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# UP IN SMOKE: USING IN-SCHOOL TOBACCO EDUCATION AND MEDIA LITERACY TO REDUCE SMOKING INITIATION AMONG 7TH GRADE STUDENTS IN A SUBURBAN SETTING

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UP IN SMOKE: USING IN-SCHOOL TOBACCO EDUCATION  
AND MEDIA LITERACY TO REDUCE SMOKING INITIATION  
AMONG 7TH GRADE STUDENTS IN A  
SUBURBAN SETTING

BY

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## ABSTRACT

### **Purpose**

The uptake of smoking by youth under the age of 18 increases the likelihood that they will become lifetime smokers. The CDC recommends best practices regarding tobacco prevention. Among them are community Policies for tobacco-free zones, community initiatives, anti-tobacco media campaigns, and access to quit-smoking resources. The last of these best practices is a recommendation to provide education in the schools. Research shows that evaluation of after-school and in-school programs can be expensive and return mixed results. They may also be difficult to implement given the challenge of aligning with district and state school performance standards. The subject of this research was the implementation of an in-school tobacco curriculum based on Media Literacy, which provides youth with critical analysis skills to decipher media messages that equate the “cool” smoking habit with beauty, confidence and superior status.

### **Methodology**

The population for this study was 470 7<sup>th</sup> graders residing in a Midwestern state school district. Data for a 2009 Smoking Media Literacy program was collected at the beginning and end of a curriculum intervention for a repeated measures T-test evaluation. The aim was to determine if there was a significant gain in smoking media literacy, a decrease in

Pro-Smoking or susceptibility to smoke attitudes and a decrease in intent to smoke.

## **Results**

Significant findings using the robust *T*-test showed that general and smoking media literacy increased from pre- to post-test. Results for Pro-Smoking attitudes were not significant in the *T*-test, but they were significant in preliminary non parametric test with normalized versions of the PSA variables. Intent to smoke results were mixed, with statistically significant movement toward long-term view of intent to smoke, and movement toward non-smoking in the short term. Overall, intent to smoke results were non significant. Despite the increase in the hypothetical test toward Pro Smoking Attitudes and less resilience to Intent to Smoke, the statistically significant and moderate correlative results do indicate that as General Media Literacy and Smoking Media Literacy increased, the Pro-Smoking attitudes decreased, as did the Intent to Smoke. Because of these mixed results, it is suggested that future research using a media literacy curriculum should include a control group and/or longitudinal testing to determine if a similar study might meet core curriculum standards and at the same time address risk behaviors among the suburban middle school population.

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## Chapter 1

### BACKGROUND

Tobacco is the leading cause of preventable death. Over 480,000 people in the United States (Ahmed, 2015) and over 6 million worldwide die each year from tobacco-related diseases. Preventing replacement smokers from adopting the habit is critical as 90 percent of lifelong smokers begin smoking before the age of 18, and 16 percent of those smoked their first whole cigarette before the age of 13 (DiClemente, Santelli, and Crosby, 2009). Prevention methods have been implemented to keep young people from smoking in the first place, but with mixed results. In 2013, The tobacco industry spent \$9.17 billion on marketing in 2015 (Federal Trade Commission, 2015). Smoking, portrayed as cool among celebrities and cultural icons, has long been a rite of passage for teens who want to fit in (CDC, 2014). During early puberty teens experience psychological and physical changes and an increased interest in the opposite sex (Dryfoos and Quinn, 2005). National risk surveys indicate that this early period of puberty, which occurs between the ages 10-15, makes them more susceptible to the excitement of risky behavior and the promise of peer acceptance (Fetor, Coyle and Pham, 2001). In fact, the media targets the youth population and acts as a super peer—dictating fashion, molding interests, influencing lifestyle choices and often promoting products that can be harmful (Glantz, 2005; Rideout, Roberts, and Foehr, 2005). Studies show that experimental use can become habits for the most susceptible individuals after first-time use (Glantz, 2002). Early use of tobacco is also a proven gateway habit to the use of alcohol, marijuana, prescription and hard drugs (Wakefield, Flay, Nichter, and Giovino, 2003; Levine,

Huang, Drisldi, Griffin, Pollack, Xu, Yin, Schaffrn, Kandel, D.B., and Kandel, E.R., 2011).

The history of the tobacco industry exploiting youth susceptibility since the early days of advertising and silent films with promising images of beauty, strength and popularity is representative of how risky behavior and addictive influences have been sold to youth. Since the era of silent film, the U.S. government has taken steps to curb media influence. The overall rate of smoking among adults has dropped steadily and the rate of smoking among youth has dropped nationwide about 6 percent over the past 10 years (CDC, Tobacco Use and United States Teens, 2016). The reduction is significant. Still, 3,800 of youth under 18 who try their first cigarette--2,100 in the same age group= become regular daily smokers (CDC, Tobacco Use and United States Teens, 2016). This phenomenon continues to be a much studied and perplexing problem for tobacco prevention advocates searching for the most effective methods to reduce and eliminate the uptake of smoking among youth under 18. The development of a relatively new field grounded in rhetorical analysis and media literacy, has shown some promise to address the attention-grabbing tactics of marketers selling products to impressionable pre-pubescent children and early adolescents.

The Tobacco Industry spends \$9 billion on marketing each year, through print and online ads, tobacco products depicted in movies and television programs, and sponsored sporting and music events (CDC, Guidelines, 2014). The U.S. Government has instituted policies to protect youth from tobacco marketing, the most recent being the Federal Drug Administration's 2009 Family Tobacco Prevention Act (FTPA) (FDA, 2010). Effective as of 2010, this law prohibits tobacco companies from

sponsoring events, giving away free products and marketing items, like hats, T-shirts and cups to underage individuals. A phased-in 2012 regulation, attached to the FTFA, also required tobacco manufacturers to display graphic images of the negative effects on 25 percent of each product. This is just one of the government's latest attempt to curb the enticement of marketing on tobacco use initiation among youth and reduce continued use of tobacco products among the general population. Other policies have preceded it. Following the peak of tobacco use among U.S. males at 67 percent in the 1950s (CDC, 2009), the U.S. government has made special efforts to curb the media influence of tobacco, beginning with prohibiting television advertising in the 1960s. In 1998, the Tobacco Industry was required by the Master Settlement Agreement to pay a percentage of the money spent on advertising in each state for tobacco prevention efforts (Sloan, Matthews and Trogon, 2004) and the CDC recommended that \$73 million be spent on efforts to ease the burden of tobacco in Missouri (Tobacco Free Kids, 2015). Instead, the money has been funneled into the state's general fund. Even in 2014, only \$107,000 of the \$73 million recommended by the CDC. Every year, the state of Missouri receives at least \$231 million from the tobacco taxes and the legal settlement with the tobacco companies (Tobacco Free Kids, 2015).

The school setting has not always been an effective place for anti-tobacco education and the creation of youth-led counter-marketing, but in recent years, schools have stepped up their efforts to create tobacco free zones by posting no smoking signs around school property, (72%), by forming community health councils (27%) and by prevention helps through their health services and with outside

providers. Schools also have found ways to provide tobacco prevention as part of their health education program (85%). Commendable as they are in effort, nationwide efforts are underfunded. For example, budget shortfalls have state education departments deciding what programs to cut (Missouri Department of Elementary and Secondary Education, 2015). Health programming is not always at the top of that list, and the nation's youth continue to smoke and use tobacco. The Centers for Disease Control online pamphlet, *Tobacco Use and United States Students* (2015) said "41% have ever tried cigarette smoking, 16% smoked cigarettes on at least one day during the 30 days before the survey and 6% smoked cigarettes on 20 or more days during the 30 days before the survey. Nine percent ever smoked at least one cigarette every day for 30 days." To counteract the uptake of smoking, school districts offer students the opportunities to "practice communication, decision-making, goal-setting, or refusal skills related to tobacco use prevention. After-school programs like Turning Resources and Energies in New Directions (TREND) and Supporting Teens at Risk (STAR) have been put in place to strengthen youth social and resilience skills. Service-learning and health education are also part of the school day to provide positive engagement opportunities and learn about avoiding harmful situations. However, the instruction often is not connected to the core academics; less time and fewer staff are dedicated to helping youth make healthy choices and teaching the hazards of using harmful substances (Valente, 2003). The after-school programs fall short as they only reach the self-selecting youth, meaning those students who are more likely to be active in school activities and more resilient to risk behaviors in the first place. Students who experiment with risky behaviors often feel alienated due to

their choices or social status and are not as likely to benefit from such programs (Valente, 2003). In the meantime, teachers are compelled to monitor behavior and investigate reports of illegal use of tobacco or other substances instead of teaching the academics, while helping their students meet performance standards. Time, money and opportunity can be wasted for educators and students alike. The effects of these factors devolve to dissatisfied parents and the decline of school performance, which may subsequently impact whole communities (Johnston, et al., 2010)

So, are there solutions? Is there a way to blend media literacy, civic engagement and health education in the school day and achieve better academic performance and empower student resilience to risk behaviors? The purpose of this study is to examine the results of an in-class media literacy program delivered during regular school hours and intertwined in the daily curriculum, and to determine its effectiveness at reducing intent to smoke among the participants. The curriculum was designed to follow youth tobacco education recommendations of the Institute of Medicine, based on a study by Brian Flay (Institute of Medicine, 2007).

### **Conceptual Framework for This Study**

Exposure to media content featuring smoking increases the rate of uptake among young people (Pierce and Wong, 1998; Dalton et al., 2003; Charlesworth and Glantz, 2005). It is also known that tobacco education, as it has been traditionally presented in school curriculum, has lacked long-term effectiveness (Flay, 2007). Countering risky behavior among teens ages 11-14 is an age-old problem for educators, public health officials, and significant adults in students' lives, especially

when media technologies and strategies make effective intervention a moving target for prevention strategists. Controlling media access and tobacco marketing exposure 24/7 to youth is impossible, but early studies indicate a solution may lie in arming them with skills inherent in the core principles of media literacy training. Media literacy is often defined as the ability to “understand, analyze, evaluate and create messages in a wide variety of forms” (Hobbs and Frost, 2011). It is not intended to replace tobacco education, which teaches young people about the harmful effects of cigarette smoke. Instead, media literacy may provide the youth population tools to deconstruct the strategic methods tobacco companies use to influence their behavior. Consequently, media literacy contributes to the reduction of intent to smoke by teenagers (Primack, Gold, Switzer, Hobbs, Land, and Fine, 2006). In the past, educators have also provided life skills training (resilience training) and education about the ill effects of substances like drugs, tobacco, and alcohol (Flay, 2007), but applying the core concepts of media literacy to tobacco advertising has proven a significant intervention to use against the super peer influence of the media (Primack, et al., 2006). In recent years, scholars studying the issue for the Center for Disease Control (2005), the American Association of Pediatrics (Rich, 1999) and The Institute of Medicine (Flay, 2007; IOM, 2007) have recommended research-based best practices when introducing curriculum in schools. They include the following recommendations considered to increase resistance and decrease decay (later lapses to smoke) through several assets:

- Include a media literacy component to complement tobacco education.
- Provide 15 lessons of in-class instruction.



- Include community outreach including advocacy and media (civic engagement).
- Add reinforcement to later grades to increase resistance among youth and reduce decay in the resolve to not smoke over time.
- Create media messages to counter-act those disseminated by the tobacco companies. (IOM, 2007)

Tobacco companies leverage every persuasive technique to sell their products—through music, billboards, product placement on television, in movies, and at concerts and sporting events. In the past, youth under 18, the legal age to smoke in most states, may have been given buttons, banners and T-shirts. Overall, youth are susceptible to the daily barrage of messaging that comes in layers of text, images and sounds. The concepts of media literacy are not new to the idea of understanding messages, analyzing purpose, or deconstruction of content. As a field of study, media literacy took hold in the 1990s when Elizabeth Thoman and a group of other educators developed core principles that would help everyone—regardless of age or discipline—understand any message whether it was delivered in print, on air, or online. Thoman and her cohorts founded the American Media Literacy Association (AMLA) known since 2008 as the National Association for Media Literacy Education (NAMLE). Their work placed core media literacy values into three distinct areas: 1) audience and analysis, 2) messages and meaning, and 3) reality and representation. They then developed five questions to assist in the inquiry:

1. Who created this message?
2. What techniques are used to attract my attention?

3. How might different people understand this message differently from me?
4. What lifestyles, values and points of view are represented in, or omitted from this message?
5. Why was this message sent?

Tobacco media researchers first took note of these core principals and applied them to training youth participating in anti-tobacco groups, (Bergsma, 2004).

Programs were developed for after-school. In 2004, Brian Primack, M.D. (2006) developed 15 smoking media literacy (SML) lessons and delivered them to a mostly Caucasian urban high school in Pennsylvania. His purpose was to test a theory of human behavior known as reasoned action, which had previously been used to predict adolescent smoking (Ajzen and Fishbein, 1980). However, he added another variable, media literacy, to the model to depict the intervention and the resulting effects on attitude and norms regarding smoking and the participants' intentions to smoke.

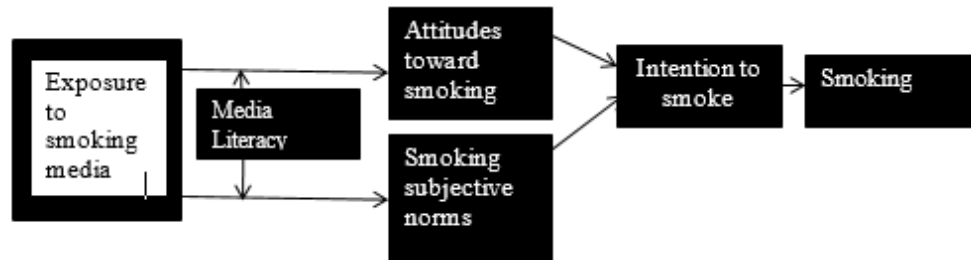


Figure 1. *Theory of Reasoned Action. Conceptual diagram adding media literacy to create mass media model for reasoned action. Individual attitudes toward smoking and external subjective norms (community, peer and family) may impact intent to smoke (@Primack, et. al., 2006).*

Participants were introduced to the primary concepts of inquiry to decipher tobacco marketing messages. His study measured the relationship between the

participants’ intent to smoke or smoking behavior, based on their attitudes and perceptions of norms before and after receiving smoking media literacy instruction. He had two priorities for his study: 1) Did the instrument for pre- and post-tests to the intervention pass validity tests, and 2) was there a significant drop in intent to smoke among students who received smoking literacy instruction? (Primack et al, 2006)

Table 1.  
*Media Literacy Domains and Core Concepts Framework*

Authors and Audiences	AA1: Authors create mass media messages for profit and/or influence
	AA2: Mass Media Authors target specific audiences
Meanings and Messages	MM1: Mass media messages have inherent values or points of view
	MM2: Different people interpret mass media messages differently
	MM3: Mass media messages affect attitudes and behaviors
	MM4: Mass media messages are developed using multiple production techniques
Reality and Representation	RR1: Mass media messages alter/filter reality
	RR2: Mass media Messages omit information

Table 1. *The above model represents an integration of two theoretical frameworks. Elizabeth Thoman developed examples of Media Literacy domains defined by C. Bazalgette (Thoman, 2003).*

The table above shows the media literacy constructs. Another dimension to the media literacy concepts listed in the table above are constructs specific to smoking media literacy (SML). In Primack’s instrument these consisted of 18 items, representing three domains and eight core concepts of media literacy. The scale contained four items representing the Authors/Audiences domain, nine representing the Meanings/Messages domain and five designed to top the Representation/Reality dimension. Representative items include “Tobacco companies are very powerful, even outside the cigarette business” (Authors and Audiences); “When people make movies and TV shows, every camera shot is carefully planned (Meanings and Messages) and “Advertisements usually leave out a lot of important information”

(Representation/Reality). (Primack et al., 2006; Bier, M. Schmidt, S., Shields, D., Zwarun, L. Sherblom, S., Pulley, C., and Rucker, B., 2011).

### **Statement of the Problem**

Strong empirical evidence indicates that reducing exposure to tobacco marketing reduces smoking initiation in adolescents (Charlesworth and Glantz, 2005). The ubiquitous access and presence of media, however, makes that impractical and unreasonable. Also, despite the U.S. Government's attempts to reduce tobacco marketing through the Master Settlement Agreement of 1998 (Roberts, Henricksen, and Christenson, 1999), tobacco marketers have by-passed restrictions with sponsorships of events, outdoor advertising, wearable advertising, point of display enticements, and other strategies to recruit replacement smokers for the 443,000 who quit every year (Roberts, et al., 1999). Although great strides are being made by school districts enacting no-tobacco zones, policies to protect youth outside of school property from tobacco are rendered ineffective by poor implementation or outright defiance by tobacco retailers. For example, the 2009 passage of the Family Tobacco Prevention Act (FDA, 2010) took effect in July 2010, but 2012 surveillance in Saint Louis County by the St. Louis Tobacco Free Coalition indicated compliance was spotty, especially in and around independently owned stores within 1000 feet of schools (Pulley, 2011). Moreover, FTPA restrictions regarding graphic warnings on all tobacco products were scheduled to take effect in 2012, but manufacturers are taking legal action claiming that their First Amendment Rights are in jeopardy (FDA, 2011). The reality is that policies and laws governing media may come and go, but adolescents will continue to experience the changes of puberty that make them

susceptible to media influence, peer pressure, and acting on their desire for independence. As mentioned before, media literacy shows promise in buffering the effects of the media, the super peer in this equation. Delivering smoking media literacy in a cross-discipline environment to middle school students could serve to validate earlier studies of its efficacy.

Although there had been other curriculum developed with media literacy components, Primack's study (2006) was ground-breaking for two reasons 1) It facilitated the development of a smoking media literacy curriculum, and 2) it tested the validity of an instrument that could measure the three domains of media literacy principles and its sub-core concepts—audience and analysis, messages and meaning, reality and reliability. While it was the researcher's intent to study the effects of smoking media literacy (SML) on teens, he sampled high school teens, most of whom were past the age of first experimentation with tobacco. On the up side, his instrument passed the validity tests of measuring what was intended, providing a foundational model for further research. A logical next step, then, is to extend his work to a middle school population in their early teens, closer to the age youth experiment with their first cigarette. The need to test this strategy at the pre-teen and early teen age level is vital. At the time this intervention was conducted, 47% of all youth had tried smoking by age 13, and 16% of those were set to become lifetime smokers (CDC, 2015).

Another barrier to testing and implementing SML is the lack of classroom time to devote to such endeavors. With the expectations for improved performance, standards testing and increased accountability, and limited budgets, schools have

pushed back on experimental curriculum in favor of approved lesson plans that meet the state standards. A way to achieve collaboration on an efficacy study like this is to link the topics and modules to required state instructional standards as illustrated in Table 2. Schools are required to address these Information Literacy Standards; a curriculum that potentially links to those standards serves an existing need.

Table 2.  
*Media Literacy Framework and Core Curriculum Standards*

Category	Media Literacy Concept	Overall Show Me Standard	State Performance Standard
Authors and Audiences	<p><b>AA1:</b> Authors create mass media messages for profit and/or influence.</p> <p><b>AA2:</b> Mass Media Authors target specific audiences.</p>	<p><b>CA: Goal 1:7</b> Evaluate the accuracy of information and the reliability of its sources</p> <p><b>CA: Goal 1:9</b> Identify, analyze and compare the institutions, traditions and art forms of past and present societies</p>	<p><b>Information Literacy 2A:</b> Identify how audience and purpose affect information needed.</p> <p><b>Reading: IAb.</b> Compare, contrast and analyze connections. Text, to text, text to self, text to world.</p> <p><b>Writing: 2A:</b> Compose text showing awareness of audience.</p>
Meanings and Messages	<p><b>MM1:</b> Mass media messages have inherent values or points of view.</p> <p><b>MM2:</b> Different people interpret mass media messages differently.</p> <p><b>MM3:</b> Mass media messages affect attitudes and behaviors.</p> <p><b>MM4:</b> Mass media messages are developed using multiple production techniques.</p>	<p><b>CA: Goal 2:3</b> Exchange information, questions and ideas while recognizing the perspectives of others.</p> <p><b>CA: Goal 1:7.</b> Identifying and evaluating relationships between language and culture</p> <p><b>CA: Goal 1.10</b> Apply acquired information to ideas and skills to different contexts as students, workers, citizens and consumers.</p> <p><b>CA: Goal 1.4</b> Use technological tools and other resources to locate, select and organize information</p>	<p><b>Reading 3Ci:</b> Determine or compare authors' viewpoints.</p> <p><b>Reading 3A:</b> Explain and analyze text features to clarify meaning, emphasizing consumer texts.</p> <p><b>Reading 3Ba-c:</b> Identify and explain examples of sensory details, figurative language, and basic literacy a. hyperbole, b. imagery, c. propaganda.</p> <p><b>Listening IA:</b> Listen critically to recognize and interpret propaganda techniques.</p> <p><b>Information Literacy 4A:</b> Identify and explain media techniques used to convey messages.</p> <p><b>Listening and Speaking 2A:</b> In discussions and presentations use media.</p>

Category	Media Literacy Concept	Overall Show Me Standard	State Performance Standard
Reality and Representation	<p><b>RR1:</b> Mass media messages alter/filter reality</p> <p><b>RR2:</b> Mass media Messages omit information</p>	<p><b>CA: Goal 1.6</b> Discover and evaluate patterns and relationships in information, ideas and structures</p> <p><b>CA: Goal 1.2</b> Conduct research to answer questions and evaluate information and ideas</p>	<p><b>Information Literacy 4Ca:</b> Analyze the source, with assistance, to determine its credibility.</p> <p><b>Information Literacy 4Cb:</b> Evaluate, with assistance, accuracy of information by determining whether it contradicts or verifies other sources.</p>

*Table 3.* Representation of two integrated theoretical frameworks. The first column contains the domains defined by Primack (2006), the second column is adapted from core concepts developed by Elizabeth Thoman, (2003). The third column contains the state's 7th grade information literacy standards.

The gaps in the research may show some gain in student resilience as a result of smoking media literacy training, but most of those studies examined programs delivered outside of class. Primack's model provides a valid and tested structure to test an in-class, cross-curricular program designed to lower the intent to smoke and smoking rate among early teens (2006).

### **Purpose of the Study**

Efficacy of school-based tobacco prevention has been studied with mixed reviews (Glantz and Mandel, 2005), and some researchers, citing methodological flaws, observe that it may not have the intended long-term effect (Wiehe, Garrison, Christakis, Ebel, and Rivara, 2005; Flay, 2007). Flay's evaluation completed for the Institute of Medicine (2007) found school-based prevention programs that include media literacy, cross-curricular approaches and 15 hours or more of lessons, can have significant short and long-term effects (Flay, 2007; Bier, et al., 2011). This justifies further development of school-based programs. This study, an updated replication of

the one done by Bier in rural and urban settings and framed with the media literacy constructs identified by Primack, et al (2006), aims to examine the efficacy of a smoking media literacy curriculum at the middle school level during in-class. In this approach an assigned team of teachers representing different disciplines (English, Social Studies, Health) delivers the Smoking Media Literacy (SML) to students they teach in common. The program focuses on the following questions:

- 1) Will evidence show that suburban middle school students make gains in smoking media literacy over the course of the intervention?
- 2) What is the impact of the intervention on suburban middle school student attitudes toward smoking?
- 3) Will intention to smoke among suburban middle school students decrease following the media literacy intervention?

Data to be used in this study was collected under a 2008-2009 project approved by a Midwestern university's Institutional Review Board. The data was collected during the second semester. Analysis of these data proposes to test the following hypotheses:

*H<sub>1</sub>*: Middle school students who receive 15 hours of methods in media analysis will make significant gains in smoking media literacy.

*H<sub>2</sub>*: Pro-Smoking attitudes among suburban middle school students who received the intervention will decrease.

*H<sub>3</sub>*: Intention to smoke will be reduced among suburban middle school students who receive the intervention.



## **Delimitations**

Although having a strong pre- and post-test sampling result, this quantitative study does have some limitations in the methodology. First, the population sample was selected by target priorities set by the State of Missouri Department of Health. Instead of a random drawing of middle schools, the assignment was to deploy the program in suburban and urban schools. The completed pre-test measure included 975 cases with 711 returning them at the end. A good portion of those, 460 for pre-test and 360 for post, were strictly from the three middle schools where the curriculum was delivered under similar circumstances—in a team-centered approach, by teachers who had received the same training. Program initiation and completion of the main component was within the same month for all. The populations of this particular sub-sample were also similar in terms of demographics and setting.

Another limitation worth noting is that the results may have been significantly influenced by the function of natural maturation (Pierce et al.,1998; Wiehe et al.,2005). The participants represent an age group prone to risk behaviors and exercising independence as they negotiate physical and emotional changes (Dryfoos and Quinn 2005; Fetro, Coyle, and Pham 2001). The discussions about the negative results of smoking have been known to temporarily influence additional interest on negative aspects (Wiehe et al.,2005; Peterson et al.,2000). These issues may be studied further by implementing an intervention that includes a control group.

## **Definition of Key Terms**

*Federal Drug Administration (FDA)*: Government agency designated to regulate tobacco use.

*Family Tobacco Prevention Act (FTPA)* passed in 2009, but took effect in July, 2010.

*Master Settlement Agreement of 1998*. Agreement reached by attorneys general of 46 states and the major tobacco manufacturing companies. This act required annual payouts to states from the tobacco companies to counteract the public burden of tobacco. Money was originally earmarked for tobacco prevention-- tobacco cessation, counter-marketing and education (Roberts, Henriksen, Christenson and Bandy, 1999)

*Media Literacy*. The ability to “understand, analyze, evaluate and create messages in a wide variety of forms” (Hobbs and Frost, 1997; Buckingham, 2003; Thoman, 2003).

*Reasoned action theory*. A behavioral theory where individual considers societal norms and consequences when deciding whether to engage in a specific activity (Primack, et al, 2006).

*Smoking Media Literacy (SML)*: Media Literacy concepts of decoding, inquiry and media creation presented in the context of marketing content delivered by tobacco companies.

## **Background Summary**

Youth continue to be targeted by tobacco companies to replace adult smokers who quit or die each year. Daily, they face a barrage of messages layered in various forms of media. Limiting their access to media is one way to reduce their smoking susceptibility, but that strategy is unrealistic when media reaches them at all hours of the day, on screen, on air and in locations frequented by youth. Another approach made effective by the preliminary research shows that smoking media literacy may buffer the media effects, when delivered in a cross-discipline approach with 15 hours of smoking media literacy lessons in school. Recommendations by Flay (2007), for the Institute of Medicine, indicate that further study of in-school tobacco education systems is warranted. Moreover, the mixed reviews of in-school tobacco education call for a more thorough investigation of media literacy training as a short-term and long-term deterrent to smoking behaviors among youth, specifically early adolescents. Further discussion of previous research and methodologies for this proposed study can be found in subsequent chapters of this dissertation.

## **Chapter 2**

### **REVIEW OF RELATED LITERATURE**

Over the past two decades, research has indicated media messages promoting tobacco have a causal effect on youth starting to smoke (Bergsma and Carey, 2008; CDC, 2009; Singh, T, Marynak, K., Arrazola, K, Cox, S., Rolle, I.V., and King, B, 2016). At the same time, studies have shown that counter-marketing geared to the youth population significantly reduces the use of tobacco (Farrelly, Niederdeppe, and Yarsevich, 2005). As tobacco is often considered an introductory habit to other harmful substances, much research has been conducted to determine best practices for reducing its risk appeal among youth and communicating the profound health issues related to its long-term use. One of the emerging practices to show promise in building immunity to choices of risk is media literacy, generally defined as an inquiry and critical analysis process that can be applied to any persuasive message encouraging counter-productive behaviors. As a component for applications within trans-disciplinary curriculum, media literacy has adaptable properties that deconstruct any message from any medium or about any subject. The literature reviewed in this chapter highlights media literacy and its ability to strengthen youth susceptibility to smoking and to other risky behaviors.

#### **Media Literacy Fits CDC's Recommended Framework**

In recent years, the CDC, Healthy Schools, (2015) has developed a best practice framework for health-conscious schools to reduce smoking. It includes these recommendations regarding tobacco use:

1. Prohibiting tobacco use at all school facilities and events
2. Encouraging and helping students and staff to quit
3. Providing developmentally appropriate instruction that addresses causes tobacco use
4. Delivering consistent messages
5. Implementing prevention tactics within the context of and reinforced by community-wide efforts to prevent tobacco use

Education is ranked among the best practices to reduce tobacco use, yet tobacco curriculum research has been difficult to quantify and has been returned with mixed results. The preventive effect of tobacco education, traditionally presented in health education courses, has not proven to be long lasting (Primack, et al, 2014)—or in psychosocial terms, its resilience effect decays among teens. Susceptibility to risk behavior is a moving target, depending on psycho-social influences an individual teen may experience from his or her physical and emotional changes and the structure of his or her individual social (peer and familial) environment (Carson, Pickett and Janssen, 2011). Loss of resilience is highly correlated with media influence; it is an engulfing, ever-present influence, acting as a super peer, sometimes out of sight and sound of parents or other significant individuals who could steer youth to better choices (Carson, et al., 2011). Refining risk prevention education to include more media literacy elements may provide a counter-influence, but it is a low priority for policy makers. In fact, despite its own Healthy Schools recommendation, in-school tobacco education has fallen off the prevention scale in terms of overall effective anti-tobacco best practices because it has not been quantified (CDC, Best Practices, 2015).

Trends in prevention policies run through cycles of community involvement, tobacco free policies, retailer surveillance, tobacco counseling by professionals and parents, and finally education. Policies controlling tobacco may change with the political wind, and community norms may reduce its prevalence. However, the nature of human maturation predicts there will always be young people experimenting with tobacco, a gateway substance that often leads to the use of harder drugs (Levine, et al., 2011), and there will always be media influences. Assuming these observations are accurate, the need remains for a curriculum that mimics the lead initiatives by addressing the most salient of influences—the media. An effective curriculum may 1) increase community (media) awareness of tobacco’s dangers, 2) strengthen resilience against tobacco use through media literacy training and 3) impact youth attitudes against smoking. Achieving all these objectives requires due diligence in designing an experiential and critical analysis curriculum such as *media literacy* that keeps pace with the technological developments that make tobacco marketing a dangerous tool of influence (CDC, Notes from the Field, 2013)

**Addressing Media as a Super Peer.** Controlling media access and tobacco marketing exposure 24/7 to youth is impossible, but early studies indicate a solution may lie in arming them with the core principles of media literacy training. Media literacy is often defined as the ability to “understand, analyze, evaluate and create messages in a wide variety of forms” (Hobbs and Frost, 1997; Buckingham, 2003; Thoman, 2003). It is not intended to replace tobacco education, which teaches young people about the harmful effects of cigarette smoke. Instead, media literacy gives youth the tools to deconstruct the strategic methods used by tobacco companies to

influence teen behavior. Consequently, media literacy contributes to the reduction of intent to smoke by teenagers (Primack, et al., 2006; Slater, M.D., Kelly, K.J., Lawrence, F, Stanley, L.R. and Comello. M. L. G., 2011). In the past, educators have also provided life skills training (resilience training) and education about the ill effects of substances like drugs, tobacco and alcohol (Flay, 2007), but applying the core concepts of media literacy to tobacco advertising has proven a significant intervention to use against the super peer influence of the media (Primack, et al., 2006; Primack 2015). In the previous decade, scholars were commissioned to study the issue for the Center for Disease Control, the American Academy of Pediatrics (Rich, 1999) and the Institute of Medicine (Flay 2007). Flay's research was published as a resource for educators. The book, *Ending the Tobacco Problem*, is still part of the library the CDC promotes among its research-based best practices when introducing curriculum in schools. They include the following recommendations considered to increase resistance and decrease decay (later lapses to smoke) through several assets:

- Include a media literacy component to compliment tobacco education.
- Provide 15 lessons of in-class instruction.
- Include community outreach including advocacy and media (civic engagement).
- Add reinforcement to later grades to increase resistance among youth and reduce decay in the resolve to not smoke over time.
- Create media messages to counter-act those disseminated by the tobacco companies (IOM, 2007)

These recommendations were made prior to the consideration that exposure to tobacco messaging occurs more than ever through exposure to tobacco-related, point-of-sale promotions, product placement in theatrical trailers, and counter-productive industry-sponsored “prevention” messages (Farrelly et al., 2005; Wakefield et al., 2003). Recent reports from the Federal Trade Commission (2015) that the tobacco industry is now as able to market to youth as it was prior to the 1998 Master Settlement Agreement (Sloan, Mathews, and Trogdon 2004) that required the tobacco industry to curb or cease some of its marketing strategies. Because of these ongoing promotional tactics, a potentially more powerful strategy available to public health advocates would be to promote media literacy. Organizations such as the American Academy of Pediatrics (1999), the Centers for Disease Control and Prevention, (2009) and the Office of National Drug Control Policy (2001) recommend media literacy to buffer the impact of mass media messages on adolescent smoking. Consequently, many organizations integrate elements of media literacy into their instructional programming.

**Media Literacy as a Field of Study.** Media literacy may be considered a new field of study, but its origins and its application of analysis to media, dates back nearly 40 years. Media literacy’s historical underpinnings are linked to principles of classical rhetoric that could be traced to ancient Greece. The philosophical framework for media analysis changes, depending on scholarly presentation. James Potter (2004) has reviewed the research and has this to say about the many scholarly definition of media literacy: “Media literacy is really the convergence of three huge bodies of



knowledge: media studies (the industries, content, and effects), human thinking (how people attend to messages and construct meaning), and becoming educated (p.23).

Media literacy is a useful term for giving critical thought and reflection to anything attached to print, image or sound. Versions of its definition have been applied to the public arena in the areas of policy, cultural, parenting, pedagogy or from the pen of well-known media analysts like Marshall McLuhan (Potter, 2004). Singer and Singer (1990) viewed pedagogical media literacy as a means for teaching critical viewing in children, noting the movement to include media literacy gained some initial acceptance in the 1970s, but it was short-lived. It did, however, resurge in the 1990s. What puzzled media literacy advocates (Kubey,1998) during its waning years in the 1980s was that the U.S. exported most of the media, yet used media literacy education less than countries in Europe. Also puzzling was that U.S. schools spent an increasing amount on technology that increased media consumption during the school day and almost nothing on pedagogy to effectively leverage its potential for leveraging classroom learning (Semali,2000).

The “media literacy” field of study is rich—and wrought—with a few theoretical frameworks. Its definition differs among groups claiming to be media literacy advocates. For example, among mass communication scholars, the concept of media analysis is framed by the theory of social comparison. Among educators, its critical pedagogy provides students with an empowering framework that makes them savvy media consumers who learn to decipher the meaning, purpose and author behind the message.

The mass media and communication field defines media literacy from several perspectives. Potter (2004) conducted an open response survey at a symposium asking *Journal of Communication* scholars to define media literacy. The answers covered a wide range of definitions. A review of the communication literature bears this out. Two of them, Adams and Hamm (1989), define media literacy as “creating personal meaning.” Others take an authorship stance with media literacy providing skills to create “some purposeful action.” Sholle and Denski (1995) consider media literacy to be a critical perspective, while Silverblatt and Eliceiri (1997) concur that it “empowers” the development of independent judgment about media. Renee Hobbs (Hobbs and Frost, 1997), a pioneer media scholar was one of the first to apply media literacy in a pedagogical or school setting. She defines media literacy as “the ability to access, analyze, evaluate, and communicate messages in a variety of forms.” Potter asserts that the variety in responses indicates media literacy’s importance, but the perspectives needed to be more unified. In 1992, Hobbs and a few other media literacy advocates attended the National Leadership Conference in Media held in Aspen, Colorado to address just that (Aufderheide, 1993). The result was a consensus to ascribe to Hobbs original definition. (Center for Media Literacy, 2011).

**Developing a Trans-Disciplinary Framework.** Following the Aspen Summit, Hobbs and other noted media literacy advocates, Elizabeth Thomann, Frank Baker, and Lynda Bergsma, among others, combined expertise, vision and resources to form the American Media Literacy Association (AMLA), known since 2008 as the National Association for Media Literacy Education (NAMLE). They developed core principles that would help everyone—regardless of age or discipline—understand any

message whether it was delivered in print, on air, or online. Their work placed core media literacy values into three distinct areas: 1) Audience and analysis, 2) messages and meaning, and 3) reality and representation. They then developed five questions to assist in the Media Literacy analysis:

1. Who created this message?
2. What techniques are used to attract my attention?
3. How might different people understand this message differently from me?
4. What lifestyles, values and points of view are represented in, or omitted from this message?
5. Why was this message sent?

The questions move the definition of media literacy one step past the Hobbs definition. They imply it isn't enough to merely possess the ability to access, analyze, evaluate, and communicate messages in a variety of forms, "one must also be able to know the context of the message as well" as recommended by Duran, Yousman, Wash, and Longshore (2008). The context determines the type of persuasive message, why a message appears as it does, who created the message, who might be affected by the message, where alternative messages might be found, and how to use the information for change. The desired outcome of media literacy education is strengthening the ability of students to deconstruct, analyze and evaluate (Yates, 2004).

**Media Literacy: Effective Treatment for Social Ills.** Media literacy, as it was defined by NAMLE and the Aspen Institute, has taken on a larger role than just providing a framework for critical analogy. It has become a valuable tool for practical

intervention in public policy, social justice, and health issues. In fact, the NAMLE stance was inspired by the critical pedagogy of Paulo Freire (1970, 1973) because it attended to not only media analysis, but also addressed social justice and individual empowerment (Bergsma, 2004).

*The Media Literacy solution in schools.* Tobacco media researchers first took note of the core principles and applied them to training youth participating in anti-tobacco groups, (Bergsma, 2004). Curriculum were developed for after-school programs. Research about the impact of media literacy education as a curricular vehicle for delivery health education is scarce before 1998 (Singer and Singer), but with the increased interest in performance and health outcomes, researchers became interested in empirical studies (Singer and Singer, 1998). A meta-analysis was performed by Bergsma, who expanded her media literacy role as a health literacy advocate, NAMLE co-founder, and director of Arizona's Rural Health Initiative (2008). The result of her review was a call to produce research that would convince school administrators of the value of media literacy in health education (Bergsma and Carey, 2008). The Committee on Public Education of the American Academy of Pediatrics (CPEAAP, 2001) endorsed that call with a cultural diagnosis on American children: "They suffered with violence and aggressive behavior, sexuality, poor academic performance, body concept, self-image and nutrition; dieting, obesity, substance use and abuse patterns" (CPEAAP, 2001). Media was charged as a major contributor to these physical and social maladies, and the attention was turned to the effects of media advertising on children.

Two researchers, Livingstone and Helsper (2006) recommended “inoculating” children of any age with an understanding of media literacy to mitigate media’s counter-productive influence. They also recommended a second look at media literacy as an application for policy change, health intervention and as a means of evaluating media’s effects. Bergsma and her research partner Carey, answered Livingstone and Helsper’s call with a systematic analysis that identified variables related to media literacy intervention. Initially, they started with 65 sources published since 1990 and narrowed them to 23. Their goal was to discover the context and process elements effective health interventions that promoted media literacy education. Searching databases, Bergsma and Carey used specific key words in studies to identify dependent variables—the intervention setting, length of the program, specific skills taught and who delivered the training. The keywords defined included 1) media literacy, 2) media education, 3) television education and 4) media analysis.

The researchers set forth some criteria for the studies they reviewed: 1) They wanted a historical representation of media literacy education. They went back to the earliest empirical studies related to media literacy education they could find, 1990, and included the most recent available (2006) in their analysis. 2) They searched for peer-reviewed studies in public and academic indexes. 3) They set a standard instruction length of 25 minutes to ensure the impact of the media literacy intervention was measurable. They felt that shorter interventions could not effectively teach media literacy skills. If media literacy was a sub-component of a more comprehensive curriculum, the researchers also sought to measure only the teaching

of media literacy skills, rather than the entire health curriculum. The skills operationalized included:

- the ability to access useful media, analyze media messages for bias and source credibility,
- determine fact from opinion by identifying the purpose of a message, evaluate a message in terms of truthfulness and relevance, and
- create messages per specific goals.

A set of standard public health issues emerged from Bergsma and Carey's (2008) meta-analysis. They included all the usual suspects: eating disorders (nine), violence prevention (six), nutrition (two), and body image distortion (one). Thirteen of the studies involved children, seven involved teens, and three included college students. Strengthening the meta-analysis was the fact that 19 of the studies had a control group, and one had two control groups. Only three studies had no control group. The structures of the interventions also varied: length, setting, who taught the intervention, the core concepts taught, and the effectiveness of the intervention. The setting for the training personnel and the method of training were also an important factor. Nineteen of the interventions took place in schools and in 11 of them, the researcher herself delivered the curriculum. Four of the interventions were delivered by teen peers. The methodology for Bergsma and Carey separated the dose (length of the media literacy instruction), but no conclusion was drawn from the length of the intervention. In fact, the results were mixed, but Bergsma and Carey could identify what health issues should be addressed through behavior outcomes and also those that would be better served through understanding knowledge or attitudes. Further

research could factor out those variables that influence behavior and those that influence knowledge or attitudes. They recommended that future principal investigators would have to evaluate the priority based on their population and some of the independent variables like setting (in-school or out-of-school).

### **Tobacco Media Literacy: A Moving Target**

Tobacco traditionally has been a priority topic for research with the literature focusing mostly on addiction factors, smoking prevalence, public policy and social norms and media messaging. It is the latter, media messaging that overlaps the three previously mentioned categories. And tobacco marketing, with its attending means for persuasion to use a harmful, yet legal and often socially acceptable substance, makes its avoidance problematic. Its delivery platforms include evolving technological devices (from the tabloid press to the mobile phone), and growing networks for delivery channels from single-source messaging (traditional broadcast media) to infinite-source messaging (social networks.) These complex systems, revolving around tobacco media, justify teaching analysis through a media literacy framework. In short, the tobacco industry is the perfect target for teaching media literacy skills.

**Making the Case to Fund Media Literacy.** Tobacco media literacy, with its increasing traction to reduce intent to smoke may result in reducing tobacco's burden on society that has been assessed regularly since the 1980s. At the time this curriculum was deployed, the CDC's Morbidity and Mortality Weekly Report for January 2009 stated that from 2000-2004, over 443,000 people died, with an annual loss of

5.11 million years of potential life (CDC, 2009, State Specific Smoking). And although the smoking rate among American males has declined since the late 1950s (from over 60 percent to 21 percent nationwide), tobacco continues to increase its spending on marketing to find replacement smokers for those that pass away or quit (FTC, 2010). The government has taken measures to reduce the burden of tobacco with \$193 million spent annually by smokers and \$97 billion lost in productivity every year (CDC, 2009). In the 1990s, attorneys general from 46 states sued four of the largest tobacco companies for blatant dishonesty about the harms of tobacco. The result was the 1998 Master Settlement, in which the attorneys general settled to cover Medicaid costs of smoke-related illnesses and tort litigation costs. In exchange, the tobacco companies agreed to stop or curtail some of its tobacco marketing practices and to pay out funds annually to educate the public about the harms of tobacco use and provide cessation services. In theory, it was a good plan. And for some states, particularly Missouri, it still is just that, a theory. Payouts to states are set by the number of potential smokers and tobacco marketing dollars spent within a state. For the state of Missouri, the CDC recommended \$72.3 million for cessation, education and counter-marketing efforts. From the date of the agreement, the State of Missouri has only budgeted \$7.5 million over a period of four years (Center for Disease Control: State System, 2015). By 2015, that amount had not nudged, and now the state spends only one tenth of one percent (.10), even dropping to \$67,000 in 2013. The funds meant to lower the tobacco and its attending annual health costs (\$2.14 billion) and loss of productivity (\$2.41 billion) have gone into the state's general fund coffers (MDHSS, 2010) to cover a diminishing state budget. This has left tobacco



prevention advocates in public health, health care, government and education scrambling to find means to effectively counter the persuasive tactics of tobacco. One of those efforts has been to strengthen the partial clean air policies that went into effect in the St. Louis region in 2011. Success has occurred in small waves with ordinances passed in five of Missouri's major metropolitan areas, but there are exemptions that impact health disparities experienced by hospitality and service workers and those of lower socio-economic status. Following an initial rise once the policy was in place, the smoking rate among adults stayed the same (25 percent in the Greater St. Louis area) (St. Louis County Department of Health, 2011), and tobacco use among youth has risen slightly (MDHSS, 2010), giving even more reason to increase education efforts among youth, the replacement smokers who quit or die from the effects of tobacco use.

**Tobacco's Latest Marketing Tactics.** The Missouri situation is a microcosm of the tobacco issue nationwide, reflecting even more the importance of curbing its use. Despite the agreement to curtail marketing, tobacco companies are finding new ways to compete against anti-tobacco policies, and in the process, adopt replacement smokers from the youth population. With Clean Air Initiatives on the rise around the country, smoking rates are down and so is overall tobacco marketing, but tobacco companies aren't going to stop selling their addictive products. The Federal Trade Commission (2013) reports that spending for marketing smokeless products had more than doubled since 2005, from \$250.8 to \$503.9 million in 2013. Anticipating a change in community norms that lower tobacco use, tobacco

companies have been churning out products tailored to youth. They have also doubled their marketing on smokeless tobacco (Tobacco Free Kids, 2010).



*Figure 2.* Smokeless tobacco items. These are made with packaging similar in size to cell phones are the latest products to be released by the tobacco industry. A few products introduced in the past four years may look inviting, but they still contain the addicting nicotine.

Smokeless tobacco items made with packaging similar in size to cell phones are the latest products to be released by the tobacco industry. A few products introduced in the past four years may look inviting, but they still contain the addicting nicotine and other toxic ingredients linked to oral cancers, gum disease, nicotine addiction and heart disease (FTC, 2010). Despite a warning from Camel the manufacturer that the dissolvables can cause cancer, these products are popular among youth and adult smokers (Alecia, 2010).

One of the most popular products in recent years is Snus, a nicotine product with origins from Europe (Tobacco Free Kids, 2010). Snus comes in tiny pouches resembling small tea bags of finely chopped tobacco and is used discreetly by placing it between the gum and the lip. It also comes in a variety of flavors, a known enticement for potential young tobacco users. The newer flavored dissolvables, Orbs, Sticks and Strips, have been dubbed “tobacco candy” and have been made from tobacco that is finely ground and held together with food binders. The tobacco

companies say they are offering the products to adults as a step to reduce or stop smoking, (Alecia, 2011), but the cell-phone sized packaging for these products is slick with bright colors. In fact, there are reports that small children mistake the products for candy and have been treated for nicotine poisoning. They have mistaken the flavored nicotine sticks for toothpicks, the nicotine pellets (Orbs) for a Tic Tac and dissolvable nicotine strips for a breath mint strip (Connolly, Richter, Aleguas, Pechaceck, Stanfill, and Hillel, 2010). One small pellet is enough to make a child sick and a whole handful could be deadly.

*Media Literacy: An Urgent Matter.* With tobacco products designed to appeal to youth, and with tobacco companies doubling their marketing budgets, the work of tobacco media literacy is even more urgent. Changes in policy cannot prevent by 100 percent the continual adoption of new smokers. A study commissioned by the Institute of Medicine by Flay (2007) bears this out.

The use of media literacy constructs to mitigate tobacco marketing messaging has a continuous history, beginning with the Truth Campaign, launched by the American Legacy Foundation in 2000. Farrelly, et al., (2005) studied the impact of the campaign on national youth smoking rates. Using the data from the Monitoring the Future Survey, they conducted a pre/post quasi-experimental design to relate trends in youth smoking prevalence to varied doses of the Truth Campaign in a national sample of approximately 50,000 students in grades 8, 10 and 12. Comparable data was used from annual surveys administered from 1997 through 2002. The findings indicated that smoking prevalence was reduced among youth. Smoking rates dropped from 25.3% in 1997 to 18% in 2002, showing the campaign was associated

with substantial declines in youth smoking and accelerated declines in youth smoking prevalence.

In a “Truth” study preceding Farrelly’s, Jeff Hicks (2001) incorporated principles of media literacy and included discussions of corporate tobacco’s motives. Following the “Truth” campaign, media literacy studies done by Pinkleton, et al., (2007) showed that media literacy improved outcomes related to behavior (decreased smoking activity), increased knowledge and improved attitude toward never smoking. The positive effects were significant for both experienced smokers and those who had never smoked. The purpose of these programs was to reduce the rate of adoption of early smokers and reduce the intent to smoke. While there are other samples of studies that include generic or traditional forms of tobacco education, i.e., the focus on the health effects and resilience training, the discussion here will address studies using media literacy constructs. Three more studies examined the effect of media literacy on smoking. One, by Banerjee and Greene (2007) was based in inoculation theory, asking youth to analyze messages using two core concepts (media are constructed messages) and production (creating media). A second by Gonzales, (2004) bore out similar results with a population sample of Hispanic youth. Admittedly, the homogenous nature of the Hispanic population was a limitation, but its strength was in line with addressing the trend of increased Hispanic youth smoking. The most intensive and longest study (two years) effectively taught core concepts one (media are constructed) and five (media message are created for profit).

**Developing a Model Media Literacy Research Scale**

Media literacy appears to have a significant positive relationship to inoculate students from smoking behavior, according to researcher Primack and his cohorts (2006). They took the issue further than previous scholars. Their goal? Developing a scale that standardized the constructs of media literacy delivered to subjects (questions 1-5). (See Table 3 below)

Table 3.  
*Media Literacy Domains and Core Concepts*

Authors and Audiences	AA1: Authors create mass media messages for profit and/or influence.
	AA2: Mass Media Authors target specific audiences.
Meanings and Messages	MM1: Mass media messages have inherent values or points of view.
	MM2: Different people interpret mass media messages differently.
	MM3: Mass media messages affect attitudes and behaviors.
	MM4: Mass media messages are developed using multiple production techniques.
Reality and Representation	RR1: Mass media messages alter/filter reality
	RR2: Mass media Messages omit information

Table 4. *The above model represents an integration of two theoretical frameworks Bazalgette, 1992, (on the left); Thoman, 2003, (on the right).*

The table above shows the media literacy constructs. Another dimension to the media literacy concepts listed are constructs specific to smoking media literacy (SML). In Primack’s instrument these consisted of 18 items, representing three domains and eight core concepts of media literacy. The scale contained four items representing the Authors/Audiences domain, nine representing the Meanings/Messages domain, and five designed to tap the Representation/Reality dimension. Representative items include “Tobacco companies are very powerful,

even outside of the cigarette business” (Authors/Audiences); “When people make movies and TV shows, every camera shot is very carefully planned” (Messages/Meanings); and “Advertisements usually leave out a lot of important information” (Representation/Reality) (Primack et al., 2006, Bier et al., 2011). He developed 15 smoking media literacy (SML) lessons and delivered them to a mostly Caucasian urban high school in Pennsylvania. He wanted to test a theory of human behavior known as reasoned action. This theory had previously been used to predict adolescent smoking (Ajzen and Fishbein, 1980). The basis of this theory is that an individual’s intent and his or her attitudes and perceptions of the norms toward a behavior determine whether he or she will engage in the risk. Using this theoretical approach and delivering lessons that featured each of the five questions in the media literacy framework developed by Thoman and the Center for Media Literacy, Primack intended to develop a “smoking media literacy” scale by using empirical survey data.

**Developing the Scale.** In the initial design phase, Primack developed 120 potential items, and then filtered them after feedback from experts and students. The 1,211 high school students, drawn from the school’s 1,690 enrollment, ranged in age from 14 to 18. A near equal number of males and females responded and their mean age was 15.9. Although this is a “city” high school, this school was predominantly white, and the demographics of the sample bore this out. There were few African Americans and Latinos, populations that often experience disparities due to tobacco. The incidence of smoking was determined among the respondents, with 19% reporting smoking in the past 30 days and 50% classified as susceptible to smoking.

The respondents were introduced to the primary concepts of inquiry to decipher tobacco marketing messages. The instrument included “cross-sectional responses to scale items, demographics, and smoking-related variables. Multiple co-variates were obtained to refine the scale and determine its reliability and validity” (Primack, et al., 2006).

Factor analysis of the results showed that, after controlling for all co-variates data, SML had a statistically significant and “independent association to current smoking” (Primack, et.al, 2006). The study concluded the SML intervention had an independent association to smoking and that it is an “effective tool for tobacco control intervention,” and in “measuring the anti-smoking norms in a population” (Primack, et al., 2006). The contribution of the Primack study is that it measured the relationship between the participants’ intent to smoke or smoking behavior, based on their attitudes and perceptions of norms before and after receiving smoking media literacy instruction. He had two priorities for his study: 1) Did the instrument for pre- and post-tests to the intervention pass validity tests, and 2) was there a significant drop in intent to smoke among students who received smoking literacy instruction? (Primack, et al., 2006)

Although Primack’s study (2006) was more to develop a valid smoking media literacy scale than to test a hypothesis of smoking media literacy, the result indicated that smoking media literacy would positively reduce susceptibility among subjects. The study also provides insight as to the effectiveness of an in-class media literacy curriculum. The media literacy framework and the content within the curriculum, presented to this Pennsylvania high school, also aligned to some of the

recommendations by the Institute of Medicine, based on a study by Brian Flay in 2007, (IOM).

### **Review of Literature Conclusion**

While results of school-based tobacco prevention programs have been mixed (Glantz and Mandel, 2005; Wiehe et al., 2005), it is not a widely studied field and some researchers disagree with reports that school-based smoking prevention programs have not been successful in the long-term, citing methodological flaws that limit the value of their conclusions (Wiehe et al., 2005; Flay, 2007). Using more refined criteria, Flay's evaluation found that school-based smoking prevention programs that include specific components, including media literacy, integrated curricular approaches, and 15 hours or more of lessons, can have significant short and long-term effects (Flay, 2007). Given that school-based programs remain a perpetual source for youth tobacco prevention activities (Medicine, 2007), there is a need for the development and testing of innovative, engaging and potentially more efficacious school-based tobacco prevention strategies.

There is also a need for additional study of school-based media literacy programming to reduce smoking susceptibility. Future research might address the following questions: 1) Is there evidence to support that students make gains in smoking media literacy over the course of the intervention? 2) Does the intervention also raise overall media literacy? 3) What is the impact of the intervention on student attitudes toward smoking? 4) Does a smoking media literacy intervention impact teens' intent to smoke.



## Chapter 3

### METHODOLOGY

Countering risky behavior among teens is an age-old problem for educators, public health officials and significant adults in students' lives, especially when emerging media technologies and strategies make effective intervention a moving target for prevention experts. Limiting youth exposure to the media is not an option in a culture flooded with many messages delivered through so many channels—peer-to-peer, mobile devices, movie and television placements, print materials, outdoor advertising, video gaming, and social media touch points such as Facebook, Instagram and Twitter. Media's ubiquitous presence makes controlling exposure challenging. As mentioned in previous chapters of this dissertation, one promising method to curb media's influence is to arm youth, and the general public, with resilience to pervasive, and sometimes subconscious, messages with analytical inquiry and deconstruction skills taught through media literacy. The literature defines it as a "means to understand, analyze, evaluate and create messages in a wide variety of forms" (Hobbs and Frost, 1997). The tobacco marketing industry takes advantage of all those forms.

Media literacy gives youth the tools to look at how they may be "tricked" by a message that sells glamour, youth and power. Studies so far, and one done by Primack, et al., (2006) have shown the significance of using media as an antidote against the super peer influence of the media. Through its unique questioning techniques, media literacy has been shown to change youth perceptions of smoking (Primack, et al., 2006; Slater, et al., 2007). The research also indicates that perhaps

media literacy should be a standard asset to a best practice in curriculum development (Flay, 2009; IOM, 2009) for tobacco prevention and prevention of other risk behaviors that may be presented in a positive light through media channels.

### **Purpose of the Study**

Efficacy of school-based tobacco prevention has been studied with mixed reviews (Glantz and Mandel, 2005), and some researchers, citing methodological flaws, observe that it may not have the intended long-term effect (Wiehe et al., 2005; Flay, 2009). Flay's evaluation completed for the Institute of Medicine (2009) found school-based prevention programs that include media literacy, cross-curricular approaches and 15 hours or more of instruction, can have significant short and long-term effects (Bier, et al., 2011; Flay, 2009). This justifies further study and development of school-based programs. This study, with replicated factors of one conducted earlier by Primack, Gold, Switzer, Hobbs, Land, & Fine (2006) in an urban Pennsylvania high school, aims to examine the efficacy of a smoking media literacy curriculum at the middle school level in a suburban setting. As the point of smoking initiation occurs in most lifelong addicts before the age of 18, the study appropriately targets 12- to 14-year-olds, who would be most influenced by the media during the critical years of choice.

#### **Study Questions**

The study focuses on the following questions:

- 1) Will evidence show that suburban middle school students make gains in smoking media literacy over the course of the intervention?

- 2) What is the impact of the intervention on suburban middle school student attitudes toward smoking?
- 3) Will intention to smoke among suburban middle school students decrease following the media literacy intervention?

## **Hypotheses**

Data used in this study was collected under a 2008-2009 project approved by a Midwestern university's Institutional Review Board. The data was collected during the second semester. Analysis of these data proposes to test the following hypotheses:

H<sub>1</sub>: Middle school students who receive 15 hours of tobacco education that includes media analysis will make significant gains in smoking media literacy.

H<sub>2</sub>: Pro-Smoking attitudes among suburban middle school students who received the intervention will decrease.

H<sub>3</sub>: Intention to smoke will be reduced among suburban middle school students who receive the intervention.

## **Intervention Design**

The YEA! TEAM Curriculum, developed by research faculty at the Midwestern University College of Education, was used for this intervention. Through the development process, the team noted that tobacco use is influenced by the social, commercial and political environment, along with individual factors youth face as they mature and find ways to express their independence. The program was grounded in a socio-ecological framework (Bier, et al, 2011). Therefore, the lessons cover the

short- and long-term negative physiological and social consequences of tobacco use, social influences on tobacco use, the health consequences of secondhand smoke, ecological impacts of tobacco production and use, tobacco industry marketing tactics, and tobacco policy. The lesson plans were drawn from existing literature on both media literacy and anti-tobacco education. In each case, to allow teachers to devote valuable class time to the lessons, they were tailored or designed to conform to the state's academic standards and Grade Level Expectations and to encourage interactive, constructivist approaches to learning. General media education lessons were included, and all the tobacco lessons covered media literacy competencies that are aligned to the media literacy model developed by Primack, et al, (2006). The content of the media literacy instruction focused on the three domains and eight factors of media literacy. The scope of this study is limited to the program's following activities--the media literacy and tobacco education curriculum.

**Characteristics of the Sample Population.** The data sample drawn for this study is a nested cohort of seventh-grade students, ages 12-14, within a broader population of 975 students in 13 Midwestern suburban schools. The intervention sites in this broader population were selected by the Midwestern State's Department of Health and Senior Services, based on priorities for delivery in suburban schools (as opposed to a similar rural study done by Bier et al (2011)). Schools were initially recruited through the district administrator in charge of curriculum. Part of the state's intents was to collect pre- and post-test data from the participants to gauge the program's success in the reduction of smoking among youths. Among the broader population receiving the intervention were middle and high school students in 13

suburban schools. Three community groups also participated in the program. The purpose of this study was to provide further evidence in the same media literacy constructs as those used in the Primack, Gold, Switzer, Hobbs, Land, & Fine (2006) study and a second media literacy using the same scales was completed by Bier, et al., (2011) on students grades 7-12 in mostly in rural middle schools and a few urban schools in 2007. Since this study was done, two more papers have been published from similar data—one by Brian Primack, (2015) on urban students that included follow up on the resilience among study participants and another by Laura Zwarun, (2015), using some of the extant data from this studies same data set. To determine further impact from this intervention, this study will target a different population, the middle school students in a suburban district who participated in the 2009 program and the results may provide insight as to how a media literacy program impacts smoking outcomes in suburban 7<sup>th</sup> grade students only.

The sub-population for this suburban-based study was selected by the Missouri Department of Health and Senior Services, and the sample was derived from three of six middle schools located in a large school district. The three middle schools followed the same team curriculum and comparable demographics. The program was offered to all six middle schools in the district, but only three middle schools volunteered to participate. Four teams of 101-124 students participated: one team from two of the schools and two from a third school. Four teachers led each team. Individual teachers were each given \$1,000 as compensation for their participation. The specific breakdown of the data includes only 7<sup>th</sup> grade students, a population

from which mothers of most students graduated from college, two-thirds finished school.

**Elements of Fidelity.** Without a control group, it became important to include training, testing, and implementation with attention to fidelity (Durlak and Dupre, 2008). To compensate the teachers/facilitators for their participation in training and extra coordination, each was given a \$1,000 stipend and a materials and supply budget for instructional and student media creativity and outreach resources. The method for site selection precluded designating control groups within each of the schools, so care was taken in the training to address the team approach and the planning and evaluation tools. In the first place, the teachers all received the 16 hours of training and were monitored by the project personnel. The training included a follow-up survey to the training which addressed teacher efficacy and the level at which the participating teachers felt adequately prepared and supported to implement the YEA! curriculum. Besides questions regarding the age-appropriateness and relevance of the materials and presentations, the post-training questionnaire asked, “Were the planning materials helpful? Do you feel adequately prepared to implement YEA! in your classroom?”

In addition to the questionnaire, the teachers were also given a facilitator’s guide with instructions and resources that covered elements of planning—delivery guidelines, pre- and post-test protocols and means for reporting and delivery protocols, and contact information for the administering project team. Media literacy resources and references to community and websites provided additional resources. Teachers were also given a color-coded implementation strategy and planning table

with a built-in timeline and built-in cells for teaching assignments of each module. In addition to a delivery plan, the teachers also filled out meeting reports and lesson evaluations as they completed the modules and topics. Project staff monitored team facilitation and provided support through weekly emails. Each team received at least two support visits from the YEA! staff and at least two observational visits for at least one member of the team during implementation. Semi-weekly emails with suggested helps also went out to the teachers.

**Lesson Plans attached to Media and Subject Constructs.** Teachers were also given an overview of each learning module (unit) and each topic (lesson) was prefaced by a summary of matching Missouri standards across two to four disciplines. Although information literacy standards for the Midwestern state are now in place relevant to media literacy, these complementary standards to media literacy were not yet specifically identified at the time the curriculum was created, but elements of media and information literacy were found in Communication Arts standards (See Table 3). Tying the lesson plans to the Missouri standards allowed for convenient assimilation into the daily curriculum. In other words, the teachers could legitimately replace a standards-based lesson with an approved lesson from the YEA! curriculum.

### **Procedure**

This intervention was designed to be consistent with the CDC recommendations and additional recommendations of the Institute of Medicine (2007), and the Office of Safe and Drug Free Schools guidelines for effective tobacco education and program implementation. The program was delivered in three phases:

1) two days (16 hours) of teacher training; 2) a cross-disciplinary media literacy-based tobacco curriculum (Modules 1-4: each with 3-4- topics); and 3) service learning/community outreach opportunities through media production and advocacy (Modules 5-8). Three main topics were integrated into the curriculum: tobacco education, media literacy training, and civic engagement. In addition, outreach activities, designed as community involvement and dissemination of youth messages, included peers, parents and families. Delivery of the curriculum progressed from instruction or input in the first phase (Modules 1-4) to experiential/civic engagement in the second (Modules 5-7).

**Instrumentation.** This study followed sound quantitative protocols. To ensure a higher participation rate, the school teams were given a form letter to copy and sent to parents notifying them of their child's participation. Later in class, students signed an assent form. The survey instructions allowed students to opt out of participation, though curriculum participation was required as a regular class activity facilitated by the site teachers. Procedures for teacher distribution and collection of the instrument were designed to promote student confidence in the confidentiality of the data that were collected before the intervention program began. Post-test data were collected within two weeks of the program being completed. The survey-style questionnaire was divided into six main sections: demographic data, level of media use, general media literacy, smoking-specific media literacy, attitudes toward smoking, questions regarding peer and family influences, and attitudes toward the intervention. For this study, only, the attitudes toward smoking, general and smoking media literacy scales, a scale measuring attitude toward smoking, and stated intent to



smoke were used in the analysis. Similar scales had been used in Primack's study (2006) of the effect of media literacy on urban high schools, and then adapted by a second completed by Bier, et al (2011). (For a list of the questions, see [Appendix B, Table 29](#)). The General Media Literacy scale and the Smoking Media Literacy scales were each based on the three core domains of media literacy. The scales on the student survey included mostly 4-point Likert type scales that ranged from strongly agree to strongly disagree. The categories of questions were three media literacy domains: Authors/Audiences, Messages/Meanings, and Representation/Reality (see [Appendix B, Table 29](#)) for their relationship to the eight Media Literacy Factors used in the curriculum). Below are some representative items for each:

- 1) *General Media Literacy (GML)*: These are questions [21a-21k in Appendix C](#). Representative items include "People are influenced by advertisements, whether they know it or not" (Authors/Audiences); "Two people may see the same advertisement and get very different ideas about it" (Messages/Meanings); and "Movies and TV shows don't usually show life like it really is." (Representation/Reality). Again, response options on the 4-point Likert-type scale ranged from "Strongly Disagree" (1) to "Strongly Agree" (4), and scores on individual items were averaged to determine an overall GML score and sub-scales representing the individual domains. Similar items were also assessed for reliability and validity in prior research (Primack, et al., 2006; Primack, Gold, Switzer, et al. 2006, Bier, et. al, 2011)
- 2) *Smoking Media Literacy (SML)*. Assessment for this construct was eleven Likert-type items; specifically questions [28a-28k in Appendix C](#).

Representative items include “Certain cigarette brands are specially designed to appeal to young children” (Authors/Audiences); “Cigarette ads link smoking to natural things that people want— like love, good looks, and power” (Messages/Meanings); and “Cigarette ads show healthy people in pleasant places to make people forget about the health risks” (Representation/Reality), (Bier, 2011). Similar items had already been assessed for reliability and validity in prior research (Primack, 2006, Bier, et al., 2006). Once the data was cleaned, scores on individual items were averaged to determine an overall SML score and a subscale score for each of the three media literacy domains. Similar items were also assessed for reliability and validity in prior research.

- 3) *Pro-Smoking Attitudes (PSA)*. The questions assessing this were on the instrument included 10 items that ([Appendix C, 29 a-j](#)) on both the pre- and post-tests assessing attitudes toward smoking. Students were asked how much they agreed with the following statements in 29a-j: “Smoking cigarettes is not as bad as everyone makes it out to be. Smoking helps you deal with stress. There is no harm in having a cigarette once in a while.” As on the media literacy items mentioned previously, these were also scored on a 4-point Likert scale that ranged from “Strongly Disagree” (1) to “Strongly Agree” (4).
- 4) *Intent to Smoke (ITS)*. The third hypothesis tested for intent to smoke. The questions on the instrument included two items that ([35-36](#)) on both the pre- and post-tests assessing intent to smoke. These too were scored on a 4-point Likert scale that ranged from “Strongly Disagree” (1) to “Strongly Agree” (4).

## Analysis

Data Solutions of St. Louis, a widely-used firm for entering data in the Midwest, keyed the data collected from the participants. Following suggested analysis protocols, the data was cleaned in a two-step process: detection and correction using Excel and then SPSS. Coding errors were also identified using frequency distributions and a crosstabs procedure discovered missing data. These preliminary data cleaning exercises pointed to cases and variable responses that were corrected. Once those steps were taken, the Excel concatenate function produced value strings combining birthdate and first and last initials. These identifying strings were matched between pre- and post-test for further analysis. The researcher found no duplicate string elements in either the pre- or the post-test with this combined variable string. For all analyses, individuals with missing data were eliminated, resulting in 161 matched pairs, a sizeable portion of the sub-sample population tested in the three schools. Frequencies were also tabulated in SPSS. Ages among respondents were 12, 49.5%; age 13, 50% and age 14, .5%. Other remarkable results were the implied socioeconomic status measured by the maternal years of schooling, with 103 (64%) graduating from college, 46 (30%) graduating from high school, and 10 (6.2%), not finishing high school. In addition, the ratio of girls to boys was 2-1, (107 to 53 or 66-33%). A strong majority, 124, (76%) identified themselves as Caucasian, with 18 (11.2%) identified as African American, and 9 (.06%) Asian. The remaining identified as mixed race or did not answer. Of note was the number of smokers, 14 or 8.6%, (9 .6). (See Table 4)

Table 4.  
*Population Sample Characteristics*

Grade	
7 <sup>th</sup>	161(100)
Age	
12	79 (49.5)
13	81 (50)
14 or older	1 (.5)
Gender	
Male	53 (33.3)
Female	107(66.6)
Race	
White/ European American	124 (76.6)
Black	18 (11.2)
Hispanic	2 (1.2)
Asian/Hawaiian/Pacific Islander	9 (1.0)
Mixed/Other/None Marked	8 (5.0)
Mixed/Other	8 (5.0)
Ethnicity	
Hispanic	2 (1.2)
Non-Hispanic	16 (98.8)
Maternal Education*	
Did not graduate high school	10 (6.2)
Graduated high school but not college	48 (30)
Graduated college but no additional education	103 (64)

\*Used as a surrogate for socioeconomic status.

**Psychometric Properties of Scales.** Although the scales already had been analyzed for age-appropriateness for the target audience (Primack 2008, Bier, et al, 2011, Zwarun, 2016), an analysis was run again to assure validity to the measurement scales: (general media literacy (GML), smoking media literacy (SML), and Pro-Smoking attitudes (PSA). Assumption testing, using several statistical processes were performed to see how well the Likert structured responses (displayed in Table 5) reflected the constructs of General Media Literacy and Smoking Media Literacy and their potential relationship with young teen’s intent to smoke.

Table 5.  
*Media Literacy Matrix of Media Literacy Scales as Instrument Questions*

Media Literacy Sub-Scales 1-3	Construct	General Media Literacy (GML) Scale Questions	Smoking Media Literacy (SML) Scale Questions
Authors and Audiences <a href="#">(results)</a>	AA1: Authors create mass media messages for profit and/or influence.	21a. People are more concerned about making money than giving correct information	28a. To make money, tobacco companies will do anything they can get away with.
	AA2: Mass Media Authors target specific audiences.	21b. People who advertise think very carefully about the people they want to buy their product.	28b. Certain cigarette brands are especially designed to appeal to young children.
Meanings and Messages <a href="#">(results)</a>	MM1: Mass media messages have inherent values or points of view.	21c. Two people may see the same movie or TV show and get different ideas about it.	28c. Cigarette ads try to link smoking to things that people want (like love, good looks, and power)
	MM2: Different people interpret mass media messages differently.	21d. Two people may see the same ad and get different ideas about it.	28d. Wearing a shirt with a cigarette logo on it makes one a walking advertisement.
	MM3: Mass media messages affect attitudes and behaviors.	21e. People are influenced by movies whether they know it or not. 21f. People are influenced by ads whether they know it or not.	28e. When people see smoking ads, they are more likely to start smoking themselves. 28f. When people see movies with smoking in them, they are more likely to start smoking themselves.
	MM4: Mass media messages are developed using multiple production techniques.	21g. When people make movies and TV shows, every camera shot is carefully planned. 21h. When people make advertisements, every camera shot is carefully planned.	28g. Movie scenes with smoking in them are made carefully. 28h. There are often hidden messages in cigarette ads
Reality and Representation <a href="#">(results)</a>	RR1: Mass media messages alter/filter reality	21i. Movies and TV shows don't usually show life like it really is.	28i. Cigarette ads show healthy people in pleasant places to make people forget about the health risks. 28j. Most movies and TV shows that show people smoking make it look more attractive than it really is.
	RR2: Mass media Messages omit information	21j. Advertisements usually leave out a lot of important information. 21k. When you see an ad, it is important to think about what was left out of the ad.	28k. When you see a smoking ad, it is important to think about what was left out of the ad.

Table 6. Each of the statements above were followed with the following options: Strongly Disagree, Disagree, Agree, Disagree and they were coded using a Likert Scale 1-4.

**Factor Analysis Results.** The purpose for this testing is generally used to see which variables account for the largest share in variance related to scale outcomes. Another purpose for its use is to help identify any outliers in each scale that may impact testing following the curriculum intervention. It also covers the assumptions of validity. For the purpose of this study, the latter is the reason for using this test.

The Principal Component Factor Analysis was selected for “pre-qualifying” the data for further tests (Laerd, 2015). It is commonly used for studies that include continuous or ordinal variables such as the Likert scale format used in this study—Strongly Disagree, Disagree, Agree and Strongly Agree. Four of the assumptions tested by this procedure were:

Community among all variables, which are evaluated using a correlation matrix, based on Pearson’s *R*.

Sampling adequacy using the Kaiser -Meyer-Olkin which provides the sampling measure for each variability. For the benefit of the reader, the quality of sampling is rated as defined in Table 6:

*Table 6.*  
*Testing for Sampling Measure*

Kaiser-Meyer-Olkin Sample Rating	
○ $KMO \geq 0.9$ :	Marvelous
○ $0.8 \leq KMO < 0.9$ :	Meritorious
○ $0.7 \leq KMO < 0.8$ :	Middling
○ $0.6 \leq KMO < 0.7$ :	Mediocre
○ $0.5 \leq KMO < 0.6$ :	Miserable

Bartlett's test of sphericity, which tests the homogeneity among variances of each variable in a scale. It is an alternative to the Levene's test or Spearman's Rank test used in ANOVA.

Additionally, correlation coefficients were determined among the various scales: the correlative relationship of general and smoking specific media literacy, and the correlative relationship between each of those, and the correlation with smoking attitudes and intent to smoke.

The scales of the instrument were pre-tested for validity and reliability determine the suitability of the data. The scale variables for SML and PSA met the assumption of being continuous—they were continuous 4-point. Factorial analysis of the scales in the instrument were also completed. And reliability of results (sampling robustness) was tested used Cronbach's Alpha.

Prior to *T*-testing, the data needed to meet the following criteria:

- Robust enough—with thirty or more cases
- Related samples (repeated, in this case) – a before and after survey was completed.
- Continuous— the data needed to be presented in scale form.
- The data needed to display an approximate normal distribution

This study met three of the assumption characteristics. First, 160 matched pair cases of the 470+ possible were extracted. Next, the samples were related—as this was the data featured repeated measure—before and after the media literacy curriculum. The third required assumption to be met was one continuous—the Likert scales ranged from a forced exact response of 1) Strongly Disagree, 2) Disagree, 3)

Agree, and 4) Strongly Agree. Because this was a convenience sample of a geographically defined population the histogram route would not produce the range of data results that one random sample would. To be representative, the skew and kurtosis had to fall within  $+1/-1$  on either side of the mean. The normality curve qualified on the Media Literacy Scale, but it was only approximately normal for the Smoking Media Literacy, and skewed for the Pro-Smoking Attitude scale—reflecting that the sample included a population that already leaned toward anti-tobacco views, thus the median on the SML Likert scale was 4 and the mean was about 3.4, on a 1-4 Likert scale; the Pro-Smoking attitudes leaned toward the lower end of the scale with the median at 1 and the mean at 1.4. Early histograms showed that responses produced a slightly negative kurtosis, meaning that most responses for GML and SML produced data that landed mostly in the threes and fours of the Likert scale. To show that there might be a relationship between the independent variables and the dependent variables, possible, bivariate scatterplots charts were produced to illustrate a relationship between each pair of variables.

The Intent to Smoke variable was a combination score of “Do you intend to smoke within the near future,” and “Do you think you will smoke within the next year.” Available responses were one also on a scale of 1-4, ranging from Strongly Agree, Agree, Disagree, Strongly Disagree. Generated histograms for these variables also indicated negatively skewed results.

A statistical response was to “normalize” data to level out the histograms. Also, proactive, ad hoc non parametric testing was done prior to running the *T*-tests.



Despite the normality issues discovered during the assumption testing, the decision was made to move forward and conduct the *T*-tests. The decision was based on the Central Limit Theorem that suggests for results for repeated sampling, results will converge to a normal distribution (Lumley et al, 2002).

Finally, to confirm these results, *T*-tests were used to determine whether participants exhibited assessed changes in these constructs over time (Bier, 2011). In addition, clinical significance (as opposed to statistical significance) of these changes, effect sizes were also computed using Cohen's *d*, equal to the difference in mean scale values, divided by the pooled variance of the pre- and post-test scores.

## Chapter 4

### RESULTS

Results covered in this chapter pertain to the three hypotheses mentioned earlier:

#### **Null hypotheses: $\mu_1 = \mu_1$**

H<sub>0</sub>: Middle school students who receive 15 hours of tobacco education that includes media analysis will have no significant changes in their pre- and post-test Smoking Media Literacy (SML) scores.

H<sub>0</sub>: Pro-Smoking attitudes among suburban middle school students who received the media literacy intervention will remain the same.

H<sub>0</sub>: Intent to Smoke pre- and post-test averages will remain the same among students who receive a Smoking Media Literacy curriculum.

Critical value was set at  $p < .05$ , meaning that there is less than a 5 percent probability that the results occurred by chance.

Research hypotheses for two-tailed test:

#### **Research hypotheses: H<sub>a</sub>: $\bar{x} \neq \bar{x}$**

H<sub>1</sub>: Middle school students who receive 15 hours of tobacco education that includes media analysis will experience a difference in their pre- and post-test Smoking Media Literacy (SML) scores.

H<sub>2</sub>: Pro-Smoking attitudes among suburban middle school students experience a difference in their pro-smoking attitudes after media literacy intervention.

H<sub>3</sub>: Intent to Smoke pre- and post-test averages will differ among students who receive a Smoking Media Literacy a media literacy curriculum.

This chapter will cover the results in four sections:

- 1) Assumption testing for data suitability to analysis
  - a. Instrument suitability:
    - i. Validity: Using Power Factor Analysis
    - ii. Reliability: Using Cronbach's Alpha
- 2) Normality:
  - a. Q-Q Plots
  - b. Normal curve, skewness and kurtosis
  - c. Non parametric ad hoc tests
- 3) Hypothesis testing: Using *T*-tests
- 4) Post hoc testing: Correlation Coefficients using Pearson's *R*

### **Results of Instrument Suitability**

Prior to testing for the hypotheses, several assumption tests were conducted to evaluate the validity and reliability of the data and their normal distribution.

The General Media Literacy (GML) scale, which is not part of the hypothesis testing, but is included in some of the results as points of references, since the GML constructs served to inform the development of the Smoking Media Literacy (SML) scale. The GML results are alluded to in the assumption testing and offered as further evidence of the relationship between overall media literacy and tobacco prevention.

Assumption testing included validity, reliability, normal distributions, and outcomes in the variable analysis of Smoking Media Literacy (SML) and Pro-Smoking.

### Testing for Validity

**Factor Analysis of General Media Literacy (GML).** Eleven questions relating to general media literacy were factor analyzed using principal component analysis (PCA) with Varimax (orthogonal) rotation. The results showed that the at least four of the components accounted for 59 percent of the variance strengthening for validity of the scale in this study. (See tables 7 through 9).

Table 7.

*GML Pre-test Variables Total % of Variance Cumulative Total*

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.203	26.690	26.690	3.203	26.690	26.690
2	1.485	12.374	39.064	1.485	12.374	39.064
3	1.380	11.497	50.560	1.380	11.497	50.560
4	1.072	8.934	59.494	1.072	8.934	59.494
5	.986	8.213	67.707			
6	.830	6.917	74.625			
7	.739	6.161	80.786			
8	.570	4.749	85.535			
9	.556	4.634	90.169			
10	.454	3.785	93.954			
11	.385	3.206	97.160			
12	.341	2.840	100.000			

The overall Kaiser-Meyer-Olkin (KMO) measure for GML was .71, a classification of “middling” significance, with all variables showing correlation coefficients above .30. The Bartlett's Test indicated that the principle of Sphericity

was maintained,  $\chi^2$  (348), and was statistically significant ( $p < .001$ ), indicating that the data was likely factorizable. (See Table 8)

Table 8. *GML Sampling Adequacy*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.707
Bartlett's Test of Sphericity	Approx. Chi-Square	348.476
	df	66
	Sig.	.000

Table 9.  
*GML Factor Analysis: Rotated Component Matrix*

Scale Variables	Component						
	Mean	S.D.	Analysis N	Authors & Meaning	Money & Deception	Product ion Techniq ue	Influe nce
GMM1-People may see same movie and get different ideas.	2.50	.577	144	.809	.177		
GPMM2-People may see same Ad and get different ideas	3.34	.671	144	.807			.184
GPMM4-In ads camera shot is carefully planned.	3.04	.827	144	.505	.390		.242
GPRR2-Ads leave out a lot of information	3.19	.760	144	.331	.644	.188	
GPAA1-Money more important than correct information	3.40	.672	144		.625		.194
GPRR1-Movies don't show life like it really is.	3.36	.706	144	.444	.593		
GPRR2-When viewing ads, think what is left out.	3.08	.798	144		.473	.173	-.117
GPMM4-In movies, camera shot is carefully planned.	3.24	.766	144		.151	.832	.225
GPAA2-Advertisers think about people who by product	2.50	.901	144	.324	-.296	.609	-.248
GPMM3-People are influenced by movies knowing or not	3.11	.649	144	.185			.839
GPMM3-People are influenced by ads know it or not.	2.92	.674	144			.207	.812

Extraction Method: Principal Component Analysis.  
Rotation converged in 7 iterations

% of Total Variance 59.949  
Eigenvalue: 26.6, 8.934

**Factor Analysis of Smoking Media Literacy (SML).** Eleven questions relating to smoking media literacy were factor analyzed using principal component analysis with Varimax (orthogonal) rotation. The results showed that at least two of the components loaded on 54 percent of the variance strengthening the claim of validity of the scale in this study. (See tables 10-12).

Table 10.

*Smoking Media Literacy (SML) Pre-test Variables Total % of Variance Cumulative*

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings					
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.140	41.403	4.140	41.403	41.403	3.436	3.436	34.364	34.364
2	1.260	12.602	54.005	1.260	12.602	54.005	1.964	19.641	54.005
3	.876	8.760	62.765						
4	.841	8.412	71.177						
5	.718	7.178	78.355						
6	.613	6.127	84.482						
7	.483	4.834	89.316						
8	.407	4.069	93.385						
9	.377	3.770	97.155						
10	.285	2.845	100.000						

The analysis yielded compelling evidence of homogeneity among the SML variables indicating that each tested similar constructs regarding Smoking Media Literacy.

The overall Kaiser-Meyer-Olkin (KMO) measure was .82, a classification of “meritorious” significance, with all variables showing correlation coefficients above .30. The Bartlett's Test indicated that the principle of Sphericity was maintained,  $\chi^2$  (469), and was statistically significant ( $p < .001$ ), indicating that the data was likely factorizable.

Table 11.  
*Smoking Media Literacy: KMO and Bartlett's Test*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.817
Bartlett's Test of Sphericity	Approx. Chi-Square	469.445
	Df	45
	Sig.	.000

Table 12. *SML Factor Analysis Rotated Component Matrix*

Variable	N	Mean	S.D.	Component		Commun-
				Money	Image	ality
SMM1. Cigarette ads link smoking to things that people want (love, looks and power).	145	3.31	.80	.795		.671
SAA1. To make money tobacco companies will do anything they can get away with.	145	3.43	.80	.766		.606
SRR2: When you see a smoking ad, it is important to think about what was left out.	145	3.21	.90	.764		.629
SAA2-Certain cigarette brands are especially designated to appeal to young children	145	3.07	.83	.701		.491
SRR1-Movies & TV shows with people smoking make it seem more attractive than it is.	145	3.09	.97	.652		.458
SMM3-When people see smoking ads, they are more likely to start smoking themselves	145	2.33	.92	.645		.730
SRR1-Ads show healthy people in pleasant places to make people forget about health risks.	145	3.17	.87	.569		.400
SMM2-Wearing a shirt with a logo on it makes one a walking advertisement	145	3.12	.89	.535	.413	.457
SMM3-When people see movies with smoking, they are more likely to start smoking.	145	2.72	.91		.849	.738
SMM4-Movie scenes with smoking in them are carefully made.	145	2.33	.92		.847	.480
SRR1- There are often hidden messages in cigarette ads	145	3.14	.85	.357	.453	.333
Extraction Method: Principal Component Analysis		Eigenvalue: 34.313, 12.368				
Rotation converged in 3 iterations		% of Total Variance 46.681				
Note: Collinearity, under the desired 1.0 and Variance Inflation Factor(VIF)						

A component plot below illustrates the homogeneity and communality among the SML factors. (See Figure 3)

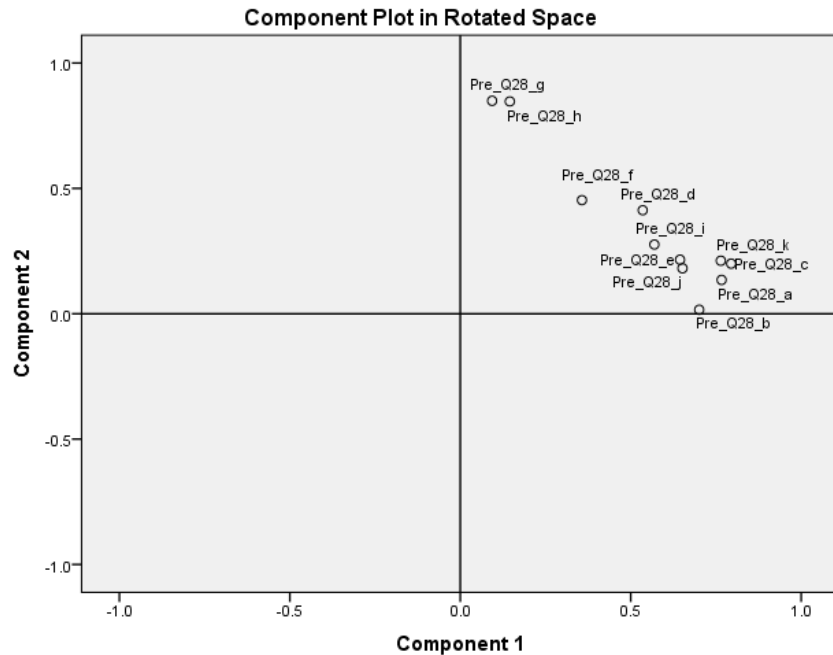
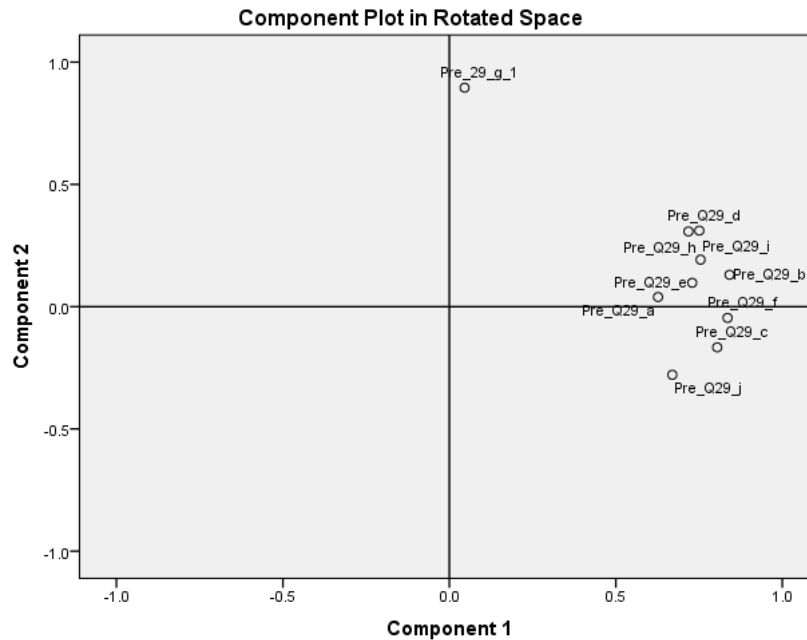


Figure 3. Factor Analysis of Smoking Media Literacy: This Component plot illustrates homogeneity

**Pro-Smoking Attitudes Factor Analysis.** The power component analysis (PCA) was run twice for the Pro-Smoking Attitudes (PSA) Factor Analysis, due to an outlier found in the component rotation. The variable “It is easy to quit smoking,” fell outside the area of homogeneity (See Figure 4).





*Figure 4.* The lack of homogeneity in the PSA. The scale item, 29g, ‘It is easy to quit smoking’, lands outside total variable component cluster.

Because of the direction the statement ‘It is easy to quit smoking’ read, the outlier variable was re-coded. That effort produced diminishing returns since each new factor combination reduced the homogeneity of the variables within the scale, so the variable was removed altogether with better results.

With the scale’s random item removed, homogeneity results for Pro-Smoking variables justified keeping the remaining 9 of the 10 PSA scale items. Eight of the 10 items correlated .55 or above, with six of them above .8. Everything were extracted into one component, explaining 63% of the variance (see Tables 13-15)

Since all variables loaded into one component, the next PCA run did not produce a plot, but the KMO .83 measure indicated sampling adequacy and the results of the Bartlett’s test for the principle of sphericity was good  $t(\chi^2(144) = 738.93, p < .000)$  (See Table 14). Finally, the communalities, all above .3, further

confirmed that each item shared some common variance with other items (see Table 15). Given these overall indicators, factor analysis indicated validity of factors were related enough to retain in the scale.

Table 13.  
*Total Variance Explained: Pro-smoking Attitude*

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.117	56.853	56.853	5.117	56.853	56.853
2	.811	9.012	65.864			
3	.727	8.083	73.947			
4	.564	6.270	80.217			
5	.540	6.002	86.219			
6	.460	5.113	91.332			
7	.345	3.828	95.160			
8	.243	2.704	97.864			
9	.192	2.136	100.000			

Extraction Method: Principal Component Analysis. Eigenvalue: 34.313, 12.368  
% of Total Variance 46.681

Table 14.  
*Pro-Smoking Attitude: KMO and Bartlett's Test*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.829
Bartlett's Test of Sphericity	Approx. Chi-Square	1705.138
	df	153
	Sig.	.000

Table 15.

*Factor Analysis Communalities of Pro-Smoking Attitudes (Items 29a-j (not including 29g) on the student survey*

Item	N	Mean	SD	Component	Communalities
Smoking cigarettes is enjoyable.	153	1.26	.547	.851	.723
Smoking helps you feel more comfortable at parties.	153	1.31	.633	.825	.681
Smoking helps you deal with problems or stress.	153	1.44	.768	.782	.611
Smoking makes you look more mature	153	1.29	.613	.781	.610
Smoking makes you look more attractive or sexy	153	1.27	.628	.771	.595
Smoking helps you stay thin.	153	1.35.	.693	.747	.559
There is no harm in having a cigarette once in a while.	153	1.33	.659	.736	.541
It would be very easy for me to get cigarettes if I wanted them.	153	1.70	.946	.635	.403
Smoking is not as bad as everyone makes it out to be.	153	1.38	.698	.627	.393

To summarize, the principal component analysis (PCA) strengthens the case for the items included on the Smoking Media Literacy scale and Pro-Smoking attitude scale.

The communality among the survey questions, the factor loading and the sphericity indicated by the analyses strengthens the validity of the scale.

**Reliability Testing.** The Cronbach's Alpha score for the combined scales showed high reliability, beginning with a combined Cronbach score ( $\alpha = .89$ ) when combining all three scales and after initial review of each one separately. (See Table 16).

Table 16.  
*Overall Scale Reliability*

$\alpha$	N/items	N/cases
.84	31	152

The GML scale consisted of 11 items ( $\alpha = .87$ ), the SML scale consisted of 11 items ( $\alpha = .90$ ), and the PSA scale consisted of 10 items ( $\alpha = .92$ ) after one of its 10 factors was removed to improve the Cronbach score. Incidentally, that scale item was the same one found to be an outlier during the factor analysis for validity of the PSA scale. (See Table 17)

Table 17.  
*Reliability of Media Literacy and Pro-Smoking Scales, 31 items combined*

Subscale	$\alpha$	N/items	N/cases
General Media Literacy	.73	11	151
Smoking Media Literacy	.86	11	151
Pro-Smoking Attitudes	.92	9	155

The purpose of the Cronbach alpha is to determine the strength of correlation among scale variables. The most important column, 'Cronbach's Alpha, if item is deleted,' in the next three tables show the strength of items that make up each scale.

*Reliability of the GML Scale.* The Cronbach's Alpha for GML shows that no item deleted changes the overall score by more than .025%, which is not enough of a difference to eliminate a single item from the scale. (See Table 18).

Table 18.

*Cronbach's Alpha (Reliability) for GML*

Item 21 Variables	Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
a.	GPAA1 Authors more concerned about making money than correct information	31.15	15.300	.294	.155	.715
b.	GPAA2 People think carefully about those who would buy product.	32.05	15.613	.123	.118	.749
c.	GPMM1. People may see same movie or TV show differently.	31.10	14.997	.440	.409	.698
d.	GPMM2 People interpret media messages differently	31.21	14.432	.474	.403	.691
e.	GPMM3. People view same ads differently.	31.44	15.241	.323	.331	.711
f.	GPMM4 People are influenced by movies	31.63	15.115	.330	.313	.710
g.	GPMM5 People are influenced by ads	31.31	14.594	.362	.348	.706
h.	GPRR1 When people make movies every shot is carefully planned	31.56	14.221	.406	.410	.699
i.	GPRR2 Movies/TV shows don't show real life	31.51	13.692	.478	.311	.687
j.	GPRR3 Ads usually leave out a lot of important information	31.19	14.447	.439	.348	.695
k.	GPRR4 Important to think what is left out of an ad.	31.35	13.937	.491	.311	.686

*Reliability of the SML Scale.* The Cronbach’s Alpha for SML shows that no item deleted changes the overall score by more than .006%, too small a difference to eliminate a single item from the scale (See Table 19).

Table 19.  
*Cronbach's Alpha (Reliability) for SML*

# 28 Items		Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
a.	SAA1 Make Money	29.66	31.866	.632	.501	.843
b.	SAA2 Brands Appeal	30.02	32.659	.510	.363	.851
c.	SMM1 Ads Link	29.78	31.340	.699	.579	.838
d.	SMM2 Logo Ad	29.97	31.680	.574	.421	.846
e.	SMM3 Movie Start	29.94	31.997	.570	.382	.847
f.	SMM4 Ads Start	30.37	32.706	.448	.241	.856
g.	SMM4 Movie Carefully Planned	30.60	33.436	.427	.394	.857
h.	SMM5: Ads Carefully Planned	30.76	32.504	.461	.413	.855
i.	SRR1: Forget Health Risks	29.92	32.090	.543	.431	.849
j.	SAA1 Make Money	30.00	31.181	.560	.462	.848
k.	SAA2 Brands Appeal	29.88	30.618	.675	.533	.838

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.860	.861	11

*Reliability for Pro-Smoking Attitude Scale.* The Cronbach’s Alpha for PSA shows that deleting item g, “If one is smoking every day, it is easy to quit” were to be removed it would changes the overall  $\alpha$  score by .07, not enough of a difference to eliminate a single item from the scale, but enough to support the validity test that one item may need to still needed to be removed. In this chart, the verbiage of that one item had been changed from ‘easy to quit’ to ‘hard to stop’ and the variables were recoded to reflect the reversal of those variables. The difference in the reliability test

still did not justify keeping that variable for subsequent normality, ad hoc non parametric tests, or the *T*-test. (See Table 20)

Table 20.  
*PSA Attitude Reliability with item G (Cronbach's Alpha)*

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
a. Not Bad	14.93	22.014	.582	.463	.842
b. Smoking Enjoyable	14.94	21.035	.777	.722	.827
c. Smoke helps deal with problems, stress	14.83	20.361	.799	.763	.823
d. Helps with staying thin	14.83	20.335	.703	.646	.830
e. No harm in having a cigarette once in a while	14.99	21.740	.774	.730	.830
f. Smoking helps you feel more comfortable at parties.	14.97	20.928	.757	.694	.827
g. If smoking every day, it is hard to stop	12.86	27.733	-.208	.102	.916
h. Smoking makes one look more mature	15.02	21.863	.765	.707	.831
i. Smoking makes you look more attractive	15.04	21.986	.693	.702	.835
j. I could easily get cigarettes if I wanted.	14.45	20.521	.524	.344	.852

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.860	.861	11

The table below shows the results of the Cronbach test after item G was removed.

(See Table 21)

Table 21.  
*Pro-Smoking Attitude (Reliability) Cronbach's Alpha*

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
a. Not Bad	11.47	22.926	.608	.463	.912
b. Smoking Enjoyable	11.48	21.939	.802	.722	.900
c. Smoke helps deal with problems, stress	11.37	21.275	.818	.762	.898
d. Helps with staying thin	11.37	21.275	.718	.644	.906
e. No harm in having a cigarette once in a while	11.53	22.627	.808	.723	.901
f. Smoking helps you feel more comfortable at parties.	11.51	21.849	.778	.694	.901
h. Smoking makes one look more mature	11.56	22.832	.784	.705	.903
i. Smoking makes you look more attractive	11.58	22.881	.726	.698	.905
j. I could easily get cigarettes if I wanted.	10.99	21.688	.510	.332	.928
Reliability Statistics					
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items		N of Items		
.916	.926		9		

**Testing for Reliability Summary.** The Cronbach alpha analysis was completed showing significant reliability among the factors of the scale (Cohen, 1977). There were no significant outliers in the General and Smoking Media Literacy scales. In contrast, the Pro-Smoking scale's single-most outlier variable or item, 'It's easy to quit smoking' was removed before further testing was conducted.

### Determining Data Normality

To have truly significant results of statistical testing, conventional parameters of normality suggest: 1) The population or sample needs to be over 30 cases, 2) the samples must be related, 3) the variables need to be continuous, and the data needs to meet the normality standards. Although the Repeated Measures *T*-test is robust to small or non-normal distributed samples (Lumley, 2002), due diligence called for



exploring the normality of the data. This section deals illustrates the normal or lack of normal distribution inherent in this data sample.

A number of exploratory functions in SPSS produce normality baselines. Two were selected—the Q-Q plot and the histogram. Each was run for the General Media Literacy Scale and the three hypotheses— $H_1$ =Increased Smoking Media Literacy (SML) score,  $H_2$ = Decrease in Positive Smoking Attitudes (PSA), and  $H_3$ = Decrease in the Intent to Smoke (ITS) was produced for the SML to indicate that variable was asymptotic. The results were indicative of approximately normal distribution for GML and SML, and skewed results for PSA and Intent to Smoke (ITS). Following each normality test presented throughout this section, the decisions to keep the outliers are discussed. In addition, measures taken to transform the median distribution of the variables by squaring the means of the PSA and ITS variables and running non parametric (Wilcoxon Rank Sign) tests. Squaring the median distribution produced a significant change in the non parametric test results for PSA, but very little change for the Intent to Smoke variables.

The following graphs will illustrate each test for GML and SML ( $H_1$ ).

**Normality GML Media Literacy.** One of the exploratory graphs that provide an idea of normal sample distribution is the Q-Q plot, as shown below.

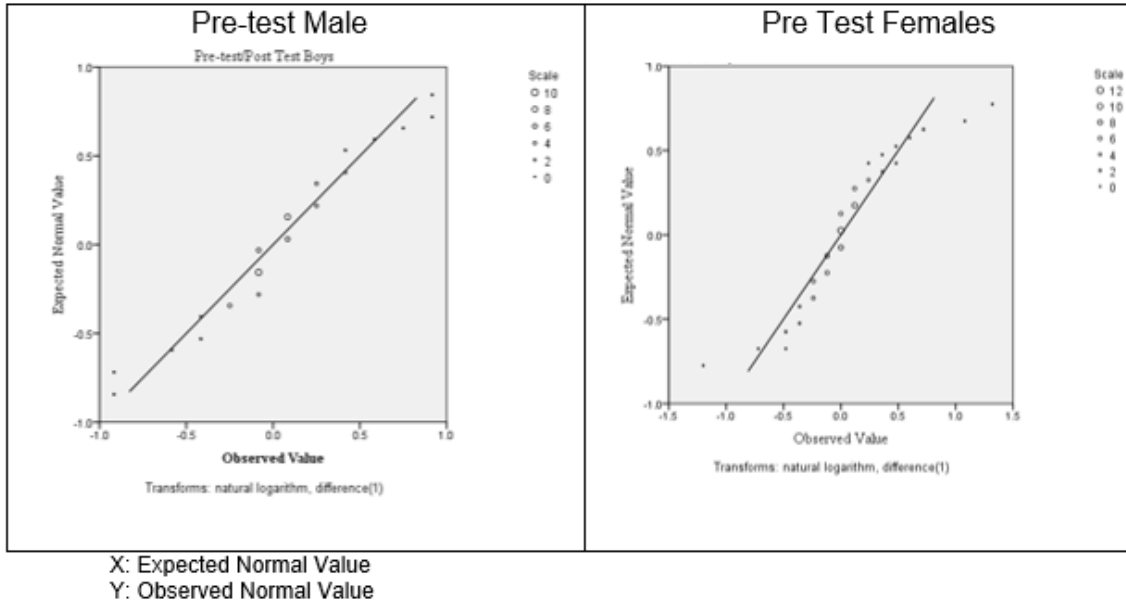


Figure 5. General Media Literacy Data: Q-Q Plot Male and Female

The GML Q-Q plot shows a steep slope and distribution of cases on either side of the line. The data here is approximately normal with a few outliers.

At this point, it would have been justified to remove the outliers and re-run the data. But the decision was made to leave the outliers with the perspective that those data points shared something about the population sampled. Removing the outliers or adjusting the skewed data would have given an inaccurate picture of the General Media Literacy scores before and after the intervention.

A second method for determining normality is to provide a histogram which would show the skew and kurtosis of the data's curve. The skew and kurtosis statistic had to fall below  $-1/+1$ .

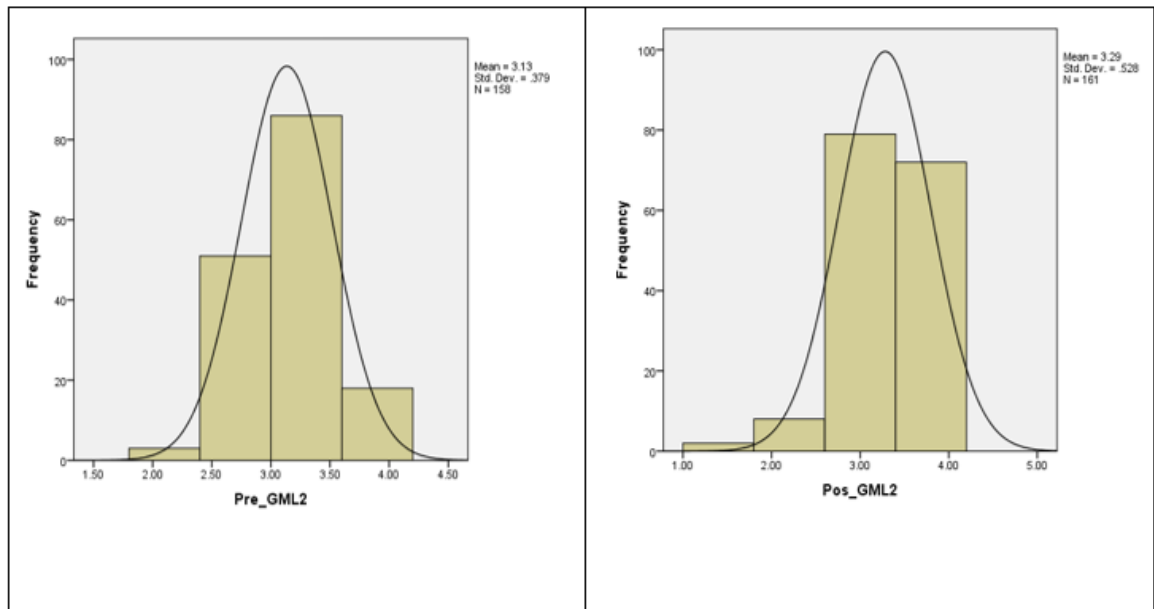


Figure 6. General Media Literacy Histograms--Pre- and Post-test Data

Descriptive statistics for GML Pre-Test and Post GML was ( $M = 3.24$ ,  $SD = 0.04$  and  $M = 3.43$ ,  $SD = 0.05$ , respectively). The GML histograms showed mixed asymptotic normal skewness of .367 ( $SE = 0.19$ ) and kurtosis of -.163 ( $SE = 0.383$ ) for the pre-test and approximately normal with a -.932 ( $SE = 0.19$ ) with a non normal leptokurtic curve of 1.216 ( $SE = 0.380$ ) for the GML post-test. ([See Appendix B, Table 30](#))

The data's skew was approximately normal because the sample included a population that already leaned toward anti-tobacco views, thus the median on the Likert scale was 4 and the mean was 3.43 for these exploratory descriptives. Since the data was approximately normal, a proactive, non parametric test was conducted. The non parametric test ignores the mean results, and instead calculates the negative and positive results on each side of the median. For GML, the results proved to be significantly asymptotic.

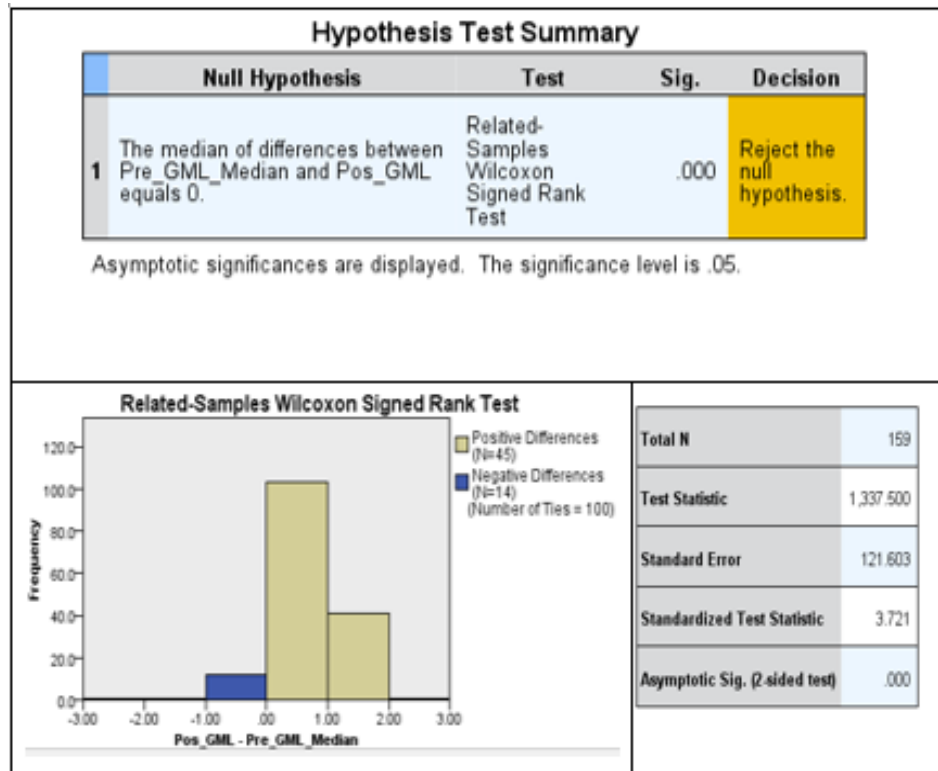


Figure 7. Wilcoxon Signed Rank Test for General Media Literacy,  $p < .001$

Of the 159 data records without missing data that were analyzed for General Media Literacy, the media literacy program elicited an increased score for 45 participants compared to 14 participants whose scores decreased. One hundred participants had no change in their GML score at all. The result is also statistically significant with a median increase in GML score,  $z=3.721$ ,  $p < .001$ .

**Normality SML Media Literacy.** Proactive assumption testing was also completed for the Smoking Media Literacy (SML) pre- and post-tests, beginning with Q-Q plots.

H<sub>1</sub>: Middle school students who receive 15 hours of media methods in general and smoking literacy will make significant gains in smoking media literacy.

The Q-Q Sample plots showed the data to be approximately normal (Laerd,2015) for the pre-and post-tests. In terms of normal sampling, the smoking media literacy scores were approximately normally distributed for both male and female.

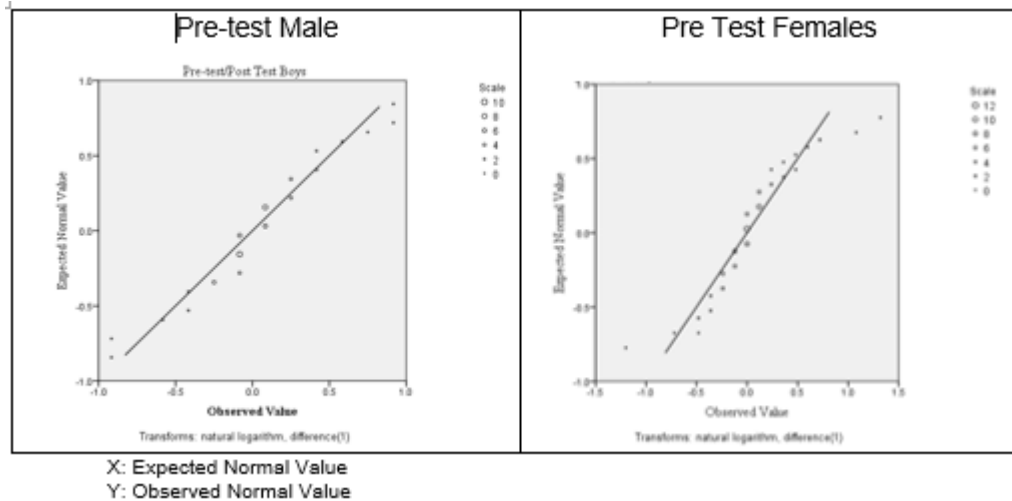


Figure 8. Smoking Media Literacy, Q-Q Plots. Male and Female Data

The moderately steep slope and distribution of cases on either side of the line show the data is approximately normal in the pre-test with a few outliers and less normal in the Post-test. A few outliers are also apparent. At this point, it would have been justified to remove the outliers and re-run the data. But like the decision regarding the GML results, the outliers for SML were retained to reflect the media literacy savviness or resilience already inherent in the population samples. Removing the outliers or very skewed data would have given an inaccurate picture of the SML scores before and after the intervention.

Exploring the normality of the SML data using descriptives and a histogram also returned mixed results that fell between  $-1/+1$ . Descriptive statistics for SML Pre-Test and SML Post-test were ( $M = 3.17$ ,  $SD = 0.05$  and  $M = 3.38$ ,  $SD = 0.06$ ,

respectively). The SML histograms showed mixed asymptotic normal skewness of -.568 (SE = 0.19) and kurtosis of -.496 (SE = 0.381) for the SML pre-test and approximately normal with a -1.32 (SE = 0.19) with a non normal leptokurtic curve of 2.14 (SE = 0.381) for the SML post-test. ([See Appendix B, Table 30](#))

The leptokurtic (cases below and cases above the slope shape) of the curve was confirmed by the exploratory Pre- and post-SML histogram statistics.

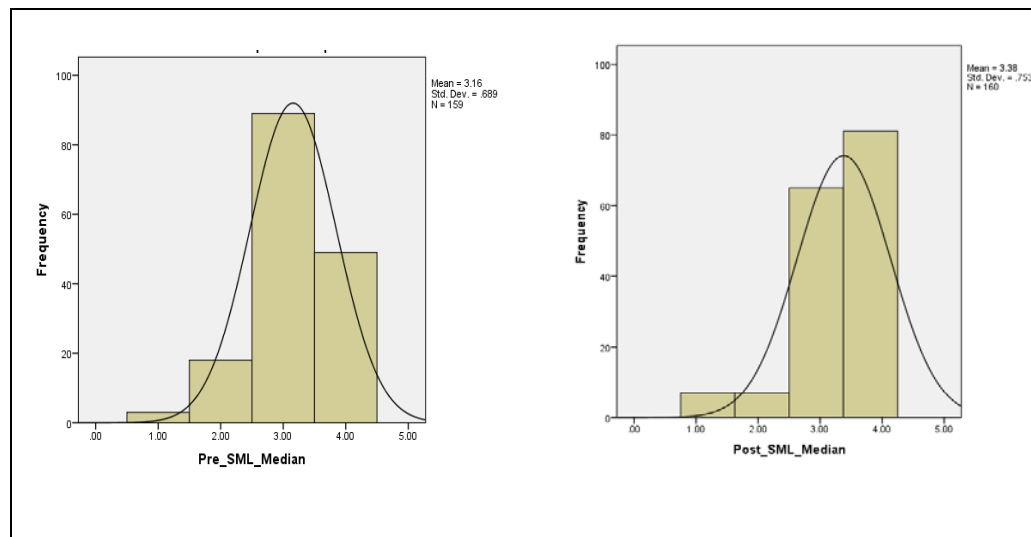


Figure 9. SML Histograms--Pre and Post-Test.

The negatively skewed data results presented a challenge to continue with the hypothesis testing. Advice from a statistics researcher presented the option of 1) squaring the medians of the pre- and post-test variables and/or running the Wilcoxon Sign test used for small samples or non-normal distributed data. Since the Z-score curve fell within the 2.58 range, squaring the median scores was deemed unnecessary, but the non parametric Wilcoxon Sign Test did provide some insight as to the change in median scores.

As shown in the graph below, the null hypothesis was rejected  $H_0 \neq 0$  at  $p < 0.05$  significance.

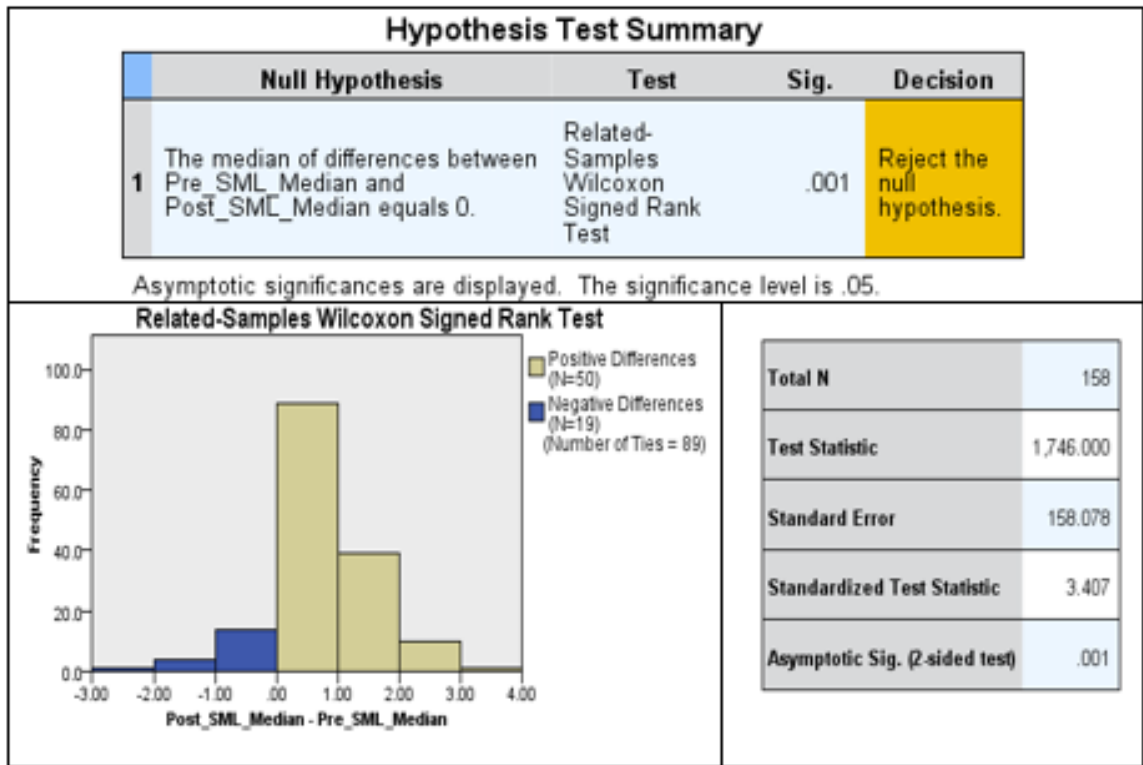


Figure 10. SML: Wilcoxon Sign Non parametric Test  $p < .001$  for Significance. The null is rejected.

Of the 159 data records without missing data that were analyzed for Smoking Media Literacy, the media literacy program elicited an increased score for 50 participants compared to 19 participants whose score decreased. Eighty-nine (89) participants had no change in their SML score at all. The result is also statistically significant with a median increase in SML score,  $z=3.407, p < .01$ . The null is rejected, and the non-parametric test proves sufficient asymptotic characteristics.

$H_0: \mu_1 = \mu_2$ : “Participating in the Smoking Media Literacy intervention will have no effect on students’ Positive Smoking Attitude.”

However, we can accept the research hypothesis for this non parametric test that compared SML medians on the pre- and post-tests:

H<sub>1</sub>:  $\tilde{x} \geq 0$ : Middle school students who receive 15 hours of tobacco education that includes media analysis will experience a significant difference in their pre- and post-test SML scores.

**Normality Pro-Smoking Attitudes.** Proactive assumption testing was also completed for the Pro-Smoking Attitudes (SML) pre- and post-tests, beginning with Q-Q plots.

H<sub>1</sub>: Middle school students who receive 15 hours of media methods in general and smoking literacy will reduce their Pro-Smoking attitudes.

The Q-Q Sample plots showed the PSA results to be non-normal (Laerd,2015) for the PSA pre-and post-tests. In terms of normal sampling, the Pro-Smoking data were approximately normally distributed for both male and female.

Males and females’ data for PSA, as assessed by visual inspection of the Normal Q-Q plots, was not in the least normal.

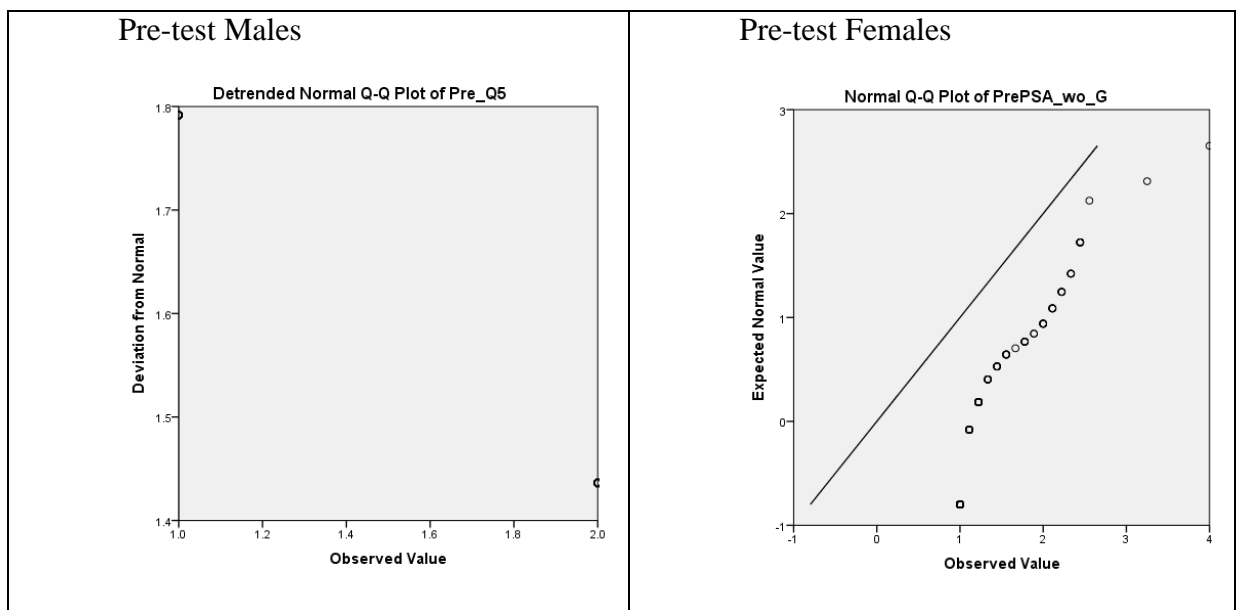


Figure 11. Original PSA Data Q\_Q Plots, Male-Female



The descriptives and a histogram were highly non normal from -1/+1 standard. Descriptive statistics for PSA Pre-test and PSA Post-test were (M = 1.39, SD = 0.535 and M = 1.63, SD = 0.515, respectively). The PSA histograms showed mixed asymptotic normal skewness of 1.71 (SE = 0.19) and kurtosis of 3.40 (SE = 0.386) for the PSA pre-test and approximately normal with 1.66 (SE = 0.19) with a non normal leptokurtic curve of 3.64 (SE = 0.384) for the PSA post-test. [See Appendix B, Table 30](#)

The leptokurtic (cases below and cases above the slope shape) of the curve confirmed hinted at by the Q-Q plot was confirmed by exploratory pre- and post-PSA histogram statistics.

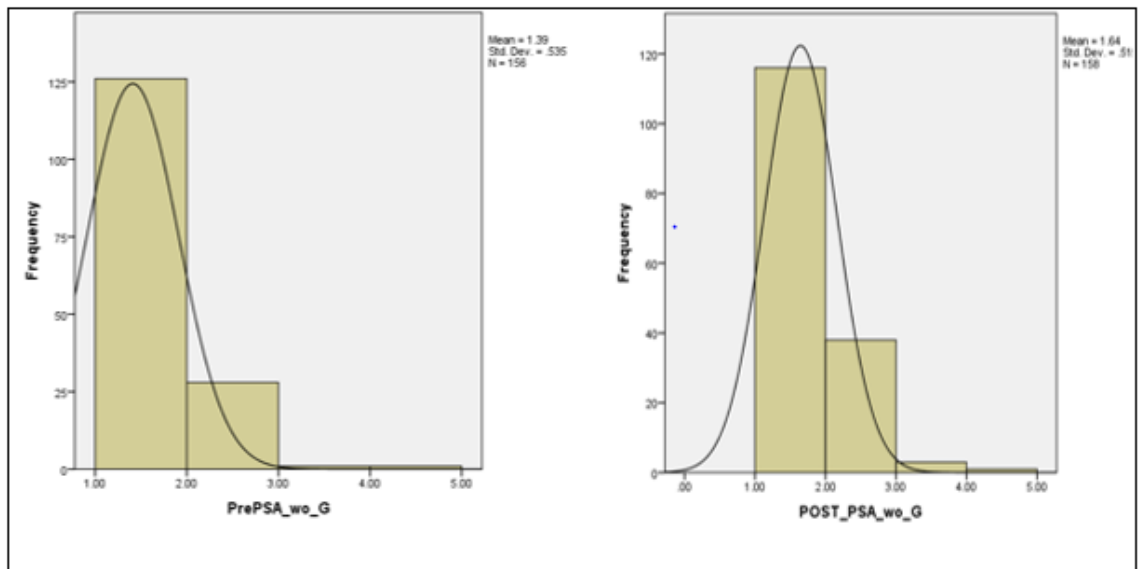


Figure 12. PSA positively skewed histogram: Pre- and Post-Test Data

Again, the decision was made to leave the outlying cases. Instead and attempt to “normalize” the data another way. Squaring the mean to extend the data curve was a recommendation made by statisticians for increasing the probability that the more times the test is repeated, the results would be similar (Lumley). Still there was a

skew and kurtosis issue. Figure 13 below shows a trend toward normality, albeit still not normal enough.

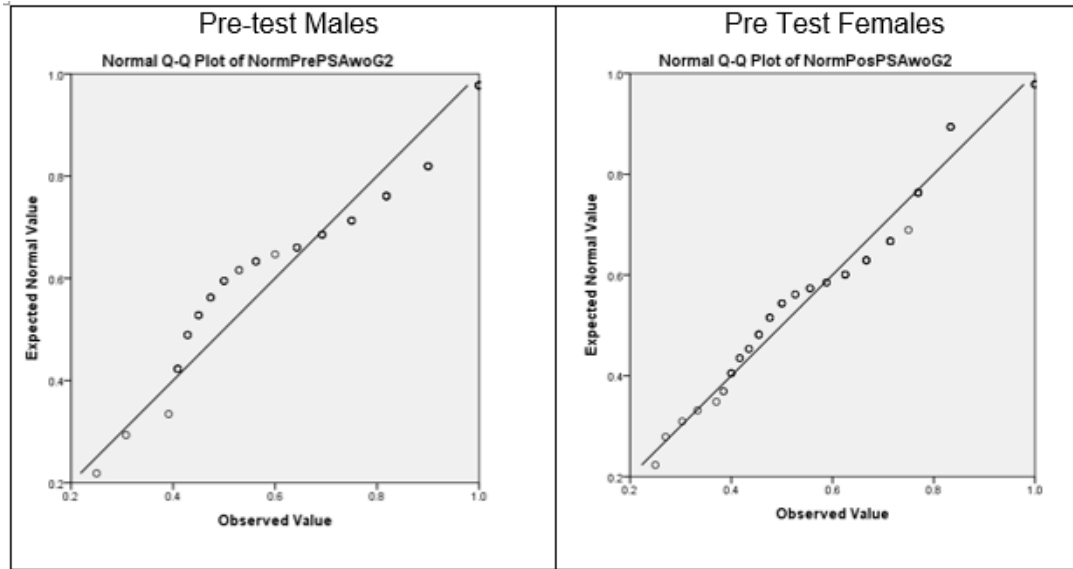


Figure 13. PSA normalized, resampled data. Q\_Q Plot, Male-Female.

Male and female data for PSA, as assessed by visual inspection of the Normal Q-Q plots, were much improved, but still not normal. This was confirmed by the descriptive results and visual inspection of the histograms for PSA that were somewhat leveled out once the means were squared, and the normalized data fell within the  $-1/+1$  standard.

Descriptive statistics for PSA pre-test and PSA post-test were ( $M = .8017$ ,  $SD = .219$  and  $M = .6592$ ,  $SD = 0.164$ , respectively). The PSA histograms showed asymptotic approximately normal skewness of  $-.921$  ( $SE = 0.19$ ) and kurtosis of  $-.419$  ( $SE = 0.386$ ) for the PSA pre-test and approximately normal with  $-.249$  ( $SE = 0.19$ ) with a non normal leptokurtic curve of  $.419$  ( $SE = 0.384$ ) for the PSA post-test. [See Appendix B, Table 30](#))

The figure below confirms the approximately normal curves. The high bins with a lower normal curve indicate the squared means representing the results if the pre- and post- tests were given infinitely on the same population.

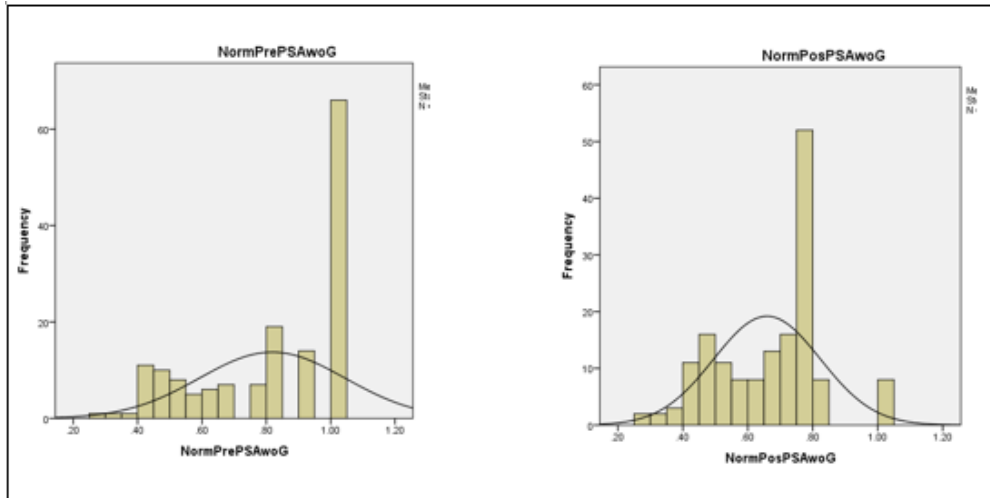


Figure 14. PSA Histograms from Normalized Data. Note that the pre-and post test data now has a more normal curve, with the PSA pre-test on the left displaying a more platykurtic (lower hump) curve than the post test.

The next two figures, 15 and 16, illustrate results from the non parametric Wilcoxon Signed Rank Test. In Figure 16 the significance was  $P=.741$ ; we reject the Null hypothesis:

$H_0 = 0$ : “Participating in the Smoking Media Literacy intervention will have no effect on students’ Positive Smoking Attitude.”

We could accept the research hypothesis:

$H_1: \geq 0$ : Middle school students who receive 15 hours of tobacco education that includes media analysis will experience a significant difference in their pre- and post-test SML scores.

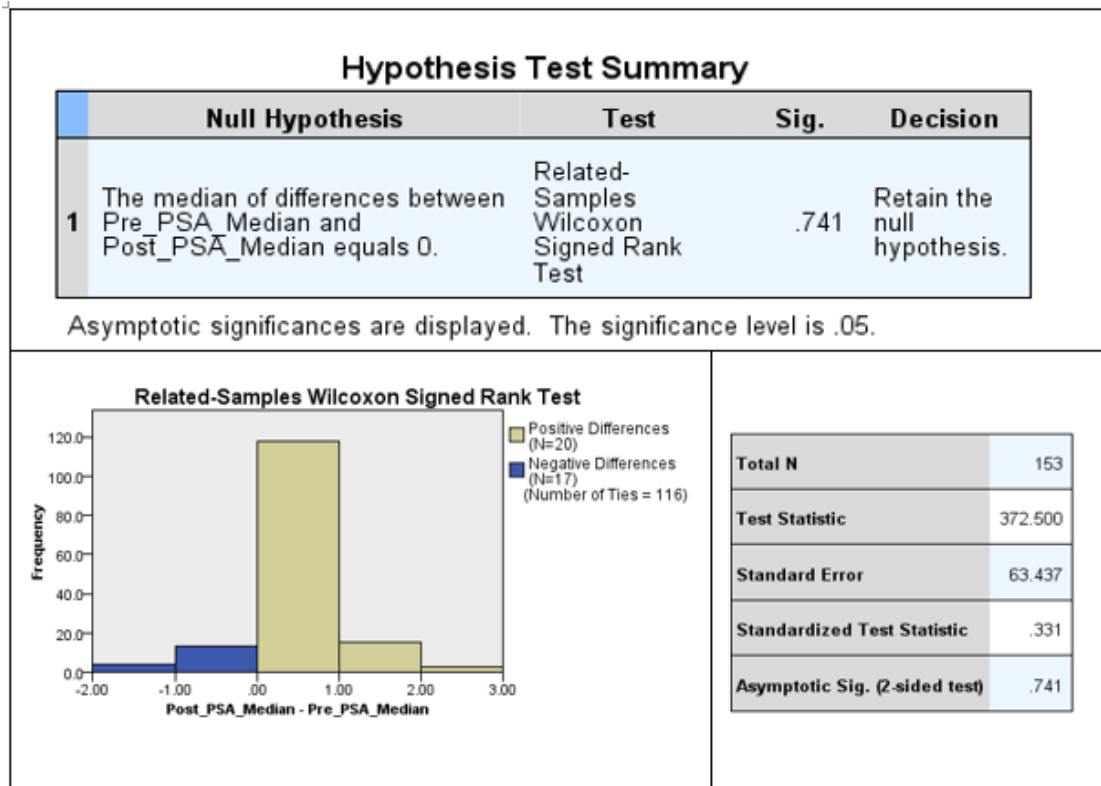


Figure 15. Non significant results of PSA non parametric test before data normalization,  $P = .741$ .

Non parametric testing of the PSA normalized PSA data produced interesting results. Recall the second batch of resampled PSA Q-Q plots and the PSA histograms, and recall that the second round produced a more rounded hump that reflected the normalized data? The Wilcoxon Sign Rank was conducted on the corrected data; the results were significant,  $p < 0.001$ , in favor of rejecting the null hypothesis and accepting a significant result for the following hypothesis.

$H_2 < 0.05$ : Students' Positive Smoking Attitudes will decrease by participating in the Smoking Media Literacy program.

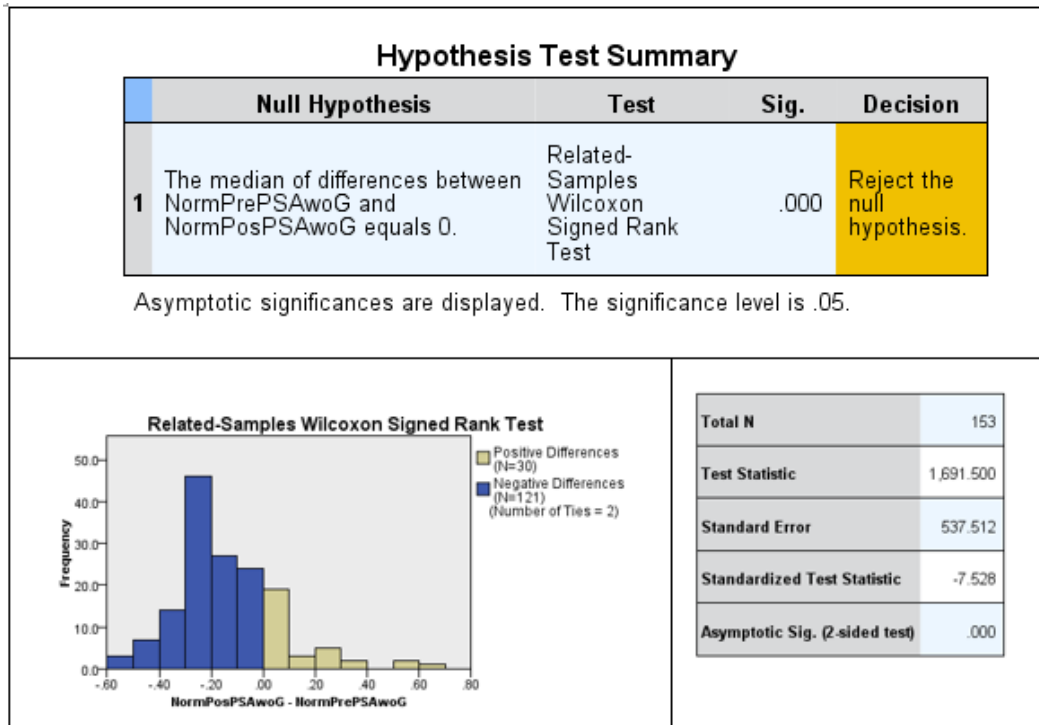


Figure 16. Wilcoxon Sign Test on Normalized PSA. Null is rejected. There was a difference in PSA scores, with the non parametric test showing significant decrease in Pro-Smoking Attitudes,  $p < .001$ .

The 153 data records without missing data were analyzed for Pro-Smoking Attitude. Results showed participation in the media literacy program elicited an increased score for 30 participants compared to 121 participants whose scores decreased. Only two (2) participants had no change in their PSA scores at all. The result is also statistically significant with a median decrease in the SML score,  $z = -7.528$ ,  $p < .005$ . The null is rejected.

### **Intent to Smoke Normality Tests**

The lack of normality seemed to be a trend for the pre- and post-data. The data for the third hypothesis:

H<sub>3</sub>: Students' Intent to Smoke (ITS) will decrease as a result of participating in the program.

To evaluate Intent to Smoke, participants were asked two questions:

- 'Do you think you will smoke in the next near future?' and
- 'Do you intend to smoke within the next year?'

Response options were 1=Strongly Agree, 2=Agree, 3, and 4=Strongly disagree.

Given the respondents of the sample to lean heavily in favor of not smoking, few students indicated they would intend to smoke. However, prior to participation in the Smoking Media Literacy course 15 students, .09%, said they intended to smoke in the near future. vs. 20, 12%, in the post test. The increase is indicative of how we could expect the normality of the data in the Q-Q plots (Figure 17) and the curve in the histograms (Figure 18) to appear.

First the Q-Q plots for ITS have so few cases depicted, there is no clear alignment to the slope.

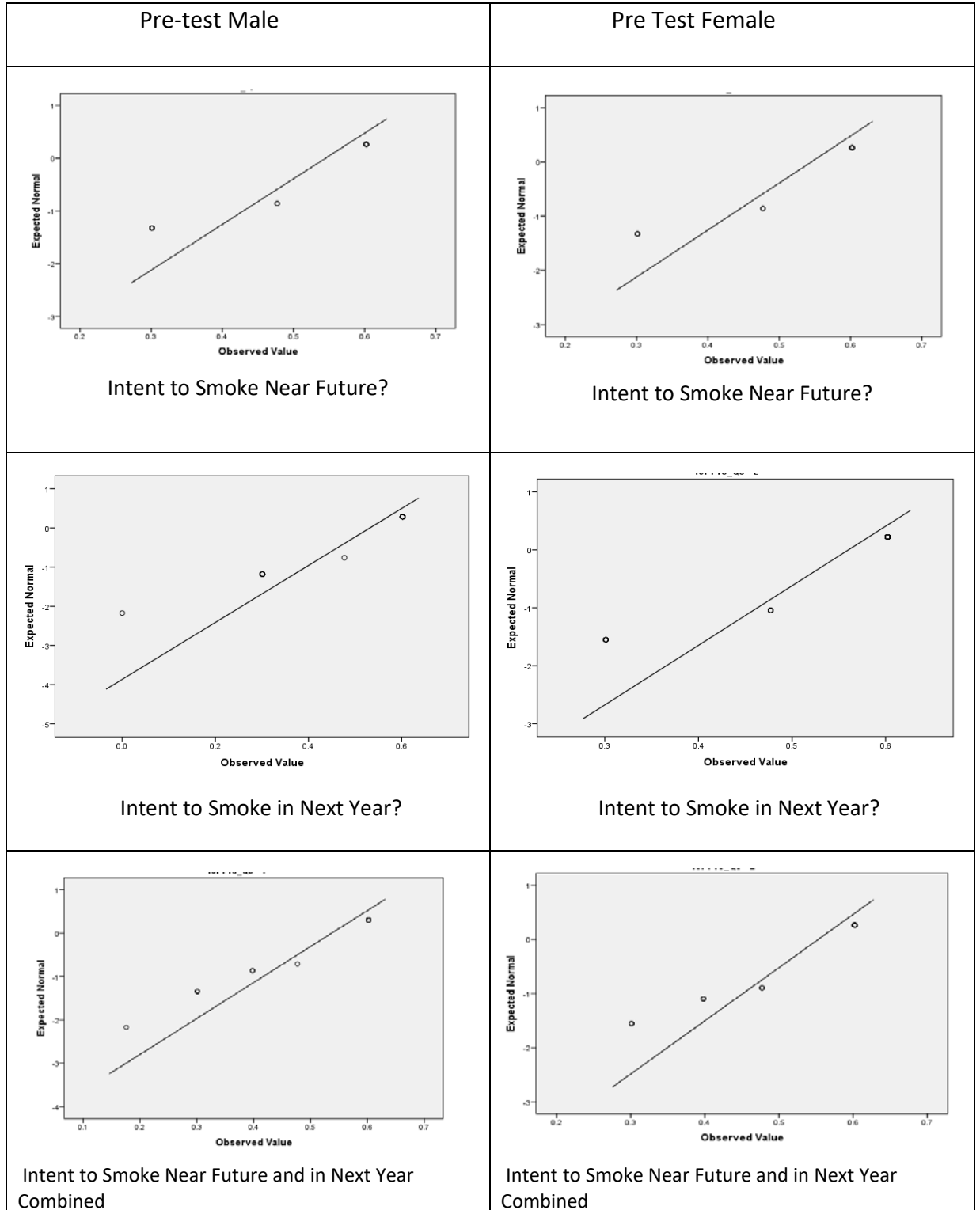


Figure 17: ITS Q-Q Plots: near future, in next year, and both ITS combined. Male and Female data. So, few students indicate intent to smoke, the Q-Q plot trends were inconclusive.

Next, the Histograms showed more of a tendency to not smoke, with the negatively skewed curve.

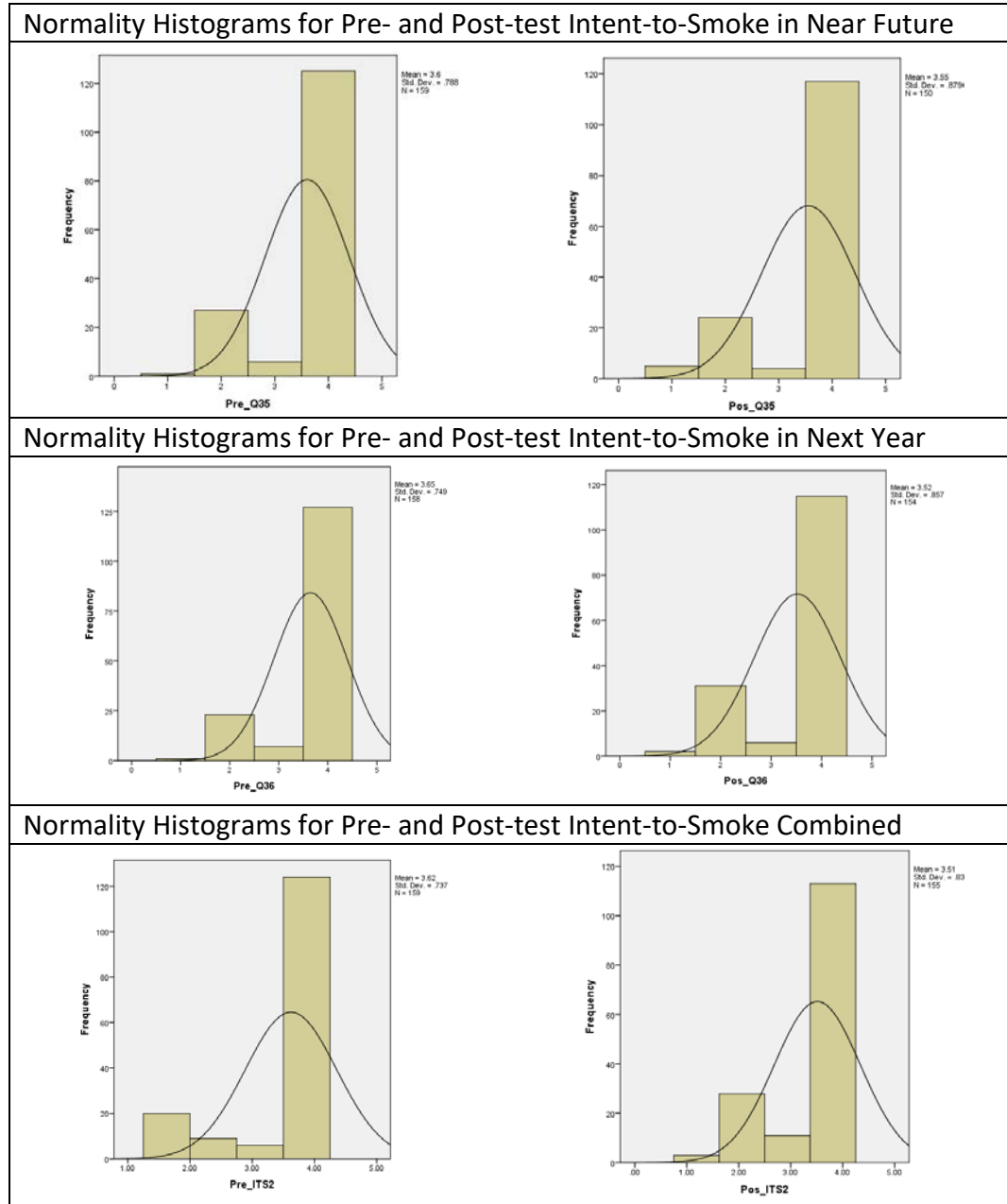


Figure 18. ITS Normalized Histograms.



At this point, it seemed appropriate that the data be normalized by squaring the mean. To level out normality for the ITS variables, the mean was multiplied by the square root. The results were still skewed. Instead of trying to create new Q-Q plots and histograms with the normalized data, we skipped right to the non parametric tests for both the non normalized and the normalized data.

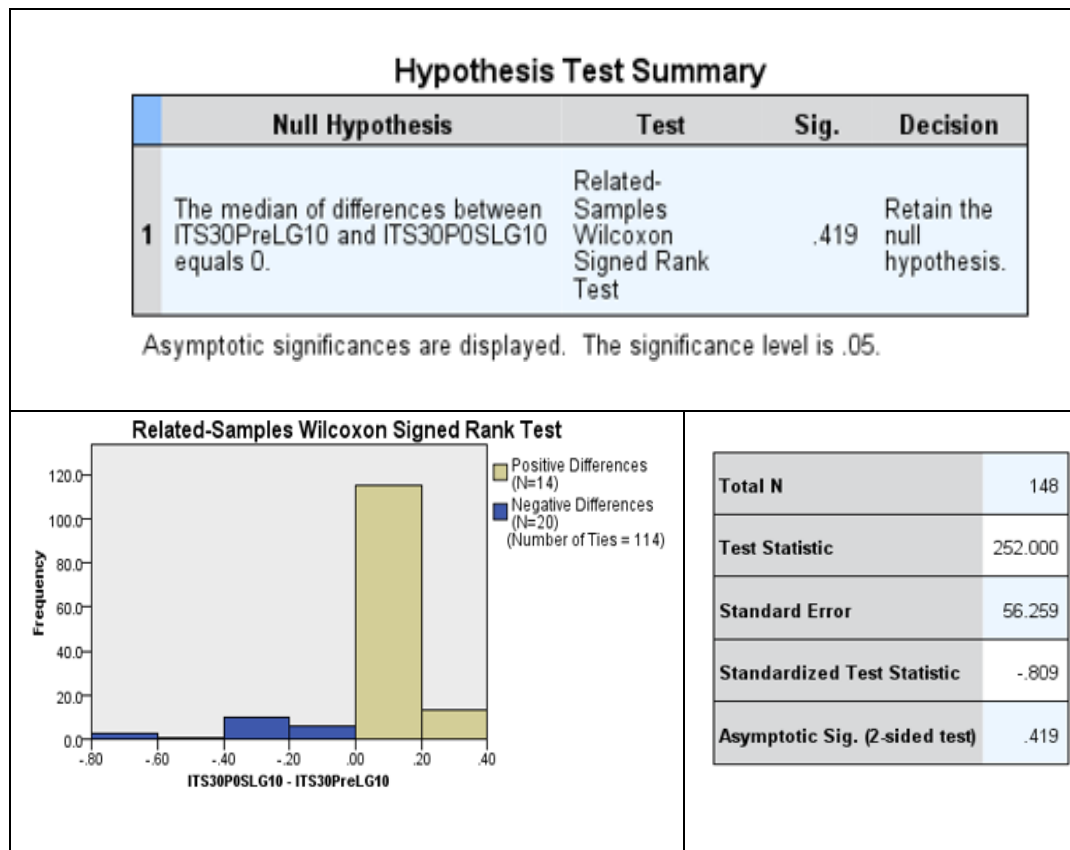


Figure 19. ITS near future test, non significant,  $P = .419$ , for normalized data.

To compensate for the skew in the population responses, the pre- and post- Intent to Smoke in the near future were squared and the Wilcoxon Signed Test was run. The scores were still insignificant and the null hypothesis—Intent to Smoke in the near future was unchanged from pre-intervention to post.

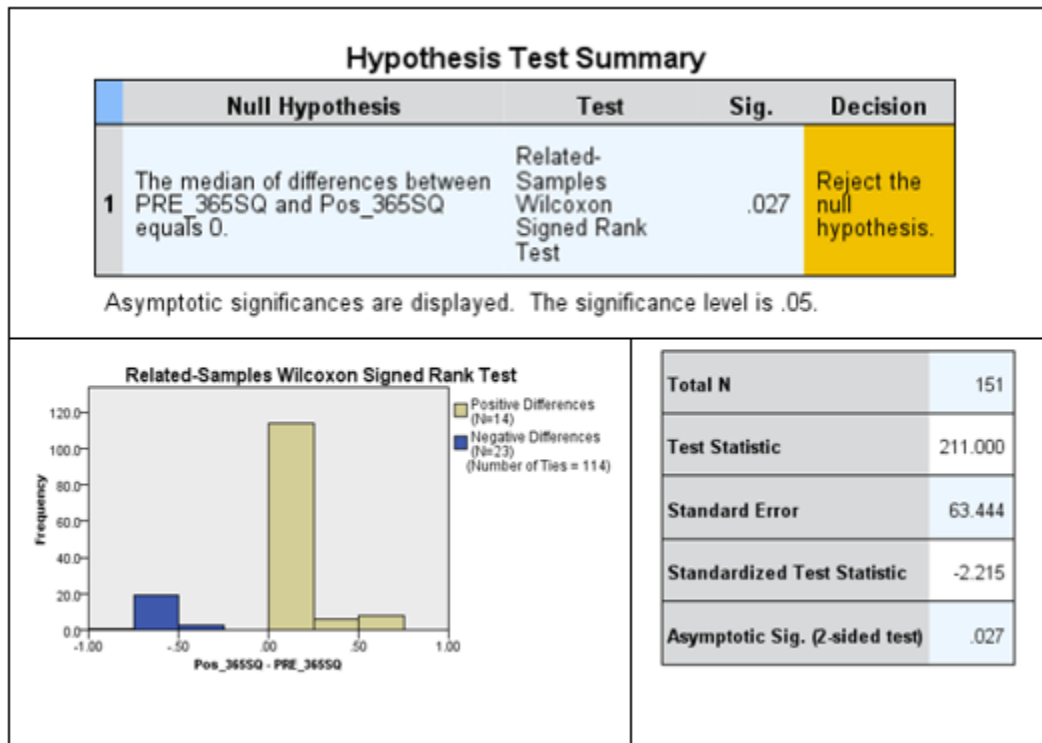


Figure 20. ITS within the next year test, significant at  $P = .027$ , in favor of Intent to Smoke.

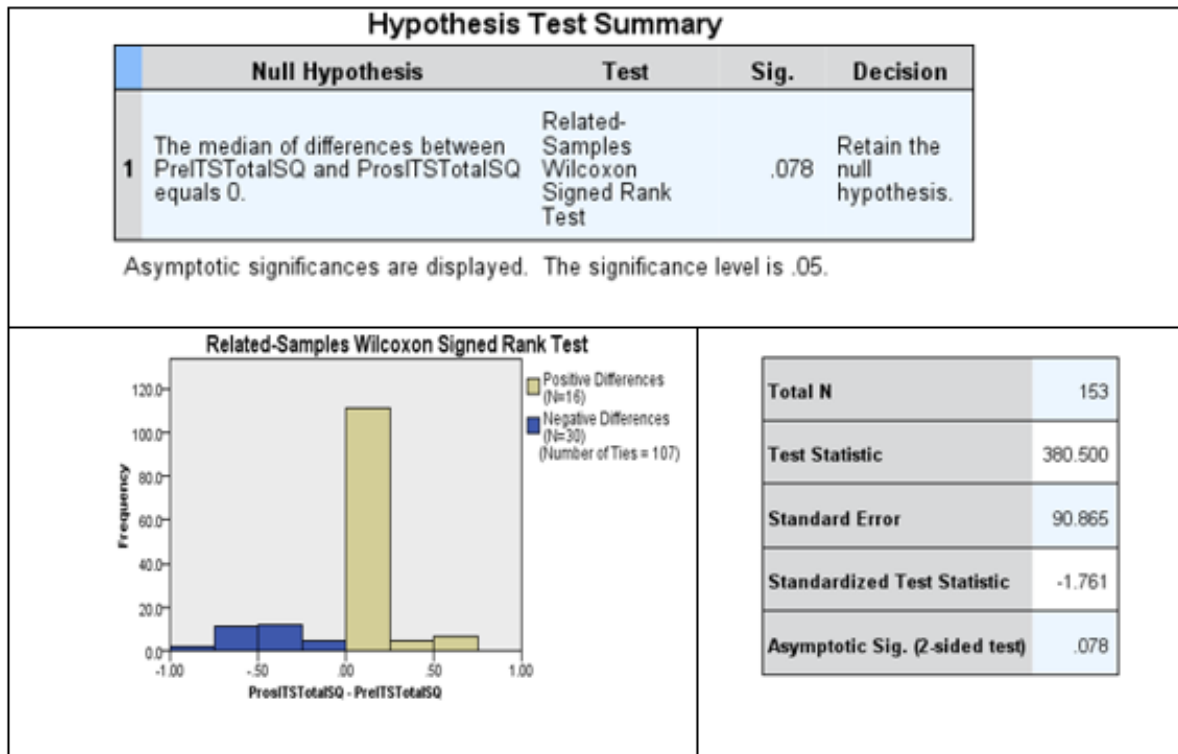


Figure 21. ITS Scores combined and normalized. Non significant,  $P = .078$

### Testing for The Hypotheses using the *T*-Test

Of all the tests that could be run, despite non-normal assumption results, the *T*-test is valid (i.e. the type 1 error rate is controlled at 5%) even when the data doesn't follow a normal distribution. This is because the central limit theorem is an underlying principle of the *T*-test which makes it robust against non normal distribution of two compared means, especially in samples with over 50 cases and even more so over 100. This study had 161 matched-pair cases. The *T*-test assumes repeated sampling, and the statistically compared means converge to normal distribution, regardless of the distribution of  $\bar{x}$  (mean or average) in the population (Lumley, T., Diehr, P., Emerson, S., and Chen, L., 2002). Also, the estimator that the *T*-test uses for the standard error of the sample means is consistent irrespective of the

distribution of  $\bar{x}$ , making it unaffected by normality. The premise was illustrated in this study by the normalizing of the PSA variable. Also, although some of the assumption testing was non-normal, the sample size for this study with matching pairs is sufficiently large to resist the effects of non-normal sample distribution, despite missing data during the SPSS analysis.

Despite the lack of normality in the data, the Central Limit Theorem provided statistical support to continue with the paired *T*-test (Lumley, T., et al, 2002). The *T*-test also evaluated whether participants exhibited higher General Media Literacy (GML), Smoking Media Literacy (SML), less Pro-Smoking Attitude (PSA) and less Intent to Smoke (ITS) after the intervention compared to pre-intervention results.

In addition to statistical significance, clinical significance was also computed using Cohen's *d*, equal to the difference in mean scale values, divided by the pooled variance of the pre- and post-test scores.

*T-Test Results.* The GML post-test mean scores increased ( $M = 3.29$ ,  $SD = 0.628$ ) on the General Media Literacy (GML) scale as opposed to their pre-test score ( $M = 3.44$ ,  $SD = 0.497$ ), a statistically significant mean increase of 0.19 km, 95% CI [0.089, 0.290],  $t(155) = 3.71$ ,  $p < .001$ ,  $d = .31$ ). Overall SML scores also increased significantly during this period. The SML post-test scores were  $M = 3.40$ ,  $SD = 0.716$  on the SML Media Literacy (SML) scale as opposed to their pre-test score ( $M = 3.17$ ,  $SD = 0.670$ ), a statistically significant mean increase of 0.23, 95% CI [.358 to 0.989],  $t(150) = 3.71$ ,  $p < .001$ ,  $d = .32$ . (See Table 22)

Table 22.  
*GML, SML and PSA Matching Pairs T-Test Including Effect*

Total Scales	N	T1	T2	T2-T1	pooled sd	95% Confidence Intervals	t	d	p
GML	156	3.13	3.29	0.16	0.45	.088853 .28967	3.56	0.36	<.001
SML	151	3.17	3.40	0.23	0.57	.10149 .37320	3.49	0.38	<.001

Based on the result above we would reject the null:

H<sub>0</sub>: Middle school students who receive 15 hours of tobacco education that includes media analysis will have no significant changes in their pre- and post-test Smoking Media Literacy (SML) scores.

And we would accept the research hypothesis:

H<sub>1</sub>: Middle school students who receive 15 hours of tobacco education that includes media analysis will experience a significant difference in their pre- and post-test SML scores.

**Analyzing the Subscales.** This *section* details the results of using the *T*-test for further analysis that looked at the impact of the sub- scales that included Media Literacy constructs of Audience and Analysis, Messages and Meaning and Reality and Representation. We began with General Media Literacy subscales and followed up with analysis of the Smoking Media Literacy subscales.

Table 23.  
*General Media Literacy Subscale T-test results*

Total Scales	N	T1	T2	T2-T1	pooled sd	95 percent confidence of interval of the difference	t	d& effect	p
GML AA Pre-test						.32833			
GML AA Post-test	158	2.96	3.16	.20	.64	.09475	3.71	.14 / .07	.000
GML MM Pre-test						.21244			
GML MM Post-test	158	3.26	3.37	.11	.54	.01192	3.78	.20 / .10	.029
GML RR Pre-test						NA			
GML RR Post-test	158	3.45	3.45	.0	.00	NA	2.21	.000	.000

**General Media Literacy Subscale Results.**  $M = 2.96$ ,  $SD = .56$  to  $M = 3.17$ ,  $SD = .62$ , a significant mean increase of ( $M = .21$   $SD = .64$ ),  $CI$  95% [.095 and .32833],  $t(158) = 3.58$ ,  $p < .001$ ,  $d = .32$ . The combined subscale for this were generated by Likert scale responses to the survey statements: 1) People advertise products they are more concerned about making money with than giving correct information. 2) People who advertise think very carefully about the people they want to buy their product. (See Table 24)

*GML Meanings and Messages:* The GML mean score for this subscale increase  $M = 3.26$ ,  $SD = .48$  to  $3.27$  ( $M = .11$ ,  $SD = .60$ ),  $CI$  95% [.011 and .212]  $t(158) = 3.78$ ,  $p < .029$ ,  $d = .20$ . The combined subscale for this were generated by Likert scale responses to the survey statements: “People are influenced by ads whether they know it or not”; “When people *make movies and TV shows*, every camera shot is carefully planned”; “When people *make advertisements*, every camera shot is carefully planned.”

*GML Reality and Representation:* The mean score, 3.45, for this variable was unchanged from the pre- and the post-test. (M=0, SD=0), rejecting any directional relationship before and after the intervention for this variable set that included Likert scale responses to the survey statements: “Movies and TV shows don’t usually show life like it really is”; “Advertisements usually leave a lot of important information,” and “When you see an ad, it is important to think about what was left out of the ad.”

A look at the results indicates the impact of the intervention on the three areas of Smoking Media Literacy. (See Table 24)

Table 24.  
*Smoking Media Literacy Subscales T-Test Results*

Total Scales	N	T1	T2	T2-T1	pooled sd	Confidence Intervals lower and upper	t	d& effect	p
SMLAA Pre-test SML AA Post-test	157	3.25	3.46	.21	.76	.37320 -.10149	3.15	.312/.154	.001
SML MM Pre-test SML MM Post-test	157	2.93	3.21	.28	.69	-.42685 -.15543	4.24	.40/.69	.000
SMLRR Pre-test SML RR Post-tests	150	3.15	3.41	.26	.82	-.40176 -.11480	3.56	.33/.16	.001

T-test Results

[SML Audience and Authorship](#): Means scores for this subscale increased from M = 3.25, SD = .69 to M = 3.25, SD = .70, which is a statistically significant difference of .21, CI 95% [-.10149 to .37320],  $t(157) = 3.15, p < .001, d = .312$ .

Variables combined to generate this subscale include the following survey statements on a scale of 1 to 4: 1) To make money, tobacco companies will do anything they can

get away with, and 2) Certain cigarette brands are especially designed to appeal to young children.

SML Meanings and Messages: Means scores for this subscale increased from  $M=2.93$  ( $SD .69$ ) to  $M3.21$ ,  $SD .71$ , a statistically significant difference of  $.28$ ,  $CI 95\% [.155-.427]$ ,  $t(150) = 4.24$ ,  $p < .001$ ,  $d = .4$ . Variables for this subscale included survey statements “Wearing a shirt with a cigarette logo on it makes one a walking advertisement”; “When people see *smoking ads*, they are more likely to start smoking themselves”; “When people *see movies with smoking in them*, they are more likely to start smoking themselves, “Movie scenes with smoking in them are made carefully.”

SML Reality and Representation: Means scores for this subscale increased from  $3.15$ ,  $SD .81$  to  $3.41$ ,  $SD .75$ , also a significant difference of  $M = .26$ ,  $SD=.82$ ,  $CI 95\% [.115- to 402]$ ,  $t(150) = -3.56$ ,  $p = .001$ ,  $d=.33$ . This subscale was created from the combined median scores for the survey statements: “Movies and TV shows don’t usually show life like it really is”; “Advertisements usually leave a lot of important information,” and “When you see an ad, it is important to think about what was left out of the ad.”

## **Results for Pro-Smoking Attitudes**

This section provides the analysis for the Pro-Smoking Attitudes, post-test results compared to baseline before the intervention.

H<sub>2</sub>: Pro-Smoking attitudes among suburban middle school students who received the intervention will decrease.



In regards to the Pro-smoking attitude questions there was a slight but non significant increase in Pro-Smoking attitudes in PSA mean score from 1.40 to 1.41 over the course of the intervention, an insignificant difference ( $M = .01$ ,  $SD = 0.29$ ,  $t(153) = -.19$ ,  $P = .850$ ,  $d = .02$ ). (See Table 25)

Table 25.  
*Pro-smoking Attitude T-test Results*

Total Scales	N	T1	T2	T2-T1	pooled sd	95% Confidence Intervals	t	d	p
PSA	153	1.40	1.41	0.01	0.47	.07002 .08491	-.19	0.02	0.850

Due to the non significant result, we accept the null:

$H_0$ : Pro-Smoking attitudes among suburban middle school students who received the media literacy intervention will remain the same.

**Media Literacy Intervention on Intent to Smoke**

The *T*-test elicited mixed results for how participation in the curriculum contributed to the intent to smoke as in the hypothesis listed below.

$H_3$ : Intent to Smoke will be decrease among students who receive the intervention.

To evaluate Intent to Smoke, participants were asked two questions:

- Do you think you will smoke in the next near future? and
- Do you intend to smoke within the next year?

Response options were 1=Definitely Yes, 2=Yes, 3=No and 4=Definitely No.

The survey questions used for the Intent to Smoke results were presented as Likert-scale questions. Students were asked on a scale of 1-4 with 1 being definitely

yes to 4 being definitely no, if they “‘thought’ [they] would smoke a cigarette soon and also if they “‘thought’ [they] would smoke a cigarette in the next year. These two variables were combined and showed a slight, but non significant negative movement in favor of smoking. The resolve to not smoke in the near future appeared to be stronger than the resolve than the confidence to no smoke within the next year, as indicated by the table below. (See Table 26)

Table 26.  
*Intent to Smoke Paired Samples T-Test Results*

Matching Pair T-Test Results	N-2	T1	T2	T2-T1	- pool ed sd	Confiden ce Level Upper and Lower	t	d/E	p
ITS Combined Pre-tests ITS Combined Post-tests	152	3.63	3.51	.12	.78	.07-.261	1.87	.04/.02	.06
ITS 30 days Pre-test ITS 30 days Post-tests	147	3.62	3.57	.05	.83	.081-.261	.897	.07/.04	.371
ITS 1-year day Pre-test ITS 1-year Post-tests	150	3.56	3.66	.10	.82	.000-.291	1.97	.90/.09	.05

The combined pre-intervention score was  $M = 3.63$ ,  $SD = .725$  as opposed to the post-intervention score  $M = 3.50$ ,  $SD = .67$  with a mean difference of .17 and a probability of .06. The result was a non significant difference toward Intent to Smoke  $M=12$ ,  $SD=.78$  and Intent to Smoke after the intervention ( $M=3.56$ ,  $SD=.94$ );  $t(154) = -15.873$ ,  $p=.06$ ,  $d=.04$ . Parsed out separately, the results between Intent to Smoke within 30 days, and the Intent to Smoke in the next year, were mixed. Intent to Smoke increased by  $M = -.05$ ,  $SD=.78$ , from  $3.62$ ,  $SD .75$  to  $3.57$ ,  $.73$ , a non significant result at .371. The resolve to not smoke “‘sometime in the next year” seemed to have a decay

factor. The means dropped ever so slightly toward the “Yes, I think I will smoke sometime in the next year” side of the Likert scale.

Based on the combined scores of “smoking in the near future” and “smoking in the next year, we can reject the null and accept the research hypothesis.

H<sub>3</sub>: Intent to Smoke pre- and post-test averages will different among students who receive a Smoking Media Literacy a media literacy curriculum.

### **Correlations Results**

In addition to the *T*-test, further analysis elicited the strength of relationship between the predictor variables of General and Smoking Media Literacy and the outcome variables of Pro-Smoking attitudes and Intent to Smoke.

A bivariate correlation (Pearson’s *R* test) confirmed the *T*-test results. There was a positive correlation between the SML and GML pre-test and post-survey results. The same Bivariate test showed an inverse correlation between the two media literacy variables and PSA. As smoking media literacy increased, PSA decreased, a medium inverse association of  $-.387$  and moderately significant  $P = .02$ . As smoking media literacy increased, Pro-Smoking attitudes decreased. And as smoking media literacy increased, the resolve to not smoke increased, a medium association of  $.315$  with a high significant probability  $p < 0.001$  that the association did not occur by chance. (See Table 27)

Table 27.  
*Pearson's R (Bivariate Correlation)*

Significance for a Two-Tailed Test	DF N-2	1	2	3	4	5	6	7
Pre-SML								
Post_SML_M	(157)	.274**						
Pre_GML_M		.472**	.279**					
Pos_GML_M	(157)	.246**	.551**	.383**				
Pre_PSA_M		-.136	-.224**	-.173*	-.183*			
Post_PSA_M	(158)	.067	-.387**	-.025	-.311**	.349**		
Pre_ITS2		.112	.161*	.096	.017	-.441**	-.192*	
Pos_ITS2	(151)	.083	.315**	.099	.205*	-.282**	-.463**	.436*

A summary for the table above Pearson's *R* test:

- Degrees of Freedom range:  $DF = (151-159)$ ,
- Range of Correlations:  $r = (.192-463)$
- Levels of probability range:  $p < .05^*$ ,  $p < 01^{**}$ . Null hypothesis is rejected for the following variables:

**\*\*Highly significant Results:**

- Pre-post SML=154  $r(.274)$ ,  $P < 00^{**}$
- Pre-post GML,  $DF=157$ ,  $r(.246)$ ,  $p < 0.01$
- Post SML and post Intent to Smoke,  $DF=151$ .  $r(.315)$ ,  $p < 0.01$
- Post GML and post Intent to Smoke (.0),  $p < 0.01$ ,
- Post SML and post Intent to Smoker (.463)  $p < 0.01$ .

\*Moderately significant was the inter-correlation for Pre-test Pro-Smoking attitudes and Post-test pro- smoking attitudes:  $DF:157$ ,  $r(.349)$ ,  $P=02$ .

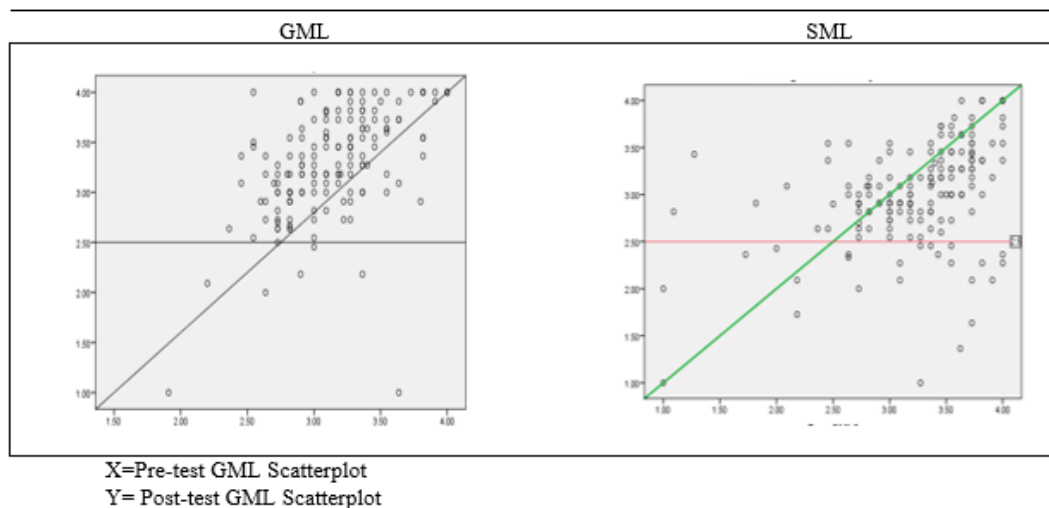
The association between the predictor variables and the outcome variables

ranged from small to medium. (See Table 28.)

**Table 28. Strength of Association Among GML, SML, PSA and ITS**

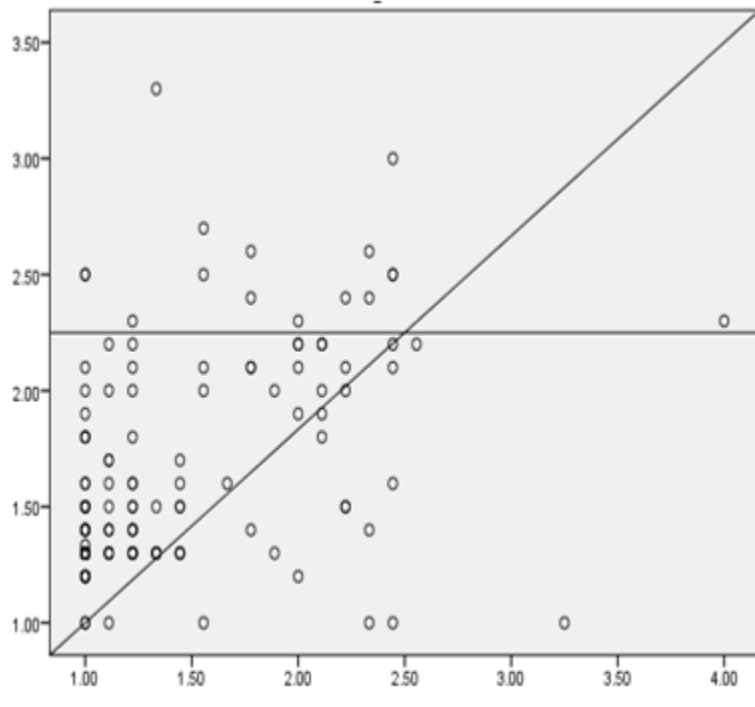
Pearson's R		
Strength of Association	Positive	Negative
Small	.1 to .3	-0.1 to -0.3
Medium	.3 to .5	-0.3 to -0.5
Large	.5 to 1.0	-0.5 to -1.0

The scatterplots below illustrate the relationship between the pre-and post-test of each scale variables: General Media Literacy, Smoking Media Literacy and Pro-Smoking Attitude variables. Pre-and post-test GML and SML are shown in Figure 22.



**Figure 22.** Pre-and Post-test Correlation for Media Literacy Scales in Scatterplots

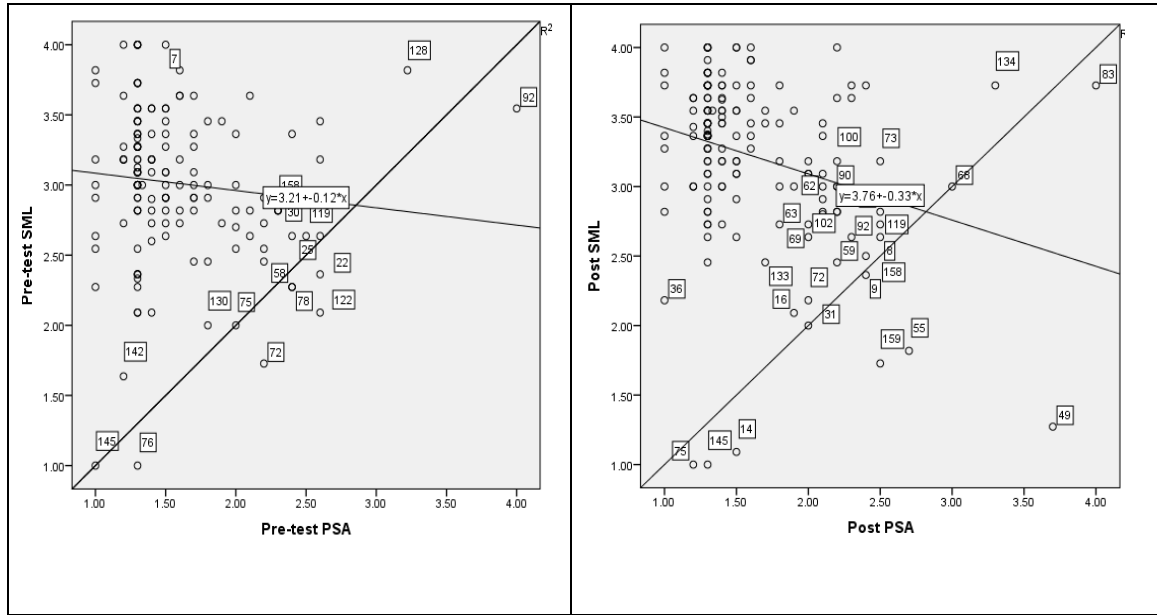
As expected, the slopes representing the literacy scales increased for both General and Smoking Media Literacy. Separate scatter plots of the three scales showed approximate linearity, with few outliers outside the 3.3 variance threshold. One question, in the Pro-Smoking scale was recoded as a result. The change was “It is easy to quit smoking” to” it is hard to quit so the direction of the question aligned with “If you start smoking, it is easy to quit (29G). Eventually, that variable was removed.



X= PSA Pre-Test Scatterplot  
Y= PSA Post-Test Scatterplot

Figure 23. Scatterplots as depicted by cases here reflects a slight PSA increase.

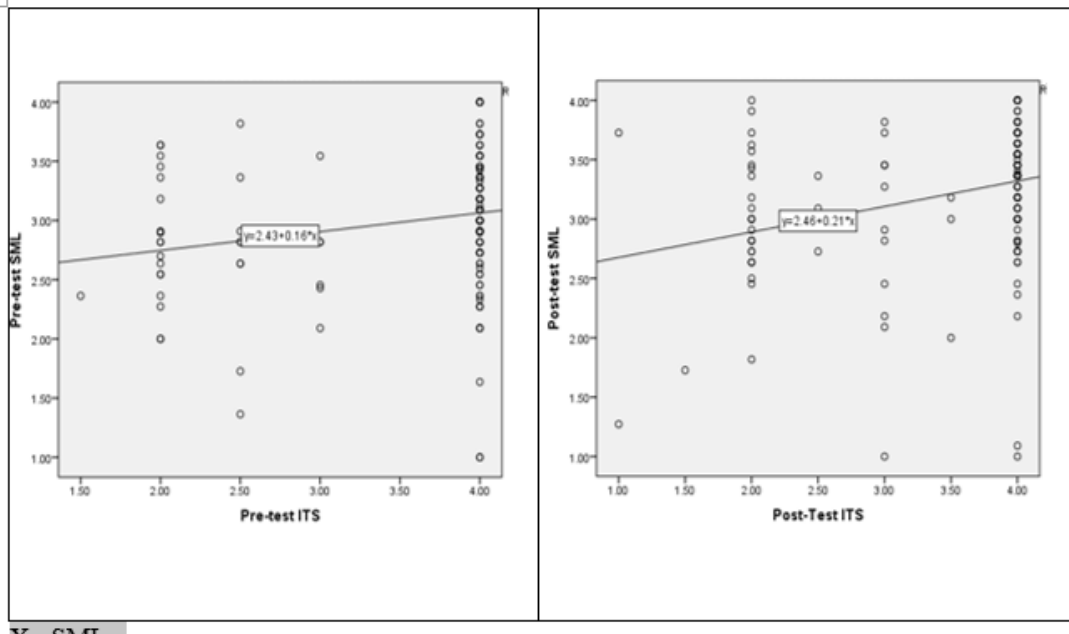
Ultimately the variable was removed, but the missing variable did not seem to impact the *T*-Test score, shared earlier in these results. From pre-test to post test, the inverse relationship of the smoking media literacy and the Pro-Smoking attitude becomes steeper. As the smoking media literacy score increased, the Pro-Smoking attitude decreased below.



X= SML  
Y=PSA

Figure 24. SML and PSA pre- and post-test correlations.

The intercepts in the two scatterplots below show that as the participants’ Smoking Media Literacy increases, the more likely the participants are to lean toward a “Definitely No” in their answer to not smoke. The ITS variable graphed in the scatterplot is a combination of the both questions, ‘Do you intend to smoke in the near future?’ and ‘Do you think you will smoke sometime in the next year?’



X= SML  
Y=ITS

Figure 25. SML scale and ITS combined variables test correlations.



## Chapter 5

### DISCUSSION

A summary of this intervention and follow up analysis experiment provides a mixed report compared to the outcomes of in-school Media Literacy programs.

Comparison and analysis here include the following research questions:

- 1) Will evidence show that suburban middle school students make gains in smoking media literacy over the course of the intervention?
- 2) What is the impact of the intervention on suburban middle school student attitudes toward smoking?
- 3) Will intention to smoke among suburban middle school students decrease following the media literacy intervention?

### **Summary of Results**

Positive attributes of this study were noticed in the delivery of the curriculum and a population different from similar Smoking Media Literacy studies in that it is suburban. A strength of this nested cohort within the larger population is the simultaneous delivery of the curriculum in three suburban middle schools located in a large Midwestern state's metropolitan area. The start date for each site was within the same 14 days in January of 2009 by facilitators trained by the research staff. The data from these schools were analyzed from these specific sites for the following reasons:

- The media literacy curriculum was delivered under the similar circumstances in each of these schools. While it is impossible to control all variables, youth

received the media literacy curriculum portion of this curriculum from a Communication Arts teacher.

- The schools participating in this program had a team system approach to grade level instruction where the entire cohort of s each teams' pupils had the same chance to receive the instruction.
- These teachers had received 16 hours of training from the research team in a pre-program seminar and in scheduled follow up meetings to the schools.
- Participants in these schools ranged from 12-14 years, an age range identified as emerging adolescence and a period identified as a critical developmental age for first time experimental users.
- Common among these schools was the systematic approach for delivering the pre- and post-tests in grade level teams. Based on identifying cases through unique variable labeling, the before- and after-data samples provided for matching cases.
- The procedure for statistical analysis was designed with the assistance of an expert methodologist and researcher at an accredited Midwestern university. The analyses tested for validity of scale and relationship and the intervention will have on three separate variables. 1) an increase in smoking media literacy and 2) youth attitudes toward smoking, and 3) youth intent to smoke!

### **Summary of Validity and Reliability Attributes of the Instrument**

The validity and reliability of the instrument scales supported the results for similar scales used in the studies done by Primack et al's (2006) and Bier et al (2011) The factor analysis scores were not as robust as were those for Bier's study, which

originally elicited a strong 71% to 97%. But this SML study for the more suburban population had an Eigenvalue range of 54% to 65%, well within an acceptable range. And the covariates ranged from 69%, 68% and 73% for the GML, SML and PSA scales, respectively.

Outcomes of the Cronbach Alpha coefficients test included scores of .73, .86, .89 for the GML, SML, respectively, and PSA. These results align with Bier, et al's (2006) study that reported coefficients of .72 to .84.

In summary, the instrument, used for a second time in the Midwest state, resulted in the same validity and reliability outcomes as the earlier General and Smoking Media Literacy Pilot Study using participants from more rural and urban settings.

### **Normality and Ad Hoc Tests**

The assumptions explored by normality and ad hoc non-parametric tests were not presented in any of the comparable studies referenced. Also, because of the Central Limit Theorem, normality didn't necessarily need to be explored because the *T*-test used on populations over 30 is robust to Type 1 errors. But due diligence was exercised and normality was explored using Q-Q plots and histograms. Exploratory normality tests were mixed with a show of some normal, but mostly skewed curves as illustrated by both the Q-Q plots and the histograms for each of the variables. The curve for GML scale was the most normal and fell within the range expected, a skew score within  $-1/+1$  range for compared means; and the SML curve, with a moderate negative skew was equally within the approximately normal range. Data associated

with the PSA was a strong positive skew, invoking the step to normalize the data. Given that the normal curves were a bit sketchy, more pro-active pad hoc testing was done to affirm outcomes. To accomplish this, the means of the variables were squared to mimic repeated samples of the pre-and post-data. The results were leptokurtic by bin, but the curve and extended distribution reflected a more normal distribution.

The significance for these ad hoc tests confirmed the approximate normality of the media literacy curve with an increased mean for media literacy ( $p < 0.001$ ). To get a better picture of the before and after PSA results, ad hoc Wilcoxon tests were also run to determine positive or negative movement before and after the intervention. After adjusting the data for repeated samples, ad hoc results for the PSA proved that the Pro-Smoking attitudes did decrease following the intervention and it did so at a statistically significant level. This development is insightful, because the if there were any ad hoc, non parametric tests or assumptions for Bier's and Primack's et al studies, they were not provided, so there is no comparison as to the skew in the data or the result for the lowering of PSA scores at a significant level in the non parametric testing of this test. Pro-Smoking attitudes scores increased before and after the intervention

### **Significance of *T*-Test Results.**

The *T*-tests results were similar to those experienced by the 2006 Pilot study.

This reaffirms the validity of the scale. And like the recommendation by Bier that a control group be included. The surprise in this study was the acceptance of the null for the PSA test when results proved just the opposite for the same the non

parametric test in which the PSA mean for participants decreased. The PSA *T*-test had an increase in the Positive Smoking Attitude didn't drop; it increased by less than .05%, and with such a small increase, the result was bound to be non significant, with a  $p = .814$ .

### Normality and Results for the Intent to Smoke Variable

H<sub>3</sub>: Intention to smoke will be reduced among suburban middle school students who receive the intervention.

The nature of the sample for the Intent to Smoke variable was also skewed, and led toward an already “basement” number of smokers among the participants.



Figure 26. Bar Chart of Intent to Smoke by gender (females on the left) —before and after intervention.

Intent to Smoke was not addressed in the reliability and validity testing, but the curve skewed positively, just as the Pro-Smoking attitude did. Similar measures were taken to address this, including squaring the means to mimic multiple sampling of the same population. The results were still skewed indicating that the means would still trend toward low smoking intent. Ad hoc non parametric testing was also done to indicate the direction and significance of the results.

Just like the non-significant Pro-Smoking attitude non parametric results, the overall Intent to Smoke results were not significant, and the Intent to Smoke non parametric tests also were mixed.

Despite the skewed results, the decision was made to move ahead with a bivariate correlation, which had the potential to illustrate the relationship among the SML, the PSA and Intent to Smoke. The skewness, after all, was based on the homogeneity of the population from which the sample drawn, so the matter is one of comparing means, however skewed they may look in graphs. The telling results support the use of SML to increase media literacy, reduce the intensity the Pro-Smoking Attitudes and curb Intent to Smoke. providing moderate and significant relationship among each of the variables.

Pre- and Post-test means for the SML scale indicated a moderate .274 relationship. SML also showed an inverse relationship of an increased SML result to the PSA. The pre-test relationship score was  $r = -.224, p < .001$  and intensified to  $r = -.387, p < .001$  after the intervention. The results were similar to the Bier, et al study, in which the SML from  $r = -.12, p = .11$  to SML  $r = -.31, p < .001$ ).

Despite the overall increase of Pro-Smoking Attitude *T*-tests, it is suggested that these increases may have been influenced by factors outside the media literacy curriculum, such as the risk-prone age group or perhaps exposure to others who smoke. The results also suggests that without the intervention, the increase in PSA scores may have been even higher, given that the middle school population is more likely to be affected by media messaging.

The SML relationship to Intent to Smoke (the higher the ITS mean score, the less likely to smoke) trends the same positive. The correlation between SML and ITS intensified from an insignificant and weak score of  $r = .112$  to  $r = .315$ , a moderate relationship with strong significance  $p < .01$ . The result lends credence to the idea that any increase in the number of smokers had more to do with other factors beyond exposure to the Smoking Media Literacy curriculum.

### ***T*-Test Comparisons with Other Study**

The results of the *T*-test for the media literacy and attitude variables before and after the intervention were also parallel to Bier's results. The mean difference, (.15) for GML  $M = 3.13$  to  $3.29$  ( $d = .38$ ,  $p < .001$ ) matched that of Bier, et al, (2006), .3.11 to .3.26.

Mean scores for SML increased from  $M = 3.17$  to  $3.40$  ( $d = .38$ ,  $p < .001$ ), similar to Bier et al's  $M = 2.99$  to  $3.22$ , ( $d = 0.44$ ,  $p < .001$ ). An exact .23 mean increase for each—the *t* difference being the higher mean score to begin with.

The match up continued with the Pro-Smoking attitude increasing from a mean of 1.40 to 1.41. a .01 difference ( $d = .02$  to  $P = .85$ .) compared with Bier's, 1.23

to .1.36. ( $d = 0.29, p < .001$ ), a significant difference of .13. The notable contrast here is the non significant probability for the suburban sample than the earlier studied population with cases representing a variety of schools and 7-12 populations throughout Missouri (Bier et al, 2006).

The Intent to Smoke results reflected followed the trend for middle school students to experiment during their early teens. What is most interesting about these results is that resolve to not smoke overall decreased by a mean difference of -.10% at  $d=.90, p = .06$ . Resolve to not smoke in the near future could not be factored in student resilience, because the results were non significant, but the mean for resolve to not smoke sometime in the next year did drop by .10,  $d=.90$ , with a significance of  $P=.05$ . A similar study with a control group may offer a more causal perspective of the intervention's success, moderate correlations, and mixed significance.

In summary, the results of this study align closely with others that 1) smoking media literacy does increase and 2) there is a relationship between increased resistance to smoking and an increase in smoking media literacy. There is some evidence that the use of media literacy as a means of teaching youth resilience may hold some promise.

### **Limitations**

A limitation of the sample for this study was homogeneity in terms of the population studied. It may have been representative of the suburban population from which it was drawn, but generalizing beyond its results should be limited. The data was also from 2009; however, its empirical nature does offer some insight on the



timeless nature of media literacy constructs that remain relevant beyond media technology, policy, or trends. The study provides relevant insight for leveraging media literacy to teach early teens' resilience to risk behaviors.

Another limitation, despite an inverse correlation between SML and PSA, is the slight increase in students' Pro-Smoking attitudes before and after the interventions. The result may not have been significant, but it would be well worth it to conduct a true research study that can reveal a causal relationship and not just a correlation. Per the Pearson's  $R$  correlations, there is a low correlation  $r=.067$ , which supports the idea that other factors may be contributing to any differences in the before and after results. The discussion of smoking, even when it focuses on negative aspects can also engender some additional interest in the topic that has been shown to be temporary in other studies" (Wiehe et al, 2005; Peterson et a 2000). Young teens also often lean more toward Pro-Smoking attitudes due to heavy exposure to media and other influences (Pierce et al., 1998; Wiehe et al, 2005.) Given the natural independence-seeking among the maturing participants, the increase, although insignificant, may also be a result of experimentation. (Dryfoos and Quinn 2005; Fetro, Coyle, and Pham 2001), and the fact that Pro-Smoking attitudes increase among this age group (Institute 2008).

More than the developmental aspect, an increase in Pro-Smoking attitudes came from a study by Austin, Pinkleton and Funabiki-Patterson (2008) wherein they described a *desirability paradox*. They noted an increase "in positive affect from media portrayals at the same time they also measured a decrease in beliefs and expectancies associated with risky behavior" (Pinkleton et al. 2008).

Bier et al (2011) observed the same phenomenon, and surmised that participants in that study may have been” reflecting greater awareness of the persuasive techniques of tobacco messages, but at the same time increased their logical decision-making skills in a way that decreases the likelihood of tobacco use,” as indicated in the increases reported in this study aligning with similar results of the study that included a more rural population. The correlative evidence in this study supports this.

An explanation for the increase in Pro-Smoking and Intent to Smoke may be the homogeneity of the participant population, which almost guaranteed a “floor effect” (Russo 2003). The pre-intervention *T*-test mean for Pro-Smoking attitudes (1.41) was already at a low possible value (1 on a scale of 1 to 4) (Bier 2011).

Another perceived limitation also may be the small decrease in the mean (-.12) for resolve to not smoke. Given that the correlation test showed a parallel increase in resistance to smoke with media literacy, an equally logical perspective may be that this variable statistic may also have been at the highest possible value to not smoke. In fact, a scatter-dot matrix of the pre-and post-smokers showed that showing less resilience to smoking were new to the experimentation and some self-identified smokers in the pre-test leaned toward not smoking. The result seems to be in keeping with the experimental habits of the early teen population.

**Limitations that May Elicit Interest for Future Research.** The study’s design and results would have been enhanced if a control group had been included. With a control group, the difference between those who received the curriculum and those who didn’t could have offered more insight into the appetite for risk and

independent choices of the suburban early teen population. Working with the school district and the state precluded a control group as the order for the curriculum was for the program to touch as many students as possible. However, the addition of a control group in future studies would add credence and greater fidelity to the results. Future studies that may include a control group design, also could be adapted to media literacy interventions to address other risk behaviors.

A tactic to further apply this type of intervention is to extend the study with a longitudinal component where students are followed bi-annually to their 21<sup>st</sup> birthday, the age when smoking uptake tapers to a minimum.

Even though the data came from 2009, the results offer insight as to how this type of curriculum might be used in the classroom to teach resilience for any number of risk behaviors—sexual activity, alcohol, bullying or even use of some drugs. The program also engages teachers as mentors and team leaders across several disciplines as they provide insight about tobacco use or any other socio-economic, political, and health consequences. The result of this mentoring provides another positive influence among the risk-prone age group.

Further insight may be gained by doing a meta-analysis of other factors that correlated with the drop in tobacco use among teens from the years 2003-2013. One of the periods for the greatest decrease occurred around 2010 and 2011, shortly after \$1.7 million was provided in 2006-2010.

This intervention program was funded by that money, and other tobacco education programs were also deployed across the Midwestern state.

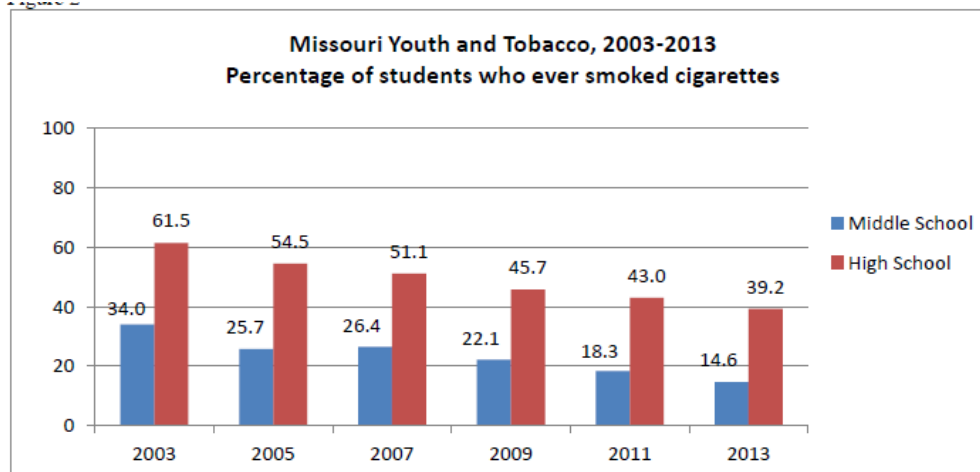


Figure 27. Smoking rate among teens from 2003-2013. Source: MDHSS, 2015

Public health statistics show a significant drop in teen smoking around the time this intervention, first deployed in 2007 in high tobacco use counties, and other youth. From 2007 to 2011, the middle school smoking rate dropped by 8.1% when this and similar programs were deployed statewide because of woefully inadequate but still unprecedented funding provided by the Midwest state's legislators to its Department of Health and Senior Services. A second part of this curriculum was media advocacy by youth to avoid smoking, community outreach and peer mentoring, and civic engagement to propose an anti-smoking law. Youth who were part of this study also engaged in social media messages and attended hearings advocating stronger smoke free laws. Whatever factors provided impetus to the drop in smoking or to influence community opinion, it may be worth investigating if the program that was disseminated throughout the St. Louis area had impact on public health policy, or if the significant drop in smoking could somehow be attributed to the in-school

programming for the areas it was deployed. This is mentioned because the second phase of this curriculum engaged youth public policy activities as they presented the human and financial cost of smoking to city governments. The result of their efforts included events and productions that were widely covered by traditional and social media. Thousands of residents living in the urban and suburban districts where the curriculum was deployed received newsletters regarding educational program and the anti-tobacco media the youth were creating. The year following the curriculum deployment, a no-smoking policy was instituted for restaurants, public places, schools and workplaces in some metropolitan areas within the state. The passing and enforcement of this policy was followed by an unrelated major community, media and public education project funded by the Centers for Disease Control to strengthen the no-smoking ban to include bars and casinos in the County where the tobacco education took place. However, while the media and community education of this second and \$10.5 million initiative probably had impact, the ordinance was not strengthened. These developments together may not have given weight to the reduction in community smoking, but re-instituting a comparatively budget friendly in-school program to potentially impact policy may be worth a second look.

### **Final Summary**

The findings in this study confirmed results of those previous. Validity and reliability tests aligned with the study by Primack et al (2006), and the results of the *T*-test were also similar to those completed by Bier (2011). Since the intervention, there has been a marked reduction in the use of cigarettes, but risk susceptibility of

teens is still leveraged as tobacco companies have more than doubled their advertising spending on tobacco dissolvables, smoking flavored cigars. The biggest rise in tobacco products has come in the form of vaping. Results of the Missouri Youth and Tobacco survey shows that cigarette use increased .4 percent from 2009 to 2015. Smokeless tobacco, however, rose 5 percent from 2005 to 2009, and peaked at 18 percent in 2013 (2016). [\(See Appendix B, Figure 28\)](#) In 2015, smokeless tobacco use dropped 17 percent in 2015, replaced by a spike in vaping [\(See Appendix B, Figure 29\)](#). From 2013-2015, the use of any kind of tobacco increased from 31 to 53 percent [\(See Appendix B, Figure 30\)](#). By looking at the data, the increased tobacco use had to come from vaping since smoking and use of smokeless products dropped for that period, with nicotine products. Smoking rates may have dropped, but 35 percent of sophomores and 58 percent of seniors had used “any kind of tobacco products” in 2015. It would be interesting to see if the ordinances raising the tobacco use from 18 to 21 in several key Missouri cities will have impact on the youth tobacco survey in 2017 (Giegerich, 2016).

For a clear view of how or when the use of tobacco increases in the wake of this new ordinance seems to call for a research study with a control group. A media literacy study with a control group could also be used to for nearly any other risk behavior.

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## Appendices

### Appendix A.

#### IRB Approval- University of Missouri St. Louis

Reply Reply All Forward      X   



#### IRBNet Board Action

John Hancock [no-reply@irbnet.org]

To: UMSL, education-irb; Hoagland, Carl; Pulley, Cynthia

Thursday, November 19, 2015 4:34 PM

Please note that University of Missouri-St. Louis IRB has taken the following action on IRBNet:

Project Title: [388247-4] UP IN SMOKE: USING MEDIA LITERACY TO REDUCE EARLY TEEN SMOKING  
Principal Investigator: Cynthia Pulley

Submission Type: Continuing Review/Progress Report  
Date Submitted: November 16, 2015

Action: APPROVED  
Effective Date: November 19, 2015  
Review Type: Full Committee Review

Should you have any questions you may contact John Hancock at hancockjc@umsl.edu.

Thank you,  
The IRBNet Support Team

[www.irbnet.org](http://www.irbnet.org)

**Appendix B: ‘****Supplemental Tables**

Appendix B, Table 29.

*Media Literacy Matrix and Sample Questions*

ML Sub-Scales 1-3	Construct	General Media Literacy (GML) Scale Questions	Smoking Media Literacy (SML) Scale Questions
Authors and Audiences <a href="#">(back to results)</a>	AA1: Authors create mass media messages for profit and/or influence.	21a. People are more concerned about making money than giving correct information	28a. To make money, tobacco companies will do anything they can get away with.
	AA2: Mass Media Authors target specific audiences.	21b. People who advertise think very carefully about the people they want to buy their product.	28b. Certain cigarette brands are especially designed to appeal to young children.
Meanings and Messages <a href="#">(back to results)</a>	MM1: Mass media messages have inherent values or points of view.	21c. Two people may see the same movie or TV show and get different ideas about it.	28c. Cigarette ads try to link smoking to things that people want (like love, good looks, and power)
	MM2: Different people interpret mass media messages differently.	21d. Two people may see the same ad and get different ideas about it.	28d. Wearing a shirt with a cigarette logo on it makes one a walking advertisement.
	MM3: Mass media messages affect attitudes and behaviors.	21e. People are influenced by movies whether they know it or not.	28e. When people see smoking ads, they are more likely to start smoking themselves.
		21f. People are influenced by ads whether they know it or not.	28f. When people see movies with smoking in them, they are more likely to start smoking themselves.
MM4: Mass media messages are developed using multiple production techniques.	21g. When people make movies and TV shows, every camera shot is carefully planned.	28g. Movie scenes with smoking in them are made carefully.	
	21h. When people make advertisements, every camera shot is carefully planned.	28h. There are often hidden messages in cigarette ads	
Reality and Representation <a href="#">(back to results)</a>	RR1: Mass media messages alter/filter reality	21i. Movies and TV shows don't usually show life like it really is.	28i. Cigarette ads show healthy people in pleasant places to make people forget about health risks.
		28j. Most movies and TV shows that show people smoking make it look more attractive than it really is.	
RR2: Mass media Messages omit information	21j. Advertisements usually leave out a lot of important information.	28k. When you see a smoking ad, it is important to think about what was left out of the ad.	
	21k. When you see an ad, it is important to think about what was left out of the ad.		

Appendix B, Table 30  
*Descriptive Statistics for Histograms*

	N	Range	Min	Max	Mean		Std. Dev.	Variance	Skewness		Kurtosis	
	Stat	Stat	Stat	Stat	Stat	Std. Error	Stat	Stat	Stat	Std. Error	Stat	Std. Error
Pre_GML	159	2.00	2.00	4.00	3.24	.039	.49	.243	.367	.192	-.163	.383
Pos_GML	161	3.00	1.00	4.00	3.43	.049	.63	.401	-.932	.191	1.216	.380
Pre_SML	159	3.00	1.00	4.00	3.17	.054	.69	.475	-.568	.192	.496	.383
Post_SML	160	3.00	1.00	4.00	3.38	.059	.75	.568	-1.32	.192	1.83	.381
Pre_PSA	156	3.00	1.00	4.00	1.26	.039	.49	.247	2.14	.194	5.79	.386
Post_PSA	158	3.00	1.00	4.00	1.36	.047	.59	.358	2.10	.193	4.82	.384

Appendix B. Figures 28 -30

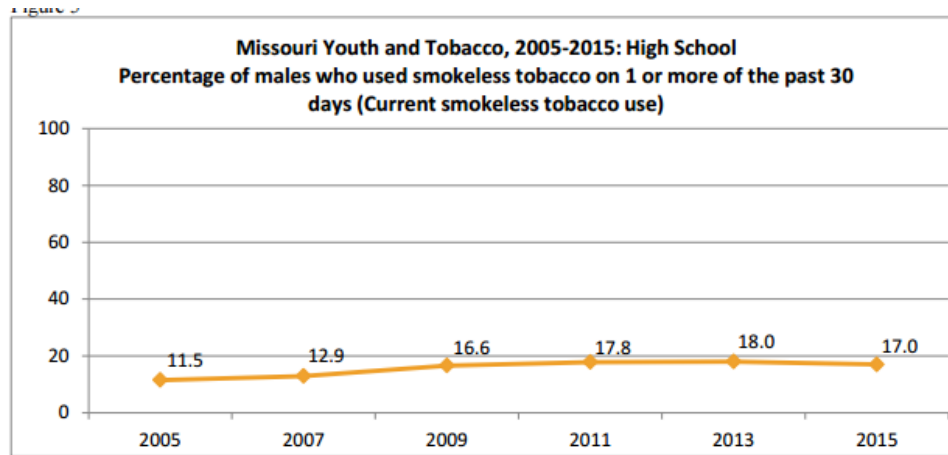


Figure 28. Smokeless tobacco use among teens from 2005-2015. Source: MDHSS, 2016

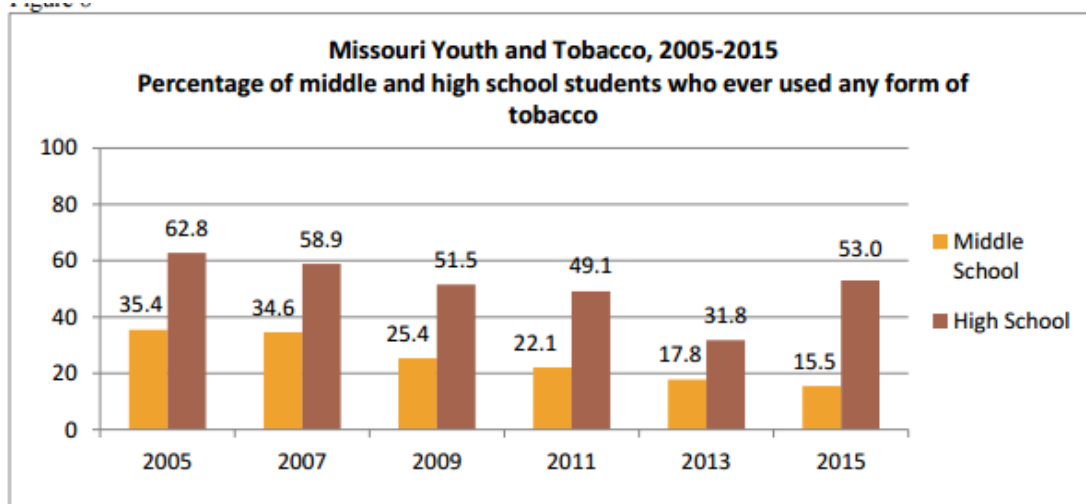


Figure 29. Any kind of tobacco use among teens from 2005-2015. Source: MDHSS, 2016.

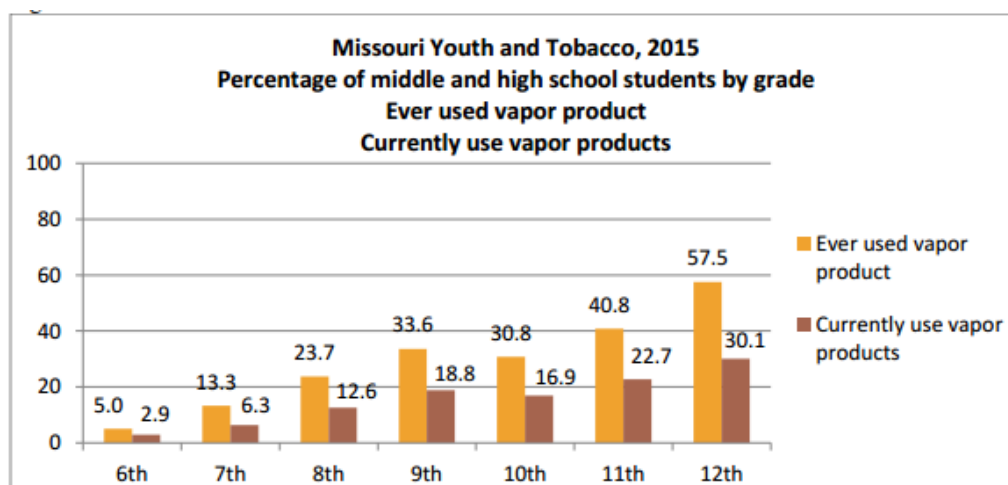
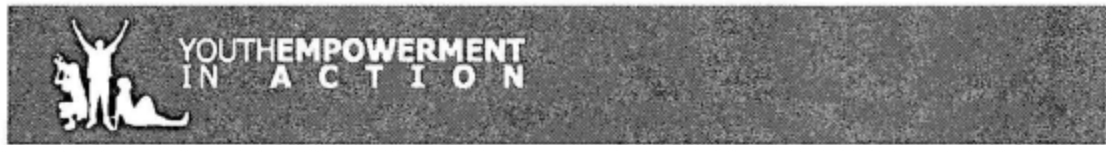


Figure 30. Vapor product use among teens from 2005-2015. Source: MDHSS, 2016.



### Appendix C: Intervention Instrument



21. Please mark how much you agree or disagree with each of these.

		Strongly Disagree	Disagree	Agree	Strongly Agree
a	Most of the time, when people advertise products they are more concerned about making money than giving correct information.				
b	People who advertise think very carefully about the people they want to buy their product.				
c	Two people may see the same movie or TV show and get very different ideas about it.				
d	Two people may see the same advertisement and get very different ideas about it.				
e	People are influenced by TV and movies, whether they know it or not.				
f	People are influenced by advertisements, whether they know it or not.				
g	When people make movies and TV shows, every camera shot is very carefully planned.				
h	When people make advertisements, every camera shot is very carefully planned.				
i	Movies and TV shows don't usually show life like it really is.				
j	Advertisements usually leave out a lot of important information.				
k	When you see an ad, it is very important to think about what was left out of the ad.				

Figure 31. General Media Literacy Questions ([Return to Methodology: GML](#))

28. Please mark how much you agree or disagree with each of these.

		Strongly Disagree	Disagree	Agree	Strongly Agree
a	To make money, tobacco companies will do anything they can get away with.				
b	Certain cigarette brands are especially designed to appeal to young children.				
c	Cigarette ads try to link smoking to things that people want (like love, good looks, and power).				
d	Wearing a shirt with a cigarette logo on it makes you a walking advertisement.				
e	There are often hidden messages in cigarette ads.				
f	Movie scenes with smoking in them are made very carefully.				
g	When people see smoking ads, they are more likely to start smoking themselves.				

28. (Cont.)

h	When people see movies with smoking in them, they are more likely to start smoking themselves.				
i	Cigarette ads show healthy people in pleasant places to make people forget about the health risks.				
j	Most movies and TV shows that show people smoking make it look more attractive than it really is.				
k	When you see a smoking ad, it is very important to think about what was left out of the ad.				

Figure 32. Smoking Media Literacy Questions. ([Return to Methodology: SML](#))

29. Please mark how much you agree or disagree with each of these.

		Strongly Disagree	Disagree	Agree	Strongly Agree
a	Smoking cigarettes is not as bad as everyone makes it out to be.				
b	Smoking cigarettes is enjoyable.				
c	Smoking helps you deal with problems or stress.				
d	Smoking helps you stay thin.				
e	There is no harm in having a cigarette once in a while.				
f	Smoking helps you feel more comfortable at parties.				
g	If you start smoking every day, it is very hard to stop.				
h	Smoking makes you look more mature.				
i	Smoking makes you look more attractive or sexy.				
j	It would be very easy for me to get cigarettes if I wanted them.				

Figure 33. Attitudes toward smoking. ([Return to Methodology: PSA](#))

35. Do you think that you will smoke a cigarette soon?
<input type="checkbox"/> Definitely Yes <input type="checkbox"/> No
<input type="checkbox"/> Yes <input type="checkbox"/> Definitely NO
36. Do you think you will smoke a cigarette in the next year?
<input type="checkbox"/> Definitely Yes <input type="checkbox"/> No
<input type="checkbox"/> Yes <input type="checkbox"/> Definitely NO

Figure 34. Intent to Smoke Questions. ([Return to Methodology: ITS](#))