily able to develop and maintain meaningful and pleasant relationships with many different kinds of people.

introvert • Directed more toward inward reflection and understanding than toward people and things outside of self. Slow to expose reactions, feelings, and thoughts to others.

intuitive • Knowing something without thinking it out - having instant understanding without need for facts or proof.

logical • Able to reason deductively from what has gone before.

mathematical • Perceiving and understanding numbers and being able to manipulate them to a desired end.

metaphorical • Able to understand and make use of visual and verbal figures of speech to suggest a likeness or an analogy in place of literal descriptions, e.g., "heart of gold."

musical • Having an interest in or talent for music and/or dance.

organized • Able to arrange people, concepts, objects, elements, etc. into coherent relationships with each other.

planning • Formulating methods or means to achieve a desired end in advance of taking actions to implement.

problem solving • Able to find solutions to difficult problems by reasoning.

quantitative • Oriented toward numerical relationships; inclined to know or seek exact measures.

rational • Making choices on the basis of reason as opposed to emotion.

reader • One who reads often and enjoys it.

rigorous thinking • Having a thorough, detailed approach to problem-solving.

sequential • Dealing with things and ideas one after another or in order.

simultaneous • Able to process more than one type of mental input at a time, e.g. visual, verbal, and musical; able to attend to more than one activity at a time.

spatial • Able to perceive, understand and manipulate the relative positions of objects in space.

spiritual • Having to do with spirit or soul as apart from the body or material things.

symbolic • Able to use and understand objects, marks, and signs as representative of facts and ideas.

synthesizer • One who unites separate ideas, elements, or concepts into something new.

technical • Able to understand and apply engineering and scientific knowledge.

teaching/training • Able to explain ideas and procedures in a way that people can understand and apply them.

verbal • Having good speaking skills; clear and effective with words.

writer • One who communicates clearly with the written word and enjoys it.

Appendix C *(continued)*

Page 2

BIOGRAPHICAL INFORMATION

Please complete **every** question according to the directions given. Each response, including your answers to questions 2, 3 and 4, provide important data. When directions are not followed or data is incomplete we are unable to process your survey, and must return it to you.

1. Name _____ 2. Sex: M ☐ F ☐

3. Educational focus or major _____

4. Occupation or job title _____

Describe your work (please be as specific as possible) _____

_____

HANDEDNESS

5. Which picture most closely resembles the way you hold a pencil?

A ☐  B ☐  C ☐  D ☐ 

6. What is the strength and direction of your handedness?

A ☐ Primary left B ☐ Primary left, some right C ☐ Both hands equal D ☐ Primary right, some left E ☐ Primary right

SCHOOL SUBJECTS

Think back to your performance in the elementary and/or secondary school subjects identified below. Rank order all three subjects on the basis of how well you did: **1** = best; **2** = second best; **3** = third best.

7. _____ Math 8. _____ Foreign language 9. _____ Native language or mother tongue

Please check that no number is duplicated: The numbers **1**, **2**, and **3 must be used once** and **only once**. Correct if necessary.

WORK ELEMENTS

Rate each of the work elements below according to your strength in that activity, using the following scale: **5** = work I do best; **4** = work I do well; **3** = neutral; **2** = work I do less well; **1** = work I do least well. Enter the appropriate number next to each element. **Do not use any number more than four times.**

10. _____ Analytical
11. _____ Administrative
12. _____ Conceptualizing
13. _____ Expressing Ideas
14. _____ Integration
15. _____ Writing
16. _____ Technical Aspects
17. _____ Implementation
18. _____ Planning
19. _____ Interpersonal Aspects
20. _____ Problem Solving
21. _____ Innovating
22. _____ Teaching/Training
23. _____ Organization
24. _____ Creative Aspects
25. _____ Financial Aspects

Please tally: Number of 5's_____, **4's**_____, **3's**_____, **2's**_____, **1's**_____. If there are more than **four** for any category, please redistribute.

KEY DESCRIPTORS

Select **eight adjectives** which best describe the way you see yourself. Enter a **2** next to each of your **eight** selections. Then change one **2** to a **3** for the adjective which **best** describes you.

26. _____ Logical
27. _____ Creative
28. _____ Musical
29. _____ Sequential
30. _____ Synthesizer
31. _____ Verbal
32. _____ Conservative
33. _____ Analytical
34. _____ Detailed
35. _____ Emotional
36. _____ Spatial
37. _____ Critical
38. _____ Artistic
39. _____ Spiritual
40. _____ Rational
41. _____ Controlled
42. _____ Mathematical
43. _____ Symbolic
44. _____ Dominant
45. _____ Holistic
46. _____ Intuitive
47. _____ Quantitative
48. _____ Reader
49. _____ Simultaneous
50. _____ Factual

Please count: seven 2's and one 3? Correct if necessary.

Appendix C *(continued)*

Page 3

HOBBIES

Indicate a **maximum of six** hobbies you are actively engaged in. Enter a **3** next to your major hobby, a **2** next to each primary hobby, and a **1** next to each secondary hobby. Enter only **one 3**.

51. _____ Arts/Crafts
52. _____ Boating
53. _____ Camping/Hiking
54. _____ Cards
55. _____ Collecting
56. _____ Cooking
57. _____ Creative Writing
58. _____ Fishing
59. _____ Gardening/Plants
60. _____ Golf
61. _____ Home Improvements
62. _____ Music Listening
63. _____ Music Playing
64. _____ Photography
65. _____ Reading
66. _____ Sailing
67. _____ Sewing
68. _____ Spectator Sports
69. _____ Swimming/Diving
70. _____ Tennis
71. _____ Travel
72. _____ Woodworking
_____ Other _____
_____

Please review: Only one **3** and **no more than six hobbies**. Correct if necessary.

ENERGY LEVEL

73. Thinking about your energy level or "drive," select the one that best represents you. Check box **A**, **B**, or **C**.

a. ☐ Day person b. ☐ Day/night person equally c. ☐ Night person

MOTION SICKNESS

74. Have you ever experienced motion sickness (nausea, vomiting) in response to vehicular motion (while in a car, boat, plane, bus, train, amusement ride)? Check box **A**, **B**, **C**, or **D** to indicate the number of times.

a. ☐ None b. ☐ 1-2 c. ☐ 3-10 d. ☐ More than 10

75. Can you read while traveling in a car without stomach awareness, nausea, or vomiting?

a. ☐ Yes b. ☐ No

ADJECTIVE PAIRS

For **each paired item** below, check the word or phrase which is more descriptive of yourself. Check box **A** or **B** for **each** pair, even if the choice is a difficult one. **Do not omit any pairs**.

76. ..... Conservative ☐ / ☐ Empathetic
77 ..... Analyst ☐ / ☐ Synthesizer
78. ..... Quantitative ☐ / ☐ Musical
79 ... Problem-solver ☐ / ☐ Planner
80 ..... Controlled ☐ / ☐ Creative
81. ..... Original ☐ / ☐ Emotional
82. ..... Feeling ☐ / ☐ Thinking
83 ..... Interpersonal ☐ / ☐ Organizer
84. ..... Spiritual ☐ / ☐ Creative
85. ..... Detailed ☐ / ☐ Holistic
86. .. Originate Ideas ☐ / ☐ Test and Prove Ideas
87 ... Warm, Friendly ☐ / ☐ Analytical
88 ..... Imaginative ☐ / ☐ Sequential
89. ..... Original ☐ / ☐ Reliable
90. ..... Creative ☐ / ☐ Logical
91. ..... Controlled ☐ / ☐ Emotional
92 ..... Musical ☐ / ☐ Detailed
93. ..... Simultaneous ☐ / ☐ Empathetic
94. ..... Communicator ☐ / ☐ Conceptualizer
95. ..... Technical Things ☐ / ☐ People-oriented
96. ..... Well-organized ☐ / ☐ Logical
97. .... Rigorous Thinking ☐ / ☐ Metaphorical Thinking
98. . Like Things Planned ☐ / ☐ Like Things Mathematical
99. ..... Technical ☐ / ☐ Dominant

Please review: Did you mark one and only one of each pair? Correct if necessary.

Appendix C *(continued)*

INTROVERSION/EXTROVERSION

100. Check one box to place yourself on this scale from introvert to extrovert:

introvert ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ extrovert

TWENTY QUESTIONS

Respond to each statement by checking the box in the appropriate column.

	strongly agree	agree	in between	disagree	strongly disagree
101. I feel that a step-by-step method is best for solving problems.	☐	☐	☐	☐	☐
102. Daydreaming has provided the impetus for the solution of many of my more important problems.	☐	☐	☐	☐	☐
103. I like people who are most sure of their conclusions.	☐	☐	☐	☐	☐
104. I would rather be known as a reliable than an imaginative person.	☐	☐	☐	☐	☐
105. I often get my best ideas when doing nothing in particular.	☐	☐	☐	☐	☐
106. I rely on hunches and the feeling of "rightness" or "wrongness" when moving toward the solution to a problem.	☐	☐	☐	☐	☐
107. I sometimes get a kick out of breaking the rules and doing things I'm not supposed to do.	☐	☐	☐	☐	☐
108. Much of what is most important in life cannot be expressed in words.	☐	☐	☐	☐	☐
109. I'm basically more competitive with others than self-competitive.	☐	☐	☐	☐	☐
110. I would enjoy spending an entire day "alone with my thoughts."	☐	☐	☐	☐	☐
111. I dislike things being uncertain and unpredictable.	☐	☐	☐	☐	☐
112. I prefer to work with others in a team effort rather than solo.	☐	☐	☐	☐	☐
113. It is important for me to have a place for everything and everything in its place.	☐	☐	☐	☐	☐
114. Unusual ideas and daring concepts interest and intrigue me.	☐	☐	☐	☐	☐
115. I prefer specific instructions to those which leave many details optional.	☐	☐	☐	☐	☐
116. Know-why is more important than know-how.	☐	☐	☐	☐	☐
117. Thorough planning and organization of time are mandatory for solving difficult problems.	☐	☐	☐	☐	☐
118. I can frequently anticipate the solutions to my problems.	☐	☐	☐	☐	☐
119. I tend to rely more on my first impressions and feelings when making judgments than on a careful analysis of the situation.	☐	☐	☐	☐	☐
120. I feel that laws should be strictly enforced.	☐	☐	☐	☐	☐

Please review to make sure you have answered all 120 questions.

Appendix C *(continued)*

Page 5

FROM

You must provide an address and indicate the method of payment in order to receive your HBDI results. Please print.

Name _____ Date _____
Company _____
Division _____
Company address _____
_____
Daytime phone (____) _____ Evening phone (____) _____ Fax (____) _____
Home address _____
_____
E-mail address _____

Note: There is a fee for processing this survey form.
Payment method (if specific arrangements have not been made, please provide credit card info):
credit card type: _____ (#) _____ Exp. Date _____
❑ other payment has been prearranged. Event date _____ Payment code _____

CONFIDENTIAL RESEARCH

The following questions are not used in scoring the HBDI. However, the answers to these questions are valuable in our continuing brain dominance research. Skip any question you wish, but please answer as many as you feel you can.

Indicate the birth order of your brothers, sisters, and self by checking the appropriate symbols. Then circle the symbol representing yourself.

MALE	♂	♂	♂	♂	♂	♂	♂	♂	♂	♂	♂	♂	MALE
	Oldest	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	
FEMALE	♀	♀	♀	♀	♀	♀	♀	♀	♀	♀	♀	♀	FEMALE

Date of birth _____ Years in current occupation _____

Nationality _____ Native language _____

Ethnicity: ❑ American Indian ❑ Black ❑ Caucasian ❑ Hispanic ❑ Asian ❑ Other: _____

How many children do you have? _____ age of oldest _____ age of youngest _____

Couple status: ❑ married ❑ separated ❑ divorced ❑ living together ❑ widow/widower ❑ single

To what extent were you formally educated for the field you are now working in?

❑ not at all ❑ somewhat ❑ to a great degree ❑ fully

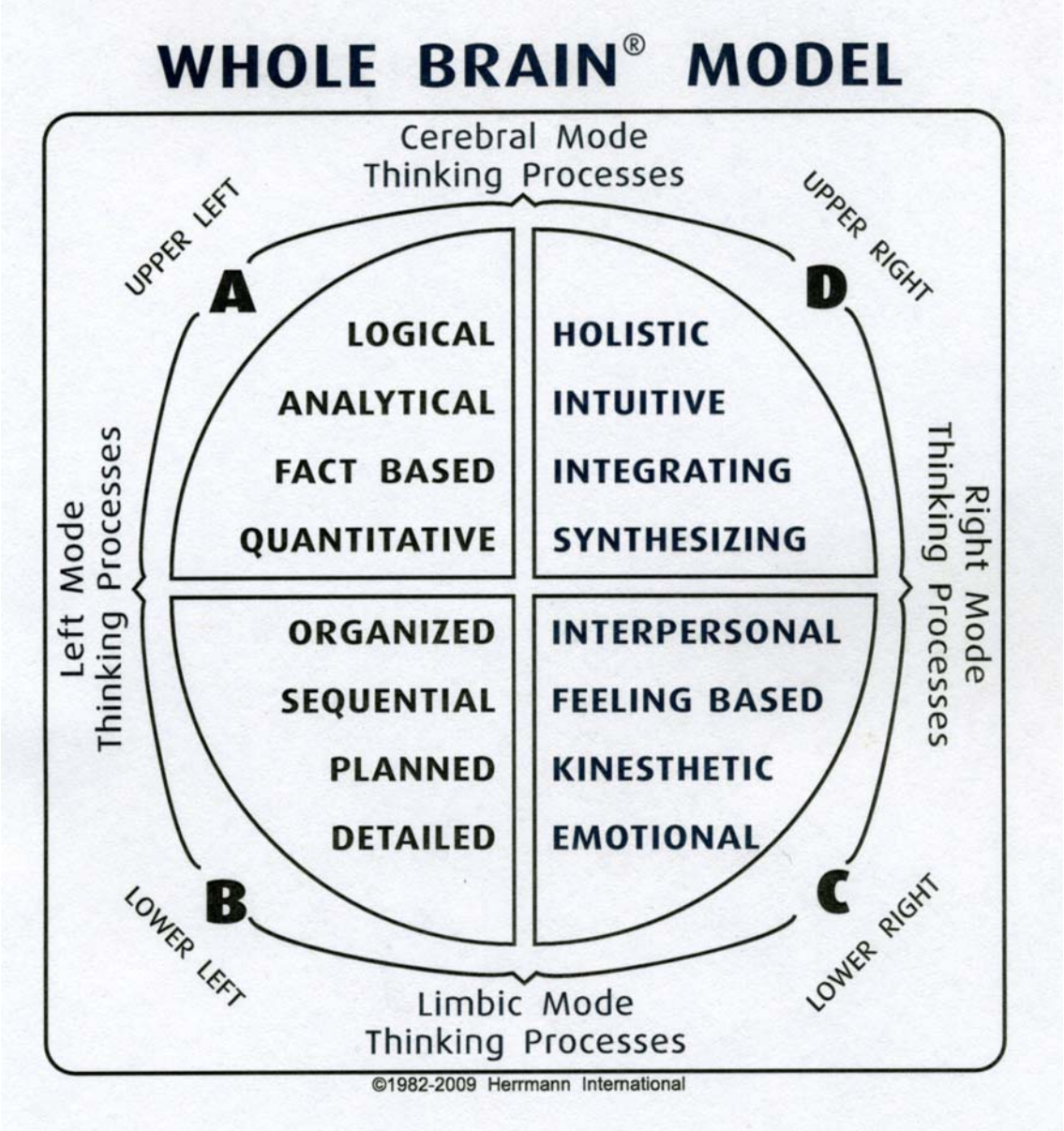
How do you see yourself? Please distribute 100 points between these four descriptions:

Rational _____ Organized _____ Interpersonal _____ Imaginative: _____

Please check the best descriptor indicating your mood or the way you felt at the time you were completing this survey:

❑ happy ❑ enthusiastic ❑ interested ❑ OK ❑ relaxed ❑ indifferent ❑ distracted ❑ tired ❑ unhappy

Appendix D
HERRMANN *WHOLE BRAIN MODEL*

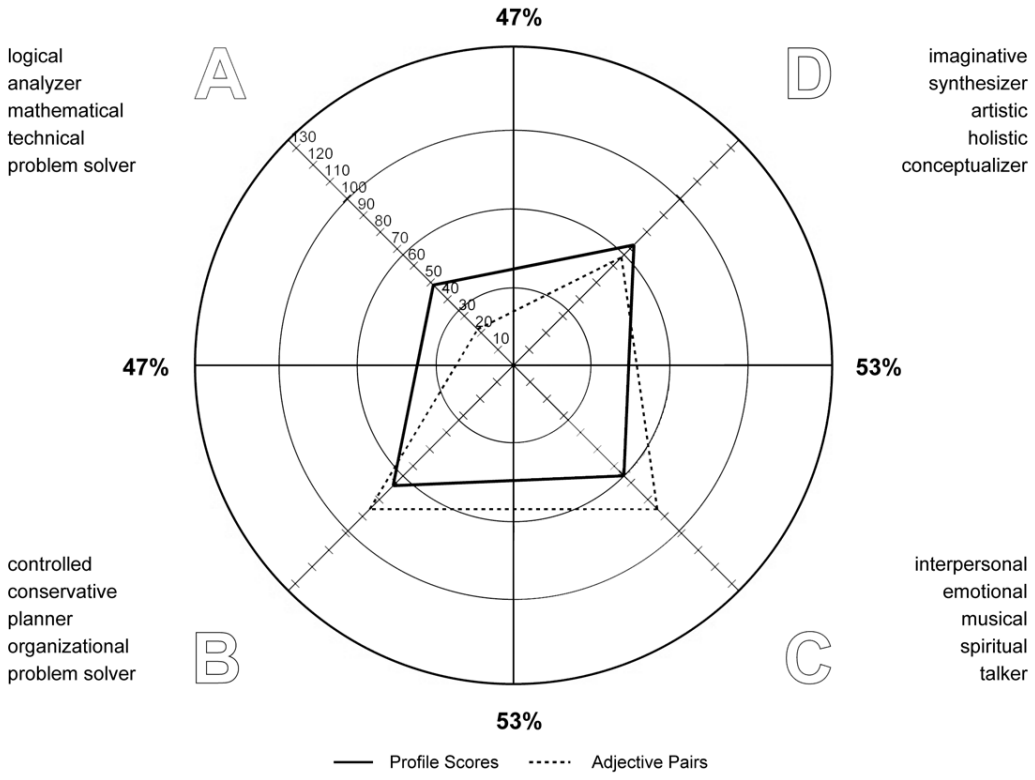


Appendix E
SAMPLE HBDI® PROFILE

HBDI®
Profile Overlay

JOHN DOE

Quadrant :	A	B	C	D
Profile Code :	2	1	2	1
Adjective Pairs :	2	8	8	6
Profile Scores :	48	72	66	72



Appendix F
PERSONAL SYLE INVENTORY (PSI) SURVEY

How intuitive are you? Find out now! Using your web browser, it only takes about ten minutes to answer 30 items in the PSI Survey and to receive a personal profile (see example) of your rational versus intuitive preferences. After you have completed the online version of the survey, we *highly recommend* that you try out the complete PSI Learning Kit which includes three other tools to help you get the most out of your Strategy Profile.

To begin, please fill in the demographic items below and proceed to the survey. The information you provide is strictly confidential. It will be used to describe *group* characteristics such as the average age of all people who have taken the PSI. At no time will *individual* results be made available to anyone.

Primary cultural heritage: (required)
(Asian, Black, Caucasian, Hispanic, Indigenous, Malayan, Other)
Please specify if Other: _____

Years of formal education completed: (required)
(e.g. High School equals 12, 4 years of College equals 16, etc.)
(1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,-22)

Date of Birth: (required) Month ____ Day ____ Year ____

Gender: (required) (Female, Male)

The results of a preference survey depend on the role you assume when you respond to the items. For instance, the way you deal with a situation as a sales manager may be quite different from how you handle a similar situation as a parent. We include a role data field below to encourage clarity about the responsibilities that you assume for answering the items.

Please Read the Instructions Carefully

- To help you select a role to use in taking the Survey, think about the different responsibilities that you have at work or at home.
- With specific responsibilities in mind, identify your role for the Survey. (e.g. construction worker, parent, manager, supervisor, retiree, etc.)
- Each statement in the Survey describes a behavior, belief or preference that most people generally have.
- Read each statement carefully in terms of the responsibilities of your role. The items are stated in terms of work. If you choose a non-work role, interpret the statements in terms of that role.

Appendix F *(continued)*

- Choose the phrase from the pull down menu that best describes how frequently the statement applies as you carry out those responsibilities. Here is a sample:

Example statement:	**Phrase choices:**
I plan ahead realistically.	1 Never 2 Once in a while 3 Sometimes 4 Quite often 5 Frequently but not always 6 Always

- Please work carefully but quickly. If you dwell on your response to a statement, you will not get your true first and usually most accurate response.
- Some items may sound alike, but they are different in some way.
- **Be sure to answer every item** since the Survey requires a response for each statement to prepare your Strategy Profile.

The Survey Questionnaire

Please indicate the role you have chosen for the Survey.
(Other, Agricultural Worker, Art/Media Specialist, Computer Specialist, Construction Worker, Consultant/Facilitator, Customer Service/Sales, Driver/Operator, Engineering Specialist, Factory/Warehouse Worker, Financial Specialist, Food Service Worker, Government Worker, Healthcare Provider, Homemaker/Parent, Legal Specialist, Manager/Supervisor, Owner/Partner, Office Worker, President/Vice-President, Primary Relationship, Professor/Teacher, Recreation Worker, Retiree, Scientist/Technician, Social Service Provider, Student, Volunteer Worker)
Please clarify your role choice. _____

1. When I have an important activity due in a week, I carefully outline what is required to get the job done.
2. To meet our shared responsibilities, I coordinate with my teammates.
3. In problem solving, I analyze step-by-step what is required to arrive at a solution.
4. I use imaginative ways of doing things.
5. In completing a task, I believe that it is important to follow prescribed guidelines.
6. I look at a problem as a whole approaching it from all sides.

Appendix F *(continued)*

7. When I have a special job to do, I organize it carefully from the start.
8. To get a job done, I cooperate with the members of my group.
9. To clearly see how they relate, I classify the elements of a problem.
10. In selecting a future course of action, I create new avenues using imaginative skills.
11. I follow established rules in completing a task assignment.
12. I believe a solution should synthesize the elements of a problem into an integrated whole.
13. I prioritize my assignments to meet future objectives.
14. In our assigned tasks, I participate with other members of the team.
15. I identify the steps required in arriving at the solution to a problem.
16. Getting ready for a new project, I improvise novel ways of doing things.
17. To accomplish a task, I focus on the procedures required to do the job.
18. I combine the elements of a problem so that I can see the issue as a whole.
19. In deciding how to complete a new project, I arrange tasks in their proper order.
20. I believe that combining our talents in a group effort helps us get the job done.
21. I investigate a problem by specifically evaluating its elements.
22. I conceive future directions by combining new ideas.
23. I believe following specific procedures helps ensure the timely completion of a task.
24. When problem parameters are incomplete, I surmise what I need to do.
25. To complete a new task on schedule, I anticipate what may cause delays.
26. I approach task accomplishment by networking with other team members.
27. In order to understand its elements, I break a problem down into its parts.
28. I visualize novel ideas in setting the direction for a new assignment.
29. I believe policies and procedures help ensure efficiency in getting work completed.
30. I explore the elements of a problem situation for a global perspective.

Be sure to respond to all statements.

Appendix G

SAMPLE PSI PROFILE

Sample PSI Strategy Profile

Here is a sample Strategy Profile that illustrates the relative strength of an Operations Manager's preferences for the **Rational** versus **Intuitive** ways of getting things done.

- *Planning* versus *Vision* ways of preparing for the future,
- *Analysis* versus *Insight* ways of solving problems, and
- *Control* versus *Sharing* ways of approaching work.

Your answers to the 30 Survey items are used to generate a unique Strategy Profile. Along with the profile, you receive a detailed explanation of your preferences for the rational and intuitive styles in the role you choose for your survey.

Role: Operations Manager

How do you prepare for the future?

28% **Planning** **Vision** **91%**

% 100 90 80 70 60 50 40 30 20 10 0 0 10 20 30 40 50 60 70 80 90 100 %

In developing proposals, you carefully outline what is required to get a job done when you have an important activity due. In completing a project on schedule, you arrange tasks in proper order, and you anticipate what may cause delays in the task schedule. When you have a special job, you organize it carefully from the start, and you prioritize assignments to meet future objectives.

In generating scenarios, you use imaginative ways of doing things. Getting ready for a new project, you improvise novel ways of doing things, and you conceive future directions by combining new ideas. In selecting a future course of action, you create new avenues using imaginative skills, and you visualize novel ideas in setting the direction for a new assignment.

Appendix G *(continued)*

How do you solve problems?

10% **Analysis** **Insight** 95%

% 100 90 80 70 60 50 40 30 20 10 0 0 10 20 30 40 50 60 70 80 90 100 %

As a specialist, you analyze step-by-step what is required to arrive at a solution. To clearly see how they relate, you classify the elements of a problem, and you identify the steps required to achieve a problem solution. In order to understand its elements, you break a problem down into its parts, and you investigate a problem by specifically evaluating each of its elements.

As a generalist, you look at a problem as a whole approaching it from all sides. Since you believe a solution should synthesize problem elements into an integrated whole, you explore the elements of a situation for a global perspective. When problem parameters are incomplete, you surmise what you need to do, and you combine problem elements to see the issue as a whole.

How do you approach work?

49% **Control** **Sharing** 59%

% 100 90 80 70 60 50 40 30 20 10 0 0 10 20 30 40 50 60 70 80 90 100 %

Being procedure centered, you believe following specific policies ensures timely task completion. To accomplish a task, you focus on procedures required to do the job, and you follow established rules in completing an assignment. Since you believe procedures ensure efficiency in getting work completed, you think that it is important to follow prescribed guidelines.

Being people centered, you approach task completion by networking with other team members. To meet shared responsibilities, you coordinate with teammates because you believe to get a job done, you should cooperate with group members. In your assigned tasks, you participate with other team members since you believe combining talents in a group effort gets the job done.

Source: http://www.the-intuitive-self.org/scripts/frameit/intro.cgi?/website/introduction/assess/psi_sample_profile.html, February 11, 2006

Appendix H
THEORETICAL FOUNDATIONS OF INTUITION (MOTT)

THEORY	TIME PERIOD	INTERPRETATION	PROPONENT
Mysticism	Pre-history	Direct perception of existence, reality and understanding	
Eastern Religious and Philosophical Doctrine		Multi-operational, disciplined spiritual act, part of universal consciousness	Hinduism
Early Philosophy	500-300 B.C.	Sensory means through which universal truths are directly perceived	Socrates, Plato, Aristotle
Theology	4th-13th Century	Non-rational, irreducible and divine knowledge, inspiration	Augustine, Aquinas
Philosophy	17th Century	Direct reasoning without doubt or question	Descartes
	18th Century	Knowing through sensory yet nonrational means	Kant
	18th Century	*A priori* understanding through which all other knowledge is derived	Russell
	20th Century	Source of primordial/ experiential knowing	Husserl
Psychology	20th Century	Extra-sensory and unconscious transmission of perception	Jung
	20th Century	Noetic, personal and conscious understanding which holistic knowing is derived	Bergson, Bruner
Neurophysiology	20th Century	Distinct and creative cognitive function originating from the prefrontal brain cortex	Clark, Herrmann, Restak

Source: Mott, V., (1994). *A phenomenological inquiry into the role of intuition in reflective adult education practice.* University of Georgia, unpublished dissertation.

Appendix I
THEORIES ABOUT TYPES OF INTUITION

Wild (1938). 31 Categories of Intuition

1. A sensation as distinct from perception
2. A form of thought …by which the space-time continuum…is assumed
3. A perception as distinct from sensation
4. The realization of particulars or wholes, as distinct from mere perception
5. A feeling or emotion (as distinct from pain and pleasure)
6. An experience on its mental side
7. An instinct on its mental side
8. Any instance of consciousness…sensation, perception, conception, feeling, etc.
9. The realization of truth, or true fact
10. The apprehension of reality as opposed to appearance
11. A "knack of the mind" by which some specially endowed people are able to arrive at conclusions without consciously formulating the premises
12. The process which occurs when the mental process involved in knowing takes place without the customary physical stimulus, and so mind communicates with mind without the intervention of the body
13. A general name for all possible ways of understanding, whether intellectual, instinctive, vital or…derived from these
14. The unconscious realization preceded by no reasoning process (conscious or unconscious) of what is suitable conduct in a particular and novel situation
15. Ineradicable pragmatic belief, conscious or unconscious
16. The conscious or unconscious assumption by the mind, when striving to comprehend the universe, or part of the universe, of certain notions or axioms upon which subsequent reasoning is based
17. The unreasoned apprehension of the future importance of a present event
18. The unreasoned mental guide to betterment or progress
19. Life as abstracted from living creatures
20. The faculty by which we recognize the ultimate values: truth, beauty, goodness, etc.
21. An appetite for new experience
22. Imagination: not the faculty which enables us to form new images from old experience, but that gives us ideas or visions transcending these
23. The faculty by which we feel truths that are not, or are only partially, truths…that wait on the future for their fulfillment
24. The faculty of knowing what is beyond the domain of demonstration or proof
25. The mental faculty which places us in touch…with what is outside the cosmos…with the spiritual world
26. God immanent, and so gives us our sense of values, our imagination, our realization of reality as distinct from appearance, our past and future, our vision, our faith, our entrance into unity with a spiritual world.
27. Mental faculty which directs action…to a biological end through the subconscious mind

Appendix I *(continued)*

28. Mental faculty by means of which a particular mind comes into such close and intimate relation with some external person, or circumstance, or mind, or even with the Absolute itself
29. Special form of knowing whose object is the self
30. The assumption…of a final end or ends, and is equally essential in every aspect of being: in matter…in life…in mind
31. A non-existent mental function, the word being loosely used to express some other function or combination of functions not clearly analyzed (pp. 211-219)

Wild ultimately reduced the 31 categories to four essential ideas: 1) knowing; 2) immediacy; 3) inexplicableness; 4) truth (p. 220).

Ewing (1941). Three Theories and Four Types of Intuition
Cartesian View—an axiomatic approach establishing the truth of certain general principles which are "true absolutely in their own right" and must be accepted without question or proof

1. Extreme Empiricism—an empirical view whose proponents, including John Stuart Mill, accepted only knowledge derived from immediate experience, and denied the existence of any other kind of knowledge. In extreme empiricism, so-called a priori propositions are seen as empirical generalizations from more than the usual number of observations

2. Coherence Theory—a systems approach holding that all true propositions form a system by which any single proposition can be justified by reference to the rest, and "their ability to fit into such a system is the sole criterion of…truth" (pp. 15-17)

Ewing also recognized the four types of intuition required to establish deductive or inductive reasoning: 1) that presupposed in deduction; 2) that presupposed in induction; 3) that presupposed in ethics; and 4) that consisting in the apprehension of a whole as a whole (pp. 9-10)

Bahm (1960). Three Sets of Three Types of Intuition
1. Objective: immediate apprehension of external objects; concerned with the intuited as opposed to the intuiter; may include: sense datum; a pattern, form, shape or essence; a relation, conjunction or connection; a sameness, difference or analogy; distinctness, indistinctness; fullness or void

   Subjective: immediate apprehension of the self; concerned with self-as-object and self-as-subject, or apparent vs. real self

   Organic: immediate apprehension of both object and subject, intuited and intuiter together; concerned with characteristics of both objective and subjective types

2. apparent, real, organic

3. aesthetic, incomplete, organic (pp. 3-16)

Appendix I *(continued)*

Vaughan, (1979). Four Levels of Intuition

1. Physical: associated with bodily sensations
   - Typically prompts somatic cues similar to primitive “jungle awareness” (i.e., bodily sensations like stomachache, headache, queasiness, shivers, etc.) alerting an individual to personal or environmental danger
   - Differs from instinct, which is unconscious
   - Can be experienced anywhere
   - Tuning in to bodily sensations (especially patterns) can help one make decisions, and can make a significant difference in how one relates to the environment

2. Emotional: associated with feelings
   - Feelings which bring intuitive information to consciousness
   - Includes being sensitive to other people's "vibes" (i.e., vibrations of energy which cause immediate liking or disliking of a person or thing with no apparent justification
   - Having an inexplicable and vague sense that one should be doing something, etc.
   - Often involves relations with other people and seems to take on a telepathic quality
   - Often referred to as “woman's intuition"

3. Mental: associated with thinking
   - Includes educated guesses, intuitive leaps and formulation of hypotheses and new theories
   - Often becomes apparent through images, or "inner vision”
   - Frequently linked with (though not limited to) problem-solving, mathematics, and science
   - Can be recognized when order suddenly arises from chaos
   - Can occur in a flash or after long, arduous work involving exhaustive applications of logic and reasoning (the latter generally more valued by Western cultures)
   - Discovery and invention, linked to this level, can be facilitated by incubation giving the mind time for chaotic disarray to fall into a pattern of order

4. Spiritual: associated with mystical experiences
   - Sometimes referred to as “pure intuition” or “illumination,” focuses on transpersonal consciousness
   - Distinguished from other forms of intuition by its independence from sensations, feelings, and thoughts
   - Level of intuition from which all other forms are derived
   - Often emerges spontaneously when the mind is quiet (pp. 66-80)
   - Activated by focusing on transpersonal rather than personal realm of intuition

Appendix I *(continued)*

Bastick (1982). 20 Common Properties of Insight and Intuition

1. Quick, immediate, sudden appearance
2. Emotional involvement
3. Preconscious process
4. Contrast with abstract reasoning, logic, or analytic thought
5. Influenced by experience
6. Understanding by feeling—emotive not tactile
7. Associations with creativity
8. Associations with egocentricity
9. Intuition need not be correct
10. Subjective certainty of correctness
11. Recentering
12. Empathy, kinesthetic or other
13. Innate, instinctive knowledge or ability
14. Preverbal concept
15. Global knowledge
16. Incomplete knowledge
17. Hypnogogic reverie
18. Sense of relations
19. Dependence on environment
20. Transfer and transposition (Table 1.3/1, p. 25)

Goldberg, (1983). Six Types of Intuition

1. Discovery: characterized by logic-transcending connections outside the conscious awareness
    - Applies to range of knowable subject matter, including mundane questions and matters of personal or social importance, as well as abstract conceptual puzzles and "creative breakthroughs"
    - Can supply answers to general or specific problems or may be insight into the real nature of the problem
    - Often takes the form of a sudden logical-transcending "connection" of which one was not previously aware
    - Also may be incremental intuitions, appear as a "sudden breakthrough" resulting from lengthy or complex pondering, or be evolution of an idea over a period of time
    - Often seems to be spontaneous, unforeseen and to emanate outside conscious awareness, though it may be "traceable" in afterthought

2. Creativity: characterized by imagination or a flow of unusual but sound ideas
    - Similar to discovery intuition and the two often overlap or work symbiotically, but creativity intuition deals with alternatives, options or possibilities instead of singular truths, facts or verifiable information
    - Generates ideas that are not more "right" factually but perhaps more "appropriate." Often produces fertile and apt ideas in quantity

Appendix I *(continued)*

- A problem-solver might generate lots of unusual solutions to a problem situation, while an artist might conceptualize the "work" (painting, music, poetry, book, etc.), and a scientist or mathematician might generate hypotheses and theories along with unusual ways to test them
- Often used in solving practical problems and making decisions; an important component in innovation

3. Evaluation: characterized by the ability to discern with certainty without sufficient data, facts, or knowledge
   - An "internal gyroscope" which often guides rational decision-making by providing "possibilities," narrowing alternatives or presenting strong feelings which aid and strengthen the ultimate choice
   - Applies to both internal and external decision-making and problem-solving, adding the element of discrimination to other products of intuition
   - Particularly useful when there is insufficient data for rational analysis, or when it is necessary to evaluate something about which the rational mind is too confused or subjective
   - Often associated with strong "feelings" of like/dislike or attraction/repulsion

4. Operation: characterized by a magnetic, overpowering certainty alerting one that they should or should not do a thing
   - May be experienced as a declarative force which prompts without explaining why or as a subtle guidance prompting without our awareness of the prompt
   - May nudge one toward or shove one away from an outcome
   - May manifest in larger issues as an undeniable sense of "calling" or mission which might be justified logically but is never logically derived
   - Similar to evaluation but does not require that it have something at hand to evaluate. May appear related to "luck" (e.g., being in the right place at the right time) but more likely related to Jung's "synchronicity"
   - A kind of "radar system" which provides good offices when accompanied by obedience to the prompting
   - Also may be related to "intimations," vague feelings that draw the attention and alert one that something is about to happen

5. Prediction: characterized by premonitions typically specific in nature though inherently unprovable
   - Similar to operation but more likely to involve a premonition, or irrational, precognitive "knowing" about an outcome
   - May be either explicit or implicit, positive or negative in nature
   - An excellent warning device, but may involve hunches about outcomes other than warnings
   - Particularly useful if one is called upon to reach a decision and must act on the basis of feelings or hunches that are unproved and unprovable

Appendix I *(continued)*

- Often hard to convince others of the authenticity of predictions due to their ephemeral quality
- May be mistaken for "guessing" by others though intuitive individuals do not think they are guessing

6. Illumination: characterized by a mystical "knowing," or awareness, that bypasses and transcends all sensory experience
   - The highest and most satisfying form of knowing, in which there is no separation between the subject (experiencer) and the object (experienced)
   - Pure awareness unaccompanied by sensation, perception or even thought
   - Pure consciousness which transcends ego or personal identity
   - Can be described as formless, intangible, timeless, boundless, immutable, beyond nature and scientism
   - Sometimes experienced in "degrees"--from hazy and fleeting to permanent realization and supreme enlightenment
   - Has transformative impact on consciousness and upgrades all cognitive faculties
   - Cultivating this form of intuition believed simultaneously to cultivate all other forms because it opens all intuitive channels (pp. 46-61)

Mishlove (1996). 17 Groups of Intuition

1. A personality trait
2. Mental imagery
3. Common sense and social conditioning
4. Subliminal computation
5. Empathy
6. Intuitive software
7. Being in the flow, perfect timing, effortless humor, joy, grace
8. Extrasensory perception, clairvoyance, precognition, telepathy, etc.
9. Instinct
10. Pattern recognition
11. Understanding language
12. Apprehension of first principles
13. Grasping mathematical relations
14. Connection with one’s essence, destiny, purpose, inner self
15. Mystical identification with the external world
16. Divine inspiration
17. Intuitive balancing act (pp. 8-14)

Cappon (1993c, 1994). 4 Parts of Intuition, 10 Input/10 Output Skills and Abilities

1. Anatomy: the capacity or ability to intuit, comprised of 20 input/output skills

2. Physiology: the accessing variables which tap and trigger the process, making it run

3. Process: the silent, unconscious aspect inferred from the application of intuition and observation of the resulting action

Appendix I *(continued)*

4. Source: the determinants of the individual's intuitive capacity (i.e., genetic inheritance, environmental background, personality, personal experience, and expertise (1993c, p. 86)

Cappon (1994) operationalized intuition by subdividing "anatomy" into 10 input and 10 output skills and abilities:

Input Skills and Abilities

1. Perceptual closure on insufficient time (quick eyes). *You know what something is despite little time to see it properly.*
2. Perceptual closure on insufficient definition (seeing through things). *You can identify something you haven't seen clearly*.
3. Perceptual recognition (finding things). *You are good at finding Waldo.*
4. Perceptual discrimination (seeing what is there). *You can distinguish elements flashed before you*.
5. Negative perceptual discrimination (seeing what is not there). *You can identify what wasn't flashed before you*.
6. Cognitive synthesis, or "Gestalt" insight (putting things together). *You can see the forest through the trees*.
7. Current time flow estimation (pretension). *You can time 3-minute eggs without a clock.*
8. Retrieving of memory, "quick memory" (quick registry and retrieval). *You can take in whole scene quickly and remember details*.
9. Passive imagination (responses to a pictureless colored background). *You are good at generating images spontaneously*.
10. Psycho-osmosis (knowing what one didn't know one knew). Y*ou identify things you have never seen before.*

Output Skills and Abilities

1. Active imagination (response to a picture or visual). *You look at a cloud and many images come to mind.*
2. Anticipation, or foresight. *You can anticipate what happens next.*
3. Optimal timing of intervention. *You always know when it's the ideal time to strike.*
4. Hunch, (seeing the problem and its solution). *You're good at hunches.*
5. Choice of optimal method. *You know the best way to figure something out.*
6. Choice of optimal application (of a discovery). *You know how to apply a discovery.*
7. Hindsight (seeing the cause of things). *You divine the causes of things.*
8. Associative matching (synthesis of cognition). *You are good at detective work; you know what elements fit together.*
9. Dissociative matching. *You look at a picture and know what elements don't fit.*
10. Seeing the meaning of things (holistic, teleological thinking skills). *You see the meaning of symbols* (1994, pp. 41, 42-43).

Appendix J
DOI ITEMS*, VARIABLES AND RELATED LITERATURE

This table shows all variables examined by the DOI, the DOI and/or HBDI® item(s) related to each variable, and the related literature.

DOI ITEM #	VARIABLES EXAMINED	RELATED LITERATURE
	Background Characteristics	
1	**Name**	*Included for cross-matching with individual respondent data from other instruments*
2	**Age**	Fallik & Eliot, 1985 *Also verifies respondent meets age criterion*
3	**Occupation/Job title**	*Included for cross-validation with data from other instruments*
4	**Ethnicity**	Vaughan, 1979 Rockenstein, 1988 Wonder & Blake, 1992
5	**Highest level of education**	*Verifies respondent meets education criterion*
6, 7a, 7b, 7c, 7d, 7e;	**Academic aptitude** **School subjects**	Westcott, 1968 Westcott & Ranzoni,1963 *Also included for cross-validation with data from other instruments*
	Intuition Experience	
8	**Frequency of intuition**	*Included for cross-validation*
9a	**Form of intuition: Visual**	Sanders, 1989
9b	**Form of intuition: Auditory**	Sanders, 1989
9c	**Form of intuition: Feeling**	Sanders, 1989
9d	**Form of intuition: Sensing**	Sanders, 1989
10a-z	**Conditions of intuition**	*Included for cross-validation*
11	**Belief in intuition**	*Included for cross-validation*
12	**Perception of own intuition**	*Included for cross-validation*
13	**Type of intuition: Discovery**	Goldberg, 1983
14	**Type of intuition: Creativity**	Goldberg, 1983
15	**Type of intuition: Evaluation**	Goldberg, 1983
16	**Type of intuition: Operation**	Goldberg, 1983
17	**Type of intuition: Prediction**	Goldberg, 1983
18	**Type of intuition: Illumination**	Goldberg, 1983
	Personality Traits	
19	**Able to accept challenge**	Westcott & Ranzoni, 1963
20	**Able to accept criticism**	Westcott & Ranzoni, 1963
21	**Able to change profoundly**	Westcott & Ranzoni, 1963

Appendix J *(continued)*

22	**Alert**	Westcott & Ranzoni, 1963
23	**Committed to causes**	Westcott & Ranzoni, 1963
24	**Concern w/abstract issues**	Westcott & Ranzoni, 1963
25	**Confident**	Westcott & Ranzoni, 1963
26	**Creative**	Westcott & Ranzoni, 1963
27	**Demanding**	Westcott & Ranzoni, 1963
28	**Foresightful**	Westcott & Ranzoni, 1963
29	**Independent**	Westcott & Ranzoni, 1963
30	**Informal**	Westcott & Ranzoni, 1963
31	**Open**	Westcott & Ranzoni, 1963
32	**Influenced by others**	Westcott & Ranzoni, 1963
33	**Resourceful**	Westcott & Ranzoni, 1963
34	**Risk-taker**	Westcott & Ranzoni, 1963
35	**Self-reliant**	Westcott & Ranzoni, 1963
36	**Spontaneous**	Westcott & Ranzoni, 1963
37	**Unafraid**	Westcott & Ranzoni, 1963
38	**Unconventional**	Westcott & Ranzoni, 1963
39	**Unworried**	Westcott & Ranzoni, 1963
	Personal Characteristics	
40	**Accepts ambiguity**	Westcott & Ranzoni, 1963
41	**Acts on beliefs**	Westcott & Ranzoni, 1963
42	**Becomes emotionally involved**	Westcott & Ranzoni, 1963
43	**Enjoys reading**	Westcott & Ranzoni, 1963
44	**Has strong self-belief**	Westcott & Ranzoni, 1963
45	**Welcome change**	Westcott & Ranzoni, 1963
	General Characteristics	
46, **66*,** 77	**Ability to visualize**	Simonton, 1980
47*, 61, 68	**Music**	Simonton, 1980
48, 64. **84***	**Interest in arts/aesthetics**	Simonton, 1980 Vaughan, 1979 Wild, 1938
49*, 72, 75	**Unconventional[ity]**	Westcott & Ranzoni, 1963
50, 56, **92***	**Cognitive style—Intuitive**	Simonton, 1980
51*, 65, 73	**Cognitive style—Analytic**	Simonton, 1980
52, 85, **98***	**Experience**	Rehm & Gadenne, 1990 Stocks, 1939
53, 59, **95***	**Creativity**	Bastick, 1982 Finke, et al, 1992 Rockenstein, 1988 Simonton, 1980 Simonton, 1975 Vaughan, 1979 Westcott & Ranzoni, 1963

Appendix J *(continued)*

54, **87*,** 93	**Innovation**	Agor, 1991
55, **89***, 97	**Carelessness w/ facts, details**	Agor, 1991
57, 67, **82***	**Cooperativeness**	Agor, 1991
58, 74, **90***	**Time of day**	Westmann & Canter, 1979
60, **70*,** 80	**Impulsivity**	Westcott & Ranzoni, 1963
62*, 88, 94	**Emotions**	Bastick, 1982 Denes-Raj & Epstein, 1994 Mitchell & Beach, 1990 Vaughan, 1979
63*, 78, 91	**Flexibility**	Westcott & Ranzoni, 1963
69, **71*,** 76	**Adventure [seeking]**	Westcott & Ranzoni, 1963
79*, 81, 83	**Imagery**	Heron, 1992 Vaughan, 1979
86, 96, **99***	**Amount of information available**	Westcott, 1961 Westcott, 1968 Cosier & Aplin, 1982 Nutt, 1979 Peters, et al, 1974
	Wrap-Up	
100	**Final thoughts**	*Included to clarify responses and inform the study*

* Negatively-worded items.

This table shows variables examined in the study but assessed by the HBDI®, not the DOI.

HBDI® ITEM #	VARIABLES EXAMINED	RELATED LITERATURE
2	**Sex**	Fallik & Eliot, 1985 Neisser, 1963 Valentine, 1929
5,6	**Handedness**	Fallik & Eliot, 1975
100	**Introversion/Extraversion****	Metzner, 1980
1-120***	**Brain hemispheres**	Fallik & Eliot, 1985 Herrmann, 1995

** HBDI® item 100 scored by marking one of nine boxes on Introvert to Extravert scale.

*** HBDI® items 1-120 produce outcome scores (quadrant profile score and hemisphere modal percent score), which form the basis of the "brain hemisphere" scores used in the study.

Appendix K
PARTIAL LIST OF STUDIES UTILIZING THE HBDI®

A, B, C, D, and E of It All: The Unfolding of the Unconscious
Helen B. Moore, The Union for Experimental Colleges and Universities, Cincinnati, OH

Analytic Case Study of the Facilitation Process Used By Individuals Functioning As Facilitators in the Quality Improvement Process in the IRS
Dr. Joan E. Cassidy, Virginia Polytechnic Institute and State University, Blacksburg, VA, November, 1990.

Assessment for the Future: An examination of Assessment Tools and Their Use
Cynthia Carlisle and Daniel Logue of Innovation Space, Austin, TX

Bicognitive Theory: The Nature, Assessment and Implication of Global and Analytic Cognitive Styles
Dan Woltz, Antioch University, 1978

Brain Dominance and Auditor Decision Making
Penny R. Clayton, 1991

Brain Dominance and Work Perceptions of Educational Administrators
Ralph Wallace, University of British Columbia, 1992

Brain Dominance Profile Differences of Teachers of Gifted and Regular Education
Margaret Mary Dukat, 1991

Brain Hemisphere Characteristics and Leadership Styles of Selected School Superintendents in Texas
Eloise Ida Soler, Ph.D., Texas A&M University, 1992.

Cognitive Style in A Personality Disorder: Evidenced by Poetry and Brain Dominance Testing
Patricia Jane Mitchell, Union for Experimenting Colleges and Universities, Cincinnati, OH, 1988.

Descriptive Study of Hemispheric Preferences, Attribute Variable, and Environmental Characteristics Among School Administrators
H. David Bryant, NC State University, 1988

Dimensionality and Occupational Discriminating Power of the Herrmann Brain Dominance Instrument®
Kevin T. Ho, Brigham Young University, 1988.

Appendix K *(continued)*

Discovering and Managing Creativity in the Firm
Wayne Patterson, Thomas Zimmerer, John M. Patrick, Clemson University, 1985

Discussion of Brain Hemisphere Characteristics and Creative Leadership among Selected Educational Administrators in Tennessee
Cynthia Jeanette Norris, The University of Tennessee, 1984.

Hemisphere Specialization and Jungian Typology – Evidence for a Relationship
James Newman, Pacific Graduate School of Psychology, Menlo Park, CA, 1984

Hemisphericity and Its Relationship to Athletics, Art, Dance, and Achievement: A Study Among Grade Twelve Students
Thomas J. Browne, Brigham Young University, 1986.

Hemisphericity in Occupational Therapy Undergraduate and Graduate Students
Ruth A. Coopee, Texas Woman's University, 1983.

Herrmann Brain Dominance Instrument® as a Management Tool
Robert Zawacki, Ph.D., Organizational Behavior, University of Colorado at Colorado Springs, 1988.

Hypnotizability, Absorption, Dreaming, and Cerebral Hemispheric Preference: A Correlation Study
Dora Hannides, The Wright Institute, 1994

Influence of Brain Hemisphericity on the Composing Process of Twelfth Graders
Reinholdine Breien Pierson, Old Dominion University, 1987.

Learning Style and Brain Hemisphere Dominance: Interrelationships and Influences on Organizational Role Section
Helen Leitch Diehl, Florida International University, 1986.

Match of Learning Style to Teaching Style Based on Use of Hemispheric Dominance Theory to Enhance Learning of Creative Thinking Skills
Robert Alan Black, B.S., M.A., M. Ed., Florida Atlantic University, 1983.

Neuropsychological Consultation Model Designed to Foster Wholebrain and Cognitive Style-Responsive Instruction for "At Risk" Elementary School Students
Thomas J. Craney Ph.D., Nova University, 1989.

Phenomenological Inquiry Into The Role of Intuition In Reflective Practice: Toward a More Holistic Epistemology of Knowing in Practice
Vivian Wilson Mott, University of Georgia, 1996

Appendix K *(continued)*

Relation Between Information Processing Style, Perfectionism and Physiological Response to Laterally Specific Tasks
Phyllis Corcoran, Chestnut Hill College, 1991

Relationship of Brain Dominance to Expressed Feelings of Marital Satisfaction in Dual-Career Couples
Karen F. Hauser, Ed.D., Southern Illinois University at Edwardsville, 1990.

Relationships of MBTI Types and HBDI® Preferences in a Population of Student Program Managers
Ruth Elizabeth DeWald, Western Michigan University, 1989.

Reports of So-Called "Peak" Experiences During a Neurotechnology-Based Training Program
Todd Masluk, Institute of Transpersonal Psychology, Palo Alto, CA, May 1997.

Right Brain, Left Brain, or No Brain At All
Tanya Muentefering, Southwest Missouri State University, 1987.

Thinking Style Preferences of Entrepreneurs and Their Executive Teams in Relation to Organizational Effectiveness and Growth
Laura L. Blodgett, Harvard University, 1988

Thinking Styles and Training Preferences of Educational and Corporate Leaders
Michael Cicchetti, Boston University, 1991

Appendix L
INITIAL EMAIL TO PROSPECTIVE DOI PARTICIPANTS

Various customized versions of this message were sent to prospective participants, beginning in January 2008.

GOOD NEWS!

I'm happy to announce that I've launched the main study for my Adult Education dissertation research at the University of MO-St. Louis. My study is designed to collect data for use in validating an instrument to measure certain aspects of intuition.

Participants must be **18 or older** and must have a **high school diploma or equivalent**. If you meet these criteria, I hope you'll help me by taking time to complete the three online instruments that are part of this project:

1. **Dimensions of Intuition** (DOI)—researcher-designed measure of certain aspects of intuition (100 items, 20-30 minutes for completion)

   To complete the DOI, go to **http://tinyurl.com/2sybg9** and follow the instructions for each section.

2. **Herrmann Brain Dominance Instrument®** (HBDI®)—validated measure of thinking styles (120 items, 20-30 minutes for completion)

   On the last page of the DOI, you'll receive a web key code, allowing you to complete the HBDI® at no cost. When you click "Next" on the last page of the DOI, you'll be directed to the HBDI®; or you may go to **http://tinyurl.com/7ngz4**.

   Click on "Complete Your Assessment—I have a code." Select "English," and enter the web key code.

   OPTIONAL: You'll also have an opportunity to purchase from the researcher your own customized HBDI® results packet at the greatly reduced price of $30.

3. **Personal Style Inventory** (PSI)—validated measure of preference for rational vs. intuitive modes (30 items, 8-10 minutes for completion)

   Upon completion of the HBDI®, go to **http://tinyurl.com/2f3e8p**. As soon as you finish the PSI, you'll receive a free online strategy profile, with a detailed explanation of your own preferences for the rational vs. intuitive styles.

Most participants will be able to complete all three instruments within one hour in a single sitting, though individual times may differ. You may also complete the instruments at different times, if you're unable to complete all the surveys at once.

Appendix L *(continued)*

A total of 300 participants are needed for this project. My goal is to have all the surveys completed as quickly as possible, so I can begin the statistical analyses in order to graduate in 2008.

You'll find the statement of confidentiality and informed consent information on the first page of the DOI instrument. If you have questions or need more information, or to provide names and contact information for other potential participants, please contact me at **314-516-4349** or **vrugtmanr@umsl.edu**.

Rosanne Vrugtman
Ph.D. Candidate
College of Education
University of MO-St. Louis

Appendix M
FIRST FOLLOW-UP EMAIL TO DOI PARTICIPANTS

Versions of this follow-up message were sent to participants, beginning in April 2008.

This message is being sent as a follow-up to the invitation to participate in my dissertation research project: **"Dimensions of Intuition" (DOI): First-Round Validation Studies."**

NOTE: *If you forwarded my previous email to others, I hope you'll take a moment to send this follow-up message to them, as well.*

I've included information below for those who have:

- **Completed all THREE instruments**
- **Completed ONE or TWO but not all three instruments**
- **Completed NONE of the instruments yet**

If you've completed all THREE instruments (DOI, HBDI® and PSI):

Thanks SO MUCH for taking time to participate in my study! With your help, I'm currently at ___ of the 300 responses I need.

Re the DOI: All participants will receive an "Executive Summary" of my findings and conclusions when the project is finished.

Re the HBDI®: When I've received 300 responses, I'll contact all participants to determine who would like to purchase the *(OPTIONAL!)* individualized HBDI® packet for the reduced, research-only price of $30.

Re the PSI: You should have received a free online report immediately after completing the PSI.

NOTE: *You can still help me with this study by forwarding the instructions at the end of this message to others who might be interested in the project.*

If you've completed ONE or TWO of the instruments but not all three:

I hope you're able to take a few minutes to complete the remaining instrument(s), since this study design requires that **all** 300 participants complete **both** the DOI and HBDI®, and at least 150 complete the PSI, as well. Follow these links to go directly to the remaining instrument(s):

1. **To complete the Dimensions of Intuition** (DOI)
   Go to **http://tinyurl.com/2sybg9** and follow the instructions for each section.

2. **To complete the Herrmann Brain Dominance Instrument®** (HBDI®)

Appendix M *(continued)*

Go to **http://tinyurl.com/7ngz4**—OR click "Next" at the bottom of the last page of the DOI.

Click on "Complete Your Assessment-I have a code." Select "English," then enter the web key code _____ (which will allow you to complete the HBDI® at no cost).

3. **To complete the Personal Style Inventory** (PSI)
   Go to **http://tinyurl.com/2f3e8p**.

   IMPORTANT: Be sure to provide your name, email address and/or date of birth on the PSI so I can match your PSI with the other instruments used in this study.

If you've completed NONE of the instruments yet:
It isn't too late to participate! The survey sites will remain open until 300 responses are received, and I believe you'll find the instruments and your individual results very interesting. The following explains the study and provides instructions and links to the instruments.

WHAT IT IS

- Ph.D. dissertation research, University of MO-St. Louis, College of Education
- Quantitative study of intuition conducted by Rosanne Vrugtman, Ph.D. Candidate, Adult Education
- Title: **"Dimensions of Intuition (DOI): First-Round Validation Studies"**
- DOI is designed to measure intuition by examining 26 personal characteristics believed to be related to intuition, 6 types (functionalities) of intuition, 4 forms (receptors) of intuition, and other aspects
- Methodologies: Confirmatory Factor Analysis (CFA); Correlation Analysis (CA); and Structural Equation Modeling (SEM)
- "Statement of Confidentiality" and "Informed Consent" information on the first page of the DOI instrument

WHO CAN PARTICIPATE

- Anyone age **18 or older**
- **High school diploma** (or equivalent) **or above**

COST/TIME/DEADLINE

- **No cost** to participants
- **40-60 minutes** for most to complete all **3 online instruments**
- Sites will remain open until a minimum **300 responses** received

INSTRUMENTS USED

1. **Dimensions of Intuition** (DOI)—researcher-designed measure of certain aspects of intuition (100 items, 20-30 min.)

Appendix M *(continued)*

2. **Herrmann Brain Dominance Instrument®** (HBDI®)—validated measure of brain dominance (preference) by quadrant and hemisphere, thinking, teaching/learning, communication styles, etc. (120 items, 20-30 min.)

3. **Personal Style Inventory** (PSI)—validated measure of preference for rational vs. intuitive modes (30 items, 8-10 min.)

PARTICIPANT RISKS

- No known or anticipated risks
- Individual outcomes confidential, personal identifiers removed, only aggregate results reported

PARTICIPANT BENEFITS

1. **DOI benefits:**
   - Support **new knowledge** about the role of intuition as a tool for knowing, teaching/ learning, etc.
   - Receive **Executive Summary** of research findings and conclusions

2. **HBDI® benefits:**
   - *OPTIONAL*: Purchase **individualized brain dominance profile packet** at research-only fee of $30 (retail $299)
   - Invitation to post-study HBDI® **debrief training** session(s)

3. **PSI benefits:**
   - Receive immediate, free, printable **online strategy profile** with detailed explanation of preference for the rational vs. intuitive modes: Planning vs. Vision (ways of preparing for the future); Analysis vs. Insight (ways of solving problems); Control vs. Sharing (ways of approaching work)

4. Intuition has implications for teaching/learning, problem-solving, decision-making, team- and relationship-building, scientific discovery, invention, human performance improvement, etc. A better understanding of what intuition is and how it works should help us to **recognize and use this elusive but vital faculty**.

PARTICIPATION INSTRUCTIONS

1. **Dimensions of Intuition** (DOI)
   Go to **http://tinyurl.com/2sybg9** and follow the instructions for each section.

2. **Herrmann Brain Dominance Instrument®** (HBDI®)
   Go to **http://tinyurl.com/7ngz4** -- OR click “Next” on the last page of the DOI.

   At the HBDI® site, click on "Complete Your Assessment-I have a code." Select "English," then enter the web key code _____ to complete the HBDI® at no cost.

Appendix M *(continued)*

3. **Personal Style Inventory** (PSI)
   Go to **http://tinyurl.com/2f3e8p**.

   IMPORTANT: Be sure to provide your name, email address and/or date of birth on the PSI so I can match your PSI with other surveys used in this study.

Questions? I can be reached at **314-516-4349** or **vrugtmanr@umsl.edu**.

Please feel free to share this information with others you know who may wish to participate, as well. Thanks so much for your help with this project!

Appendix N
SECOND FOLLOW-UP EMAIL TO DOI PARTICIPANTS

Various versions of this final message were sent to participants, beginning in June 2008.

NOTE: *If you forwarded my previous email(s) to others, I hope you'll take a moment to send this message to them, as well.*

This is a follow-up to my previous invitation to participate in my dissertation research project: **"Dimensions of Intuition (DOI): First-Round Validation Studies."** I've included below:

- **STATUS OF THE STUDY**
- **PURCHASE YOUR HBDI® PACKET**

STATUS OF THE STUDY

I'm currently at **___ responses** to the DOI instrument. My study design requires that participants complete BOTH the **DOI and HBDI®,** so I'm leaving the data collection open for a short while longer.

If you haven't done so already, please take a few minutes to complete the remaining instrument(s), using the following links:

1. **Dimensions of Intuition** (DOI)
   Go to **http://tinyurl.com/2sybg9** and follow the instructions for each section.

   (NOTE: If you're unfamiliar with the purpose and design of my study, I've included additional information at the end of this message.)

2. **Herrmann Brain Dominance Instrument®** (HBDI®)
   Go to **http://tinyurl.com/7ngz4**—OR click "Next" at the bottom of the last page of the DOI.

   Click on "Complete Your Assessment-I have a code." Select "English," then enter the web key code _____ to complete the HBDI® at no cost.

3. **Personal Style Inventory** (PSI)
   Go to **http://tinyurl.com/2f3e8p**.

   IMPORTANT: Be sure to provide your name, email address and/or date of birth on the PSI so I can match your PSI with the other instruments used in this study.

If you aren't sure which instruments you've completed, feel free to email me at: **vrugtmanr@umsl.edu.**

Appendix N *(continued)*

PURCHASE YOUR HBDI® PACKET *(Optional!)*

I'm making the individualized HBDI® packet available to my study participants for a greatly reduced, **one-time-only** research price of **$30**.

***NOTE: To qualify for this price, you* MUST COMPLETE BOTH the DOI and HBDI®.**

To see a sample HBDI® packet go to:
http://www.HBDI®.com/uploads/100029_practitionersarea/100369.swf

To learn more about the fundamentals of the HBDI® profile, go to:
http://HBDI®.com/WholeBrainProductsAndServices/theHBDI®.cfm

To get your HBDI®:
After I close data collection for my project, I'll receive all participants' HBDI® data, and will prepare individualized packets for those who have requested them.

Questions, please contact me at **vrugtmanr@umsl.edu** or **314-516-4349**.

Please share this information with others you know who may still wish to participate. And thanks again for your help!

Appendix O
THE HBDI® IN RESEARCH PROJECTS
HERRMANN INTERNATIONAL RESEARCH CONSENT FORM

Please read the following stipulations. If you agree, sign and return this form to Herrmann International for permission to use materials copyrighted by the Ned Herrmann Group.

This is to acknowledge that **Rosanne Vrugtman** has requested permission from Herrmann International, to use in her dissertation certain materials that are copyrighted by Herrmann International. Permission may be granted to the above-named researcher by complying with the following:

1. An advance copy of the research protocol will be sent to Herrmann International, for comment and final approval.

2. The research approach will be an appropriate application of the Herrmann Brain Dominance Instrument®.

3. The researcher will gain knowledge of the HBDI® and Whole Brain technology by reading *The Creative Brain*© and *The Whole Brain Business Book*© by Ned Herrmann.

4. The researcher will submit copies of all materials to be used in the study, project or publication to Herrmann International. These copies will remain in possession of Herrmann International.

5. The copyright will appear on all said materials and appropriate credit will be given for the use of the HBDI® data and materials.

6. A copy of the final publication or study will be sent to Herrmann International for its library.

7. Pricing and fees are determined by Herrmann International Research & Development Department and are calculated on a project-by-project basis.

8. All results, reports and articles resulting from research using the HBDI® are to be sent to Herrmann International prior to publication for approval.

When the Herrmann Brain Dominance Instrument® is administered, the researcher **must** convey the following information to the participants: (A cover sheet attached to the Survey Form is required - Sample available):

1. This is **NOT** a test, but rather a survey of preferred thinking styles or brain dominance.

2. The researcher will have access to the participants' personal HBDI® data.

If paper survey forms are used, they must be returned by participants to the **researcher** rather than Herrmann International.

Appendix O *(continued)*

ADDITIONAL INFORMATION NEEDED

Foundational Hypotheses and Assumptions

My dissertation research, tentatively entitled "Dimensions of Intuition: First Round Validation Studies," is intended to fulfill the requirements of the Ph.D. in Adult Learning degree at the University of MO-St. Louis. My research interest is the relationship between intuition and brain dominance as measured by the HBDI®. My underlying premise agrees with Agyakwa (1988) that there are two ways of knowing anything: the first is deduction/induction; the other is intuition. Unfortunately, traditional Western education focuses almost entirely on the former, while not only neglecting but too often actively stifling and negating the latter. Worse, by the time most students emerge from the typical K-12 classroom, they have suppressed and possibly lost the use of their innate intuitive abilities. I am particularly interested in determining how adults can reclaim their intuition and utilize it as a learning tool.

Additional assumptions underlying my research include:

1. Intuition is accessible to everyone—not just the gifted few.

2. Intuitive abilities can be built and/or increased through purposeful use (exercise).

3. Intuition is especially valuable in those situations in which we:
   a) cannot control or predict all the variables in a given situation
   b) cannot measure, quantify, and define with precision
   c) do not have complete and adequate information (Goldberg, 1983).

4. It may be possible to measure intuition by operationalizing 25 intuition-related variables from three factorial clusters:
   a) Social/acquired: intrinsic characteristics which may be socially influenced or learned/developed
   b) Biological: personal or demographic characteristics which are generally fixed or non-manipulable
   c) Situational: extrinsic or environmental characteristics (Shirley and Langan-Fox, 1996).

   (List of variables attached.)

5. Intuitive functioning can be divided into six discrete types: discovery, creativity, evaluation, operation, prediction, and illumination (Goldberg, 1983).

Research Question and Design

The purpose of my research project is to:

1. verify a set of underlying dimensions (i.e., common factors) in intuitive functioning;

2. quantify the relative contributions of each factor and intuitive function confirmed in step 1 above for each quadrant of the brain as measured by the HBDI®; and

Appendix O *(continued)*

3. determine whether the measured intuitive functions are right-brained, left-brained or whole-brained.

In addition to the HBDI® quadrant and modal percent scores, my study will examine 25 of the 57 intuition-related variables identified in a literature review by Shirley and Langan-Fox (1996).

The project is designed to identify and measure the underlying dimensions of intuition as they relate to brain dominance. I am particularly interested in the "brainedness" of intuition, which I hypothesize to be a whole-brained, and not merely a right-brained, as generally believed. One assumption is that the HBDI® loads intuition on the right hemisphere because the intuition-related constructs measured by the HBDI® focus on those associated with the right-brain. In addition to delving into C quadrant-related "people intuition" and D quadrant-related "idea intuition." as identified by the HBDI®, I will attempt to operationalize, capture and measure intuition variables associated with the left brain aspects of intuitive functioning.

Two other instruments will be used in the study: the researcher-designed "Dimensions of Intuition" (DOI) instrument; and Taggart's "Personal Style Inventory" (PSI) instrument, which measures the relative strengths of preference for the rational vs. intuitive modes (http://www.the-intuitive-self.org/website/introduction/framesets/frameset_psi_survey.html). All respondents (approximately 300) will complete the DOI and HBDI®; half (approximately 150) will also complete the PSI.

The hypotheses associated with this project are:

1. Absolute, incremental and parsimonious fit measures developed using confirmatory factor analysis (CFA) will allow the researcher to fit the 25 variables to be examined in this study into the factor structure, or "clusters," designated by Shirley and Langan-Fox (1996).

2. Utilizing the intuitive functions as measured by the DOI instrument as independent variables and the HBDI® quadrant scores as dependent variables will enable the researcher to discover the relative weights in both variates.

3. Utilizing the intuitive functions measured by the DOI as independent variables and the HBDI® left/right modal percent scores as dependent variables, the researcher will be able to discover the relative weights in both variates.

4. A strong positive correlation will be found between intuition as measured by the DOI and the PSI's intuitive mode scores for vision, insight and sharing.

Confirmatory factor analysis, structural equation modeling and correlation analysis will be employed to determine the most potent (predictive) among the variables on one or more of the measures to be used in the study—the DOI, the HBDI®, and the PSI

Appendix O *(continued)*

(Taggart's Personal Style Inventory). I plan to determine the relative weights of 26 intuition-related variables which are also measured by the HBDI® and the PSI. By comparing results from the related items on the three instruments, I hope to determine which of the variables account for the greatest amount of variance in intuitive functioning, as well as where those constructs load on each of the quadrants of the Herrmann's *Whole-Brain Model*. Ultimately, this study should be a first step toward designing and validating the DOI as an instrument to measure intuition, both as a content and a process.

I understand the HBDI®s completed as part of this project will cost $XX each. Standard Herrmann International protocols will be observed to protect respondents and their data.

APPROXIMATE NUMBER OF PARTICIPANTS IN THE STUDY
The project will require approximately 300 participants—minimum of 10 for each of the variables examined.

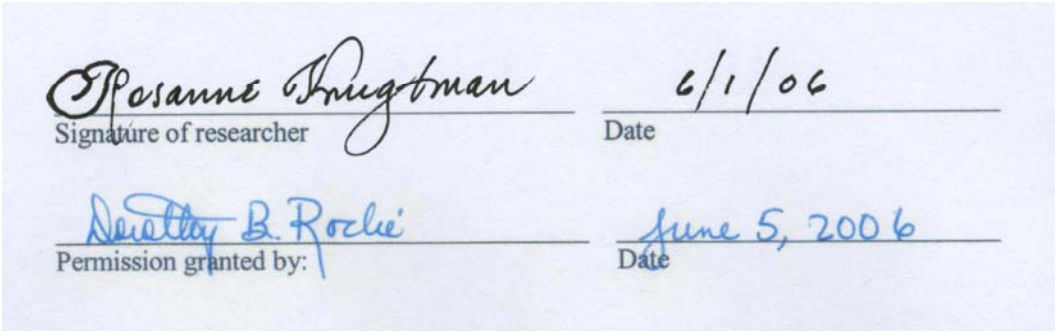
TARGETED DATE TO BEGIN STUDY: June 2006

TARGETED DATE OF COMPLETION: December 2008

OTHER ASSESSMENTS TO BE USED
See above.

Thank you for your help with my research! I hope my findings will be significant, and useful to Herrmann. I'll be sure to update you as my research design evolves. If you still have questions or need additional information about anything, please contact me:

Work: vrugtmanr@umsl.edu
314-516-4349



Appendix P
PERMISSION TO USE THE PSI IN THIS PROJECT

The following email messages received from Bill Taggart confirms that his willingness to participate in the proposed research project.

From: Bill Taggart
Sent: Thu 1/19/2006 11:37 AM
To: Vrugtman, Rosanne
Subject: Re: Inquiry from Website

Rosanne

[*Re validation of the PSI*] Here's the link to the paper with the validation study completed in 2000: http://www.the-intuitive-self.org/website/documents/publications/psi_revision_pdf.html

You are welcome to use the PSI—y our subjects would log on to the site, take the PSI, print the hard copy of their profile with their percentile scores on the six scales for you to use in the study.

Since I was retired from academe, the paper wasn't published in a journal.

Hope this helps.

Bill [Taggart]

From: Bill Taggart [mailto: postmaster@the-intuitive-self.org]
Sent: Thu 1/19/2006 3:20 PM
To: Vrugtman, Rosanne
Subject: Re: Inquiry from Website

Rosanne

I'll check out the link you sent and run the PSI past my chair.

Another thought - for statistical analysis, an individual's raw scores would probably be more appropriate.

If your subjects use the PSI and they include their name (for you to identify them) and a unique identifier (for me to identify them as your subjects) in their personal data, I can forward each person's raw scores to you.

Good luck whichever way you decide to go.

Bill [Taggart]

Appendix Q
U.S. CENSUS 2000
SEX, AGE AND RACE

NOTE: **Bold** *type indicates rows relevant to DOI respondents and/or variables examined.*

TOTAL POPULATION	**NUMBER**	**PERCENT**
SEX AND AGE		
Male	**138,053,563**	**49.1**
Female	**143,368,343**	**50.9**
Under 5 years	19,175,798	6.8
5 to 9 years	20,549,505	7.3
10 to 14 years	20,528,072	7.3
15 to 19 years	20,219,890	7.2
20 to 24 years	18,964,001	6.7
25 to 34 years	39,891,724	14.2
35 to 44 years	45,148,527	16
45 to 54 years	37,677,952	13.4
55 to 59 years	13,469,237	4.8
60 to 64 years	10,805,447	3.8
65 to 74 years	18,390,986	6.5
75 to 84 years	12,361,180	4.4
85 years and over	4,239,587	1.5
Median age (years)	35.3	N/A
18 years and over	**209,128,094**	**74.3**
Male	**100,994,367**	**35.9**
Female	**108,133,727**	**38.4**
21 years and over	196,899,193	70
62 years and over	41,256,029	14.7
65 years and over	34,991,753	12.4
Male	14,409,625	5.1
Female	20,582,128	7.3
RACE		
White (only)	**211,460,626**	**75.1**
Black or African American (only)	**34,658,190**	**12.3**
Hispanic or Latino (of any race)	**35,305,818**	**12.5**
TOTAL POPULATION	**281,421,906**	**100**

Source: http://factfinder.census.gov, US Census 2000, Age Groups and Sex, October 14, 2008

Detailed online source: DP-1. Profile of General Demographic Characteristics: 2000; Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data; Geographic Area: U.S.

URL: http://factfinder.census.gov/servlet/QTTable?_bm=y&-qr_name=DEC_2000_SF1_U_DP1&-geo_id=01000US&-ds_name=DEC_2000_SF1_U&-_lang=en&-format=&-CONTEXT=qt

Appendix R
U.S. CENSUS 2000
AGE AND SEX

NOTE: **Bold** *type indicates rows relevant to DOI respondents and/or variables examined.*

AGE	NUMBER			PERCENT		
	Both	**Male**	**Female**	**Both**	**Male**	**Female**
Total population	**281,421,906**	**138,053,563**	**143,368,343**	**100**	**100**	**100**
Under 5 years	19,175,798	9,810,733	9,365,065	6.8	7.1	6.5
5 to 9 years	20,549,505	10,523,277	10,026,228	7.3	7.6	7
10 to 14 years	20,528,072	10,520,197	10,007,875	7.3	7.6	7
15 to 19 years	20,219,890	10,391,004	9,828,886	7.2	7.5	6.9
20 to 24 years	**18,964,001**	**9,687,814**	**9,276,187**	**6.7**	**7**	**6.5**
25 to 29 years	**19,381,336**	**9,798,760**	**9,582,576**	**6.9**	**7.1**	**6.7**
30 to 34 years	**20,510,388**	**10,321,769**	**10,188,619**	**7.3**	**7.5**	**7.1**
35 to 39 years	**22,706,664**	**11,318,696**	**11,387,968**	**8.1**	**8.2**	**7.9**
40 to 44 years	**22,441,863**	**11,129,102**	**11,312,761**	**8**	**8.1**	**7.9**
45 to 49 years	**20,092,404**	**9,889,506**	**10,202,898**	**7.1**	**7.2**	**7.1**
50 to 54 years	**17,585,548**	**8,607,724**	**8,977,824**	**6.2**	**6.2**	**6.3**
55 to 59 years	**13,469,237**	**6,508,729**	**6,960,508**	**4.8**	**4.7**	**4.9**
60 to 64 years	**10,805,447**	**5,136,627**	**5,668,820**	**3.8**	**3.7**	**4**
65 to 69 years	**9,533,545**	**4,400,362**	**5,133,183**	**3.4**	**3.2**	**3.6**
70 to 74 years	**8,857,441**	**3,902,912**	**4,954,529**	**3.1**	**2.8**	**3.5**
75 to 79 years	**7,415,813**	**3,044,456**	**4,371,357**	**2.6**	**2.2**	**3**
80 to 84 years	4,945,367	1,834,897	3,110,470	1.8	1.3	2.2
85 to 89 years	2,789,818	876,501	1,913,317	1	0.6	1.3
90 years/over	1,449,769	350,497	1,099,272	0.5	0.3	0.8
Under 18 years	72,293,812	37,059,196	35,234,616	25.7	26.8	24.6
18 to 64 years	174,136,341	86,584,742	87,551,599	61.9	62.7	61.1
18 to 24 years	27,143,454	13,873,829	13,269,625	9.6	10	9.3
25 to 44 years	85,040,251	42,568,327	42,471,924	30.2	30.8	29.6
25 to 34 years	39,891,724	20,120,529	19,771,195	14.2	14.6	13.8
35 to 44 years	45,148,527	22,447,798	22,700,729	16	16.3	15.8
45 to 64 years	61,952,636	30,142,586	31,810,050	22	21.8	22.2
45 to 54 years	37,677,952	18,497,230	19,180,722	13.4	13.4	13.4
55 to 64 years	24,274,684	11,645,356	12,629,328	8.6	8.4	8.8
65 years/over	34,991,753	14,409,625	20,582,128	12.4	10.4	14.4
65 to 74 years	18,390,986	8,303,274	10,087,712	6.5	6	7
75 to 84 years	12,361,180	4,879,353	7,481,827	4.4	3.5	5.2
85 years/over	4,239,587	1,226,998	3,012,589	1.5	0.9	2.1

Appendix R *(continued)*

16 years/over	217,149,127	105,134,229	112,014,898	77.2	76.2	78.1
18 years/over	**209,128,094**	**100,994,367**	**108,133,727**	**74.3**	**73.2**	**75.4**
21 years/over	196,899,193	94,737,132	102,162,061	70	68.6	71.3
60 years/over	45,797,200	19,546,252	26,250,948	16.3	14.2	18.3
62 years/over	41,256,029	17,373,013	23,883,016	14.7	12.6	16.7
67 years/over	31,101,522	12,594,818	18,506,704	11.1	9.1	12.9
75 years/over	16,600,767	6,106,351	10,494,416	5.9	4.4	7.3

Source: http://factfinder.census.gov, US Census 2000, Age Groups and Sex, October 14, 2008.

Detailed online source: QT-P1. Age Groups and Sex: 2000
Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data
Geographic Area: United States

URL: http://factfinder.census.gov/servlet/STTable?_bm=y&-geo_id= 01000US&-qr_name=ACS_2006_EST_G00_S0101&-ds_name=ACS_2006_ EST_G00_&-redoLog=false.

Appendix S
U.S. CENSUS 2000
POPULATION AND EDUCATION BY SEX AND RACE

POPULATION
(Rounded to Nearest 1000)

Selected Population		Total Population	
Total Population/White:	211,461,000	Total Population/All:	281,422,000
Male/White:	103,773,000	Male/All:	138,054,000
Female/White:	107,687,000	Female/All:	143,368,000
18 and over/White:	161,862,000	18 and over/All:	209,128,000
Total Population/Black:	34,658,000	Total Population/All:	281,422,000
Male/Black:	16,465,000	Male/All:	138,054,000
Female/Black:	18,193,000	Female/All:	143,368,000
18 and over/Black:	23,772,000	18 and over/All:	209,128,000
Total Population/Hispanic-Latino:	35,306,000	Total Population/All:	281,422,000
Male/Hispanic-Latino:	18,162,000	Male/All:	138,054,000
Female/Hispanic-Latino:	17,144,023	Female/All:	143,368,000
18 and over/Hispanic-Latino:	22,964,000	18 and over/All:	209,128,000

EDUCATION 25 AND OVER
(Rounded to Nearest 1000)

Selected Population		Total Population	
Total 25 and over/White:	143,086,000	Total 25 and over/All:	182,212,000
HS graduate or higher/White:	119,587,000	HS grad or higher/All:	146,496,000
Bachelor's or higher/White:	37,292,000	Bachelor's or higher/All:	44,463,000
Total 25 and over/Black:	19,858,000	Total 25 and over/All:	182,212,000
HS graduate or higher/Black:	14,350,000	All HS grad or higher:	146,496,000
Bachelor's or higher/Black:	2,831,000	All Bachelor's or higher:	44,463,000
Total 25 and over/Hisp.or Latino:	18,270,000	Total 25 and over/All:	182,212,000
HS grad or higher/Hisp.or Latino:	9,577,000	All HS grad or higher:	146,496,000
Bachelor's or higher/Hisp.or Latino:	1,908,000	All Bachelor's or higher:	44,463,000

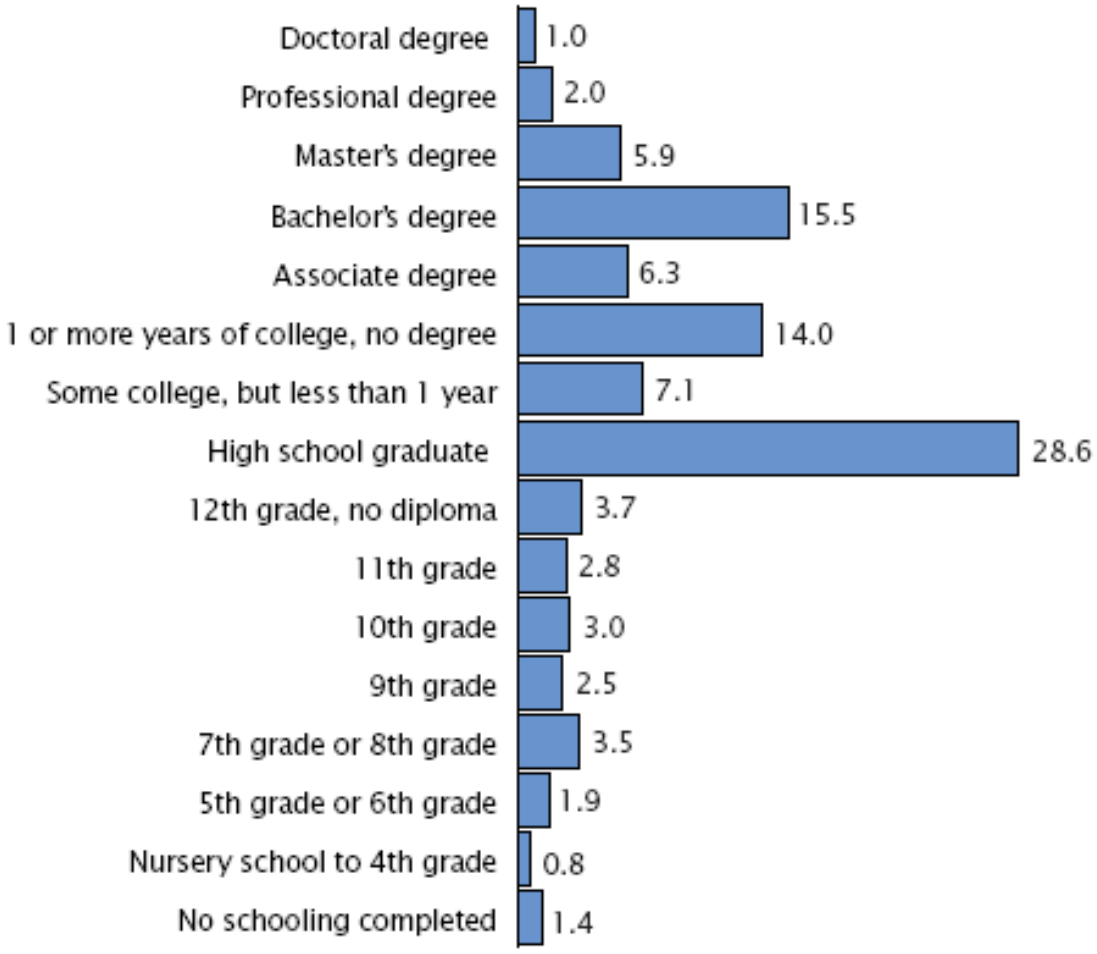
Compiled from Source: http://factfinder.census.gov, Population Finder/Fact Sheet, October 14, 2008.

Appendix T
U.S. CENSUS 2000
HIGHEST EDUCATIONAL ATTAINMENT LEVEL
OF THE POPULATION 25 YEARS AND OVER

Figure 2.

Highest Educational Attainment Level of the Population 25 Years and Over: 2000

(In percent. Data based on sample. For more information on confidentiality protection, sampling error, nonsampling error, and definitions, see *www.census.gov/prod/cen2000/doc/sf3.pdf*)



Source: U.S. Census Bureau, Census 2000 Summary File 3.
http://www.census.gov/prod/2003pubs/c2kbr-24.pdf, October 14, 2008

Appendix U
DIMENSIONS OF INTUITION (DOI)
SURVEY WITH CODING

BACKGROUND CHARACTERISTICS (7 items)
Follow the instructions for responding to each of these items.

1. **Name** (First, Middle, Last)**:** _____

2. **Current Age** (Years)**:**_____

   Age = Number (range = minimum 18 to maximum ____)

3. **Occupation/Job Title:**_____

Management	**= 1**
Business and Financial Operations	**= 2**
Computer and Mathematical	**= 3**
Architecture and Engineering	**= 4**
Life, Physical, and Social Science	**= 5**
Community and Social Services	**= 6**
Legal	**= 7**
Education, Training, and Library	**= 8**
Arts, Design, Entertainment, Sports, and Media	**= 9**
Healthcare Practitioners and Technical	**= 10**
Healthcare Support	**= 11**
Protective Service	**= 12**
Food Preparation and Serving Related	**= 13**
Building and Grounds Cleaning and Maintenance	**= 14**
Personal Care and Service	**= 15**
Sales and Related	**= 16**
Office and Administrative Support	**= 17**
Farming, Fishing, and Forestry	**= 18**
Construction and Extraction	**= 19**
Installation, Maintenance, and Repair	**= 20**
Production	**= 21**
Transportation and Material Moving	**= 22**
Military Specific	**= 23**
Student	**= 24**
Other	**= 25**

Classifications 1-23 are based on the 23 major categories identified as "Standard Occupation Classifications" (SOC) by the U.S. Department of Labor, Bureau of Labor Statistics (www.bls.gov). Classifications 24 and 25 added to cover all other possibilities.

Appendix U *(continued)*

4. **Ethnicity** (Select one of the following responses)**:**

____African-American or Black	**= 1**
_____Asian	**= 2**
_____Euro-American or White	**= 3**
_____Hispanic or Latino	**= 4**
_____Middle-Eastern or Arabic	**= 5**
_____Native American or Alaskan Native	**= 6**
_____Native Hawaiian or other Pacific Islander	**= 7**
_____Other	**= 8**

5. **Highest Level of Education or Degree Completed** *(Select one of the following responses)***:**

_____High school or equivalent	**= 1**
_____Some college credit	**= 2**
_____Associate's degree	**= 3**
_____Bachelor's degree	**= 4**
_____Master's degree	**= 5**
_____PhD/EdD degree	**= 6**
_____Professional certification or licensure	**= 7**
_____Other	**= 8**

6. **Academic Aptitude*****(Select the academic area in which you have GREATER skills)***:**

_____Verbal (reading, writing, and speaking)	**= 3 (100)***
_____Mathematical (numbers and computation)	**= 1 (0)***
_____Both equally	**= 2 (50)***

7. **School Subjects*** *(Rank these subjects 1, 2, 3, 4 and 5 in order of your preference for each of these school subjects. 1 = MOST Preferred, 5 = LEAST Preferred.)*

_____English (literature, reading and writing)	**= 1, 2, 3, 4, or 5****
_____History/Social Studies	**= 1, 2, 3, 4, or 5****
_____Mathematics	**= 1, 2, 3, 4, or 5****
_____Science (biology, chemistry, physics)	**= 1, 2, 3, 4, or 5****
_____Foreign Languages	**= 1, 2, 3, 4, or 5****

*** Weighted scores for item 6 were assigned relative to their HBDI® quadrant and hemisphere loadings.**

**** Weighted scores for item 7 were assigned relative to their HBDI® quadrant and hemisphere loadings, then assigned a relative score based on the 1-5 rankings each was given by the respondent.**

A formula for the mean of the range between the minimum and maximum scores for DOI items 6 and 7 was utilized to combine these scores and obtain a 0-100 scale score equivalent for the "academic aptitude" variable.

Appendix U *(continued)*

INTUITION EXPERIENCE (5 items)
Intuition can be defined as "knowing something without knowing how you know." With this definition in mind, respond to each of the following items as indicated.

8. **Select one of the following responses to indicate HOW OFTEN you experience intuition (i.e., have intuitive insights).**
   _____Frequently (one or more times a day) **= 6**
   _____Regularly (one or more times a week, but not daily) **= 5**
   _____Periodically (one or more times a month, but not weekly) **= 4**
   _____Infrequently (one or more times a year, but not monthly) **= 3**
   _____Never **= 2**
   _____Not sure **= 1**

Frequently=6; Regularly=5; Periodically=4; Infrequently=3; Never=2; Not sure=1

*** NOTE: This 1-6 scoring code is used for all DOI items below scored in this way.**

9. **Consider the FORMS by which you typically receive your intuitive insights. Indicate the % of those insights that comes in each of the forms described below.** *Total distribution among the six items must equal 100. If you never experience intuition, indicate 0 for items 1-5 and 100 for item 5.*
   _____**Visual** (inner vision: may include flashes of insight and/or seeing pictures, images, symbols, shapes, mental maps, drawings, colors, night/day dreams, precognitions, visions, etc.) **= Number**
   _____**Auditory** (inner hearing: may include hearing voices, words, phrases, conversations or mental dialogues, songs, poems, etc.) **= Number**
   _____**Feeling** (inner emotion: may include unexpected emotions, gut feelings, energy vibrations and/or bodily sensations like “butterflies,” nausea, abdominal pain, etc.) **= Number**
   _____**Sensing** (inner awareness: may include hunches, impressions, precognition, déjà vu experiences, reading changes in energy or light, sudden insights and/or knowing without external stimulus or rational support or evidence) **= Number**
   _____**Other** **= Number or 0**
   _____**None** (I never experience intuitive insights.) **= 100 or 0**

10. **From the following list, select the CONDITIONS (times, places, etc.) under which you commonly experience intuition.**
    _____At home **No = 0, Yes = 1**
    _____At work **No = 0, Yes = 1**
    _____During free time (play, leisure, relaxation, etc.) **No = 0, Yes = 1**
    _____In or around water (showering, bathing, swimming, etc.) **No = 0, Yes = 1**
    _____Outdoors or in nature **No = 0, Yes = 1**
    _____When I'm alone **No = 0, Yes = 1**
    _____When I’m with others **No = 0, Yes = 1**

Appendix U *(continued)*

_____During or after physical exertion	**No = 0, Yes = 1**
_____Just before going to sleep	**No = 0, Yes = 1**
_____Just before or upon waking	**No = 0, Yes = 1**
_____During the daytime	**No = 0, Yes = 1**
_____In daydreams	**No = 0, Yes = 1**
_____During the nighttime	**No = 0, Yes = 1**
_____In night dreams	**No = 0, Yes = 1**
_____During or after a nap	**No = 0, Yes = 1**
_____While driving or commuting	**No = 0, Yes = 1**
_____During long trips	**No = 0, Yes = 1**
_____While doing routine chores	**No = 0, Yes = 1**
_____During or after meditation	**No = 0, Yes = 1**
_____During or after prayer	**No = 0, Yes = 1**
_____In crisis situations	**No = 0, Yes = 1**
_____Under time pressure	**No = 0, Yes = 1**
_____After reflection (contemplation, mental processing, etc.)	**No = 0, Yes = 1**
_____While listening to music	**No = 0, Yes = 1**
_____In response to a specific inquiry	**No = 0, Yes = 1**
_____Other	**No = 0, Yes = 1**

11. Select the response that characterizes your level of BELIEF in intuition.
The HIGHER the %, the STRONGER your belief. 0=NOT AT ALL; 100=ABSOLUTELY.

0- 4 = **0**	5- 14 = **10**	15- 24 = **20**
25- 34 = **30**	35- 44 = **40**	45- 55 = **50**
56- 65 = **60**	66- 75 = **70**	76- 85 = **80**
86- 95 = **90**	96-100 = **100***	

*** NOTE: This 0-100 scoring coding is used for all DOI items below scored in this way.**

12. Select the response that characterizes how intuitive you PERCEIVE yourself to be. *The HIGHER the %, the STRONGER your perception of your intuitiveness. 0=NOT AT ALL;100=ABSOLUTELY.*
0-100 (see item 11)

TYPES OF INTUITION (6 items)
Read each description below, then indicate how frequently you experience each of these six TYPES of intuition.

13. Creativity Intuition: *Characterized by imagination or a flow of unusual but sound ideas. Similar to discovery intuition but, instead of providing the one BEST answer, creativity intuition supplies a quantity of apt alternatives, options or possibilities. Often utilized for problem-solving, decision-making, invention and innovation.*

Appendix U *(continued)*

I experience creativity intuition *(check one)***:**
Frequently=6; Regularly=5; Periodically=4; Infrequently=3; Never=2; Not sure=1 (see item 8)

14. **Discovery Intuition:** *Linked to sudden creative breakthroughs, right answers to specific problems, or insights into the true nature of a problem. Typically supplies the one correct answer or best solution. Often appears with sudden awareness as if out of the blue, but may be the result of ideas that evolved unconsciously over time. Transcends logic and exists outside conscious awareness; but with afterthought one may be able to trace this type of intuitive idea back to its origin in some prior knowledge or experience.*

    I experience discovery intuition *(check one)***:**
    Frequently=6; Regularly=5; Periodically=4; Infrequently=3; Never=2; Not sure=1 (see item 8)

15. **Evaluation Intuition:** *Allows one to discern with certainty, even with insufficient data, facts, or knowledge. Often guides rational decision-making by narrowing the number of alternatives, or strengthening one's sense of the best choice among a number of possibilities. Particularly useful where there is insufficient data or too little time for rational analyses.*

    I experience evaluation intuition *(check one)***:**
    Frequently=6; Regularly=5; Periodically=4; Infrequently=3; Never=2; Not sure=1 (see item 8)

16. **Illumination Intuition:** *Characterized by a mystical "knowing" or awareness which bypasses and transcends all sensory experience. Considered by some to be the highest form of "knowing," illumination is denoted by lack of separation between subject and object and is unaccompanied by sensation, perception or conscious thought. As a kind of pure consciousness, it is limitless, formless and without boundaries. Because it transcends the ego, it is transformative and opens the intuitive channels to other forms of "knowing."*
    I experience illumination intuition *(check one)***:**
    Frequently=6; Regularly=5; Periodically=4; Infrequently=3; Never=2; Not sure=1 (see item 8)

17. **Operation Intuition:** *Characterized by a magnetic, overpowering certainty alerting one when a thing should or should not be done. Often experienced as a sense that something is about to happen. A strong force, providing guidance, prompting without explanation, and moving one in a given direction or providing an undeniable sense of calling or mission.*

    I experience operation intuition *(check one)***:**
    Frequently=6; Regularly=5; Periodically=4; Infrequently=3; Never=2; Not sure=1 (see item 8)

Appendix U *(continued)*

18. Prediction Intuition: *Characterized by specific but unprovable premonition that something is going to happen. Similar to operation intuition but generally provides more precognitive knowing about a given outcome. May be explicit or implicit, positive or negative. May involve hunches, including warnings and may be mistaken for guessing by others, though intuitive individuals do not think they are guessing.*

I experience prediction intuition *(check one)***:**
Frequently=6; Regularly=5; Periodically=4; Infrequently=3; Never=2; Not sure=1 (see item 8)

PERSONALITY TRAITS (21 items)
Select the level to which each of these CHARACTERISTICS describes you. (The HIGHER the %, the GREATER your level of agreement. 0=NOT AT ALL; 100=ABSOLUTELY.)

I would describe myself as:
19. Able to accept challenges easily.
0-100 (see item 11)

20. Able to accept criticism easily.
0-100 (see item 11)

21. Able to change profoundly with ease.
0-100 (see item 11)

22. Alert.
0-100 (see item 11)

23. Committed to causes.
0-100 (see item 11)

24. Concerned with abstract issues (truth, beauty, human values, etc.)
0-100 (see item 11)

25. Confident.
0-100 (see item 11)

26. Creative.
0-100 (see item 11)

27. Demanding.
0-100 (see item 11)

28. Foresightful.
0-100 (see item 11)

Appendix U *(continued)*

29. Independent.
0-100 (see item 11)

30. Informal.
0-100 (see item 11)

31. Open.
0-100 (see item 11)

32. Readily influenced by others (especially to aid personal development).
0-100 (see item 11)

33. Resourceful.
0-100 (see item 11)

34. Risk-taker.
0-100 (see item 11)

35. Self-reliant.
0-100 (see item 11)

36. Spontaneous.
0-100 (see item 11)

37. Unafraid (of myself, my experiences, my world).
0-100 (see item 11)

38. Unconventional.
0-100 (see item 11)

39. Unworried (about the ups and downs of my feelings and experiences).
0-100 (see item 11)

PERSONAL CHARACTERISTICS (6 items)
Indicate the degree to which this statement is true of you. The HIGHER the %, the GREATER your level of agreement. 0=NOT AT ALL; 100=ABSOLUTELY.

40. I accept ambiguity (doubt and uncertainty) easily.
0-100 (see item 11)

41. I act on my beliefs.
0-100 (see item 11)

42. I become emotionally involved in things I do.
0-100 (see item 11)

Appendix U *(continued)*

43. I enjoy reading.
0-100 (see item 11)

44. I have a strong belief in myself.
0-100 (see item 11)

45. I welcome change.
0-100 (see item 11)

GENERAL CHARACTERISTICS (54 items)
Select your level of agreement for each statement. The HIGHER the %, the GREATER your level of agreement. 0=NOT AT ALL; 100=ABSOLUTELY.

46. It is easy for me to envision unique or novel uses for things (objects, space, etc.)
0-100 (see item 11)

47. I am NOT musically oriented.
0-100 (see item 11)

48. I am interested in art.
0-100 (see item 11)

49. I prefer NOT to stand out from the crowd.
0-100 (see item 11)

50. My best ideas often come to me suddenly.
0-100 (see item 11)

51. I prefer NOT to rely on step-by-step directions.
0-100 (see item 11)

52. After reflection, I can often trace my intuitive insights to something I have known or experienced in the past.
0-100 (see item 11)

53. I am good at finding multiple ways of solving problems.
0-100 (see item 11)

54. It is easy for me to recognize patterns among seemingly unrelated ideas, elements, etc.
0-100 (see item 11)

55. I do NOT try to collect all the facts before making decisions.
0-100 (see item 11)

56. I tend to rely on intuition when I have limited information (facts, evidence, etc.)
0-100 (see item 11)

Appendix U *(continued)*

57. I prefer to work in a cooperative environment.
0-100 (see item 11)

58. I am LESS receptive to intuition at certain times of day.
0-100 (see item 11)

59. I regularly make time for creative activities.
0-100 (see item 11)

60. I prefer to do things spontaneously (without much pre-planning).
0-100 (see item 11)

61. Listening to music aids my intuitive awareness.
0-100 (see item 11)

62. I am NOT very connected to emotions (my own or others').
0-100 (see item 11)

63. I rely on "To Do" lists, appointment books, etc., to help me stay organized.
0-100 (see item 11)

64. I appreciate art in many forms.
0-100 (see item 11)

65. I tend to analyze carefully in order to understand things or situations.
0-100 (see item 11)

66. It is DIFFICULT for me to visualize alternatives (different ways of doing things, solving problems, making decisions, etc.)
0-100 (see item 11)

67. I prefer to cooperate, rather than compete, with others.
0-100 (see item 11)

68. I enjoy music (listening or performing).
0-100 (see item 11)

69. I sometimes take risks--even when I don't have to do so.
0-100 (see item 11)

70. I feel LOST without a plan or agenda.
0-100 (see item 11)

71. I do NOT actively seek out new adventures.
0-100 (see item 11)

Appendix U *(continued)*

72. I am unconventional (in my thoughts, actions, dress, etc.)
0-100 (see item 11)

73. I arrive at correct conclusions by carefully considering the facts.
0-100 (see item 11)

74. I tend to be MORE intuitive at certain times of day.
0-100 (see item 11)

75. I feel comfortable with the idea of being different from other people.
0-100 (see item 11)

76. I enjoy exploring the unknown.
0-100 (see item 11)

77. I am good at visualizing unique solutions to problems.
0-100 (see item 11)

78. I prefer plans that are flexible (tentative, easily changed, etc.)
0-100 (see item 11)

79. I am NOT good at interpreting symbols, hidden meanings, etc.
0-100 (see item 11)

80. I tend to make decisions impulsively.
0-100 (see item 11)

81. My insights often come in the form of mental images (pictures, visions, flashes).
0-100 (see item 11)

82. I do NOT consider cooperation to be particularly important.
0-100 (see item 11)

83. I am good at creating metaphors.
0-100 (see item 11)

84. I do NOT particularly enjoy fine art.
0-100 (see item 11)

85. I tend to act on my first instinct, rather than analyzing situations too carefully.
0-100 (see item 11)

86. Sometimes I know things that I have no obvious way of knowing.
0-100 (see item 11)

87. It is DIFFICULT for me to find novel ways of doing things.
0-100 (see item 11)

Appendix U *(continued)*

88. I tend to become emotionally involved (with people, situations, causes, etc.)
0-100 (see item 11)

89. I prefer to be precise about the facts of a matter.
0-100 (see item 11)

90. At certain times of day, it is easier for me to work productively.
0-100 (see item 11)

91. My flexibility makes it easy for me to change profoundly.
0-100 (see item 11)

92. I am NOT very confident about my decisions without supporting evidence.
0-100 (see item 11)

93. I am good at finding alternative solutions to problems.
0-100 (see item 11)

94. My ideas are often emotionally compelling.
0-100 (see item 11)

95. I am NOT very imaginative.
0-100 (see item 11)

96. I am able to make good decisions rapidly, even without much evidence.
0-100 (see item 11)

97. I regularly rely on my intuition (to answer questions, solve problems, make decisions, discern truth, "read" situations and people, etc.)
0-100 (see item 11)

98. I tend to rely on prior experience to guide my decisions.
0-100 (see item 11)

99. When I'm making decisions, I tend to need MORE information than other people do.
0-100 (see item 11)

WRAP-UP – Optional (1 item)
Include here any final thoughts, ideas, comments, explanations, etc., that might aid this research.

100. OPTIONAL: What additional comments would you like to share with the researcher about INTUITION? _____

Appendix V
HERRMANN BRAIN DOMINANCE INSTRUMENT® (HBDI®) SURVEY WITH CODING

BIOGRAPHICAL INFORMATION (4 items)

1. **Name:** _____

2. **Sex:** **Male = 1**
   Female = 2

3. **Educational Focus or Major:** _____

4. **Occupation or Job Title:** _____
   Describe your work. **(narrative = qualitative data)**

Management	**= 1**
Business and Financial Operations	**= 2**
Computer and Mathematical	**= 3**
Architecture and Engineering	**= 4**
Life, Physical, and Social Science	**= 5**
Community and Social Services	**= 6**
Legal	**= 7**
Education, Training, and Library	**= 8**
Arts, Design, Entertainment, Sports, and Media	**= 9**
Healthcare Practitioners and Technical	**= 10**
Healthcare Support	**= 11**
Protective Service	**= 12**
Food Preparation and Serving Related	**= 13**
Building and Grounds Cleaning and Maintenance	**= 14**
Personal Care and Service	**= 15**
Sales and Related	**= 16**
Office and Administrative Support	**= 17**
Farming, Fishing, and Forestry	**= 18**
Construction and Extraction	**= 19**
Installation, Maintenance, and Repair	**= 20**
Production	**= 21**
Transportation and Material Moving	**= 22**
Military Specific	**= 23**
Student	**= 24**
Other	**= 25**
Not Applicable	**= 0**

*** Classifications 1-23 are based on the 23 major categories identified as "Standard Occupation Classifications" (SOC) by the U.S. Department of Labor, Bureau of Labor Statistics (www.bls.gov). Classifications 24, 25 and 0 added to cover all other possibilities.**

Appendix V *(continued)*

HANDEDNESS (2 items)

5. Handedness* *Which picture most closely resembles the way you hold a pencil?*

_____A **= 1**
_____B **= 2**
_____C **= 3**
_____D **= 4**

6. Handedness *What is the strength and direction of your handedness?*

_____A Primary left **= 1**
_____B Primary left, some right **= 2**
_____C Both hands equal **= 3**
_____D Primary right, some left **= 4**
_____E Primary right **= 5**

*** Item 5 choices were recoded to reflect their relationship to right-brain dominance: 1 (*least right*), 2, 3, and 4 (*most right*).**

**** Item 6 preferences were reverse coded from *most left-* to *most right-brained:* A=5; B=4; C=3; B=2; and E=1.**

Recoded items 5 and 6 were analyzed to derive a combined tri-level score reflecting intuitive leaning based on handedness preference: 1= predominant right hand/left-brain dominance; 2=combined right and left hand/ mixed brain dominance; 3= predominant left hand/right brain dominance.

SCHOOL SUBJECTS (3 items)

Rank order all three subjects differently on the basis of how well you did: 1=best; 2=second best; 3=third best.

7. _____Math **= Number (1, 2 or 3)**
8. _____Foreign language **= Number (1, 2 or 3)**
9. _____Native language or mother tongue **= Number (1, 2 or 3)**

WORK ELEMENTS (16 items)

Rate each of the work elements below according to your strength in that activity: 5=work I do best; 4=work I do well; 3=neutral; 2=work I do less well; 1=work I do least well.

10. Analytical **=Number (1,2,3,4,5)**
11. Administrative **=Number (1,2,3,4,5)**
12. Conceptualizing **=Number (1,2,3,4,5)**
13. Expressing Ideas **=Number (1,2,3,4,5)**
14. Integration **=Number (1,2,3,4,5)**

Appendix V *(continued)*

15. Writing	**=Number (1,2,3,4,5)**
16. Technical aspects	**=Number (1,2,3,4,5)**
17. Implementation	**=Number (1,2,3,4,5)**
18. Planning	**=Number (1,2,3,4,5)**
19. Interpersonal aspects	**=Number (1,2,3,4,5)**
20. Problem solving	**=Number (1,2,3,4,5)**
21. Innovating	**=Number (1,2,3,4,5)**
22. Teaching/training	**=Number (1,2,3,4,5)**
23. Organization	**=Number (1,2,3,4,5)**
24. Creative aspects	**=Number (1,2,3,4,5)**
25. Financial aspects	**=Number (1,2,3,4,5)**

KEY DESCRIPTORS (25 items)
Select 8 adjectives which best describe the way you see yourself. Enter a 2 next to each of your 8 selections. Then change one 2 to a 3 for the adjective which best describes you.

26. Logical	**= Number (2, 3 or 0)**
27. Creative	**= Number (2, 3 or 0)**
28. Musical	**= Number (2, 3 or 0)**
29. Sequential	**= Number (2, 3 or 0)**
30. Synthesizer	**= Number (2, 3 or 0)**
31. Verbal	**= Number (2, 3 or 0)**
32. Conservative	**= Number (2, 3 or 0)**
33. Analytical	**= Number (2, 3 or 0)**
34. Detailed	**= Number (2, 3 or 0)**
35. Emotional	**= Number (2, 3 or 0)**
36. Spatial	**= Number (2, 3 or 0)**
37. Critical	**= Number (2, 3 or 0)**
38. Artistic	**= Number (2, 3 or 0)**
39. Spiritual	**= Number (2, 3 or 0)**
40. Rational	**= Number (2, 3 or 0)**
41. Controlled	**= Number (2, 3 or 0)**
42. Mathematical	**= Number (2, 3 or 0)**
43. Symbolic	**= Number (2, 3 or 0)**
44. Dominant	**= Number (2, 3 or 0)**
45. Holistic	**= Number (2, 3 or 0)**
46. Intuitive	**= Number (2, 3 or 0)**
47. Quantitative	**= Number (2, 3 or 0)**
48. Reader	**= Number (2, 3 or 0)**
49. Simultaneous	**= Number (2, 3 or 0)**
50. Factual	**= Number (2, 3 or 0)**

Items = seven 2's, one 3, others 0

Appendix V *(continued)*

HOBBIES (23 items)
Indicate a maximum of 6 hobbies you are actively engaged in. 3=major hobby; 2=primary hobby; 1=secondary hobby.

51. Arts/crafts **=Number (3,2,1or 0)**
52. Boating **=Number (3,2,1or 0)**
53. Camping/hiking **=Number (3,2,1or 0)**
54. Cards **=Number (3,2,1or 0)**
55. Collecting **=Number (3,2,1or 0)**
56. Cooking **=Number (3,2,1or 0)**
57. Creative writing **=Number (3,2,1or 0)**
58. Fishing **=Number (3,2,1or 0)**
59. Gardening/plants **=Number (3,2,1or 0)**
60. Golf **=Number (3,2,1or 0)**
61. Home improvements **=Number (3,2,1or 0)**
62. Music listening **=Number (3,2,1or 0)**
63. Music playing **=Number (3,2,1or 0)**
64. Photography **=Number (3,2,1or 0)**
65. Reading **=Number (3,2,1or 0)**
66. Sailing **=Number (3,2,1or 0)**
67. Sewing **=Number (3,2,1or 0)**
68. Spectator sports **=Number (3,2,1or 0)**
69. Swimming/diving **=Number (3,2,1or 0)**
70. Tennis **=Number (3,2,1or 0)**
71. Travel **=Number (3,2,1or 0)**
72. Woodworking **=Number (3,2,1or 0)**
Other _____ **=Narrative**

ENERGY LEVEL (1 item)
Thinking about your energy level or drive, select the one (A, B or C) that best represents you.

73. Energy Level
_____A Day person **= 1**
_____B Day/night person equally **= 2**
_____C Night person **= 3**

MOTION SICKNESS (2 items)
74. Motion Sickness *Have you ever experienced motion sickness (nausea, vomiting) in response to vehicular motion? Check box A, B, C, or D to indicate number of times.*
_____A None **= 1**
_____B 1-2 **= 2**
_____C 3-10 **= 3**
_____D more than 10 **= 4**

Appendix V *(continued)*

75. Motion Sickness *Check box A or B to indicate whether you can read while traveling in a car without stomach awareness, nausea, or vomiting.*

_____A Yes **=1**
_____B No **=0**

ADJECTIVE PAIRS (24 items)
For each paired item, check the word or phrase which is more descriptive of you. Check box A or B for each pair, even if the choice is a difficult one.

76. Conservative/Empathetic **= Checked = 1/Not checked = 0**
77. Analyst/Synthesizer **= Checked = 1/Not checked = 0**
78. Quantitative/Musical **= Checked = 1/Not checked = 0**
79. Problem-solver/Planner **= Checked = 1/Not checked = 0**
80. Controlled/Creative **= Checked = 1/Not checked = 0**
81. Original/Emotional **= Checked = 1/Not checked = 0**
82. Feeling/Thinking **= Checked = 1/Not checked = 0**
83. Interpersonal/Organizer **= Checked = 1/Not checked = 0**
84. Spiritual/Creative **= Checked = 1/Not checked = 0**
85. Detailed/Holistic **= Checked = 1/Not checked = 0**
86. Originate ideas/Test/prove ideas **= Checked = 1/Not checked = 0**
87. Warm, friendly/Analytical **= Checked = 1/Not checked = 0**
88. Imaginative/Sequential **= Checked = 1/Not checked = 0**
89. Original/Reliable **= Checked = 1/Not checked = 0**
90. Creative/Logical **= Checked = 1/Not checked = 0**
91. Controlled/Emotional **= Checked = 1/Not checked = 0**
92. Musical/Detailed **= Checked = 1/Not checked = 0**
93. Simultaneous/Empathetic **= Checked = 1/Not checked = 0**
94. Communicator/Conceptualizer **= Checked = 1/Not checked = 0**
95. Technical things/People-oriented **= Checked = 1/Not checked = 0**
96. Well-organized/Logical **= Checked = 1/Not checked = 0**
97. Rigorous thinking/Metaphorical thinking **= Checked = 1/Not checked = 0**
98. Like things planned/Like things mathematical **= Checked = 1/Not checked = 0**
99. Technical/Dominant **= Checked = 1/Not checked = 0**

INTROVERSION/EXTRAVERSION* (1 item)
Check one box only to place yourself on this introvert/extrovert scale.

100. Introvert ___ ___ ___ ___ ___ ___ ___ ___ ___ Extravert
1 2 3 4 5 6 7 8 9

*** The 1-9 responses on the introversion/extraversion continuum were converted to a 0-100% scale equivalent.**

Appendix V *(continued)*

TWENTY QUESTIONS (20 items)
Respond to each statement by checking the box in the appropriate column.

Strongly agree = 5
Agree = 4
In between = 3
Disagree = 2
Strongly disagree = 1

		SA	A	IB	D	SD
101.	I feel a step-by-step method is best for solving problems.	= 5	4	3	2	1
102.	Daydreaming has provided the impetus for the solution of many of my more important problems.	= 5	4	3	2	1
103.	I like people who are most sure of their conclusions.	= 5	4	3	2	1
104.	I would rather be known as a reliable than an imaginative person.	= 5	4	3	2	1
105.	I often get my best ideas when doing nothing in particular.	= 5	4	3	2	1
106.	I rely on hunches and the feeling of "rightness" or "wrong-ness" when moving toward the solution to a problem.	= 5	4	3	2	1
107.	I sometimes get a kick out of breaking the rules and doing things I'm not supposed to do.	= 5	4	3	2	1
108.	Much of what is most important in life cannot be expressed in words.	= 5	4	3	2	1
109.	I'm basically more competitive with others than self-competitive.	= 5	4	3	2	1
110.	I would enjoy spending an entire day "alone with my thoughts."	= 5	4	3	2	1
111.	I dislike things being uncertain and unpredictable.	= 5	4	3	2	1
112.	I prefer to work with others in a team effort rather than solo	= 5	4	3	2	1
113.	It is important for me to have a place for everything and everything in its place.	= 5	4	3	2	1
114.	Unusual ideas and daring concepts interest and intrigue me.	= 5	4	3	2	1
115.	I prefer specific instructions to those which leave many details optional.	= 5	4	3	2	1
116.	Know-why is more important than know-how.	= 5	4	3	2	1
117.	Thorough planning and organization of time are mandatory for solving difficult problems.	= 5	4	3	2	1
118.	I can frequently anticipate the solutions to my problems.	= 5	4	3	2	1
119.	I tend to rely more on my first impressions and feelings when making judgments than on a careful analysis of the situation.	= 5	4	3	2	1
120.	I feel that laws should be strictly enforced.	= 5	4	3	2	1

Appendix W
PERSONAL STYLE INVENTORY (PSI)
SURVEY WITH CODING

How intuitive are you? Find out now! Using your web browser, it only takes about ten minutes to answer 30 items in the PSI Survey and to receive a personal profile of your rational versus intuitive preferences. To begin, please fill in the demographic items below and proceed to the survey.

Primary cultural heritage: (required)

Asian	= **2**	Indigenous	= **5**
Black	= **1**	Malayan	= **6**
Caucasian	= **3**	Other Please specify:	= **7**
Hispanic	= **4**		

Years of formal education completed: (required) (high school=12, 4 years of college= 16, etc.)

1	= **1**	6	= **6**	11	= **11**	17	= **17**
2	= **2**	7	= **7**	12	= **12**	18	= **18**
3	= **3**	8	= **8**	13	= **13**	19	= **19**
4	= **4**	9	= **9**	14	= **14**	20	= **20**
5	= **5**	10	= **10**	15	= **15**	21	= **21**
				16	= **16**	22	= **22**

Education categories from DOI:

____High school or equivalent	= **1**	____Master's degree	= **5**
____Some college credit	= **2**	____Ph.D./Ed.D. degree	= **6**
____Associate's degree	= **3**	____Prof'l certification/licensure	= **7**
____Bachelor's degree	= **4**	____Other	= **8**

NOTE: PSI data for this item will not be used, since the DOI collects "Highest Level of Education" data. PSI years 1-11 are not relevant to the study, because DOI criteria requires that all participants have a high school diploma or equivalent. Also PSI equivalents for years of education 13-22 are not comparable to education categories from DOI, since participants may have 16 years of education without having completed a Bachelor's degree, etc. This is not a factor, since participants will have designated on DOI their education level (not merely number of years attended).

Date of Birth: (required) Month____ Day____ Year____

Year converted to Age — Age=Number (range=minimum 18 to maximum ___)

Gender: (required)

Female = **2**

Male = **1**

Appendix W *(continued)*

The Survey Questionnaire

Please indicate the role you have chosen for the Survey.

Agricultural Worker	Financial Specialist	Primary Relationship
Art/Media Specialist	Food Service Worker	Professor/Teacher
Computer Specialist	Government Worker	Recreation Worker
Construction Worker	Healthcare Provider	Retiree
Consultant/Facilitator	Homemaker/Parent	Scientist/Technician
Customer Service/Sales	Legal Specialist	Social Service Provider
Driver/Operator	Manager/Supervisor	Student
Engineering Specialist	Owner/Partner	Volunteer Worker
Factory/Warehouse	Office Worker	Other
Worker	President/Vice-President	

Please clarify your role choice. _____

Management	**= 1**
Business and Financial Operations	**= 2**
Computer and Mathematical	**= 3**
Architecture and Engineering	**= 4**
Life, Physical, and Social Science	**= 5**
Community and Social Services	**= 6**
Legal	**= 7**
Education, Training, and Library	**= 8**
Arts, Design, Entertainment, Sports, and Media	**= 9**
Healthcare Practitioners and Technical	**= 10**
Healthcare Support	**= 11**
Protective Service	**= 12**
Food Preparation and Serving Related	**= 13**
Building and Grounds Cleaning and Maintenance	**= 14**
Personal Care and Service	**= 15**
Sales and Related	**= 16**
Office and Administrative Support	**= 17**
Farming, Fishing, and Forestry	**= 18**
Construction and Extraction	**= 19**
Installation, Maintenance, and Repair	**= 20**
Production	**= 21**
Transportation and Material Moving	**= 22**
Military Specific	**= 23**
Student	**= 24**
Other	**= 25**
Not Applicable	**= 0**

*** Classifications 1-23 are based on the 23 major categories identified as "Standard Occupation Classifications" (SOC) by the U.S. Department of Labor, Bureau of Labor Statistics (www.bls.gov). Classifications 24, 25 and 0 added to cover all other possibilities.**

Appendix W *(continued)*

Responses to items 1-30:

1 Never	4 Quite often
2 Once in a while	5 Frequently but not always
3 Sometimes	6 Always

1. When I have an important activity due in a week, I carefully outline what is required to get the job done.
2. To meet our shared responsibilities, I coordinate with my teammates.
3. In problem solving, I analyze step-by-step what is required to arrive at a solution.
4. I use imaginative ways of doing things.
5. In completing a task, I believe that it is important to follow prescribed guidelines.
6. I look at a problem as a whole approaching it from all sides.
7. When I have a special job to do, I organize it carefully from the start.
8. To get a job done, I cooperate with the members of my group.
9. To clearly see how they relate, I classify the elements of a problem.
10. In selecting a future course of action, I create new avenues using imaginative skills.
11. I follow established rules in completing a task assignment.
12. I believe a solution should synthesize the elements of a problem into an integrated whole.
13. I prioritize my assignments to meet future objectives.
14. In our assigned tasks, I participate with other members of the team.
15. I identify the steps required in arriving at the solution to a problem.
16. Getting ready for a new project, I improvise novel ways of doing things.
17. To accomplish a task, I focus on the procedures required to do the job.
18. I combine the elements of a problem so that I can see the issue as a whole.
19. In deciding how to complete a new project, I arrange tasks in their proper order.
20. I believe that combining our talents in a group effort helps us get the job done.
21. I investigate a problem by specifically evaluating its elements.
22. I conceive future directions by combining new ideas.
23. I believe following specific procedures helps ensure the timely completion of a task.
24. When problem parameters are incomplete, I surmise what I need to do.
25. To complete a new task on schedule, I anticipate what may cause delays.
26. I approach task accomplishment by networking with other team members.
27. In order to understand its elements, I break a problem down into its parts.
28. I visualize novel ideas in setting the direction for a new assignment.
29. I believe policies and procedures help ensure efficiency in getting work completed.
30. I explore the elements of a problem situation for a global perspective.

NOTE: Coding not required for responses to items 1-30, since only the resulting 6 modes of the Strategy Profile will be examined:

Outcome Subscores:

Ways of preparing for the future	**1. Planning**	**= Percent** vs.	**2. Vision**	**= Percent**
Ways of solving problems	**3. Analysis**	**= Percent** vs.	**4. Insight**	**= Percent**
Ways of approaching work	**5. Control**	**= Percent** vs.	**6. Sharing**	**= Percent**

Appendix X
DESCRIPTIVE STATISTICS FOR DOI VARIABLES BY AGE/DECADE

These tables present the descriptives for the DOI variables by Age/Decade demographic.

Descriptive Statistics of DOI Academic Aptitude/Right Brain by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—ACADEMIC APTITUDE (R-Brain)	N	62	53	54	71	47	8
	Mean	15.94	15.70	16.41	16.41	16.38	16.50
	Median	17.00	16.00	17.00	17.00	17.00	16.50
	Std Dev	2.69	2.49	2.14	2.27	1.87	1.85
	Intqtl Range	5	5	2	4	3	4
	Minimum	11	11	11	11	12	14
	Maximum	19	19	19	19	19	19
	Skewness	-.63	-.18	-.88	-.70	-.57	-.27
	Kurtosis	-1.12	-1.21	.22	-.65	-.59	-1.18

Descriptive Statistics of DOI Cognitive Style/Analytical by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—COGNITIVE STYLE/ANALYTICAL	N	62	53	54	71	47	8
	Mean	64.95	68.68	59.69	60.38	59.93	68.75
	Median	66.67	70.00	63.33	60.00	60.00	71.67
	Std Dev	16.26	15.58	19.62	18.78	21.33	19.27
	Intqtl Range	21	20	30	20	23	35
	Minimum	17	17	7	10	3	37
	Maximum	100	97	90	93	97	90
	Skewness	-.55	-.83	-.78	-.53	-.75	-.87
	Kurtosis	.70	1.24	.12	.46	.88	-.42

Descriptive Statistics of DOI Cognitive Style/Intuitive by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—COGNITIVE STYLE/INTUITIVE	N	62	53	54	71	47	8
	Mean	67.90	63.40	72.22	71.22	73.12	77.08
	Median	66.67	63.33	70.00	70.00	73.33	80.00
	Std Dev	15.47	15.34	16.58	14.91	15.11	13.62
	Intqtl Range	18	25	23	17	23	25
	Minimum	37	30	27	30	23	60
	Maximum	100	93	100	100	97	97
	Skewness	.22	-.08	-.42	-.34	-.84	-.12
	Kurtosis	-.30	-.60	-.17	.28	1.25	-1.44

Appendix X *(continued)*

Descriptive Statistics for DOI Experience by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—EXPERIENCE	N	62	53	54	71	47	8
	Mean	49.95	45.47	50.25	51.22	53.33	48.75
	Median	51.67	46.67	50.00	53.33	50.00	45.00
	Std Dev	13.95	12.18	13.04	12.36	14.28	18.77
	Intqtl Range	20	17	20	17	20	40
	Minimum	17	17	20	17	30	27
	Maximum	80	67	77	90	87	73
	Skewness	-.41	-.66	-.06	-.12	.53	.24
	Kurtosis	-.13	-.06	-.43	.66	-.19	-1.49

Descriptive Statistics for HBDI® Introversion/Extraversion by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
HBDI®—INTROVERSION/EXTRAVERSION	N	52	43	49	63	38	6
	Mean	5.50	5.74	6.29	6.02	6.11	5.33
	Median	5.00	7.00	7.00	7.00	6.50	6.00
	Std Dev	2.01	1.97	1.97	2.16	2.06	2.34
	Intqtl Range	3	3	3	3	4	3
	Minimum	2	2	2	1	2	1
	Maximum	9	9	9	9	9	7
	Skewness	.11	-.35	-.57	-.53	-.46	-1.59
	Kurtosis	-.89	-1.32	-.63	-.75	-.96	2.55

Descriptive Statistics of DOI Creativity by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—CREATIVITY	N	62	53	54	71	47	8
	Mean	66.77	59.87	71.60	73.94	71.21	64.58
	Median	68.33	60.00	75.00	73.33	70.00	63.33
	Std Dev	20.79	15.55	19.06	16.32	17.28	21.15
	Intqtl Range	34	25	30	30	27	39
	Minimum	23	30	27	37	33	33
	Maximum	100	90	100	100	97	93
	Skewness	-.27	.05	-.40	-.26	-.38	-.07
	Kurtosis	-.88	-.87	-.81	-.85	-.87	-1.21

Appendix X *(continued)*

Descriptive Statistics of DOI Innovation by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—INNOVATION	N	62	53	54	71	47	8
	Mean	71.67	72.26	75.12	76.95	75.18	75.00
	Median	73.33	73.33	75.00	76.67	76.67	80.00
	Std Dev	17.22	13.93	16.58	16.05	15.11	20.39
	Intqtl Range	23	20	24	27	23	40
	Minimum	30	40	37	30	33	43
	Maximum	100	100	100	100	97	97
	Skewness	-.25	-.48	-.21	-.51	-.64	-.48
	Kurtosis	-.67	.07	-.74	-.15	-.05	-1.39

Descriptive Statistics of DOI Carelessness/Facts-Details by Age/Decade —% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—CARELESSNESS with FACTS/DETAILS	N	62	53	54	71	47	8
	Mean	47.42	40.31	52.72	52.21	52.41	51.25
	Median	50.00	40.00	46.67	53.33	50.00	50.00
	Std Dev	15.25	15.57	20.21	16.91	18.94	17.36
	Intqtl Range	21	18	31	23	30	28
	Minimum	3	7	23	13	17	33
	Maximum	80	73	97	97	90	83
	Skewness	-.48	-.02	.54	.04	.03	.76
	Kurtosis	.35	-.38	-.80	.03	-.74	.15

Descriptive Statistics of DOI Cooperativeness by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—COOPERATIVENESS	N	62	53	54	71	47	8
	Mean	78.12	80.63	83.77	82.44	75.39	89.58
	Median	81.67	83.33	88.33	90.00	83.33	91.67
	Std Dev	17.12	15.65	17.14	16.79	20.04	9.67
	Intqtl Range	30	15	21	20	27	21
	Minimum	40	37	33	37	10	77
	Maximum	100	100	100	100	100	100
	Skewness	-.52	-1.19	-1.48	-1.02	-1.22	-.40
	Kurtosis	-.91	1.12	2.04	.23	1.55	-1.62

Appendix X *(continued)*

Descriptive Statistics of DOI Impulsivity by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—IMPULSIVITY	N	62	53	54	71	47	8
	Mean	53.76	40.63	56.36	58.73	58.65	64.17
	Median	56.67	40.00	60.00	60.00	66.67	63.33
	Std Dev	22.02	17.43	22.83	20.07	22.41	15.91
	Intqtl Range	31	22	34	30	40	23
	Minimum	3		10	10	13	37
	Maximum	100	87	97	93	97	87
	Skewness	-.04	.25	-.26	-.42	-.28	-.34
	Kurtosis	-.38	.28	-.76	-.38	-1.09	-.12

Descriptive Statistics of DOI Flexibility by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—FLEXIBILITY	N	62	53	54	71	47	8
	Mean	57.42	48.36	54.75	57.18	55.32	65.00
	Median	60.00	50.00	60.00	60.00	53.33	61.67
	Std Dev	17.32	16.49	16.44	15.68	18.41	16.43
	Intqtl Range	21	25	20	20	27	27
	Minimum	13	17	7	17	13	43
	Maximum	97	90	97	90	87	93
	Skewness	.00	.15	-.31	-.24	-.24	.53
	Kurtosis	.01	-.07	.98	-.03	-.61	-.30

Descriptive Statistics of DOI Interest/Arts-Aesthetics by Age/Decade —% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—INTEREST in ARTS/AESTHETHICS	N	62	53	54	71	47	8
	Mean	72.53	64.47	77.41	76.43	71.21	72.50
	Median	78.33	70.00	88.33	86.67	83.33	73.33
	Std Dev	24.93	27.10	24.88	24.13	28.49	19.00
	Intqtl Range	20	3		3	10	47
	Minimum	100	100	100	100	100	93
	Maximum	41	37	34	30	47	40
	Skewness	-.56	-.69	-1.23	-1.23	-.93	-.38
	Kurtosis	-.92	-.45	.85	.90	-.56	-1.45

Appendix X *(continued)*

Descriptive Statistics of DOI Music by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI--MUSIC	N	62	53	54	71	47	8
	Mean	64.89	65.35	70.62	64.08	62.62	59.58
	Median	66.67	63.33	73.33	66.67	66.67	68.33
	Std Dev	21.17	21.74	23.34	21.37	21.80	32.29
	Intqtl Range	24	37	31	30	30	58
	Minimum	3	17		17	10	3
	Maximum	100	100	100	100	100	93
	Skewness	-.64	-.19	-1.24	-.29	-.47	-.94
	Kurtosis	.58	-.87	2.08	-.59	-.31	-.25

Descriptive Statistics of DOI Adventure-Seeking by Age/Decade —% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—ADVENTURE-SEEKING	N	62	53	54	71	47	8
	Mean	61.88	60.75	64.51	70.75	70.57	58.33
	Median	63.33	63.33	63.33	73.33	76.67	51.67
	Std Dev	23.34	19.36	19.55	18.09	19.66	26.67
	Intqtl Range	33	25	28	27	37	53
	Minimum	.0	10	17	30	30	27
	Maximum	100	100	100	100	100	97
	Skewness	-.51	-.57	-.28	-.45	-.53	.49
	Kurtosis	.03	.40	-.41	-.51	-.97	-1.36

Descriptive Statistics of DOI Unconventionality by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—UNCONVENTION-ALITY	N	62	53	54	71	47	8
	Mean	61.88	53.14	59.01	60.70	59.57	57.08
	Median	63.33	53.33	63.33	60.00	60.00	55.00
	Std Dev	18.84	19.90	19.50	16.19	17.76	18.03
	Intqtl Range	25	28	37	23	23	23
	Minimum	23	7	30	13	13	33
	Maximum	100	87	100	93	97	90
	Skewness	-.14	-.28	.04	-.35	-.21	.63
	Kurtosis	-.62	-.44	-.93	.00	.14	.19

Appendix X *(continued)*

Descriptive Statistics of DOI Ability to Visualize by Age/Decade —% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—ABILITY TO VISUALIZE	N	62	53	54	71	47	8
	Mean	69.30	68.93	74.38	76.62	76.31	77.50
	Median	66.67	70.00	76.67	76.67	80.00	83.33
	Std Dev	19.01	15.26	19.14	16.77	17.49	19.98
	Intqtl Range	34	20	30	27	23	39
	Minimum	27	40	30	30	30	50
	Maximum	100	93	100	100	100	100
	Skewness	-.14	-.25	-.55	-.53	-.97	-.52
	Kurtosis	-.92	-.77	-.55	-.22	.55	-1.54

Descriptive Statistics of DOI Imagery by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—IMAGERY	N	62	53	54	71	47	8
	Mean	56.51	52.89	54.88	59.77	56.67	61.67
	Median	53.33	56.67	53.33	63.33	56.67	61.67
	Std Dev	20.19	18.48	16.94	20.58	17.99	16.33
	Intqtl Range	28	28	17	30	27	31
	Minimum	3	20	17	7	17	40
	Maximum	100	87	100	97	87	87
	Skewness	-.01	-.19	.11	-.50	-.31	.22
	Kurtosis	.09	-.91	.62	-.12	-.57	-.84

Descriptive Statistics of DOI Emotions by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—EMOTIONS	N	62	53	54	71	47	8
	Mean	77.20	68.11	77.16	73.00	69.08	66.67
	Median	83.33	73.33	80.00	76.67	73.33	70.00
	Std Dev	19.09	23.67	16.90	20.74	20.57	21.46
	Intqtl Range	27	27	30	30	30	32
	Minimum	20	10	30	27	20	27
	Maximum	100	100	100	100	100	93
	Skewness	-1.05	-.96	-.75	-.65	-.70	-.88
	Kurtosis	.46	.03	.00	-.56	-.25	.50

Appendix X *(continued)*

Descriptive Statistics of DOI Time of Day by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—TIME OF DAY	N	62	53	54	71	47	8
	Mean	56.67	56.98	51.60	58.31	51.70	50.83
	Median	56.67	60.00	53.33	60.00	53.33	41.67
	Std Dev	24.86	22.50	25.63	26.00	26.19	27.70
	Intqtl Range	31	27	34	50	40	53
	Minimum	.0	.0	.0	.0	.0	17
	Maximum	100	100	100	100	100	90
	Skewness	-.43	-.52	-.32	-.18	-.15	.39
	Kurtosis	-.28	.09	-.46	-.97	-.72	-1.66

Descriptive Statistics of DOI Amount of Info Available by Age/Decade—% Scale

	AGE/DECADE	20's	30's	40's	50's	60's	70's
DOI—AMOUNT of INFO AVAILABLE	N	62	53	54	71	47	8
	Mean	59.84	58.81	66.85	66.62	68.01	69.58
	Median	60.00	60.00	66.67	66.67	66.67	73.33
	Std Dev	19.65	15.76	17.55	17.12	17.41	14.30
	Intqtl Range	22	22	27	27	30	22
	Minimum	10	13	30	23	30	43
	Maximum	100	87	100	100	93	87
	Skewness	-.15	-.43	-.03	-.22	-.34	-.77
	Kurtosis	.08	.06	-.84	-.50	-.64	.14

Appendix Y
INTRA-VARIABLE CORRELATIONS—POSITIVE AND NEGATIVE IN DESCENDING ORDER, STRONGEST TO WEAKEST

This table, related to Tables 4.72-4.90, provides an alternative listing of the positive and negative intra-variable correlations.

VARIABLE	CORRELATED WITH	POSITIVE	NEGATIVE
Academic aptitude/pref T score	Academic aptitude	.943**	
DOI Interest in arts/aesth T score	64. Appreciate art	.920**	
DOI Interest in arts/aesth T score	48. Interest arts/aesthetics	.896**	
DOI Interest in arts/aesth T score	84. NOT enjoy art		-.895**
Academic aptitude/pref T score	Academic preference	.867**	
Academic preference/R-brain	Math		-.864**
DOI Time of day T score	74. More intuitive times	.853**	
DOI Time of day T score	58. Less receptive	.843**	
Academic preference/R-brain	English	.833**	
DOI Impulsivity T score	60. Spontaneously	.826**	
DOI Emotions T score	88. Emotionally involved	.825**	
DOI Ability to visualize T score	77. Visualize solutions	.822**	
DOI Innovation T score	93. Finding alternatives	.822**	
DOI Cog style/Analytic T score	73. Consider facts	.817**	
DOI Carelessness/facts T score	55. NOT collect facts	.812**	
Academic aptitude/pref T score	Math	.810**	
DOI Creativity T score	59. Creative activities	.804**	
DOI Adventure-seeking T score	69. Take risks	.800**	
DOI Creativity T score	95. NOT imaginative		-.798**
64. Appreciate art	48. Interest arts/aesthetics	.794**	
DOI Innovation T score	87. DIFFICULT/novel ways		-.794**
DOI Cooperativeness T score	67. Cooperate	.785**	
DOI Adventure-seeking T score	76. Enjoy unknown	.785**	
DOI Adventure-seeking T score	71. NOT seek adventures		-.779**
DOI Emotions T score	94. Compelling ideas	.777**	
DOI Cog style/Intuitive T score	92. NOT confident		-.770**
DOI Emotions T score	62. NOT connect/emotion		-.769**
DOI Cooperativeness T score	82. NOT cooperation		-.768**
DOI Total score T score	DOI Creativity T score	.758**	
DOI Music T score	68. Enjoy music	.758**	
DOI Cooperativeness T score	57. Cooperative	.756**	
DOI Ability to visualize T score	66. DIFFICULT to visualize		-.754**
DOI Cog style/Analytic T score	65. Analyze things	.752**	
DOI Experience T score	85. Act on instinct	.749**	
DOI Music T score	47. NOT musical		-.747**
DOI Unconventionality T score	72. Unconventional	.739**	
DOI Ability to visualize T score	46. Novel uses	.736**	

Appendix Y *(continued)*

VARIABLE	CORRELATED WITH	POSITIVE	NEGATIVE
74. More intuitive times	58. Less receptive	.736**	
DOI Impulsivity T score	70. LOST w/o plan		-.735**
DOI Flexibility T score	78. Flexible plans	.733**	
DOI Impulsivity T score	80. Decisions impulsive	.731**	
DOI Music T score	61. Listen to music	.730**	
DOI Cog style/Intuitive T score	56. Rely on intuition	.722**	
84. NOT enjoy art	64. Appreciate art		-.721**
DOI Amount of info T score	99. MORE info		-.716**
DOI Imagery T score	83. Metaphors	.703**	
DOI Cog style/Analytic T score	51. NOT step-by-step		-.701**
DOI Flexibility T score	91. Flexibility	.699**	
DOI Innovation T score	54. Recognize patterns	.699**	
DOI Total score T score	DOI Ability to visualize T score	.695**	
DOI Unconventionality T score	75. Comfortable/different	.692**	
DOI Amount of info T score	86. Know w/o knowing	.688**	
DOI Total score T score	DOI Cog style/Intuitive T score	.684**	
DOI Amount of info T score	96. Good decisions	.681**	
DOI Imagery T score	79. NOT good at symbols		-.667**
DOI Total score T score	DOI Innovation T score	.665**	
84. NOT enjoy art	48. Interest in arts/aesthetics		-.664**
DOI Total score T score	77. Visualize solutions	.660**	
Math	Academic aptitude	.655**	
Academic apt/pref T score	English		-.655**
Academic preference/R-brain	Academic Aptitude		-.651**
Academic preference/R-brain	Academic preference/R-brain		-.651**
DOI Total score T score	DOI Adventure-seeking T score	.649**	
DOI Carelessness T score	89. Precise facts		-.649**
DOI Unconventionality T score	49. NOT stand out		-.647**
73. Consider facts	65. Analyze things	.640**	
DOI Total score T score	DOI Amt of info T score	.629**	
DOI Flexibility T score	63. To do lists		-.619**
DOI Total score T score	76. Enjoy unknown	.617**	
DOI Total score T score	DOI Imagery T score	.617**	
DOI Time of day T score	90. NOT more productive		-.617**
DOI Total score T score	93. Finding alternatives	.616**	
DOI Imagery T score	81. Insights/mental images	.612**	
DOI Cog style/Intuitive T score	50. Sudden ideas	.609**	
DOI Total score T score	95. NOT imaginative		-.605**
DOI Carelessness T score	97. Rely on intuition	.604**	
DOI Total score T score	46. Novel uses	.602**	
DOI Creativity T score	53. Multiple ways	.593**	
DOI Total score T score	97. Rely on intuition	.582**	
77. Visualize solutions	46. Novel uses	.578**	

Appendix Y *(continued)*

VARIABLE	CORRELATED WITH	POSITIVE	NEGATIVE
DOI Total score T score	59. Creative activities	.572**	
DOI Experience T score	52. Trace insights	.569**	
94. Compelling ideas	88. Emotionally involved	.546**	
DOI Total score T score	78. Flexible plans	.540**	
DOI Total score T score	83. Metaphors	.531**	
93. Finding alternatives	87. DIFFICULT/novel ways		-.531**
DOI Total score T score	DOI Impulsivity T score	.527**	
DOI Total score T score	DOI Carelessness T score	.520**	
68. Enjoy music	61. Listen to music	.514**	
DOI Total score T score	86. Know w/o knowing	.513**	
DOI Total score T score	48. Interest in arts/aesthetics	.512**	
DOI Total score T score	56. Rely on intuition	.512**	
DOI Total score T score	53. Multiple ways	.511**	
DOI Total score T score	DOI Unconventionality T score	.510**	
80. Decisions impulsive	60. Spontaneously	.508**	
DOI Total score T score	60. Spontaneously	.501**	
DOI Total score T score	96. Good decisions	.499**	
DOI Total score T score	50. Sudden ideas	.498**	
DOI Total score T score	87. DIFFICULT/novel ways		-.496**
76. Enjoy unknown	69. Take risks	.488**	
DOI Total score T score	DOI Flexibility T score	.484**	
DOI Total score T score	69. Take risks	.481**	
DOI Total score T score	DOI Interest arts/aesth T score	.472**	
91. Flexibility	78. Flexible plans	.471**	
DOI Total score T score	92. NOT confident		-.463**
DOI Total score T score	94. Compelling ideas	.462**	
DOI Total score T score	71. NOT seek adventures		-.459**
DOI Total score T score	DOI Experience T score	.456**	
DOI Total score T score	75. Comfortable/different	.454**	
76. Enjoy unknown	71. NOT seek adventures		-.451**
DOI Total score T score	91. Flexibility	.445**	
DOI Total score T score	54. Recognize patterns	.444**	
93. Finding alternatives	54. Recognize patterns	.441**	
History/Social studies	Math		-.441**
English	Math		-.441**
75. Comfortable/different	72. Unconventional	.440**	
English	Academic Aptitude		-.440**
67. Cooperate	57. Cooperative	.439**	
88. Emotionally involved	62. NOT connect/emotion		-.432**
DOI Total score T score	72. Unconventional	.427**	
DOI Total score T score	79. NOT good at symbols		-.418**
Science	History/Social studies		-.414**
95. NOT imaginative	59. Creative activities		-.412**

Appendix Y *(continued)*

VARIABLE	CORRELATED WITH	POSITIVE	NEGATIVE
70. LOST w/o plan	60. Spontaneously		-.410**
DOI Total score T score	64. Appreciate art	.406**	
DOI Total score T score	DOI Emotions T score	.397**	
DOI Total score T score	85. Act on instinct	.386**	
DOI Total score T score	66. DIFFICULT to visualize		-.386**
77. Visualize solutions	66. DIFFICULT to visualize		-.385**
DOI Total score T score	80. Decisions impulsive	.382**	
English	Science		-.380**
82. NOT cooperation	57. Cooperative		-.379**
Academic apt/pref T score	History/Social studies		-.373**
DOI Total score T score	84. NOT enjoy art		-.371**
68. Enjoy music	47. NOT musical		-.364**
71. NOT seek adventures	69. Take risks		-.364**
DOI Total score T score	51. NOT step-by-step	.360**	
56. Rely on intuition	50. Sudden ideas	.360**	
DOI Total score T score	61. Listen to music	.354**	
82. NOT cooperation	67. Cooperate		-.354**
History/Social studies	Academic Aptitude		-.345**
DOI Total score T score	DOI Music T score	.343**	
94. Compelling ideas	62. NOT connect/emotion		-.338**
DOI Total score T score	Academic apt/pref T score	.334**	
Academic preference/R-brain	History/Social studies	.333**	
DOI Total score T score	70. LOST w/o plan		-.332**
83. Metaphors	79. NOT good at symbols		-.327**
89. Precise facts	55. NOT collect facts		-.327**
DOI Experience T score	98. Prior experience		-.325**
DOI Total score T score	99. MORE info		-.319**
95. NOT imaginative	53. Multiple ways		-.315**
DOI Total score T score	Academic Aptitude	.306**	
DOI Total score T score	Academic preference/R-brain	.302**	
DOI Total score T score	Math	.298**	
73. Consider facts	51. NOT step-by-step		-.297**
Foreign language	Math		-.293**
DOI Total score T score	52. Trace insights	.290**	
DOI Total score T score	81. Insights/mental images	.287**	
DOI Total score T score	55. NOT collect facts	.278**	
92. NOT confident	56. Rely on intuition		-.276**
DOI Total score T score	DOI Cog Style/Analytic T score		-.274**
99. MORE info	96. Good decisions		-.269**
Foreign language	Science		-.265**
96. Good decisions	86. Know w/o knowing	.259**	
Academic preference/R-brain	Science		-.257**
DOI Total score T score	89. Precise facts		-.254**
97. Rely on intuition	55. NOT collect facts	.253**	

Appendix Y *(continued)*

VARIABLE	CORRELATED WITH	POSITIVE	NEGATIVE
DOI Total score T score	62. NOT connect/emotion		-.253**
English	Foreign language		-.248**
DOI Total score T score	88. Emotionally involved	.237**	
90. NOT more productive	74. More intuitive times		-.231**
66. DIFFICULT to visualize	46. Novel uses		-.229**
59. Creative activities	53. Multiple ways	.228**	
DOI Total score T score	74. More intuitive times	.227**	
98. Prior experience	52. Trace insights	.224**	
87. DIFFICULT/ novel ways	54. Recognize patterns		-.220**
DOI Total score T score	68. Enjoy music	.213**	
80. Decisions impulsive	70. LOST w/o plan		-.213**
DOI Total score T score	English		-.210**
90. NOT more productive	58. Less receptive		-.209**
DOI Total score T score	49. NOT stand out		-.209**
Academic apt/pref T score	Science	.208**	
DOI Total score T score	73. Consider facts		-.198**
Foreign language	History/Social studies		-.193**
DOI Total score T score	47. NOT musical		-.192**
DOI Total score T score	57. Cooperative	.176**	
DOI Total score T score	DOI Time of day T score	.169**	
61. Listen to music	47. NOT musical		-.163**
DOI Total score T score	DOI Cooperativeness T score	.158**	
65. Analyze things	51. NOT step-by-step		-.158**
99. MORE info	86. Know w/o knowing		-.158**
DOI Total score T score	82. NOT cooperation		-.155**
Science	Academic aptitude	.145*	
75. Comfortable/different	49. NOT stand out		-.144*
92. NOT confident	50. Sudden ideas		-.130*
78. Flexible plans	63. To do lists		-.124*
83. Metaphors	81. Insights/mental images	.123*	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Appendix Z
INTER-ITEM CORRELATIONS EXTRACTED FROM TABLES 4.91-4.101

These inter-item correlations, significant at the 0.01 (**) and 0.05 (*) levels, were extracted from Tables 4.91-4.101. Items are organized numerically beginning with negatives. Items in RED were negatively worded in the DOI.

RED+RED=Negatively worded item/Negative correlation—as expected
BLACK+BLACK=non-Negatively worded item/non-Negative correlation—as expected
BLACK+BLUE=non-Negatively worded item; Negative correlation—not as expected
RED+GREEN=Negatively worded item/non-Negative correlation—not as expected

	DOI Total Score T Score
95. NOT imaginative	-.606**
87. DIFFICULT/novel ways	-.485**
71. NOT seek adventures	-.459**
92. NOT confident	-.449**
79. NOT good/symbols	-.417**
84. NOT enjoy art	-.384**
66. DIFFICULT/visualize	-.367**
70. LOST w/o plan	-.325**
99. MORE info	-.315**
62. NOT connect/emotions	-.260**
89. Precise facts	-.259**
7a. Subject/English	-.210**
49. NOT stand out	-.210**
47. NOT musical	-.203**
73. Consider facts	-.194**
82. NOT cooperation	-.165**
Age	.176**
57. Cooperative	.180**
HBDI® 100 Introversion/Extraversion	.224**
68. Enjoy music	.228**
74. More intuitive times	.235**
88. Emotionally involved	.242**
55. NOT collect facts	.279**
81. Insights/mental images	.282**
7c. Subject/Math	.298**
52. Trace insights	.299**
6. Academic Aptitude	.306**
51. NOT step-by-step	.349**
61. Listen to music	.367**
80. Decisions impulsive	.374**
85. Act on instinct	.385**
64. Appreciate art	.417**

Appendix Z *(continued)*

72. Unconventional	.420**
91. Flexibility	.437**
54. Recognize patterns	.440**
75. Comfortable/different	.451**
94. Compelling ideas	.464**
69. Take risks	.478**
60. Spontaneously	.490**
96. Decisions	.495**
50. Sudden ideas	.500**
53. Multiple ways	.500**
56. Rely on intuition	.511**
86. Know w/o knowing	.522**
48. Interest in arts/aesthetics	.526**
78. Flexible plans	.526**
83. Metaphors	.540**
97. Rely on intuition	.580**
59. Creative activities	.581**
46. Novel uses	.601**
93. Finding alternatives	.602**
76. Enjoy unknown	.614**
77. Visualize solutions	.654**

	6. Academic Aptitude
7a. Subject/English	-.440**
7b. Subject/History-Social Studies	-.345**
95. NOT imaginative	-.171**
84. NOT enjoy art	-.166**
62. NOT connect/emotions	-.152**
89. Precise facts	-.150**
82. NOT cooperation	-.137*
71. NOT seek adventures	-.123*
99. MORE info	-.122*
79. NOT good/symbols	-.121*
56. Rely on intuition	.120*
68. Enjoy music	.134*
76. Enjoy unknown	.137*
7d. Subject/Science	.145*
91. Flexibility	.151**
88. Emotionally involved	.169**
61. Listen to music	.172**
57. Cooperative	.176**
HBDI® 100 Introversion/Extraversion	.182**
83. Metaphors	.195**

Appendix Z *(continued)*

64. Appreciate art	.200**
59. Creative activities	.221**
48. Interest in arts/aesthetics	.256**
94. Compelling ideas	.258**
7c. Subject/Math	.655**

	7c. Subject/Math
7a. Subject/English	-.441**
7b. Subject/History-Social Studies	-.441**
7e. Subject/Foreign Language	-.293**
95. NOT imaginative	-.200**
84. NOT enjoy art	-.197**
89. Precise facts	-.174**
71. NOT seek adventures	-.155**
62. NOT connect/emotions	-.143*
79. NOT good/symbols	-.132*
82. NOT cooperation	-.122*
49. NOT stand out	-.119*
47. NOT musical	-.114*
86. Know w/o knowing	.117*
52. Trace insights	.119*
Sex	.126*
76. Enjoy unknown	.138*
94. Compelling ideas	.151**
64. Appreciate art	.179**
68. Enjoy music	.205**
61. Listen to music	.230**
83. Metaphors	.230**
48. Interest in arts/aesthetics	.258**
59. Creative activities	.280**

	7b. Subject/History-Social Studies
7d. Subject/Science	-.414**
7e. Subject/Foreign Language	-.193**
80. Decisions impulsive	-.116*

	7d. Subject/Science
7a. Subject/English	-.380**
7e. Subject/Foreign Language	-.265**
76. Enjoy unknown	-.195**
72. Unconventional	-.166**
77. Visualize solutions	-.135*
69. Take risks	-.118*

Appendix Z *(continued)*

51. NOT step-by-step	-.114*
87. DIFFICULT/novel ways	.115*
HBDI® 6 Hand Right-Dominance	.124*

	7e. Subject/Foreign Language
7a. Subject/English	-.248**
68. Enjoy music	-.169**
89. Precise facts	.117*
46. Novel uses	.121*
49. NOT stand out	.130*
Age	.222**

	7a. Subject/English
48. Interest in arts/aesthetics	-.214**
Sex	-.200**
64. Appreciate art	-.184**
94. Compelling ideas	-.173**
HBDI® 6. Handedness Right Dominance	-.155*
86. Know w/o knowing	-.149*
Age	-.149*
88. Emotionally involved	-.140*
57. Cooperative	-.136*
HBDI® 6. Handedness Left/Right	-.135*
83. Metaphors	-.130*
74. More intuitive times	-.123*
61. Listen to music	-.122*
82. NOT cooperation	.144*
84. NOT enjoy art	.144*

	51. NOT step-by-step
73. Consider facts	-.297**
70. LOST w/o plan	-.295**
89. Precise facts	-.262**
71. NOT seek adventures	-.250**
92. NOT confident	-.242**
95. NOT imaginative	-.228**
87. DIFFICULT/novel ways	-.218**
63. To do lists	-.175**
65. Analyze things	-.158**
99. MORE info	-.154**
66. DIFFICULT/visualize	-.146*
64. Appreciate art	.119*
48. Interest in arts/aesthetics	.122*

Appendix Z *(continued)*

83. Metaphors	.127*
47. NOT musical	.135*
61. Listen to music	.142*
90. NOT more productive	.152**
97. Rely on intuition	.153**
54. Recognize patterns	.164**
59. Creative activities	.203**
53. Multiple ways	.217**
96. Decisions	.225**
50. Sudden ideas	.253**
46. Novel uses	.265**
85. Act on instinct	.273**
77. Visualize solutions	.274**
56. Rely on intuition	.276**
93. Finding alternatives	.278**
80. Decisions impulsive	.301**
72. Unconventional	.308**
78. Flexible plans	.308**
91. Flexibility	.323**
69. Take risks	.343**
75. Comfortable/different	.346**
76. Enjoy unknown	.384**
55. NOT collect facts	.400**
60. Spontaneously	.444**

	65. Analyze things
85. Act on instinct	-.276**
55. NOT collect facts	-.256**
80. Decisions impulsive	-.229**
HBDI® 6 Hand R-Dominance	-.168**
HBDI® 6 Hand Left/Right	-.126*
71. NOT seek adventures	.117*
77. Visualize solutions	.144*
68. Enjoy music	.144*
52. Trace insights	.150*
49. NOT stand out	.171**
64. Appreciate art	.190**
81. Insights/mental images	.217**
92. NOT confident	.219**
53. Multiple ways	.234**
54. Recognize patterns	.235**
70. LOST w/o plan	.289**
63. To do lists	.309**

Appendix Z *(continued)*

98. PRIOR experience	.367**
99. MORE info	.403**
89. Precise facts	.573**
73. Consider facts	.640**

	73. Consider facts
55. NOT collect facts	-.402**
80. Decisions impulsive	-.359**
85. Act on instinct	-.313**
60. Spontaneously	-.172**
56. Rely on intuition	-.161**
69. Take risks	-.158**
96. Decisions	-.129*
50. Sudden ideas	-.120*
81. Insights/mental images	.135*
53. Multiple ways	.153**
95. NOT imaginative	.177**
49. NOT stand out	.191**
54. Recognize patterns	.198**
71. NOT seek adventures	.264**
63. To do lists	.294**
70. LOST w/o plan	.314**
92. NOT confident	.341**
99. MORE info	.407**
98. PRIOR experience	.412**
89. Precise facts	.656**

	50. Sudden ideas
95. NOT imaginative	-.305**
79. NOT good/symbols	-.185**
87. DIFFICULT/novel ways	-.171**
70. LOST w/o plan	-.150**
92. NOT confident	-.130*
99. MORE info	-.121*
81. Insights/mental images	.128*
52. Trace insights	.129*
91. Flexibility	.146*
64. Appreciate art	.207**
75. Comfortable/different	.211**
55. NOT collect facts	.219**
61. Listen to music	.220**
94. Compelling ideas	.224**
96. Decisions	.238**

Appendix Z *(continued)*

69. Take risks	.242**
97. Rely on intuition	.277**
48. Interest in arts/aesthetics	.278**
93. Finding alternatives	.290**
72. Unconventional	.297**
78. Flexible plans	.298**
85. Act on instinct	.303**
59. Creative activities	.305**
60. Spontaneously	.315**
80. Decisions impulsive	.315**
54. Recognize patterns	.316**
53. Multiple ways	.329**
76. Enjoy unknown	.334**
77. Visualize solutions	.338**
56. Rely on intuition	.360**
86. Know w/o knowing	.368**
83. Metaphors	.410**
46. Novel uses	.442**

	56. Rely on intuition
92. NOT confident	-.276**
95. NOT imaginative	-.190**
89. Precise facts	-.183**
67. Cooperate	.116*
81. Insights/mental images	.122*
74. More intuitive times	.129*
Age	.139*
64. Appreciate art	.181**
91. Flexibility	.186**
88. Emotionally involved	.188**
69. Take risks	.196**
61. Listen to music	.197**
83. Metaphors	.201**
52. Trace insights	.205**
57. Cooperative	.220**
54. Recognize patterns	.224**
75. Comfortable/different	.235**
53. Multiple ways	.236**
93. Finding alternatives	.249**
72. Unconventional	.258**
59. Creative activities	.267**
48. Interest in arts/aesthetics	.272**
46. Novel uses	.279**

Appendix Z *(continued)*

96. Decisions	.282**
77. Visualize solutions	.285**
94. Compelling ideas	.289**
80. Decisions impulsive	.289**
76. Enjoy unknown	.294**
78. Flexible plans	.315**
60. Spontaneously	.376**
85. Act on instinct	.378**
86. Know w/o knowing	.390**
55. NOT collect facts	.399**
97. Rely on intuition	.583**

	92. NOT confident
96. Decisions	-.358**
77. Visualize solutions	-.290**
86. Know w/o knowing	-.268**
93. Finding alternatives	-.258**
97. Rely on intuition	-.230**
60. Spontaneously	-.220**
76. Enjoy unknown	-.217**
85. Act on instinct	-.206**
75. Comfortable/different	-.203**
69. Take risks	-.203**
53. Multiple ways	-.197**
46. Novel uses	-.188**
55. NOT collect facts	-.163**
91. Flexibility	-.157**
80. Decisions impulsive	-.147*
Age	-.142*
83. Metaphors	-.136*
72. Unconventional	-.128*
78. Flexible plans	-.118*
58. LESS receptive	.117*
63. To do lists	.133*
47. NOT musical	.133*
62. NOT connect/emotions	.183**
98. PRIOR experience	.236**
49. NOT stand out	.265**
89. Precise facts	.302**
79. NOT good/symbols	.303**
87. DIFFICULT/novel ways	.355**
71. NOT seek adventures	.365**
70. LOST w/o plan	.372**

Appendix Z *(continued)*

95. NOT imaginative	.392**
66. DIFFICULT/visualize	.393**
99. MORE info	.501**

	52. Trace insights
71. NOT seek adventures	-.175**
62. NOT connect/emotions	-.158**
60. Spontaneously	.134*
97. Rely on intuition	.151**
49. NOT stand out	.160**
91. Flexibility	.168**
58. LESS receptive	.170**
61. Listen to music	.173**
76. Enjoy unknown	.178**
74. More intuitive times	.182**
93. Finding alternatives	.188**
81. Insights/mental images	.196**
69. Take risks	.197**
78. Flexible plans	.202**
88. Emotionally involved	.206**
83. Metaphors	.207**
77. Visualize solutions	.212**
94. Compelling ideas	.222**
98. PRIOR experience	.224**
53. Multiple ways	.229**
46. Novel uses	.236**
59. Creative activities	.259**
54. Recognize patterns	.303**

	85. Act on instinct
89. Precise facts	-.244**
99. MORE info	-.187**
70. LOST w/o plan	-.146*
71. NOT seek adventures	-.121*
HBDI® 100 Introversion/Extraversion	.130*
75. Comfortable/different	.133*
59. Creative activities	.150**
Age	.152**
94. Compelling ideas	.160**
81. Insights/mental images	.164**
61. Listen to music	.167**
93. Finding alternatives	.167**
91. Flexibility	.182**

Appendix Z *(continued)*

46. Novel uses	.186**
77. Visualize solutions	.190**
78. Flexible plans	.224**
72. Unconventional	.230**
86. Know w/o knowing	.258**
76. Enjoy unknown	.299**
60. Spontaneously	.328**
69. Take risks	.349**
97. Rely on intuition	.367**
96. Decisions	.393**
55. NOT collect facts	.464**
80. Decisions impulsive	.531**

	98. PRIOR experience
82. NOT cooperation	-.122*
58. LESS receptive	.118*
78. Flexible plans	.131*
79. NOT good/symbols	.134*
57. Cooperative	.144*
54. Recognize patterns	.145*
70. LOST w/o plan	.148*
63. To do lists	.195**
99. MORE info	.295**
89. Precise facts	.421**

	53. Multiple ways
66. DIFFICULT/visualize	-.402**
87. DIFFICULT/novel ways	-.383**
95. NOT imaginative	-.315**
71. NOT seek adventures	-.206**
79. NOT good/symbols	-.201**
84. NOT enjoy art	-.130*
70. LOST w/o plan	-.124*
57. Cooperative	.120*
81. Insights/mental images	.145*
94. Compelling ideas	.146*
64. Appreciate art	.156**
Age	.157**
48. Interest in arts/aesthetics	.191**
86. Know w/o knowing	.195**
59. Creative activities	.228**
60. Spontaneously	.229**
91. Flexibility	.267**

Appendix Z *(continued)*

72. Unconventional	.268**
75. Comfortable/different	.274**
69. Take risks	.289**
97. Rely on intuition	.300**
83. Metaphors	.300**
78. Flexible plans	.310**
76. Enjoy unknown	.389**
96. Decisions	.407**
54. Recognize patterns	.469**
46. Novel uses	.499**
77. Visualize solutions	.578**
93. Finding alternatives	.680**

	59. Creative activities
95. NOT imaginative	-.412**
84. NOT enjoy art	-.267**
87. DIFFICULT/novel ways	-.252**
89. Precise facts	-.160**
71. NOT seek adventures	-.160**
79. NOT good/symbols	-.148*
62. NOT connect/emotions	-.128*
82. NOT cooperation	-.123*
Sex	.123*
Age	.126*
57. Cooperative	.146*
88. Emotionally involved	.169**
80. Decisions impulsive	.174**
55. NOT collect facts	.175**
81. Insights/mental images	.176**
75. Comfortable/different	.183**
96. Decisions	.187**
72. Unconventional	.217**
68. Enjoy music	.222**
69. Take risks	.234**
54. Recognize patterns	.245**
60. Spontaneously	.284**
91. Flexibility	.294**
78. Flexible plans	.296**
94. Compelling ideas	.298**
97. Rely on intuition	.303**
76. Enjoy unknown	.309**
93. Finding alternatives	.313**
61. Listen to music	.324**

Appendix Z *(continued)*

77. Visualize solutions	.326**
64. Appreciate art	.346**
86. Know w/o knowing	.354**
83. Metaphors	.364**
48. Interest in arts/aesthetics	.466**
46. Novel uses	.474**

	95. NOT imaginative
77. Visualize solutions	-.482**
93. Finding alternatives	-.457**
46. Novel uses	-.440**
83. Metaphors	-.409**
76. Enjoy unknown	-.308**
97. Rely on intuition	-.302**
48. Interest in arts/aesthetics	-.278**
54. Recognize patterns	-.270**
86. Know w/o knowing	-.268**
78. Flexible plans	-.246**
75. Comfortable/different	-.237**
60. Spontaneously	-.227**
96. Decisions	-.207**
72. Unconventional	-.196**
64. Appreciate art	-.179**
94. Compelling ideas	-.164**
91. Flexibility	-.163**
69. Take risks	-.161**
HBDI® 100 Introversion/Extraversion	-.156*
58. LESS receptive	.159**
82. NOT cooperation	.173**
89. Precise facts	.209**
47. NOT musical	.209**
62. NOT connect/emotions	.216**
49. NOT stand out	.237**
99. MORE info	.258**
84. NOT enjoy art	.280**
70. LOST w/o plan	.330**
71. NOT seek adventures	.375**
66. DIFFICULT/visualize	.450**
79. NOT good/symbols	.455**
87. DIFFICULT/novel ways	.629**

Appendix Z *(continued)*

	54. Recognize patterns
79. NOT good/symbols	-.321**
87. DIFFICULT/novel ways	-.220**
66. DIFFICULT/visualize	-.190**
71. NOT seek adventures	-.152**
89. Precise facts	.123*
60. Spontaneously	.153**
64. Appreciate art	.158**
69. Take risks	.175**
81. Insights/mental images	.185**
48. Interest in arts/aesthetics	.197**
91. Flexibility	.207**
94. Compelling ideas	.207**
96. Decisions	.223**
75. Comfortable/different	.230**
78. Flexible plans	.233**
97. Rely on intuition	.256**
72. Unconventional	.265**
86. Know w/o knowing	.295**
76. Enjoy unknown	.351**
83. Metaphors	.413**
93. Finding alternatives	.441**
46. Novel uses	.442**
77. Visualize solutions	.548**

	87. DIFFICULT/novel ways
93. Finding alternatives	-.531**
77. Visualize solutions	-.493**
46. Novel uses	-.402**
76. Enjoy unknown	-.276**
75. Comfortable/different	-.274**
91. Flexibility	-.232**
96. Decisions	-.232**
97. Rely on intuition	-.217**
83. Metaphors	-.211**
72. Unconventional	-.203**
78. Flexible plans	-.193**
69. Take risks	-.186**
60. Spontaneously	-.150**
48. Interest in arts/aesthetics	-.138*
89. Precise facts	.134*
82. NOT cooperation	.153**
49. NOT stand out	.188**

Appendix Z *(continued)*

84. NOT enjoy art	.214**
99. MORE info	.258**
71. NOT seek adventures	.350**
70. LOST w/o plan	.350**
79. NOT good/symbols	.473**
66. DIFFICULT/visualize	.573**

	93. Finding alternatives
66. DIFFICULT/visualize	-.456**
79. NOT good/symbols	-.316**
71. NOT seek adventures	-.303**
70. LOST w/o plan	-.198**
99. MORE info	-.165**
Sex	-.156**
49. NOT stand out	-.119*
84. NOT enjoy art	-.116*
55. NOT collect facts	.119*
HBDI® 100 Introversion/Extraversion	.127*
48. Interest in arts/aesthetics	.154**
Age	.154**
81. Insights/mental images	.168**
80. Decisions impulsive	.177**
94. Compelling ideas	.187**
86. Know w/o knowing	.256**
60. Spontaneously	.259**
72. Unconventional	.274**
69. Take risks	.313**
75. Comfortable/different	.317**
91. Flexibility	.331**
78. Flexible plans	.344**
83. Metaphors	.394**
97. Rely on intuition	.442**
76. Enjoy unknown	.473**
96. Decisions	.511**
46. Novel uses	.551**
77. Visualize solutions	.730**

	55. NOT collect facts
89. Precise facts	-.327**
99. MORE info	-.114*
49. NOT stand out	.116*
74. More intuitive times	.116*
75. Comfortable/different	.124*

Appendix Z *(continued)*

84. NOT enjoy art	.130*
58. LESS receptive	.138*
62. NOT connect/emotions	.146*
78. Flexible plans	.161**
76. Enjoy unknown	.164**
Age	.175**
82. NOT cooperation	.179**
91. Flexibility	.220**
72. Unconventional	.235**
97. Rely on intuition	.253**
96. Decisions	.284**
69. Take risks	.295**
60. Spontaneously	.335**
80. Decisions impulsive	.411**

	89. Precise facts
80. Decisions impulsive	-.264**
60. Spontaneously	-.150**
91. Flexibility	-.145*
78. Flexible plans	-.122*
62. NOT connect/emotions	.115*
49. NOT stand out	.178**
63. To do lists	.183**
71. NOT seek adventures	.229**
70. LOST w/o plan	.258**
99. MORE info	.354**

	97. Rely on intuition
79. NOT good/symbols	-.235**
62. NOT connect/emotions	-.170**
49. NOT stand out	-.170**
71. NOT seek adventures	-.134*
84. NOT enjoy art	-.117*
Age	.160**
61. Listen to music	.171**
57. Cooperative	.173**
64. Appreciate art	.190**
81. Insights/mental images	.197**
88. Emotionally involved	.206**
91. Flexibility	.219**
83. Metaphors	.249**
75. Comfortable/different	.256**
69. Take risks	.260**

Appendix Z *(continued)*

72. Unconventional	.268**
48. Interest in arts/aesthetics	.278**
80. Decisions impulsive	.284**
76. Enjoy unknown	.296**
78. Flexible plans	.300**
60. Spontaneously	.314**
94. Compelling ideas	.323**
46. Novel uses	.355**
77. Visualize solutions	.400**
96. Decisions	.430**
86. Know w/o knowing	.502**

	57. Cooperative
82. NOT cooperation	-.379**
61. Listen to music	.120*
48. Interest in arts/aesthetics	.129*
78. Flexible plans	.129*
46. Novel uses	.129*
63. To do lists	.193**
49. NOT stand out	.197**
Sex	.206**
91. Flexibility	.230**
67. Cooperate	.439**

	67. Cooperate
82. NOT cooperation	-.354**
72. Unconventional	-.125*
96. Decisions	-.122*
48. Interest in arts/aesthetics	.117*
Sex	.126*
64. Appreciate art	.128*
63. To do lists	.141*
79. NOT good/symbols	.143*
71. NOT seek adventures	.165**
49. NOT stand out	.312**

	82. NOT cooperation
HBDI® 100 Introversion/Extraversion	-.184**
48. Interest in arts/aesthetics	-.142*
Sex	-.131*
47. NOT musical	.159**
72. Unconventional	.173**
62. NOT connect/emotions	.248**

Appendix Z *(continued)*

66. DIFFICULT/visualize	.249**
84. NOT enjoy art	.254**

	60. Spontaneously
70. LOST w/o plan	-.410**
71. NOT seek adventures	-.224**
63. To do lists	-.151**
99. MORE info	-.119*
61. Listen to music	.125*
47. NOT musical	.136*
81. Insights/mental images	.140*
83. Metaphors	.153**
Age	.155**
94. Compelling ideas	.179**
48. Interest in arts/aesthetics	.223**
75. Comfortable/different	.233**
46. Novel uses	.243**
86. Know w/o knowing	.256**
77. Visualize solutions	.283**
96. Decisions	.286**
72. Unconventional	.302**
76. Enjoy unknown	.303**
91. Flexibility	.334**
69. Take risks	.414**
80. Decisions impulsive	.508**
78. Flexible plans	.534**

	70. LOST w/o plan
78. Flexible plans	-.292**
80. Decisions impulsive	-.213**
HBDI® 6 Hand Left/Right	-.196**
96. Decisions	-.192**
91. Flexibility	-.184**
76. Enjoy unknown	-.175**
46. Novel uses	-.173**
HBDI® 6 Hand Right-Dominance	-.165**
Age	-.156**
77. Visualize solutions	-.147*
72. Unconventional	-.125*
74. More intuitive times	.115*
49. NOT stand out	.120*
61. Listen to music	.125*
58. LESS receptive	.150**

Appendix Z *(continued)*

79. NOT good/symbols	.220**
66. DIFFICULT/visualize	.348**
99. MORE info	.378**
71. NOT seek adventures	.395**
63. To do lists	.448**

	80. Decisions impulsive
99. MORE info	-.151**
75. Comfortable/different	.131*
83. Metaphors	.133*
81. Insights/mental images	.143*
46. Novel uses	.150*
77. Visualize solutions	.166**
HBDI® 100 Introversion/Extraversion	.166**
86. Know w/o knowing	.178**
72. Unconventional	.192**
91. Flexibility	.214**
94. Compelling ideas	.237**
76. Enjoy unknown	.243**
78. Flexible plans	.298**
96. Decisions	.348**
69. Take risks	.388**

	63. To do lists
HBDI® 6 Hand Left/Right	-.196**
HBDI® 6 Hand Right-Dominance	-.170**
78. Flexible plans	-.124*

66. DIFFICULT/visualize	.129*
HBDI® 100 Introversion/Extraversion	.175**
71. NOT seek adventures	.190**
88. Emotionally involved	.198**
Sex	.199**
68. Enjoy music	.200**
99. MORE info	.201**

	78. Flexible plans
84. NOT enjoy art	-.178**
66. DIFFICULT/visualize	-.161**
71. NOT seek adventures	-.135*
88. Emotionally involved	.133*
81. Insights/mental images	.154**
90. NOT more productive	.177**

Appendix Z *(continued)*

61. Listen to music	.180**
83. Metaphors	.215**
64. Appreciate art	.232**
94. Compelling ideas	.257**
72. Unconventional	.260**
48. Interest in arts/aesthetics	.264**
96. Decisions	.285**
86. Know w/o knowing	.288**
77. Visualize solutions	.294**
46. Novel uses	.320**
75. Comfortable/different	.326**
76. Enjoy unknown	.329**
69. Take risks	.350**
91. Flexibility	.471**

	91. Flexibility
71. NOT seek adventures	-.193**
66. DIFFICULT/visualize	-.182**
83. Metaphors	.132*
48. Interest in arts/aesthetics	.136*
72. Unconventional	.137*
64. Appreciate art	.139*
61. Listen to music	.160**
86. Know w/o knowing	.173**
81. Insights/mental images	.177**
HBDI® 100 Introversion/Extraversion	.185**
94. Compelling ideas	.198**
69. Take risks	.239**
77. Visualize solutions	.255**
75. Comfortable/different	.256**
46. Novel uses	.257**
90. NOT more productive	.278**
96. Decisions	.278**
76. Enjoy unknown	.339**

	48. Interest in arts/aesthetics
84. NOT enjoy art	-.664**
79. NOT good/symbols	-.188**
62. NOT connect/emotions	-.150**
Sex	.129*
96. Decisions	.165**
81. Insights/mental images	.175**
69. Take risks	.191**

Appendix Z *(continued)*

88. Emotionally involved	.202**
72. Unconventional	.230**
75. Comfortable/different	.253**
68. Enjoy music	.261**
86. Know w/o knowing	.265**
94. Compelling ideas	.268**
77. Visualize solutions	.271**
61. Listen to music	.274**
83. Metaphors	.291**
76. Enjoy unknown	.302**
46. Novel uses	.393**
64. Appreciate art	.794**

	64. Appreciate art
84. NOT enjoy art	-.721**
62. NOT connect/emotions	-.169**
79. NOT good/symbols	-.134*
69. Take risks	.124*
81. Insights/mental images	.136*
77. Visualize solutions	.153**
Sex	.162**
88. Emotionally involved	.183**
86. Know w/o knowing	.201**
83. Metaphors	.215**
94. Compelling ideas	.237**
75. Comfortable/different	.238**
72. Unconventional	.241**
61. Listen to music	.252**
76. Enjoy unknown	.281**
46. Novel uses	.285**
68. Enjoy music	.290**

	84. NOT enjoy art
68. Enjoy music	-.265**
83. Metaphors	-.197**
46. Novel uses	-.173**
77. Visualize solutions	-.166**
76. Enjoy unknown	-.162**
61. Listen to music	-.151**
94. Compelling ideas	-.137*
72. Unconventional	-.135*
75. Comfortable/different	-.132*
Sex	-.123*

Appendix Z *(continued)*

71. NOT seek adventures	.122*
90. NOT more productive	.125*
47. NOT musical	.185**
62. NOT connect/emotions	.195**
66. DIFFICULT/visualize	.212**
79. NOT good/symbols	.217**

	47. NOT musical
68. Enjoy music	-.364**
Sex	-.221**
HBDI® 100 Introversion/Extraversion	-.184**
86. Know w/o knowing	-.179**
61. Listen to music	-.163**
88. Emotionally involved	-.121*
83. Metaphors	-.115*
58. LESS receptive	.121*
90. NOT more productive	.135*
71. NOT seek adventures	.159**
62. NOT connect/emotions	.168**
79. NOT good/symbols	.220**
49. NOT stand out	.245**

	61. Listen to music
58. LESS receptive	.135*
88. Emotionally involved	.138*
69. Take risks	.138*
46. Novel uses	.141*
77. Visualize solutions	.148*
72. Unconventional	.150*
75. Comfortable/different	.158**
83. Metaphors	.172**
94. Compelling ideas	.178**
76. Enjoy unknown	.184**
86. Know w/o knowing	.190**
81. Insights/mental images	.251**
74. More intuitive times	.277**
68. Enjoy music	.514**

	68. Enjoy music
62. NOT connect/emotions	-.133*
94. Compelling ideas	.123*
83. Metaphors	.145*
46. Novel uses	.159**

Appendix Z *(continued)*

Sex	.164**
88. Emotionally involved	.179**

	69. Take risks
71. NOT seek adventures	-.364**
Sex	-.116*
49. NOT stand out	-.115*
58. LESS receptive	.118*
74. More intuitive times	.123*
86. Know w/o knowing	.130*
81. Insights/mental images	.141*
HBDI® 100 Introversion/Extraversion	.149*
83. Metaphors	.166**
94. Compelling ideas	.185**
46. Novel uses	.240**
75. Comfortable/different	.301**
77. Visualize solutions	.350**
96. Decisions	.372**
72. Unconventional	.407**
76. Enjoy unknown	.488**

	71. NOT seek adventures
76. Enjoy unknown	-.451**
77. Visualize solutions	-.317**
96. Decisions	-.233**
46. Novel uses	-.230**
83. Metaphors	-.192**
HBDI® 100 Introversion/Extraversion	-.170**
75. Comfortable/different	-.141*
86. Know w/o knowing	-.119*
49. NOT stand out	.266**
99. MORE info	.305**
79. NOT good/symbols	.342**
66. DIFFICULT/visualize	.374**

	76. Enjoy unknown
79. NOT good/symbols	-.214**
66. DIFFICULT/visualize	-.212**
49. NOT stand out	-.148*
74. More intuitive times	.122*
Age	.147*
81. Insights/mental images	.152**
86. Know w/o knowing	.262**

Appendix Z *(continued)*

94. Compelling ideas	.277**
96. Decisions	.314**
72. Unconventional	.334**
83. Metaphors	.341**
46. Novel uses	.386**
75. Comfortable/different	.463**
77. Visualize solutions	.539**

	49. NOT stand out
HBDI® 100 Introversion/Extraversion	-.312**
96. Decisions	-.167**
75. Comfortable/different	-.144*
77. Visualize solutions	-.136*
94. Compelling ideas	-.123*
99. MORE info	.205**
79. NOT good/symbols	.222**

	72. Unconventional
79. NOT good/symbols	-.166**
94. Compelling ideas	.139*
83. Metaphors	.218**
96. Decisions	.231**
86. Know w/o knowing	.262**
46. Novel uses	.287**
77. Visualize solutions	.319**
75. Comfortable/different	.440**

	75. Comfortable/different
66. DIFFICULT/visualize	-.138*
83. Metaphors	.217**
86. Know w/o knowing	.236**
96. Decisions	.251**
46. Novel uses	.333**
77. Visualize solutions	.362**

	46. Novel uses
79. NOT good/symbols	-.243**
66. DIFFICULT/visualize	-.229**
90. NOT more productive	.131*
Age	.201**
81. Insights/mental images	.216**
94. Compelling ideas	.221**
96. Decisions	.347**

Appendix Z *(continued)*

86. Know w/o knowing	.370**
83. Metaphors	.429**
77. Visualize solutions	.578**

	66. DIFFICULT/visualize
77. Visualize solutions	-.385**
96. Decisions	-.247**
83. Metaphors	-.211**
58. LESS receptive	.146*
88. Emotionally involved	.181**
99. MORE info	.269**
79. NOT good/symbols	.371**

	77. Visualize solutions
79. NOT good/symbols	-.382**
99. MORE info	-.158**
Sex	-.154**
Age	.159**
94. Compelling ideas	.208**
81. Insights/mental images	.280**
86. Know w/o knowing	.312**
96. Decisions	.370**
83. Metaphors	.508**

	79. NOT good/symbols
83. Metaphors	-.327**
86. Know w/o knowing	-.210**
HBDI® 5 Handedness	-.174**
94. Compelling ideas	-.149*
96. Decisions	-.126*
62. NOT connect/emotions	.178**
99. MORE info	.205**

	81. Insights/mental images
94. Compelling ideas	.122*
83. Metaphors	.123*
90. NOT more productive	.149*
58. LESS receptive	.168**
74. More intuitive times	.205**
86. Know w/o knowing	.245**

	83. Metaphors
62. NOT connect/emotions	-.146*

Appendix Z *(continued)*

99. MORE info	-.120*
Sex	-.130*
Age	.152**
94. Compelling ideas	.295**
96. Decisions	.300**
86. Know w/o knowing	.301**

	62. NOT connect/emotions
88. Emotionally involved	-.432**
94. Compelling ideas	-.338**
Sex	-.188**
HBDI® 100 Introversion/Extraversion	-.182**
86. Know w/o knowing	-.136*
99. MORE info	.181**
90. NOT more productive	.190**

	88. Emotionally involved
90. NOT more productive	-.120*
Age	-.117*
HBDI® 100 Introversion/Extraversion	.202**
Sex	.206**
94. Compelling ideas	.546**

	94. Compelling ideas
58. LESS receptive	.117*
Sex	.123*
96. Decisions	.156**
74. More intuitive times	.164**
86. Know w/o knowing	.204**
HBDI® 100 Introversion/Extraversion	.318**

	58. LESS receptive
90. NOT more productive	-.209**
99. MORE info	.147*
74. More intuitive times	.736**

	74. More intuitive times
90. NOT more productive	-.231**

	90. NOT more productive
96. Decisions	.131*

Appendix Z *(continued)*

	86. Know w/o knowing
99. MORE info	-.158**
Sex	.146*
96. Decisions	.259**

	96. Decisions
99. MORE info	-.269**
Sex	-.137*
HBDI® 100 Introversion/Extraversion	.137*
Age	.199**

	99. MORE info
Age	-.117*

	HBDI®100 Introversion/Extraversion
HBDI® 6 Hand Right-Dominance	-.175**

	HBDI® 5 Handedness
Age	-.245**
HBDI® 6 Hand Right-Dominance	.633**

	HBDI® 6 Hand Left/Right
Age	.134*
HBDI® 6 Hand Right-Dominance	.668**

No significant inter-item correlations were found for the variables Handedness/Right Dominance, Sex or Age.

Cognitive Style/Analytic items: Item 51 is negatively worded for Cognitive Style/Analytic, which is negatively related to intuition; so this item is reversed. Items 65 and 73 are positively worded for Cognitive Style/Analytic, but should be reversed in relationship to intuition.

Appendix AA
INTER-ITEM CORRELATION MATRIX—BY ITEM

This table presents the same data as Tables 4.91-4.101 but in an item-by-item, instead of variable-by-variable format.

Inter-Variable Correlation Matrix	Acad Apt/ Pref T score	46. Novel uses	47. Not musical	48. Interest arts/aes-thetics	49. Not stand out	50. Sudden ideas	51. Not step-by-step	52. Trace in-sights	53. Multi-ple ways	54. Recog-nize patterns	55. Not collect facts	56. Rely on intui-tion
DOI Academic Aptitude/ Pref T score	1.000											
46. Novel uses	-.004	1.000										
47. Not musical	.048	-.107	1.000									
48. Interest in art	.091	.393	-.043	1.000								
49. Not stand out	-.028	.061	.245	.030	1.000							
50. Sudden ideas	-.008	.442	.000	.278	.045	1.000						
51. Not step-by-step	.033	.265	.135	.122	-.027	.253	1.000					
52. Trace insights	-.011	.236	.107	.097	.160	.129	.087	1.000				
53. Multiple ways	-.016	.499	.042	.191	-.017	.329	.217	.229	1.000			
54. Recognize patterns	.007	.442	-.067	.197	.006	.316	.164	.303	.469	1.000		
55. Not collect facts	.024	.109	.083	.066	.116	.219	.400	.112	.073	.079	1.000	
56. Rely on intuition	.065	.279	.061	.272	.001	.360	.276	.205	.236	.224	.399	1.000
57. Cooperative	.116	.129	.100	.129	.197	.040	.105	.090	.120	.004	.102	.220
58. Less receptive	-.005	-.040	.121	.008	.031	.035	.058	.170	.005	.031	.138	.108
59. Creative activities	.089	.474	-.104	.466	.017	.305	.203	.259	.228	.245	.175	.267
60. Spontaneously	.086	.243	.136	.223	-.057	.315	.444	.134	.229	.153	.335	.376
61. Listen to music	.042	.141	-.163	.274	-.013	.220	.142	.173	.092	.054	.086	.197
62. Not connect/emotion	-.067	-.002	.168	-.150	.029	-.106	.111	-.158	.047	.034	.146	-.098
63. To do lists	.092	.028	-.110	.061	.048	.001	-.175	.094	.062	.070	-.089	.056
64. Appreciate art	.075	.285	-.113	.794	.067	.207	.119	.037	.156	.158	.001	.181
65. Analyze things	-.107	.112	.006	.110	.171	-.036	-.158	.150	.234	.235	-.256	-.056
66. Difficult to visualize	-.057	-.229	.101	-.060	.104	-.065	-.146	.034	-.402	-.190	.092	.055
67. Cooperate	.094	.044	.070	.117	.312	.005	.020	-.017	-.009	-.063	.047	.116
68. Enjoy music	.012	.159	-.364	.261	.007	.091	-.093	.075	.031	.036	-.052	.036
69. Take risks	-.035	.240	.004	.191	-.115	.242	.343	.197	.289	.175	.295	.196
70. Lost w/o plan	.002	-.173	.000	-.081	.120	-.150	-.295	.099	-.124	-.016	-.102	-.039
71. Not seek adventures	-.065	-.230	.159	-.100	.266	-.095	-.250	-.175	-.206	-.152	-.059	-.025
72. Unconventional	-.035	.287	-.081	.230	-.096	.297	.308	.028	.268	.265	.235	.258

Appendix AA *(continued)*

Inter-Variable Correlation Matrix	Acad Apt/ Pref T score	46. Novel uses	47. Not musical	48. Interest in arts/ aesth.	49. Not stand out	50. Sudden ideas	51. Not step-by-step	52. Trace in-sights	53. Multi-ple ways	54. Recog-nize patterns	55. Not collect facts	56. Rely on intuit-tion
73. Consider facts	-.098	.059	.083	.020	.191	-.120	-.297	.076	.153	.198	-.402	-.161
74. More intuitive times	.014	.005	-.029	.087	-.046	.021	.029	.182	.046	-.001	.116	.129
75. Comfortable/different	.010	.333	-.079	.253	-.144	.211	.346	.036	.274	.230	.124	.235
76. Enjoy unknown	.085	.386	-.035	.302	-.148	.334	.384	.178	.389	.351	.164	.294
77. Visualize solutions	.000	.578	-.015	.271	-.136	.338	.274	.212	.578	.548	.071	.285
78. Flexible plans	.087	.320	.052	.264	.001	.298	.308	.202	.310	.233	.161	.315
79. Not good at symbols	-.072	-.243	.220	-.188	.222	-.185	-.106	.034	-.201	-.321	.098	-.054
80. Decisions impulsive	.079	.150	.076	.107	-.098	.315	.301	.016	.066	.007	.411	.289
81. Insight/mental images	.045	.216	.044	.175	.098	.128	.031	.196	.145	.185	-.006	.122
82. Not cooperation	-.043	.009	.159	-.142	-.015	.042	.099	.067	.078	.078	.179	-.032
83. Metaphors	.068	.429	-.115	.291	-.089	.410	.127	.207	.300	.413	.019	.201
84. Not enjoy art	-.040	-.173	.185	-.664	.038	-.050	-.003	.044	-.130	-.057	.130	-.078
85. Act on instinct	.012	.186	.049	.082	-.055	.303	.273	.073	.074	.033	.464	.378
86. Know w/o knowing	-.032	.370	-.179	.265	-.079	.368	.097	.087	.195	.295	.105	.390
87. Difficult/novel ways	-.040	-.402	.112	-.138	.188	-.171	-.218	-.045	-.383	-.220	.048	-.075
88. Emotionally involved	.100	.028	-.121	.202	-.102	.062	-.039	.206	-.046	.001	-.031	.188
89. Precise facts	-.081	.012	.074	.000	.178	-.100	-.262	.056	.096	.123	-.327	-.183
90. Not more productive	.016	.131	.135	-.062	.062	.000	.152	.001	.019	.007	.039	.031
91. Flexibility	.142	.257	.095	.136	-.056	.146	.323	.168	.267	.207	.220	.186
92. Not confident	-.047	-.188	.133	-.030	.265	-.130	-.242	.029	-.197	-.070	-.163	-.276
93. Finding alternatives	-.001	.551	-.011	.154	-.119	.290	.278	.188	.680	.441	.119	.249
94. Compelling ideas	.172	.221	-.074	.268	-.123	.224	.081	.222	.146	.207	.107	.289
95. Not imaginative	-.093	-.440	.209	-.278	.237	-.305	-.228	-.097	-.315	-.270	.007	-.190
96. Decisions	-.065	.347	.039	.165	-.167	.238	.225	.112	.407	.223	.284	.282
97. Rely on intuition	-.011	.355	-.047	.278	-.170	.277	.153	.151	.300	.256	.253	.583
98. Prior experience	-.020	.079	.046	.046	.106	-.054	-.067	.224	.112	.145	-.095	.019
99. More info	-.101	-.079	.051	.011	.205	-.121	-.154	.007	-.099	.037	-.114	-.107

Appendix AA *(continued)*

Inter-Variable Correlation Matrix	57. Coop-erative	58. Less recep tive	59. Crea-tive activ-ities	60. Spon-tane-ously	61. Listen to music	62. Not connect w/emo-tions	63. To do Lists	64. Appre-ciate art	65. Anal-yze things	66. Diffi-cult/vis-ualize	67. Coop-erate	68. Enjoy music	69. Take risks	70. Lost w/o plan	71. Not seek adven-tures
Academic Aptitude/ Pref T score															
46. Novel uses															
47. Not musical															
48. Interest in art															
49. Not stand out															
50. Sudden ideas															
51. Not step-by-step															
52. Trace insights															
53. Multiple ways															
54. Recognize patterns															
55. Not collect facts															
56. Rely on intuition															
57. Cooperative	1.000														
58. Less receptive	.084	1.000													
59. Creative activities	.146	.014	1.000												
60. Spontaneously	.040	.070	.284	1.000											
61. Listen to music	.120	.135	.324	.125	1.000										
62. Not connect/emotion	-.023	.078	-.128	.014	-.050	1.000									
63. To do lists	.193	-.017	.053	-.151	.084	-.036	1.000								
64. Appreciate art	.086	-.006	.346	.110	.252	-.169	.041	1.000							
65. Analyze things	.084	.104	-.019	-.046	.041	.074	.309	.190	1.000						
66. Difficult to visualize	-.055	.146	-.070	-.081	.065	.058	.129	-.017	-.032	1.000					
67. Cooperate	.439	.004	.109	.034	.036	-.077	.141	.128	.013	.040	1.000				
68. Enjoy music	.056	-.064	.222	-.048	.514	-.133	.200	.290	.144	.034	.035	1.000			
69. Take risks	.061	.118	.234	.414	.138	.089	-.025	.124	.015	-.105	-.088	.022	1.000		
70. Lost w/o plan	.069	.150	-.098	-.410	.125	.010	.448	-.029	.289	.348	.076	.088	-.112	1.000	
71. Not seek adventures	-.008	.088	-.160	-.224	-.087	.092	.190	-.045	.117	.374	.165	-.023	-.364	.395	1.000

Appendix AA *(continued)*

Inter-Variable Correlation Matrix	57. Coop-erative	58. Less recep tive	59. Crea-tive activity	60. Spon-tane-ously	61. Listen to music	62. Not connect emotion	63. To do Lists	64. Appre-ciate art	65. Ana-lyze things	66. Diffi-cult/vis-ualize	67. Coop-erate	68. Enjoy music	69. Take risks	70. Lost w/o plan	71. Not seek Adventure
72. Unconventional	-.022	.035	.217	.302	.150	.079	.025	.241	.023	-.042	-.125	.089	.407	-.125	-.076
73. Consider facts	.080	.076	-.077	-.172	-.014	.111	.294	.069	.640	.110	.022	.053	-.158	.314	.264
74. More intuitive times	.075	.736	.088	.045	.277	.026	-.029	.078	.040	.015	-.048	.073	.123	.115	.011
75. Comfortable/different	.056	.009	.183	.233	.158	-.011	.008	.238	.075	-.138	-.057	.099	.301	-.106	-.141
76. Enjoy unknown	.028	.077	.309	.303	.184	-.049	-.027	.281	.093	-.212	-.057	.065	.488	-.175	-.451
77. Visualize solutions	.024	.043	.326	.283	.148	-.006	.022	.153	.144	-.385	-.056	-.008	.350	-.147	-.317
78. Flexible plans	.129	.041	.296	.534	.180	-.074	-.124	.232	-.037	-.161	.109	.020	.350	-.292	-.135
79. Not good at symbols	.091	.097	-.148	-.065	-.069	.178	.022	-.134	.017	.371	.143	-.008	-.079	.220	.342
80. Decisions impulsive	.010	.102	.174	.508	.069	.017	-.096	.043	-.229	.059	.038	-.022	.388	-.213	-.096
81. Insight/mental images	.100	.168	.176	.140	.251	.051	.050	.136	.217	-.012	.107	.078	.141	.099	.049
82. Not cooperation	-.379	.066	-.123	.051	-.060	.248	-.077	-.101	-.063	.249	-.354	-.045	.040	.028	.097
83. Metaphors	-.020	.062	.364	.153	.172	-.146	.016	.215	.085	-.211	-.106	.145	.166	-.078	-.192
84. Not enjoy art	-.050	.041	-.267	-.052	-.151	.195	.018	-.721	-.033	.212	-.048	-.265	-.051	.113	.122
85. Act on instinct	.023	.038	.150	.328	.167	.037	-.048	.005	-.276	.079	-.008	.006	.349	-.146	-.121
86. Know w/o knowing	.068	-.023	.354	.256	.190	-.136	.031	.201	-.020	-.024	.026	.086	.130	-.104	-.119
87. Difficult/novel ways	.042	.114	-.252	-.150	.009	.111	.094	-.062	.080	.573	.086	.025	-.186	.350	.350
88. Emotionally involved	.108	.095	.169	.045	.138	-.432	.198	.183	.106	.181	.073	.179	.090	.103	-.010
89. Precise facts	.085	.012	-.160	-.150	-.074	.115	.183	.054	.573	.087	.044	-.066	-.105	.258	.229
90. Not more productive	.001	-.209	.023	.088	.004	.190	-.017	-.041	.047	.026	.086	-.037	.065	.014	.049
91. Flexibility	.230	.025	.294	.334	.160	-.037	-.021	.139	-.039	-.182	.074	.037	.239	-.184	-.193
92. Not confident	.015	.117	-.059	-.220	-.001	.183	.133	.038	.219	.393	.033	.018	-.203	.372	.365
93. Finding alternatives	.089	.030	.313	.259	.099	.032	-.026	.089	.093	-.456	-.067	-.023	.313	-.198	-.303
94. Compelling ideas	.111	.117	.298	.179	.178	-.338	.060	.237	.077	.006	.038	.123	.185	.085	-.108
95. Not imaginative	.103	.159	-.412	-.227	-.099	.216	.084	-.179	.063	.450	.078	-.098	-.161	.330	.375
96. Decisions	.015	.018	.187	.286	.092	.053	-.068	.081	-.041	-.247	-.122	.017	.372	-.192	-.233
97. Rely on intuition	.173	.050	.303	.314	.171	-.170	.063	.190	.019	-.077	.039	-.011	.260	-.098	-.134
98. Prior experience	.144	.118	.023	.074	.067	.027	.195	.000	.367	.043	.070	.064	.064	.148	.068
99. More info	.090	.147	-.074	-.119	.068	.181	.201	.068	.403	.269	.085	.036	-.062	.378	.305

Appendix AA *(continued)*

Inter-Variable Correlation Matrix	72. Uncon ventional	73. Con- sider facts	74. More intuitive times	75. Com- fortable/ different	76. Enjoy un- known	77. Visua- lize solutions	78. Flexi- ble plans	79. Not good/ symbol	80. Deci- sions impulsv	81. Insight /mental images	82. Not coope- ration	83. Meta- phors	84. Not enjoy art	85. Act on Instinct
DOI Academic Aptitude/ Pref T score														
46. Novel uses														
47. Not musical														
48. Interest in art														
49. Not stand out														
50. Sudden ideas														
51. Not step-by-step														
52. Trace insights														
53. Multiple ways														
54. Recognize patterns														
55. Not collect facts														
56. Rely on intuition														
57. Cooperative														
58. Less receptive														
59. Creative activities														
60. Spontaneously														
61. Listen to music														
62. Not connected/emotion														
63. To do lists														
64. Appreciate art														
65. Analyze things														
66. Difficult to visualize														
67. Cooperate														
68. Enjoy music														
69. Take risks														
70. Lost w/o plan														
71. Not seek adventures														

Appendix AA *(continued)*

Inter-Variable Correlation Matrix	72. Uncon-ven-tional	73. Con-sider facts	74. More intuitive times	75. Com-fortable/ diff'rent	76. Enjoy un-known	77. Visua-lize solutions	78. Flexi-ble plans	79. Not good/ symbols	80. Deci-sions impulsive	81. Insight /mental images	82. Not coope-ration	83. Meta-phors	84. Not enjoy art	85. Act on Instinct
72. Unconventional	1.000													
73. Consider facts	-.050	1.000												
74. More intuitive times	-.013	.011	1.000											
75. Comfortable/different	.440	.031	.101	1.000										
76. Enjoy unknown	.334	-.051	.122	.463	1.000									
77. Visualize solutions	.319	.083	.110	.362	.539	1.000								
78. Flexible plans	.260	-.082	.092	.326	.329	.294	1.000							
79. Not good at symbols	-.166	.068	.012	-.073	-.214	-.382	-.052	1.000						
80. Decisions impulsive	.192	-.359	.069	.131	.243	.166	.298	.104	1.000					
81. Insights/mental images	.070	.135	.205	.063	.152	.280	.154	-.020	.143	1.000				
82. Not cooperation	.173	-.049	-.002	-.043	-.037	.025	-.099	.091	.102	.019	1.000			
83. Metaphors	.218	.033	.092	.217	.341	.508	.215	-.327	.133	.123	.019	1.000		
84. Not enjoy art	-.135	-.018	-.091	-.132	-.162	-.166	-.178	.217	.012	-.059	.254	-.197	1.000	
85. Act on instinct	.230	-.313	.020	.133	.299	.190	.224	.056	.531	.164	.112	.085	.067	1.000
86. Know w/o knowing how	.262	-.085	.038	.236	.262	.312	.288	-.210	.178	.245	.009	.301	-.096	.258
87. Difficult/novel ways	-.203	.110	.026	-.274	-.276	-.493	-.193	.473	-.010	.026	.153	-.211	.214	.031
88. Emotionally involved	.051	-.025	.037	.035	.104	-.024	.133	-.005	.108	.049	-.087	.034	-.056	.097
89. Precise facts	-.104	.656	-.058	-.020	-.084	.007	-.122	.100	-.264	.096	-.037	-.055	.061	-.244
90. Not more productive	-.005	.013	-.231	.056	.036	.086	.177	.028	.045	.149	.080	-.069	.125	.094
91. Flexibility	.137	-.072	.034	.256	.339	.255	.471	-.031	.214	.177	-.094	.132	-.033	.182
92. Not confident	-.128	.341	.039	-.203	-.217	-.290	-.118	.303	-.147	.029	.041	-.136	.094	-.206
93. Finding alternatives	.274	.003	.071	.317	.473	.730	.344	-.316	.177	.168	.043	.394	-.116	.167
94. Compelling ideas	.139	-.028	.164	.095	.277	.208	.257	-.149	.237	.122	-.016	.295	-.137	.160
95. Not imaginative	-.196	.177	-.020	-.237	-.308	-.482	-.246	.455	-.045	-.056	.173	-.409	.280	-.065
96. Decisions	.231	-.129	.028	.251	.314	.370	.285	-.126	.348	.094	.078	.300	-.104	.393
97. Rely on intuition	.268	-.108	.057	.256	.296	.400	.300	-.235	.284	.197	.016	.249	-.117	.367
98. Prior experience	-.100	.412	.070	-.028	.043	.033	.131	.134	-.073	.083	-.122	.107	.089	-.051
99. More info	.013	.407	.044	-.111	-.057	-.158	-.081	.205	-.151	.096	.025	-.120	.029	-.187

Appendix AA *(continued)*

Inter-Variable Correlation Matrix	86. Know w/oknow-ing how	87. Difficult novel ways	88. Emo-tionally involved	89. Precise facts	90. Not more productive	91. Flexi-bility	92. Not confi-dent	93. Find alter-natives	94. Com-pelling ideas	95. Not imagi-native	96. Good deci-sions	97. Rely on intui-tion	98. Prior experi-ence	99. More info
72. Unconventional														
73. Consider facts														
74. More intuitive times														
75. Comfortable/different														
76. Enjoy unknown														
77. Visualize solutions														
78. Flexible plans														
79. Not good at symbols														
80. Decisions impulsive														
81. Insights/mental images														
82. Not cooperation														
83. Metaphors														
84. Not enjoy art														
85. Act on instinct														
86. Know w/o knowing how	1.000													
87. Difficult/novel ways	-.082	1.000												
88. Emotionally involved	.113	.030	1.000											
89. Precise facts	-.096	.134	-.016	1.000										
90. Not more productive	-.017	.001	-.120	-.004	1.000									
91. Flexibility	.173	-.232	.039	-.145	.278	1.000								
92. Not confident	-.268	.355	.018	.302	-.006	-.157	1.000							
93. Finding alternatives	.256	-.531	-.060	-.007	.103	.331	-.258	1.000						
94. Compelling ideas	.204	-.053	.546	-.075	-.061	.198	-.030	.187	1.000					
95. Not imaginative	-.268	.629	-.034	.209	.033	-.163	.392	-.457	-.164	1.000				
96. Decisions	.259	-.232	-.052	-.058	.131	.278	-.358	.511	.156	-.207	1.000			
97. Rely on intuition	.502	-.217	.206	-.063	.056	.219	-.230	.442	.323	-.302	.430	1.000		
98. Prior experience	-.002	.104	.085	.421	.038	.106	.236	.067	.083	.062	.077	.063	1.000	
99. More info	-.158	.258	.053	.354	.077	-.103	.501	-.165	-.001	.258	-.269	-.094	.295	1.000

Appendix AB
ALPHA IF DELETED—RELIABILITY STUDY

This table presents the Alpha If Deleted outcomes for the DOI.

N=295	Mean	Std Dev	Scale Mean if Item Deleted	Scale Vari-ance if Item Deleted	Correct'd Item Total Corre-lation	Squared Multiple Corre-lation	Cron-bach's Alpha if Item Deleted
DOI Academic Aptitude/Prefer-ence T score	50.00	10.00	3307.25	168670.33	.111	.327	.796
46. Novel uses	76.81	20.74	3280.44	162102.27	.428	.625	.789
47.NOT musical	47.56	36.96	3309.69	165226.53	.103	.409	.799
48.Interest/arts	71.36	26.74	3285.90	161494.41	.348	.754	.790
49.NOT stand out	58.17	29.98	3299.08	165469.46	.136	.433	.796
50.Sudden ideas	79.76	17.95	3277.49	163750.30	.386	.482	.790
51.NOT step-by-step	55.46	28.78	3301.80	162645.51	.267	.513	.792
52.Trace insights	70.20	24.76	3287.05	162049.00	.352	.410	.790
53.Multiple ways	79.80	17.84	3277.46	164186.83	.358	.619	.791
54.Recognize patterns	75.93	20.50	3281.32	163286.01	.361	.524	.790
55.NOT collect facts	46.20	29.83	3311.05	161393.66	.309	.557	.791
56.Rely on intuition	78.03	19.70	3279.22	161978.91	.461	.586	.788
57.Cooperative	84.61	19.81	3272.64	165244.33	.251	.487	.793
58.LESS receptive	50.24	32.72	3307.02	161530.41	.269	.658	.792
59.Creative activities	57.73	29.71	3299.53	159719.48	.382	.516	.788
60.Spontaneously	60.10	27.44	3297.15	160694.43	.374	.604	.789
61.Listen to music	57.02	31.89	3300.24	159972.48	.341	.520	.789
62.NOT connected/emotio n	26.51	28.09	3330.75	167803.28	.047	.479	.799
63.To do lists	72.85	28.34	3284.41	165082.82	.165	.381	.795
64.Appreciate art	77.05	26.68	3280.20	162853.97	.284	.780	.791
65.Analyze things	74.71	23.16	3282.54	164230.45	.262	.636	.792
766.DIFFICULT to visualize	32.14	27.33	3325.12	166164.79	.124	.604	.796
67.Cooperate	78.10	23.60	3279.15	166779.08	.122	.416	.796
68.Enjoy music	86.51	20.53	3270.75	167101.33	.129	.513	.795
69.Take risks	59.42	28.50	3297.83	160118.40	.384	.540	.788
70.LOST w/o plan	52.17	30.95	3305.08	165813.71	.115	.580	.797
71.NOT seek adventures	40.75	27.76	3316.51	168589.88	.014	.558	.800
72.Unconventional	56.47	28.58	3300.78	161294.99	.330	.462	.790
73.Consider facts	69.32	22.07	3287.93	166528.13	.148	.682	.795

Appendix AB *(continued)*

N=295	Mean	Std Dev	Scale Mean if Item Deleted	Scale Vari-ance if Item Deleted	Correct'd Item Total Corre-lation	Squared Multiple Corre-lation	Cron-bach's Alpha if Item Deleted
74.More intuitive times	53.25	32.77	3304.00	162990.83	.212	.679	.794
75.Comfortable/ different	78.71	21.45	3278.54	163849.19	.309	.478	.791
76.Enjoy unknown	78.07	21.99	3279.19	161989.60	.407	.610	.789
77.Visualize solutions	75.12	21.46	3282.14	162675.90	.378	.744	.790
78.Flexible plans	73.90	22.30	3283.36	161783.09	.412	.552	.789
79.NOT good at symbols	46.47	28.59	3310.78	167641.74	.052	.504	.799
80.Decisions impulsive	54.47	27.19	3302.78	161909.10	.321	.551	.790
81.Insights/ment al images	49.49	31.00	3307.76	159391.07	.377	.328	.788
82.NOT cooperation	21.15	24.02	3336.10	167536.05	.080	.527	.797
83.Metaphors	66.51	26.91	3290.75	163011.99	.274	.517	.792
84.NOT enjoy art	30.31	32.23	3326.95	171570.84	-.110	.712	.805
85.Act on instinct	55.69	27.44	3301.56	161652.32	.330	.528	.790
86.Know w/o knowing	71.32	26.64	3285.93	162393.91	.306	.488	.791
87.DIFFICULT/ novel ways	31.56	24.35	3325.69	168595.59	.025	.654	.798
88.Emot'ly involved	75.93	25.26	3281.32	165487.89	.173	.530	.795
89.Precise facts	72.20	23.45	3285.05	167410.70	.090	.586	.797
90.Not more productive	37.76	32.11	3319.49	165704.83	.113	.346	.797
91.Flexibility	64.31	24.64	3292.95	162391.10	.337	.471	.790
92.NOT confident	48.51	28.53	3308.75	167378.75	.064	.574	.798
93.Finding alternatives	78.61	17.51	3278.64	164590.22	.337	.741	.791
94.Compelling ideas	69.49	24.55	3287.76	162218.85	.347	.516	.790
95.NOT imaginative	31.15	26.47	3326.10	170471.65	-.068	.657	.802
96.Decisions	70.00	21.92	3287.25	163858.26	.301	.549	.791
97.Rely on intuition	73.49	23.22	3283.76	161524.89	.408	.633	.788
98.PRIOR experience	75.86	17.24	3281.39	165538.70	.274	.418	.793
99.MORE info	48.92	28.12	3308.34	164776.88	.180	.488	.795
			3357.25				

Appendix AC
RESPONSES TO DOI WRAP-UP ITEM 100

The following 78 narrative responses were collected from DOI item 100 (optional) and placed in general categories by content.

100. Please include here any additional information, thoughts or comments you would like to share with the researcher.

COMMENTS RE THE DOI INSTRUMENT OR STUDY

Toward the end of these questions, I found myself less responsive/alert. And, I feel my answers reflected that situation.

The same question over and over again. I hope it helps with the validity of the instrument. Good luck.)

Interesting study

Interesting process

I tried to answer all questions quickly but found myself "evaluating" the yes/no part of agreeing or disagreeing with the statement. One that stands out from the questions is "enjoys fine art." My thought went to "What is fine art?" Also, deciding a percent of agree or disagree became . . . yes I do that always (95-100 %) to I do that frequently (85-95 %). Plus in the opposite total percent I think I mostly chose 25% range!

The survey was a bit lengthy and the question stems had extremely high literacy, not something I could take without thinking a lot about it. Served to be distracting.

Questions are becoming redundant, but I suppose that's partly the point of this exercise.

In some cases I felt that the choice depended on the situation -- the circumstances -- the critical nature of the decision.

I find some of your last 30 or so Likert scale questions problematic because they assume belief in intuition and clairvoyance of some kind (e.g., "are you more intuitive at certain times of the day?).

Very compelling survey questions. Made me think about how intuitive flashes come to me on a regular basis, and that I trust and rely on them.

There are a few questions you ask that are too vague and beg to be answered with..."Yes, but that's only when..."

I would love to see your study when you complete it. I am ABD and am trying to finish this year as well. Good luck!

Appendix AC *(continued)*

Just this – and you've probably considered it. Individuals likely to spend time on this may be skewed to those of us who believe in and rely on our intuition. Also, just FYI, I've invested quite a bit of time and energy into honing my intuition, matching what I intuited to actual consequences to kind of weed out feelings that may be just anxiety as opposed to a WARNING. Good luck with your project!

The opinion of this tool is important to me. What does that say about me?

This task was very interesting. Insightful into the fact that perhaps there is more intuition than I permit myself to feel or absorb.

Life is all about being open to new thoughts, ideas and adventures. I send you prosperity in whatever you do. Life is a bowl of cherries. Enjoy!

Question #12. In my opinion is very 1-sided, and there is no wiggle room. I tried to put in 2%, 8%, 30%, 60% and 0% respectively and I was not able to do so.

Some of the questions were repetitive and while they check a person's responses, they were annoying.

COMMENTS RE THE NATURE OF INTUITION

My intuition, I believe, is divinely-originating, so I am sometimes insecure about change. (It is outside my own power.)

I cannot help but read people and situations all of the time. I cannot turn it off.

I find I do rely on a combination of my past experiences as well as my gut feelings in analyzing a new acquaintance for instance.

I believe my intuition to be "unreliable" in that it is not always there to guide me, but when it is - I rely on it implicitly.

My intuition most often is expressed as a sudden "knowing" that something is a fact, that a course is correct, or that someone else feels a certain way. When I get that flash of insight or profundity, I tend to act with great confidence. I believe that I am very empathic - that I sense other people's emotions very strongly without any evidence for them.

I feel I have sensed things since childhood, I felt I could understand what motivated the actions of people.

My gut instinct/feelings are almost always correct. I can see things before they happen

My most accurate intuitions often occur in times of high stress or emotion.

Much of my intuition you could call clairvoyant. I will just know things that have nothing to do with decision making style or ability.

Appendix AC *(continued)*

I believe myself to not be very intuitive. I am pretty average. However, there are things, typically minor, that I know the answer or what to do without any known reason. At my age, much of this may be experience or conversations or things gleaned from reading, TV, etc.

I believe that a great deal of intuition is used, however, I do believe that it is coupled with good sound data management. Revelations about the data and correlations seem to develop. In situations without the ability to take the time to properly develop and analyze data, intuition is the most relied upon activity for decision making.

I tend to rely heavily on what one might consider intuition but at the same time, I understand "intuition" to be strictly learned behavior although we might not be able to explain exactly how we learned it. I read, a lot, so I know much of my "intuition" has come from that. I even tend to draw on experiences fictional characters have had which, ultimately, I suppose is the function of great literature. So, in other words, my sense of "intuition" is largely developed and maintained through the arts although I do recognize it to be learned behavior. Another disclaimer: I ranked English low because I LOVE to read but I HATE to write.

I tend to intuit first but then want to get the facts before trusting that intuition.

I have been learning to trust my intuition rather than going back to learned experiences in the past. Intuition comes to me, and it is very often right on target, but I have had to learn to trust that because of my childhood and upbringing. This is not something they teach in school or church or college or life. It is a spiritual matter to me and something I work with everyday.

As I have gotten older I trust my intuition more. I recognize that I have had intuitive experiences all my life but I also know that I did not trust these intuitive moments until I was over 30.

I depend on God and the Bible to form my thoughts and intuitions. I can tell a difference in myself when I'm spending time alone with God and when I'm not. I'm more perceptive and spirit-led when I spend more time with God and read the Bible.

In my ethnic heritage, there is a tradition of valuing people who have foresight and visions. They are cited in literature, poetry and songs, so I think that is one reason why I feel comfortable with the idea and trust my own intuition. I attribute my intuition to spiritual guidance.

I have experienced the "flow" that is talked about in sports. It seems to me to a way of DOING without knowing how you are doing it.

There is a big difference, in me, personally, between work and not at work. I feel more creative, I'm more outspoken, and more unique away from work.

I feel intuition plays a larger role in our lives than we are usually aware.

Appendix AC *(continued)*

My intuition is predominately based on impressions I get from others - verbal, nonverbal, vocal, facial, physical.

People tell me I am operating on intuition more than I am aware that I am operating on intuition. I think it is so much a part of who I am that I don't realize or think about it as being different from others.

I think that intuition only exists when someone believes in it. If someone doesn't believe in it, it won't matter how much intuition they are capable of, because they will never be able to reach it.

Intuition is real and I use it all the time to move through my day and my work. I am relaxed about it, but it is just one part of the "decision-making" mix for me.

Being aware of and open to my own intuitive insights—and giving them weight in everyday life -- has increased with the increase of loss and trauma in my life. For me, it's not so much a factor of age as it is having been cracked open by certain experiences which brought the realization that I have resources I never took seriously before or, at least, seriously considered. An especially insightful counselor also helped guide me to trust my own intuitions more.

I have been like this since I was a kid!

In my profession, I frequently must provide hard data to support my decisions (related to legal, procedural or policy issues). However, I rely on my intuition to "ask the right questions."

I have had several visions out of the clear blue of accidents with death or injuries a day or two before they happen.

I believe repeated visuals, actions, symbols, nature actions, signs (visual or audio) and events that are out of my control give me reasons to make a decision for or against doing something.

Even though I am male, I feel I have cycles throughout the month. Some days I am more intuitive than others.

I tend to "think" in what I call "time periods". However, during those "thinking time periods", I really am doing nothing more but sitting and staring, with no "thoughts" entering or leaving my mind. I then tend to immediate "act" on whatever it was that "came to me" during those moments. Basically, I would say I just "realize something" by "getting lost in my mind".

I am most productive early in the morning or when I'm exerting myself during exercise.

It is not so much the time of day when intuition happens, but the context or situation.

It is challenging to know/remember when intuition hits me. It just does!

Appendix AC *(continued)*

Intuition doesn't come on a daily or weekly basis it just comes when it comes. Sometimes when the mind keeps dwelling on something and other times out of the blue.

I am female. Not only is my intuition different at different times of the day, but at different times in my monthly cycle. I definitely have more or less creativity and connectedness depending on my hormone levels. Makes me wonder if it will change with menopause.

Intuition is something everyone comes equipped with. How connected one is to their intuition depends greatly on their belief, trust and desire to connect. Meditation is one of the greatest ways to connect initially and 3, otherwise you lose the ability to do so.

COMMENTS RE APPLICATIONS OF INTUITION

I count on my intuition to redirect my thinking, and search for the information behind the intuition later.

Application of intuition (decision-making)

I tend to generalize vs. citing specifics to solutions, problem solving, etc. I'll be in the right "church", but the wrong "pew"

I had not thought about how intuition impacts my decision making. I consider myself analytical yet emotions are important "facts" to consider. All that said, on occasion, I just "have a feeling" that guides more final decision.

Sometimes it is difficult to remember your FEELINGS, particularly if they occur during a work related experience that one uses their intuition to make a decision. Sometimes they become split second, and one moves on to the next crisis.

When faced with problems that I am having difficultly solving, I think through the issue and then sleep on it. Usually I will dream of the answer or have an insight that helps.

I use intuition less at work than at home. I wasn't sure when answering these questions which point of view from which to answer. So I tried to answer overall. I hope that's OK.

Although I consider myself intuitive, my job as a Healthcare Practitioner requires me to utilized scientific evidence to support my actions. I tend to consciously minimize my intuition during patient encounters and strive to collect facts.

It seems I am very good at "reading" people and situations, except with long term relationships. I appear to have a complete block there. I have a low trust level with all things.

Appendix AC *(continued)*

My education and training have emphasized the collection of facts to make decisions. So I find myself doing this much more than I did prior, and relying on a balance of fact and intuition. I wonder sometimes if this focus has made me less comfortable with my intuition.

On #63, I have to write things down. It's easy for me to remember to do boring things. When I see people, it's really weird, I can tell what they are going to do if young, if they are good or bad and I always tell my children (they're young adults now) always follow your gut! If you have a certain feeling about something, listen. My mother was the same way only better. She could tell really bad things before they happened. She would really get upset if know one listened especially when one of us would be sent to the hospital (car accident or whatever) and she'd say I told you so!

I appreciate intuitive information because I always receive tangible confirmation about the decisions I made or actions I've taken based on this intuitive information. For instance, if I feel compelled to do a thing and don't do it and there is a negative consequence for my non-action, it will always be brought back to my recollection that "something told me I should have done that."

GENERAL COMMENTS RE INTUITION

Women's intuition is real!

The universe holds the answers if we stand still, pay attention, trust, and learn. It is not easy, but I have found it to be a very strong driving force in my life after a very bad childhood and past.

I sometimes like the definition of Intuition as the "shortcuts" our brains make. It seems to describe me a lot of the time.

I love that you are doing this research. I think it is an important part of humanity that gets squelched in early childhood but is so very valuable if one doesn't allow that to happen.

Not everyone is one or the other...some of us are both. Analytical...and intuitive.

My intuition is strongest where people are involved. I am a very good judge, by intuition, of people...and their response...or lack of it "in the moment."

MISCELLANEOUS COMMENTS

On the DISC system I used to be a high D. With age I have found it "fun" to be a supporter of young high D's to help them be understood by those they supervise.

I have undifferentiated schizophrenia. My brain just works differently.

Appendix AC *(continued)*

I tend to look at things a little differently than most of the people I work with. I find that too many people take the "company line" or the political line of the day at face value. The truth seems always to be at odds with the establishment line.

I am an identical twin that often has the same opinion, view of problems and situations that my sister has. When trying to solve difficult problems, I often consult her and we arrive at the same conclusion.

I am ambidextrous and I have dyslexia. I teach classes in the creative arts.

All we "know" is already "here"

Appendix AD

CONFIRMATORY FACTOR ANALYSIS—RESEARCH HYPOTHESIS 1
3 FACTORS—VARIMAX ROTATED COMPONENT, QUARTIMAX
ROTATED COMPONENT, AND OBLIMIN PATTERN MATRICES

This table presents the Varimax, Quartimax and Oblimin analyses conducted to test the three-factor solution proposed in the Shirley and Langan-Fox intuition model.

VARIABLE/ITEM		Varimax Rotated Component Matrix[a]			Quartimax Rotated Component Matrix[b]			Oblimin Pattern Matrix[c]		
		Component			Component			Component		
		1	2	3	1	2	3	1	2	3
Biological	Age									
	Sex (Female)									
	Euro-American (White)									
	Handedness (Right Dom)									
	Handedness (L/R Dom.)									
Extra-version	Introversion/ Extraversion									
Acad Apt/Pref	Academic Aptitude (R-Brain)									
	Academic Preference (R-Brain)									
Cog Style/ Analy	51.NOT step-by-step	.484	-.368		.444	-.352		.454	-.350	
	65.Analyze things		.663			.635			.635	
	73.Consider facts		.697			.670			.670	
Cog Style/ Intuit	50.Sudden ideas	.557			.558			.561		
	56.Rely on intuition	.634			.576		.305	.599		
	92.NOT confident		.539	.311		.571			.571	
Exper i-ence	52.Trace insights	.366			.354			.365		
	85.Act on instinct	.525	-.318	.340	.418		.495	.451		.481
	98.PRIOR experience		.465			.466			.467	
Crea-tivity	53.Multiple ways	.480		-.401	.565			.542		
	59.Creative activities	.574			.606			.602		
	95.NOT imaginative	-.357		.637	-.498	.312	.495	-.451	.312	.513
Inno-vation	54.Recognize patterns	.433		-.352	.510			.491		
	87.DIFFCLT/novel ways		.306	.658	-.376	.381	.539	-.324	.381	.554
	93.Finding alternatives	.546		-.453	.638			.610		-.304

Appendix AD *(continued)*

		Varimax Rotated Component Matrix[a]			Quartimax Rotated Component Matrix[b]			Oblimin Pattern Matrix[c]		
VARIABLE	**ITEM**	**Component**			**Component**			**Component**		
		1	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
Care-lessness	55.Not collect facts	.464	-.333	.441	.333		.579	.373		.567
	89.PRECISE facts		.587			.569			.569	
	97.Rely on intuition	.621			.621			.625		
Cooper-at'vness	57.Cooperative									
	67.Cooperate									
	82.NOT cooperation									
Impul-sivity	60.Spontaneously	.599			.545			.563		
	70.LOST without plan		.595			.618			.618	
	80.Decisions impulsive	.521	-.332	.346	.412		.502	.446		.487
Flexi-bility	63.TO DO lists		.487			.483			.483	
	78.Flexible plans	.597			.584			.592		
	91.Flexibility	.489			.479			.485		
Interest in Arts/ Aesth	48.Interest in art	.509			.564			.555		
	64.Appreciate art	.400	.341		.455	.313		.446	.314	
	84.NOT enjoy art			.427	-.318		.378			.387
Music	47.NOT musical			.355			.352			.354
	61.Listen to music	.402			.390			.401		
	68.Enjoy music		.304							
Adven-ture-seekng	69.Take risks	.562			.532			.543		
	71.NOT seek adventures		.389	.402	-.334	.432		-.302	.432	
	76.Enjoy unknown	.618			.657			.648		
Unconv ention-ality	49.NOT stand out		.309			.337			.338	
	72.Unconventional	.473			.475			.477		
	75.Comfortable/different	.456			.490			.482		

Appendix AD *(continued)*

		Varimax Rotated Component Matrix[a]			Quartimax Rotated Component Matrix[b]			Oblimin Pattern Matrix[c]		
VARIABLE	**ITEM**	**Component**			**Component**			**Component**		
		1	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
Ability/ Vis'lize	46.Novel uses	.594		-.381	.671			.652		
	66.DIFFICULT/visualize			.644		.366	.564		.366	.574
	77.Visualize solutions	.583		-.485	.684		-.315	.655		-.336
Imag- ery	79.NOT good/symbols			.624			.544			.556
	81.Insights/ment. Images	.349			.332			.345		
	83.Metaphors	.460		-.386	.542			.520		
Emo- tions	62.NOT connect/emotion									
	88.Emotionally involved									
	94.Compelling ideas	.483			.482			.489		
Time of Day	58.LESS receptive						.312			.311
	74.More intuitive times									
	90.NOT more productive									
Amt of Info Avail.	86.Know w/o knowing	.509			.526			.524		
	96.Decisions	.517			.523			.521		
	99.MORE info		.584			.604			.604	

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Extraction Method: Principal Component Analysis.

Rotation Method: Quartimax with Kaiser Normalization.

b. Rotation converged in 5 iterations.

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

c. Rotation converged in 13 iterations.

Appendix AE

CONFIRMATORY FACTOR ANALYSIS—RESEARCH HYPOTHESIS 1
21 FACTORS—VARIMAX ROTATED COMPONENT MATRIX

VARIABLE/ ITEM*		COMPONENT																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Biological	Age									.315		-.492										
	Sex/ Female				-.431														.364			
	Euro/-Am White												.395			-.417						
	Hand/ Right									-.437		.322			.404		-.431					
	Hand/ Left-Rt													.543							.313	
Extra-version	Introv/ Extrav						.472															
Acad Apt/Pref	AcadApt/ Right				-.483																	
	AcadPref/ Right				-.481				.300							.331						
Cog Style/ Analy	51.	.489																				
	65.		.670		.363																	
	73.		.666		.411																	
Cog tyle/ Intuit	50.	.546														-.320						
	56.	.524		.383																		
	92.	-.447	.451																			
Experi-ence	52.											.307			-.374						-.350	
	85.	.413		.517																		
	98.		.476																			
Crea-tivity	53.	.579			.415																	
	59.	.567																				
	95.	-.615		.448																		

Appendix AE *(continued)*

VARIABLE/ ITEM*		COMPONENT																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Inno-vation	54.	.490			.328																	
	87.	-.521		.518																		
	93.	.695			.393																	
Care-lessness	55.	.323		.586																		
	89.		.547		.430																	
	97.	.597						-.345														
Cooper-at'vness	57.		.301			-.427	.403				-.318											
	67.					-.571																
	82.				.320	.386	-.436															
Impul-sivity	60.	.552		.345																		
	70.	-.360	.528																			
	80.	.410		.521																		
Flexi-bility	63.		.485					-.349														
	78.	.565																				
	91.	.472																				
Int .Arts/ Aesth	48.	.494	.401		-.322		-.355															
	64.	.377	.435		-.320		-.436															
	84.	-.317		.309	.384		.318															
Music	47.			.336	.358									-.303								
	61.	.302	.311							.349		.307										
	68.		.343		-.356					.384												

Appendix AE *(continued)*

VARIABLE/ ITEM*		COMPONENT																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Adv-Seek	69.	.532							-.350													
	71.	-.463																				
	76.	.666																				
Unconvent ion-ality	49.					-.448			.305													
	72.	.473					-.415						.328									
	75.	.496							-.306											.351		
Ability/ Vis'lize	46.	.669																				
	66.	-.383		.561																		
	77.	.722			.333																	
Imag-ery	79.	-.404		.519																		
	81.		.312										-.307				.305	.466				
	83.	.547							.321													
Emo-tions	62.				.505					.334												
	88.		.309		-.413																	
	94.	.408																				
Time of Day	58.			.354		.391		.560			-.310											
	74.					.393		.604			-.385											
	90.					-.326				.341				-.305								
Amt of Info Avail.	86.	.511																				
	96.	.566															-.316					
	99.		.531																	-.384		

Extraction Method: Principal Component Analysis.
a. 21 components extracted.
* Numbered items as shown in Appendix AD.

Appendix AF
CONFIRMATORY FACTOR ANALYSIS—RESEARCH HYPOTHESIS 1
21 FACTORS—TOTAL VARIANCE EXPLAINED

This table, related to Hypothesis 1, provides the total and cumulative % of variance explained by the 21-factor solution.

COM-PO-NENT	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
1	9.797	15.802	15.802	5.942	9.584	9.584
2	4.658	7.514	23.316	3.515	5.669	15.253
3	3.701	5.969	29.285	3.117	5.027	20.280
4	3.635	5.863	35.148	2.777	4.479	24.759
5	2.268	3.659	38.807	2.522	4.067	28.826
6	2.136	3.446	42.253	2.338	3.770	32.597
7	1.976	3.188	45.441	2.298	3.707	36.304
8	1.756	2.833	48.273	2.097	3.382	39.685
9	1.639	2.643	50.917	2.041	3.292	42.977
10	1.537	2.480	53.396	1.982	3.197	46.174
11	1.416	2.284	55.681	1.946	3.139	49.313
12	1.342	2.164	57.845	1.891	3.050	52.363
13	1.275	2.056	59.901	1.770	2.855	55.218
14	1.221	1.969	61.870	1.732	2.794	58.012
15	1.200	1.935	63.805	1.697	2.738	60.749
16	1.095	1.767	65.572	1.417	2.285	63.035
17	1.001	1.615	67.187	1.349	2.176	65.211
18	.968	1.561	68.748	1.317	2.124	67.335
19	.939	1.515	70.263	1.259	2.031	69.365
20	.919	1.482	71.746	1.230	1.984	71.349
21	.814	1.313	**73.059**	1.060	1.710	**73.059**
22	.801	1.292	74.351			
23	.778	1.255	75.606			
24	.755	1.218	76.824			
25	.713	1.149	77.973			
26	.700	1.129	79.102			
27	.662	1.068	80.170			
28	.648	1.045	81.215			
29	.615	.991	82.207			
30	.612	.987	83.194			

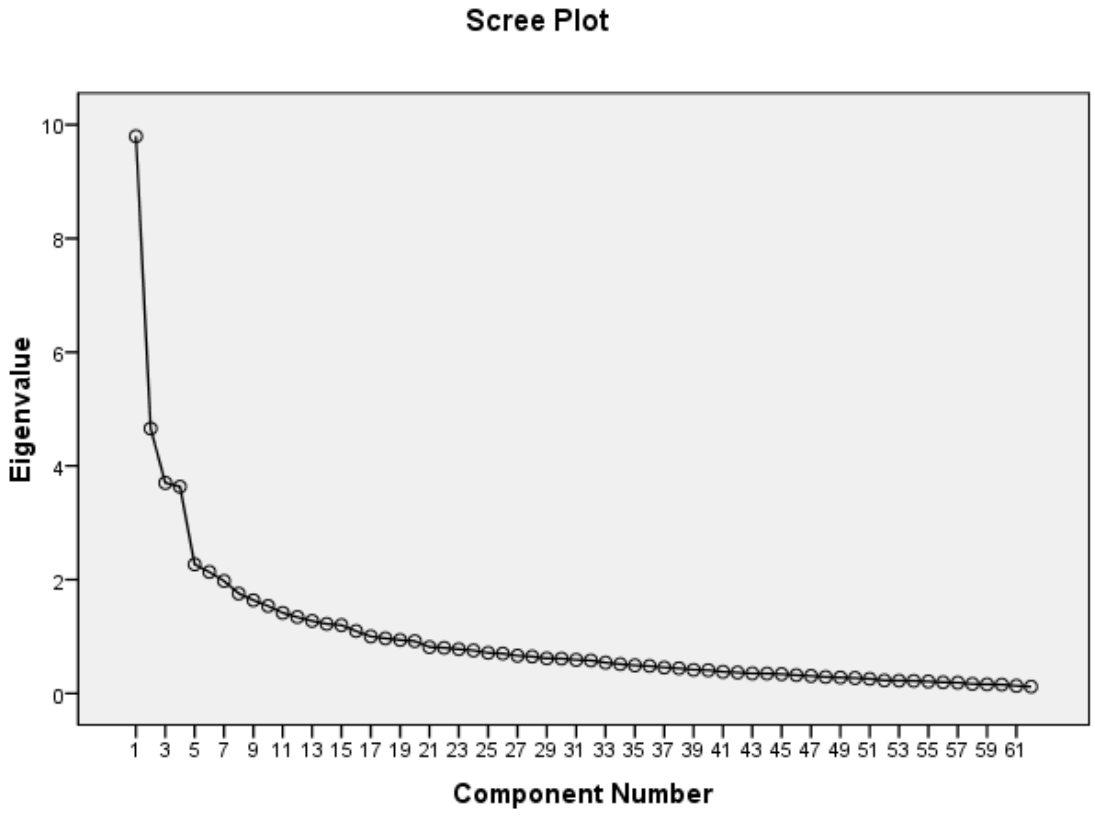
Appendix AF *(continued)*

COM-PO-NENT	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
31	.590	.952	84.145			
32	.580	.935	85.081			
33	.540	.872	85.952			
34	.515	.830	86.782			
35	.492	.794	87.576			
36	.481	.776	88.352			
37	.455	.734	89.087			
38	.441	.711	89.798			
39	.415	.669	90.467			
40	.407	.657	91.123			
41	.380	.613	91.736			
42	.368	.593	92.329			
43	.352	.567	92.896			
44	.348	.561	93.457			
45	.339	.546	94.004			
46	.321	.518	94.522			
47	.306	.494	95.016			
48	.288	.465	95.481			
49	.279	.451	95.932			
50	.270	.436	96.368			
51	.256	.412	96.780			
52	.229	.369	97.149			
53	.225	.362	97.511			
54	.220	.355	97.866			
55	.209	.337	98.203			
56	.195	.314	98.517			
57	.190	.306	98.823			
58	.166	.267	99.090			
58	.166	.267	99.090			
59	.158	.256	99.346			
60	.155	.250	99.596			
61	.133	.215	99.811			
62	.117	.189	100.000			

% of Var.=% of Variance; Cum. %= Cumulative %

Appendix AG
CONFIRMATORY FACTOR ANALYSIS—RESEARCH HYPOTHESIS 1
21 FACTORS—SCREE PLOT CHART

This table, related to Hypothesis 1, provides the scree plot chart for the 21-factor solution.



Appendix AH
DESCRIPTIVE STATISTICS—DOI SOCIAL/ACQUIRED AND SITUATIONAL VARIABLES, DOI TOTAL SCORE T SCORE BY HBDI® BRAIN DOMINANCE

This table, related to Hypotheses 2 and 3, provides descriptive statistics for the 20 DOI social/acquired and situational variables and DOI Total Score-T Scores by HBDI® brain dominance (tri-level). N=258 respondents who completed both the DOI and HBDI®.

BRAIN HEMISPHERES		Left-Brain Dominance (N=75)	Distributed (L/R) Brain Dominance (N=107)	Right-Brain Dominance (N=76)
DOI—ACADEMIC APTITUDE T SCORE	Mean	44.16	50.07	55.50
	Median	44.59	54.06	57.85
	Std Dev	10.56	10.02	5.35
	Intqtl Range	17.05	13.26	5.21
	Minimum	25.64	25.64	37.01
	Maximum	59.74	59.74	59.74
	Skewness	-.17	-1.10	-1.71
	Kurtosis	-1.20	.08	2.35
DOI—COGNITIVE STYLE/ANALYTCL T SCORE	Mean	54.10	51.10	44.04
	Median	53.85	52.05	44.86
	Std Dev	7.03	9.91	9.95
	Intqtl Range	10.79	10.79	12.58
	Minimum	41.27	17.90	19.70
	Maximum	68.23	70.03	62.84
	Skewness	.08	-1.19	-.27
	Kurtosis	-.85	2.07	-.10
DOI—COGNITIVE STYLE/INTUITV T SCORE	Mean	43.94	51.38	54.70
	Median	43.79	49.09	55.46
	Std Dev	9.46	9.28	8.25
	Intqtl Range	12.73	12.73	10.61
	Minimum	20.45	24.69	31.06
	Maximum	65.00	69.25	69.25
	Skewness	.04	-.12	-.52
	Kurtosis	-.05	-.32	.30
DOI—EXPERIENCE T SCORE	Mean	45.83	49.78	54.37
	Median	45.02	49.99	54.96
	Std Dev	9.61	9.65	8.69
	Intqtl Range	12.43	14.29	9.94
	Minimum	25.14	25.14	32.59
	Maximum	62.42	77.33	72.36
	Skewness	-.19	-.02	-.40
	Kurtosis	-.57	.60	.23

Appendix AH *(continued)*

BRAIN HEMISPHERES		Left-Brain Dominance (N=75)	Distributed (L/R) Brain Dominance (N=107)	Right-Brain Dominance (N=76)
HBDI®—INTROVSN/ EXTRAVERSION T SCORE	Mean	47.37	49.18	53.74
	Median	45.69	50.55	55.40
	Std Dev	9.46	10.54	8.67
	Intqtl Range	14.57	14.57	9.71
	Minimum	26.26	26.26	26.26
	Maximum	65.11	65.11	65.11
	Skewness	.16	-.32	-1.10
	Kurtosis	-.80	-1.06	.89
DOI—CREATIVITY T SCORE	Mean	42.39	50.34	56.10
	Median	41.66	51.55	59.65
	Std Dev	7.24	9.01	9.51
	Intqtl Range	10.79	13.49	12.59
	Minimum	25.47	30.86	27.27
	Maximum	57.85	66.84	66.84
	Skewness	-.06	-.21	-1.49
	Kurtosis	-.28	-.82	2.01
DOI—INNOVATION T SCORE	Mean	45.72	49.50	54.86
	Median	45.22	50.42	57.70
	Std Dev	9.36	9.83	9.50
	Intqtl Range	12.49	16.65	11.97
	Minimum	28.57	22.32	22.32
	Maximum	63.95	66.03	66.03
	Skewness	-.08	-.36	-1.20
	Kurtosis	-.59	-.24	1.50
DOI— CARELESSNESS T SCORE	Mean	44.17	48.94	57.22
	Median	44.86	48.60	56.08
	Std Dev	8.45	9.24	9.11
	Intqtl Range	13.10	14.97	12.63
	Minimum	26.14	24.27	35.50
	Maximum	59.83	72.93	76.67
	Skewness	-.14	.07	.11
	Kurtosis	-.76	-.29	-.49
DOI— COOP'TIVENESS T SCORE	Mean	47.34	50.35	51.45
	Median	51.62	52.59	55.48
	Std Dev	9.97	9.59	10.61
	Intqtl Range	13.48	13.48	12.99
	Minimum	9.27	22.75	18.90
	Maximum	61.25	61.25	61.25
	Skewness	-1.14	-.89	-1.42
	Kurtosis	1.71	.19	1.30

Appendix AH *(continued)*

BRAIN HEMISPHERES		Left-Brain Dominance (N=75)	Distributed (L/R) Brain Dominance (N=107)	Right-Brain Dominance (N=76)
DOI—IMPULSIVITY T SCORE	Mean	46.12	48.53	55.39
	Median	46.57	48.10	55.76
	Std Dev	8.82	10.11	8.33
	Intqtl Range	13.78	13.78	14.17
	Minimum	29.72	25.13	38.91
	Maximum	63.42	71.07	69.54
	Skewness	.02	.09	-.22
	Kurtosis	-.84	-.58	-.94
DOI—FLEXIBILITY T SCORE	Mean	46.17	49.29	54.13
	Median	45.04	49.93	54.82
	Std Dev	9.96	11.04	7.41
	Intqtl Range	13.70	15.66	9.30
	Minimum	25.47	21.56	33.30
	Maximum	70.48	74.39	72.43
	Skewness	.36	-.14	-.11
	Kurtosis	.03	-.20	.60
DOI—INTEREST in ARTS/AESTHETICS T SCORE	Mean	44.71	49.72	55.54
	Median	46.37	52.83	58.65
	Std Dev	9.07	10.17	7.99
	Intqtl Range	12.93	13.57	5.17
	Minimum	25.68	23.10	21.80
	Maximum	60.59	60.59	60.59
	Skewness	-.37	-1.03	-2.42
	Kurtosis	-.80	.16	5.89
DOI—MUSIC T SCORE	Mean	46.22	51.00	53.22
	Median	47.60	50.61	55.12
	Std Dev	9.68	9.65	9.32
	Intqtl Range	16.56	13.55	13.17
	Minimum	22.01	20.50	22.01
	Maximum	64.15	65.66	65.66
	Skewness	-.39	-.72	-.85
	Kurtosis	-.28	.80	.81
DOI—ADVENTURE-SEEKING T SCORE	Mean	46.05	49.22	55.63
	Median	45.66	50.53	57.01
	Std Dev	9.02	9.90	7.49
	Intqtl Range	14.59	14.59	11.35
	Minimum	22.97	18.10	32.69
	Maximum	65.12	66.74	66.74
	Skewness	-.12	-.37	-.83
	Kurtosis	-.02	-.23	.81

Appendix AH *(continued)*

BRAIN HEMISPHERES		Left-Brain Dominance (N=75)	Distributed (L/R) Brain Dominance (N=107)	Right-Brain Dominance (N=76)
DOI—UNCONVENTIONAL T SCORE	Mean	46.09	48.87	55.08
	Median	46.93	48.73	54.15
	Std Dev	9.75	9.56	8.67
	Intqtl Range	14.45	14.45	13.55
	Minimum	25.25	25.25	34.28
	Maximum	72.22	70.41	70.41
	Skewness	-.07	.03	-.42
	Kurtosis	-.10	-.52	-.40
DOI—ABILITY TO VISUALIZE T SCORE	Mean	45.77	49.61	55.03
	Median	46.30	50.97	57.51
	Std Dev	9.34	9.63	9.33
	Intqtl Range	14.95	14.95	9.34
	Minimum	25.74	25.74	23.87
	Maximum	64.99	64.99	64.99
	Skewness	-.07	-.37	-1.51
	Kurtosis	-.47	-.58	2.18
DOI—IMAGERY T SCORE	Mean	46.75	49.83	54.45
	Median	48.33	50.08	53.59
	Std Dev	9.39	9.69	8.84
	Intqtl Range	12.29	14.04	12.29
	Minimum	23.76	27.27	29.02
	Maximum	65.88	72.90	72.90
	Skewness	-.42	-.07	-.23
	Kurtosis	-.04	-.57	.39
DOI—EMOTIONS T SCORE	Mean	44.84	50.86	54.54
	Median	46.93	51.80	56.68
	Std Dev	10.18	9.30	7.71
	Intqtl Range	17.88	13.00	8.13
	Minimum	24.17	19.29	27.42
	Maximum	61.55	63.18	63.18
	Skewness	-.37	-.90	-1.59
	Kurtosis	-.86	.47	2.91
DOI—TIME OF DAY T SCORE	Mean	48.42	51.05	51.16
	Median	49.24	51.89	53.22
	Std Dev	9.77	9.31	10.56
	Intqtl Range	14.60	13.27	18.25
	Minimum	28.01	28.01	28.01
	Maximum	65.16	67.82	67.82
	Skewness	-.40	-.29	-.34
	Kurtosis	-.46	-.55	-.70

Appendix AH *(continued)*

BRAIN HEMISPHERES		Left-Brain Dominance (N=75)	Distributed (L/R) Brain Dominance (N=107)	Right-Brain Dominance (N=76)
DOI—AMOUNT of INFO AVAILABLE T SCORE	Mean	45.59	50.27	53.47
	Median	45.80	50.49	53.30
	Std Dev	9.28	10.10	8.12
	Intqtl Range	13.11	13.11	11.24
	Minimum	30.82	19.58	34.56
	Maximum	66.41	70.15	68.28
	Skewness	.34	-.25	-.19
	Kurtosis	-.66	.05	-.60
DOI—TOTAL SCORE T SCORE	Mean	41.40	49.97	58.62
	Median	41.85	50.40	59.48
	Std Dev	7.13	7.88	7.64
	Intqtl Range	9.31	11.09	8.67
	Minimum	25.50	32.33	34.53
	Maximum	57.89	72.35	75.93
	Skewness	-.29	.08	-.52
	Kurtosis	-.11	-.03	.84

Std Dev=Standard Deviation; Intqtl Range=Interquartile Range (all tables in this section); L/R=Left/Right

Appendix AI
CORRELATION MATRIX—DOI TOTAL SCORE T SCORE AND PSI SUBSCALES

This table, related to Hypothesis 4, provides correlation analysis for the DOI Total Score-T Score by each of the six subscales of the PSI Rational vs. Intuitive modes. N=120-122 respondents who completed both the DOI and PSI.

DOI VARIABLE/ PSI SUBSCALE	CORRELATED WITH	PEARSON'S CORRELATION	SIG. (2-tailed)	N
DOI Total Score T score	DOI Total Score-T score	1.000		
	PSI Planning %	-0.106	.251	120
	PSI Analysis %	-0.091	.324	120
	PSI Control %	**-.240***	.009	120
	PSI Vision %	**.560***	.000	120
	PSI Insight %	**.330***	.000	120
	PSI Sharing %	0.030	.744	120
PSI Planning %	DOI Total Score-T score	-0.106	.251	120
	PSI Planning %	1.000		
	PSI Analysis %	**.730***	.000	122
	PSI Control %	**.620***	.000	122
	PSI Vision %	-0.092	.313	122
	PSI Insight %	**.320***	.000	122
	PSI Sharing %	**.280***	.002	122
PSI Analysis %	DOI Total Score-T score	-0.091	.324	120
	PSI Planning %	**.730***	.000	122
	PSI Analysis %	1.000		
	PSI Control %	**.550***	.000	122
	PSI Vision %	0.124	.172	122
	PSI Insight %	**.340***	.000	122
	PSI Sharing %	**.320***	.000	122
PSI Control %	DOI Total Score-T score	**-.240***	.009	120
	PSI Planning %	**.620***	.000	122
	PSI Analysis %	**.620***	.000	122
	PSI Control %	1.000		
	PSI Vision %	**-.240***	.007	122
	PSI Insight %	-0.012	.894	122
	PSI Sharing %	**.250***	.006	122
PSI Vision %	DOI Total Score-T score	**.560***	.000	120
	PSI Planning %	-0.092	.313	122
	PSI Analysis %	0.124	.172	122
	PSI Control %	**-.240***	.007	122
	PSI Vision %	1.000		
	PSI Insight %	**.370***	.000	122
	PSI Sharing %	0.145	.112	122

Appendix AI *(continued)*

DOI VARIABLE/ PSI SUBSCALE	CORRELATED WITH	PEARSON'S CORRELATION	SIG. (2-tailed)	N
PSI Insight %	DOI Total Score-T score	**.330***	.000	120
	PSI Planning %	**.320***	.000	122
	PSI Analysis %	**.340***	.000	122
	PSI Control %	-0.012	.894	122
	PSI Vision %	**.370***	.000	122
	PSI Insight %	1.000		
	PSI Sharing %	**-.270***	.002	122
PSI Sharing %	DOI Total Score-T score	0.030	.744	120
	PSI Planning %	**.280**	.002	122
	PSI Analysis %	**.320***	.000	122
	PSI Control %	**.250**	.006	122
	PSI Vision %	0.145	.112	122
	PSI Insight %	**.270**	.002	122
	PSI Sharing %	1.000		

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix AJ
CORRELATION MATRIX—DOI VARIABLE T SCORES AND PSI SUBSCALES IN DESCENDING ORDER, STRONGEST TO WEAKEST

This table, related to Hypothesis 4, lists the significant positive and negative correlations between DOI T Scores and PSI subscales, in descending order from strongest to weakest.

DOI VARIABLE/ PSI SUBSCALE	CORRELATED WITH	POSITIVE	NEGATIVE
Analysis	Planning	.727**	
Control	Planning	.617**	
Creativity	Vision	.612**	
Cog. Style/Analytic	Control	.608**	
Ability to Visualize	Vision	.560**	
Control	Analysis	.555**	
Adventure-seeking	Vision	.542**	
Innovation	Vision	.534**	
Flexibility	Vision	.474**	
Amount of Info Available	Vision	.457**	
Cog. Style/Intuitive	Vision	.443**	
Impulsivity	Vision	.440**	
Cog. Style/Analytic	Analysis	.432**	
Cooperativeness	Sharing	.408**	
Cog. Style/Analytic	Planning	.395**	
Carelessness	Analysis		-.389**
Carelessness	Control		-.374**
Unconventionality	Vision	.373**	
Insight	Vision	.367**	
Imagery	Vision	.367**	
Impulsivity	Control		-.361**
Adventure-seeking	Control		-.352**
Innovation	Insight	.349**	
Insight	Analysis	.344**	
Carelessness	Vision	.333**	
Ability to Visualize	Insight	.328**	
Cog. Style/Intuitive	Control		-.325**
Experience	Vision	.324**	
Insight	Planning	.321**	
Impulsivity	Planning		-.321**
Adventure-seeking	Insight	.320**	
Sharing	Analysis	.316**	
Cog. Style/Analytic	Vision		-.300**
Carelessness	Planning		-.298**

Appendix AJ *(continued)*

DOI VARIABLE/PSI SUBSCALE	CORRELATED WITH	POSITIVE	NEGATIVE
Unconventionality	Insight	.297**	
Flexibility	Control		-.297**
Unconventionality	Control		-.292**
Flexibility	Planning		-.287**
Sharing	Planning	.284**	
Flexibility	Insight	.280**	
Sharing	Insight	.274**	
Creativity	Insight	.271**	
Amount of Info Available	Control		-.257**
Amount of Info Available	Insight	.256**	
Sharing	Control	.247**	
Vision	Control		-.242**
Cog. Style/Intuitive	Insight	.241**	
Imagery	Insight	.240**	
Innovation	Control		-.240**
Time of Day	Vision		-.221*
Time of Day	Sharing		-.217*
Flexibility	Analysis		-.212*
Cog. Style/Intuitive	Analysis		-.188*
Ability to Visualize	Control		-.184*

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX AK
INTUITION QUOTES

Every discovery contains…a creative intuition. — Karl Popper

When I examine…my methods of thought, I come to the conclusion that the gift of fantasy has meant more to me than my talent for absorbing knowledge. — Albert Einstein

The intellect has little to do on the road to discovery. There comes a leap in consciousness, call it intuition or what you will, the solution comes to you and you don't know how or why. — Albert Einstein

It is always with excitement that I wake up in the morning wondering what my intuition will toss up to me, like gifts from the sea. I work with it and rely on it. It's my partner. — Jonas Salk

Intuition is when you know something, but, like, where did it come from? — Unidentified 15-year-old girl

Intuition does not denote something contrary to reason, but something outside the province of reason. – Carl Jung

The reason I recommend intuition so highly…is that it operates equally well for salvaging the past, enriching the present and enabling right decision or action for the future. – Anne Durrum Robinson

Reason is the slow and torturous method by which those who do not know the truth discover it. — Pascal

I asked it. — George Washington Carver (explaining how he knew what to do with the peanut)

…intuition flourishes only when it is valued… — Frances Vaughan

To the rationally minded the mental processes of the intuitive appear to work backward. His conclusions are reached before his premises. — Frances Wickes

The heart has its reasons, which reason does not know. — Pascal

Invention occurs here as a constructive act. This does not, therefore, constitute what is essentially original in the matter, but the creation of a method of thought to arrive at a logically coherent system…the really valuable factor is intuition!

If we knew what…we were doing, it would not be called research, would it? – Albert Einstein

Appendix AK *(continued)*

It is a miracle that curiosity survives formal education. — Albert Einstein

The history of science makes clear that the greatest advancements in man's understanding of the universe are made by intuitive leaps at the frontiers of knowledge, not by intellectual walks along well-traveled paths. — Andrew Weil

Truth is not that which is demonstrable. Truth is that which is ineluctable.
— St. Exupery

Perhaps the only limits to the human mind are those we believe in. **—** Willis Harman

Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution. — Albert Einstein

It is by logic that we prove. It is by intuition that we discover. — Jules Henri Poincare'

After great pain, a formal feeling comes. — Emily Dickinson

the dreamer, the believer, the holder, the rhyme
in step with the universe, a step out of time
(excerpted from the poem "Free Flight") — Mary Starr Whitney

Now there are diversities of gifts, but the same Spirit. …the manifestation of the Spirit is given to every man to profit withal. For to one is given by the Spirit the word of wisdom; to another the word of knowledge by the same Spirit; to another faith by the same Spirit, to another the gifts of healing by the same Spirit; to another the working of miracles; to another prophecy; to another discerning of spirits; to another divers kinds of tongues; to another the interpretation of tongues: But all these worketh that one and the selfsame Spirit, dividing to every man severally as he will. –I Corinthians, 12:4, 7-11 (Holy Bible, King James Version)

The really valuable thing is intuition. Without it, I could not see how to begin. -- Einstein

Intuition will tell the thinking mind where to look next. – Jonas Salk

Those who guess well are called intuitive; those who are intuitive, however, don't think they are guessing. – Philip Goldberg

I deplore those who have only the facts but not the phosphorescence. – Emily Dickinson

We live beyond the limits of our bodies. – St. Augustine

I simply imagine it so, then go about to prove it. – Albert Einstein

Appendix AK *(continued)*

I never came upon any of my discoveries through the process of rational thinking. –Albert Einstein

For I neither received it of man, neither was I taught it, but by the revelation of Jesus Christ. –Galatians 1:12 (Holy Bible, King James Version)

I shall not commit the fashionable stupidity of regarding everything I cannot explain as a fraud. – Carl Jung

There are two ways to be fooled. One is to believe what isn't so; the other is to refuse to believe what is so. **—** Soren Kierkegaard

…and between your knowledge and your understanding, there is a secret path… — Kahlil Gibran

It's what you learn after you know it all that counts. – Ethel Barrymore

It is, in fact, nothing short of a miracle that the modern methods of instruction have not entirely strangled the holy curiosity of inquiry. — Albert Einstein

The last word on intuition is as far in the future as the first word on intuition is in the past. – Malcolm Westcott

Sometimes serendipity reigns. — Steven Spaner

And ye shall know the truth, and the truth shall make you free. –St. John 8:32 (Holy Bible, King James Version)