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The Psychological Flexibility Model and PTSD Intrusion Symptoms

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Abstract

The psychological flexibility model offers a lens through which to view the development and maintenance of PTSD symptoms. The model consists of six behavioral processes, including cognitive fusion, experiential avoidance, and lack of contact with the present moment, which are said to interact with each other to either resolve or maintain symptoms of PTSD. The mediation models proposed within the psychological flexibility model have yet to be examined within any sample. This study examined the relationships between cognitive fusion, experiential avoidance, lack of contact with the present moment, and PTSD intrusion symptoms within a sample of trauma-exposed adults experiencing symptoms of posttraumatic stress (N = 308). Results indicated that all three of the behavioral processes predicted PTSD intrusion symptoms, as hypothesized within the model. Also as hypothesized, cognitive fusion predicted both experiential avoidance and lack of contact with the present moment. Experiential avoidance mediated the relationship between cognitive fusion and PTSD intrusion symptoms, but lack of contact with the present moment did not. Contrary to expectations, experiential avoidance and lack of contact with the present moment did not both significantly and uniquely contribute to PTSD intrusion symptom severity. Experiential avoidance had a significant and unique impact in the model, but lack of contact with the present moment did not. These results provide support for many of the proposed relationships within the psychological flexibility model and also highlight the possibility that experiential avoidance may play a larger role in the development and maintenance of PTSD intrusion symptom severity than that of lack of contact with the present moment.

The Psychological Flexibility Model and PTSD Intrusion Symptoms

The psychological flexibility model (Hayes, Luoma, Bond, Masuda, & Lillis, 2006) rests on the assumption that, regardless of the form that human problems take across time and cultures, the human experience of pain is ubiquitous (Hayes, Strosahl, & Wilson, 1999, 2012). Pain is believed to be naturally occurring and transient. Although pain may feel uncomfortable, the philosophy underlying the model indicates that it is one component of a broad dimension: the human capacity to feel emotions (Linehan, 1993). Without pain there could not be joy; without anger there could not be compassion. The ability to feel pain intensely and to remain in contact with experiences of pain means that joy can be felt with equal intensity and awareness. Thus, the authors of the psychological flexibility model deem pain an important part of human experience (Hayes et al., 2012; Walser & Westrup, 2007).

Alternatively to the natural existence of pain, the psychological flexibility model contains the proposition that humans create suffering when they attempt to negate or avoid their experiences of pain (Eifert & Forsyth, 2005; Follette, Palm, & Pearson, 2006). In modern Western cultures, it is common for people to feel pain and then turn on the television, go to sleep, or tell themselves that their pain is less than the pain of others, all in an attempt to escape from the experience of their uncomfortable emotions. Proverbs regarding the key to happiness abound. Pain, in its many forms, is unwanted, and happiness is prized. The theorists behind the psychological flexibility model warn that negating one's pain comes at a cost: the implicit message that an aspect of one's experience is "bad" or "wrong," or even worse, that part of one's self

is “wrong” (Hayes et al., 2012; Walser & Westrup, 2007). The model is based on the assumption that, unlike pain, suffering is avoidable (Follette et al., 2006).

The psychological flexibility model stems from a contextual behavioral theory regarding the development and maintenance of psychological problems: relational frame theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001). The model is based on the RFT premise that certain relationships with language lead to the creation of suffering, or to the creation of most psychological problems. Six behavioral processes constitute the model, and interact with each other, language, and behavioral context to produce psychological flexibility or inflexibility. Psychological flexibility is defined as “the ability to contact the present moment more fully as a conscious human being, and to change or persist in behavior when doing so serves valued ends” (Hayes et al., 2006, p. 7). On the other hand, psychological inflexibility occurs when behavioral repertoires narrow, often as people avoid painful thoughts and feelings in an attempt to achieve a specific internal state or maintain a self-image (Hayes et al., 2006). For the purposes of this study, three of the six behavioral processes are examined: cognitive fusion, experiential avoidance, and lack of contact with the present moment.

The psychological flexibility model is proposed to provide a theoretical foundation from which most types of psychological problems can be conceptualized and treated (Hayes et al., 2006). Although facets of the model have been examined in relation to depression (Bond & Bunce, 2000; Hayes et al., 2004; Plumb, Orsillo, & Luterek, 2004), generalized anxiety disorder (Roemer, Salters, Raffa, & Orsillo, 2005) , trichotillomania (Begotka, Woods, & Wetterneck, 2004) , physical pain (McCracken & Gutiérrez-Martínez, 2011; McCracken, Williams, & Tang, 2011; Vowles,

McCracken, & O'Brien, 2011), and posttraumatic stress disorder (Batten, Follette, & Aban, 2002; Kumpula, Orcutt, Bardeen, & Varkovitzky, 2011; Maack, Tull, & Gratz, 2011; Marx & Sloan, 2005; Merwin, Zachary Rosenthal, & Coffey, 2009; Tull, Gratz, Salters, & Roemer, 2004), much of this research has focused on the relationships between a single behavioral process, experiential avoidance, the diagnostic criteria of the disorders, and known correlates of the disorders. The claim that the interrelationships between the behavioral processes in the psychological flexibility model can account for the development and maintenance of most psychological disorders remains unexamined.

Posttraumatic stress disorder (PTSD) is an important psychological problem and is the most commonly diagnosed psychological disorder following the experience of a traumatic event (APA, 2013). Traumatic events include experiences such as sexual assault, physical abuse, exposure to war, exposure to natural disaster, criminal victimization, and combat exposure. PTSD impacts approximately 8% of the United States population (APA, 2000; Kessler, Sonnega, Bromet, Hughes, & Nelson, Christopher, 1995) and accrues great costs to society via lost work hours and increased utilization of the healthcare system (Greenberg et al., 1999; Koss, Koss, & Woodruff, 1991).

PTSD is conceptualized as having four distinct symptom clusters: intrusion, avoidance, negative alterations in cognitions and mood, and arousal (APA, 2013). The intrusion symptom cluster consists of recurrent and distressing memories of the traumatic event, flashbacks, or trauma-related dreams, as well as intense psychological distress and physiological reactions to reminders of the traumatic event. The avoidance

symptom cluster encompasses attempts to avoid internal thoughts and feelings related to the traumatic event, as well as external cues, such as people, places, or things that serve as trauma reminders. Negative alterations in cognitions and mood include: difficulty remembering an important part of the traumatic event; a loss of interest in activities that previously brought enjoyment; feelings of detachment from others; difficulty experiencing positive emotions; persistent negative states of emotion, such as fear, anger, or guilt; and persistent inaccurate trauma-related thoughts, either exaggerated negative beliefs or inaccurate thoughts about the cause of the event, that lead individuals to blame themselves or others. The arousal symptom cluster consists of difficulties with concentration and sleep, an exaggerated startle response, hypervigilance, irritable behavior, and self-destructive behavior.

The current study focuses on PTSD intrusion symptoms for two reasons. First, the intrusion symptom cluster has remained the same through the recent transition from the DSM-IV-TR to the DSM-5 (APA, 2000; APA, 2013). Second, PTSD intrusion symptoms may play an important role in the maintenance of PTSD. Trauma researchers have proposed that the presence of trauma-related intrusions leads some trauma-exposed individuals to engage in avoidance behaviors designed to mitigate any uncomfortable thoughts, emotions, or physiological sensations associated with the intrusions (Ehlers & Clark, 2000). These researchers state that avoidance behaviors serve to decrease functioning and increase the frequency and severity of trauma-related intrusions (Ehlers & Clark, 2000). Indeed, trauma-related intrusions predict subsequent symptoms of avoidance and general psychological functioning, such that, as endorsement of intrusive symptoms increases, avoidance also increases and general

psychological functioning decreases (Creamer, Burgess, & Pattison, 1992; McFarlane, 1992). The hypothesis that the intrusion symptom cluster may play an important role in the maintenance of PTSD is also supported by the finding that intrusions are a stronger predictor of PTSD symptom severity 6 months after the experience of a traumatic event than PTSD diagnostic status at baseline assessment (Michael, Ehlers, Halligan, & Clark, 2005). Thus, it is important to examine potential maintenance factors of the intrusion symptom cluster.

Cognitive Fusion, Experiential Avoidance, and PTSD Intrusion Symptoms

The psychological flexibility model contains the proposition that cognitive fusion and experiential avoidance, two behavioral processes, both contribute to the development of most symptoms of psychopathology (Hayes et al., 2001; Hayes, Strosahl, & Wilson, 2012). Cognitive fusion is defined as the act of placing importance on the content of thoughts, such that people assume that their thought content is congruent with an external "reality" (Strosahl, Hayes, Wilson, & Gifford, 2004). Cognitive fusion is conceptualized as a metacognitive behavioral process regarding the function of thoughts, and, thus, is believed to be distinct from topographical properties of thoughts, such as their frequency or content (Blackledge, 2007). Proponents of the psychological flexibility model believe that cognitive fusion is problematic because people are said to evidence rigid behavioral patterns when they treat their thoughts as literal (Blackledge & Drake, 2013; Eifert & Forsyth, 2005). In opposition to the process of cognitive fusion stands cognitive defusion, a behavioral process that requires individuals to adopt a detached stance from thought content, including the recognition that thinking is an event that produces products, or thoughts,

that are not necessarily representative of an underlying essence (Hayes et al., 2012; Luoma & Hayes, 2009).

The proposal that cognitive fusion contributes to the maintenance of psychopathology can easily be applied to the maintenance of PTSD intrusion symptoms. It is possible that cognitive fusion influences individuals' relationships to their trauma-related intrusions, such that the intrusions serve the function of indicating the presence of the traumatic event (Blackledge, 2004). That is, individuals experiencing PTSD intrusions may be so merged with or focused on the content of their intrusions that they behaviorally respond as if the intrusions represent literal truths (Blackledge & Drake, 2013; Dymond, Roche, & Bennett, 2013). For example, trauma-exposed individuals who are experiencing symptoms of posttraumatic stress may see images of their assailants in their minds and then respond to the images by engaging in safety behaviors designed to protect them from real and present threats to their safety, such as checking to make sure their doors are locked, arming themselves with pepper spray, or ducking behind a piece of furniture. These trauma-exposed individuals may also involuntarily respond to the images with increased heart rates, blood pressure, and electrical conductance of the skin, and will be less likely to focus on the contextual features of the images, which may include the rooms they are in while the images enter their minds, what they were doing immediately before the images arose, and the quality of their breath in response to the images. Although initial findings provide support for a positive relationship between cognitive fusion and general psychopathology, including symptoms of anxiety and depression (Gillanders et al., 2013), the relationship between cognitive fusion and PTSD intrusion symptom

severity has yet to be examined. Empirical research is needed to examine the proposed theoretical link between cognitive fusion and PTSD intrusion symptom severity.

The second behavioral process presented in the psychological flexibility model is experiential avoidance. Experiential avoidance is an unwillingness to remain in contact with thoughts, emotions, and sensations, including attempts to alter their content, form, or frequency (Strosahl et al., 2004). Experientially avoidant behaviors are believed to engender suffering, or general psychopathology, for two main reasons: Experiential avoidance leads to: 1) an increase in the frequency and intensity of the avoided internal stimuli, and 2) a narrowing of behavior (Blackledge & Barnes-Holmes, 2009; Hayes et al., 2006; Kashdan, Barrios, Forsyth, & Steger, 2006). The observed increase in the frequency and intensity of avoided internal stimuli can be explained by the fact that individuals who allocate mental resources to scanning their mind for signs of feared stimuli invariably contribute to the continued presence of the stimuli, for they must hold a representation of the stimuli in their mind with which to compare all other stimuli (Nixon, Cain, Nehmy, & Seymour, 2009; Wenzlaff, Wegner, & Klein, 1991; Wisco, Pineles, Shipherd, & Marx, 2013). Experiential avoidance leads to a narrowing of behavior because individuals become increasingly restricted in behavioral options as they survey potential behaviors and behavioral contexts (i.e., going to the movies, going grocery shopping, jogging in their neighborhood) in which the unwanted stimuli might appear, either as a physical representation in the external world or as a thought or image in their mind upon encountering a trauma trigger in their external environment. The counterpart to experiential avoidance, experiential

acceptance, is the process of nonjudgmentally and willingly contacting the present moment (Hayes et al., 1999).

The proposed relationship between experiential avoidance and general psychopathology can also be applied to the maintenance of PTSD intrusion symptoms. In this case, experiential avoidance leads to the maintenance of intrusion symptoms by causing an increase in the frequency and intensity of the intrusions, the avoided internal stimuli (Blackledge & Barnes-Holmes, 2009; Hayes et al., 2006; Kashdan et al., 2006; Shipherd & Beck, 2000; Walser & Hayes, 2006; Walser & Westrup, 2007).

It is somewhat counterintuitive that increased levels of experiential avoidance lead to an increase in intrusion symptom frequency and intensity, as these two constructs appear to be opposite in nature. However, the creators of RFT state that when people engage in experientially avoidant behaviors they strengthen the relationship between the behavior and the avoided stimuli by pairing them together: when encounter x, engage in y (Hayes et al., 2001; Levin & Hayes, 2009). Additionally, RFT contains the premise that relationships between stimuli are bidirectional, meaning that the presence of one stimulus would evoke the other, or at least the functions of the other (Hayes et al., 2001). Intrusion symptoms increase as more and more stimuli become paired with both the intrusive stimuli and the experientially avoidant behavior and subsequently evoke the intrusive stimuli (Hayes et al., 2001; Walser & Westrup, 2007). For example, the image of a perpetrator's face in a trauma survivor's mind initially becomes associated with an angry mood and behavior intended to suppress the image. Later, the trauma survivor is listening to the radio and experiences the intrusive image. The image is then paired with the song that

was playing on the radio, such that listening to the song may bring the intrusive image back to mind.

A large body of research has focused on the impact of thought suppression, a form of experiential avoidance, on cognition. Indeed, evidence suggests that thought suppression leads to a "rebound effect," or an increase in the self-report of avoided internal stimuli (Wegner & Gold, 1995; Wegner, 1994; Wegner, Schneider, Knutson, & McMahon, 1991; Wenzlaff et al., 1991). Some researchers have examined the phenomenon of thought suppression within individuals who meet criteria for PTSD. As hypothesized, suppressing trauma-related thoughts does result in a "rebound effect" for individuals who meet criteria for a diagnosis of PTSD (Amstadter & Vernon, 2006; J. Shipherd & Beck, 2000). One set of researchers found that intrusion symptoms increased in motor vehicle accident survivors as more and more stimuli became paired with the intrusive stimuli (Steil & Ehlers, 2000). Additionally, thought suppression has been shown to be correlated, moderately and positively, with PTSD symptom severity in numerous samples (Ehlers, Mayou, & Bryant, 1998) and has been found to predict PTSD intrusion symptom severity (Wisco et al., 2013). Empirical data regarding the significant and positive relationship between thought suppression and intrusive thoughts lends credibility to the proposition, within the psychological flexibility model, that avoidance or negation of internal experience relates to increased frequency of the avoided internal experience.

As hypothesized by the authors of the model, there are findings demonstrating a moderate and positive relationship between experiential avoidance and PTSD intrusion symptom severity (Gold, Feinstein, Skidmore, & Marx, 2011; Kumpula et

al., 2011; Meyer & Morissette, 2013; Rosenthal, Rasmussen Hall, Palm, Batten, & Follette, 2008; Tull, Barrett, McMillan, & Roemer, 2007; Tull et al., 2004; Tull, Jakupcak, Paulson, & Gratz, 2007; Tull & Roemer, 2003). The moderate and positive relationship has been found to hold across type of traumatic event. For example, experiential avoidance significantly related to PTSD intrusion symptom severity in a sample of combat-exposed veterans (Meyer & Morissette, 2013), survivors of childhood sexual and physical assault (Gold et al., 2011; Rosenthal et al., 2008), adult females exposed to a campus shooting (Kumpula et al., 2011), Kosovo citizens exposed to war crimes (Kashdan, Morina, & Priebe, 2009), survivors of adult interpersonal violence (Tull, Jakupcak, et al., 2007; Tull & Roemer, 2003), and a sample of participants who experienced multiple traumatic experiences (Tull et al., 2004). Additionally, the relationship between the two variables was replicated within a sample of trauma-exposed adolescents (Shenk, Putnam, & Noll, 2012).

Experiential avoidance has also demonstrated unique predictive power of PTSD total symptom severity (Meyer et al., 2013; Orcutt, Pickett, & Pope, 2005; Plumb, Orsillo, & Luterek, 2004). Experiential avoidance has predicted PTSD symptom severity beyond that predicted by the experience of traumatic interpersonal events (Orcutt et al., 2005), trauma severity (Plumb et al., 2004), and a host of peri- and posttruama variables, including the presence of combat exposure, perceived threat during trauma, peritraumatic dissociation, social support, and recent life stress (Meyer & Morissette, 2013).

Building upon the proposed relationships between cognitive fusion, experiential avoidance, and general psychopathology, the psychological flexibility

model contains the added hypothesis that experiential avoidance mediates the relationship between cognitive fusion and general psychopathology. Cognitive fusion is thought to lead to experiential avoidance because literal interpretations of language may ineffectively guide behavior (Hayes et al., 2012). Language serves to alert individuals to stimuli in their environment. Yelling, "Watch out!" when someone is walking into oncoming traffic can help people to modify their behavior and keep themselves safe. In the above example, taking a literal interpretation of "Watch out," that is, assuming that there was something to watch out for, may have proved helpful to the individual who heard the warning. However, there are instances of language that do not completely correlate to the external environment. For example, having a thought about an impending outcome does not mean that that outcome is going to happen. Labeling a stimulus as "good" or "bad" in your mind does not provide concrete information about the characteristics and context of the stimulus as they appear in the external environment. When words do not correspond to their referent and are taken as literal truth, then they may ineffectively influence behavior. That is because fusion with thought content often leads to inappropriate avoidance of stimuli that are not present in individuals' external surroundings. For example, when individuals use evaluative language such as "bad" to label their experiences, such as experiencing an intrusive image related to their assailant while watching television, they thereby increase their desire to escape the experience, which often leads them to engage in behaviors of experiential avoidance (Hayes et al., 2006). The relationships between cognitive fusion, experiential avoidance, and general symptoms of

psychopathology are thought to account for the proposed significance of the relationship between cognitive fusion and general symptoms of psychopathology.

Applying the proposed mediation model to PTSD intrusion symptoms, it is possible that experiential avoidance mediates the relationship between cognitive fusion and PTSD intrusion symptom severity. Initial data, collected within 4 samples – a sample of prison service officers, adults with multiple sclerosis, a sample of clients receiving mental health services, and employees participating in a stress-management workshop - suggests that cognitive fusion and experiential avoidance are strongly and positively correlated (Gillanders et al., 2013), but the relationship between the two constructs has not yet been examined within a sample of trauma-exposed individuals experiencing symptoms of posttraumatic stress. There are 4 questions that must be examined to test the proposed relationships between cognitive fusion, experiential avoidance, and PTSD intrusion symptom severity (see Figure 1): 1). Does cognitive fusion significantly relate to PTSD intrusion symptom severity? Although this relationship has been implied, it has yet to be empirically tested. 2). Does cognitive fusion significantly relate to experiential avoidance? Again, this proposed relationship has not been empirically examined. 3). Does experiential avoidance significantly relate to PTSD intrusion symptom severity? Experiential avoidance has most been demonstrably related to PTSD intrusion symptom severity, and these past findings would need to be confirmed within the present study. 4). Does experiential avoidance mediate the relationship between cognitive fusion and PTSD intrusion symptom severity?

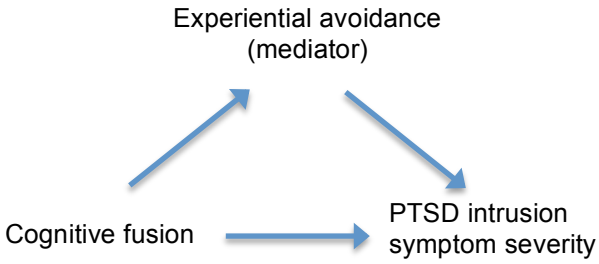

Figure 1. Theoretical relationship between cognitive fusion, experiential avoidance, and PTSD intrusion symptom severity.

Cognitive Fusion, Lack of Contact with the Present Moment, and PTSD Intrusion Symptoms

The psychological flexibility model contains the proposition that a third behavioral process, lack of contact with the present moment, also contributes to the development of most symptoms of psychopathology (Walser & Hayes, 2006). Lack of contact with the present moment occurs when people spend time thinking about thoughts, feelings, and physical sensations experienced in the past, or imagining such experiences taking place in the future (Blackledge & Barnes-Holmes, 2009). The creators of the psychological flexibility model state that lack of contact with the present moment contributes to the development of symptoms of psychopathology because awareness of current experience is needed to engage in acceptance and non-judgment of that experience (Hayes et al., 2012). These psychological theorists indicate that individuals whose attention is focused outside of the present moment are not able to consciously choose value-consistent behaviors and productively engage with their environment. Conversely, contact with the present moment occurs when people center their awareness in their current thoughts, feelings, and physical sensations.

Lack of contact with the present moment may lead to PTSD intrusion symptoms because individuals who direct their attention away from experiences occurring in the present moment, including thoughts, feelings, physiological sensations, and sensory perceptions, may have difficulty accepting their experiences and may engage in behaviors that could be classified as avoidance (Blackledge & Barnes-Holmes, 2009; Vujanovic, Niles, Pietrefesa, Schmertz, & Potter, 2013; Walser & Westrup, 2007). That is, "contact" refers to attention, and when attention is directed toward the present moment individuals may practice experiential acceptance of their present experiences (Follette, Palm, & Rasmussen Hall, 2004; Hayes et al., 2012).

Initial data indicates that there may, indeed, be a significant and negative relationship between lack of contact with the present moment and PTSD total symptom severity (Bernstein, Tanay, & Vujanovic, 2011; Smith et al., 2011; Vujanovic et al., 2013). Researchers examined a sample of 124 urban firefighters and a sample of 76 adults exposed to at least one traumatic event and found evidence of a moderate and positive significant relationship between lack of contact with the present moment and PTSD total symptom severity in both cases (Bernstein et al., 2011; Smith et al., 2011). Lack of contact with the present moment was also a unique contributor to PTSD symptom severity when examined alongside the number of traumatic events experienced by each participant (Bernstein et al., 2011) and in relation to demographic variables and quantitative descriptors of exposure to fires on the job (Smith et al., 2011). Although one group of researchers found that lack of contact with the present moment was not correlated with any of the PTSD symptom clusters within a sample of veterans, these results are likely attributed to an underpowered, low sample size: 15

combat-exposed veterans with diagnoses of PTSD, 15 combat-exposed veterans without diagnoses of PTSD, and 15 non-combat veterans without diagnoses of PTSD (Wahbeh, Lu, & Oken, 2011). However, future studies are needed to examine the relationship between contact with the present moment and PTSD intrusion symptom severity in a trauma-exposed sample.

The authors of the psychological flexibility model further posit that lack of contact with the present moment mediates the relationship between cognitive fusion and symptoms of general psychopathology (Hayes et al., 2012). These psychological researchers indicate that cognitive fusion leads to lack of contact with the present moment because of over-identification with thought content that is past- or future-focused (Walser & Westrup, 2007). When individuals take their thoughts literally, they focus on the content of the thought as a manifestation of reality, rather than directing their attention toward their immediate process of thinking. Because these individuals are, then, fused with the content of their thoughts, their attention is drawn away from the present moment and they demonstrate lack of contact with the present moment (Blackledge & Drake, 2013). Lack of contact with the present moment and cognitive fusion are both hypothesized to relate to general symptoms of psychopathology, and the psychological flexibility model contains the added hypothesis that lack of contact with the present moment mediates the relationship between cognitive fusion and symptoms of psychopathology, placing emphasis on the role of attention in the development of psychopathology.

The proposed mediation model can also be applied to PTSD intrusion symptoms. It is possible that lack of contact with the present moment mediates the

relationship between cognitive fusion and PTSD intrusion symptom severity. Although psychological researchers have begun to examine the relationships between cognitive fusion and known correlates of lack of contact with the present moment, no studies were found, within any sample, that have focused directly on cognitive fusion as it relates to lack of contact with the present moment. There are four questions that must be asked to test the proposed relationships between cognitive fusion, lack of contact with the present moment, and PTSD intrusion symptom severity (see Figure 2): 1). Does cognitive fusion significantly relate to PTSD intrusion symptom severity? An empirical examination of this question would be conducted within an analysis of the first mediation model proposed within this study. 2). Does cognitive fusion significantly relate to lack of contact with the present moment? Empirical data is needed to examine this theoretical relationship. 3). Does lack of contact with the present moment significantly relate to PTSD intrusion symptom severity? There is initial data to suggest that lack of contact with the present moment significantly relates to PTSD total symptom severity. For the proposed mediation model to hold, results within the current study would need to confirm the hypothesis that lack of contact with the present moment does relate to PTSD intrusion symptom severity. 4). Does lack of contact with the present moment mediate the relationship between cognitive fusion and PTSD intrusion symptom severity?

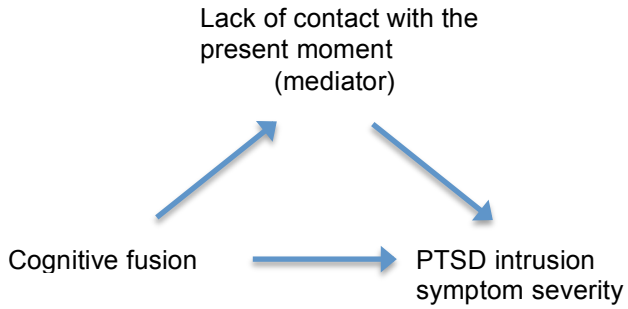

Figure 2. Theoretical relationship between cognitive fusion, lack of contact with the present moment, and PTSD intrusion symptom severity.

Experiential Avoidance, Lack of Contact with the Present Moment, and PTSD Intrusion Symptoms

The authors of the psychological flexibility model indicate that experiential avoidance and lack of contact with the present moment are unique, but related, behavioral processes. Indeed, there is indication that the behavioral processes are correlated at a moderate level within populations experiencing chronic pain (Herzberg et al., 2012; Latzman & Masuda, 2013; McCracken & Gutiérrez-Martínez, 2011; McCracken et al., 2011), within a sample of adult outpatients presenting for cognitive-behavioral therapy (Silberstein, Tirch, Leahy, & McGinn, 2012), and within nonclinical college populations (R. A. Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Masuda & Tully, 2012). These recent results provide preliminary support for the conceptualization of experiential avoidance and lack of contact with the present moment as separate, but related, constructs.

The psychological flexibility model also encompasses the assumption that both experiential avoidance and lack of contact with the present moment are unique contributors to psychological distress, including PTSD intrusion symptom severity (Hayes et al., 2006). Although research examining experiential avoidance and lack of

contact with the present moment, as they both relate to PTSD intrusion symptom severity, has yet to be conducted, findings within chronic pain samples have demonstrated that only experiential avoidance, and not lack of contact with the present moment, uniquely contributed to insomnia severity (McCracken & Gutiérrez-Martínez, 2011; McCracken et al., 2011). It is important to assess whether or not both behavioral processes, experiential avoidance and lack of contact with the present moment, uniquely contribute to PTSD intrusion symptom severity, to test the relationships proposed within the model.

It has been proposed that both experiential avoidance and lack of contact with the present moment are equally powerful mediators of the relationship between cognitive fusion and symptoms of general psychopathology (see Figure 3; Dymond et al., 2013; Hayes et al., 2006). However, this hypothesis has not yet been empirically examined. Further research is needed to assess whether or not one of the behavioral processes is a more powerful mediator of the relationship between cognitive fusion and PTSD intrusion symptom severity.

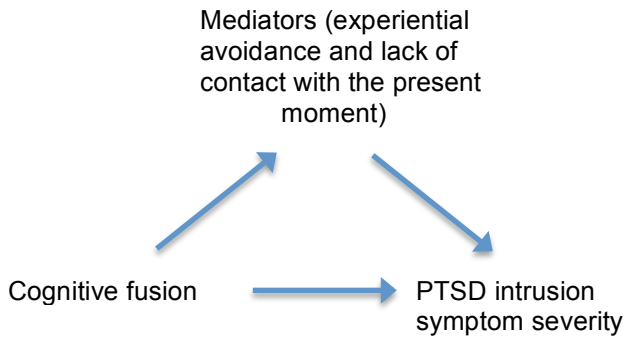

Figure 3. Theoretical relationship between cognitive fusion, experiential avoidance, lack of contact with the present moment, and PTSD intrusion symptom severity.

The Present Study

The current study seeks to examine the hypotheses that three behavioral processes - cognitive fusion, experiential avoidance, and lack of contact with the present moment - are partially responsible for the development of most symptoms of psychopathology, by investigating the hypotheses within a sample of trauma-exposed adults experiencing symptoms of posttraumatic stress. Although prior research indicates that experiential avoidance is related to symptoms of posttraumatic stress, further research is needed to examine the relationship between cognitive fusion and symptoms of posttraumatic stress, as well as the relationship between lack of contact with the present moment and symptoms of posttraumatic stress. Additionally, the mediation models proposed within the psychological flexibility model, whereby both experiential avoidance and lack of contact with the present moment significantly and uniquely mediate the relationship between cognitive fusion and general symptoms of psychopathology, have yet to be examined within any sample, nevertheless a trauma-exposed sample. It is important to empirically examine the relationships between these three behavioral processes and PTSD intrusion symptom severity, as the psychological flexibility model provides a theoretical basis on which to build treatments for PTSD. The present study will examine the relationships between cognitive fusion, experiential avoidance, lack of contact with the present moment, and PTSD intrusion symptom severity, and will test the mediation models proposed within the psychological flexibility model.

1. Cognitive Fusion, Experiential Avoidance, and PTSD Intrusion Symptom Severity

a. It is hypothesized that cognitive fusion will predict PTSD intrusion symptom severity.
b. It is hypothesized that cognitive fusion will predict experiential avoidance.
c. It is hypothesized that experiential avoidance will predict PTSD intrusion symptom severity.
d. It is hypothesized that experiential avoidance will mediate the relationship between cognitive fusion and PTSD intrusion symptom severity.

2. Cognitive Fusion, Lack of Contact with the Present Moment, and PTSD Intrusion Symptom Severity
    a. It is hypothesized that cognitive fusion will predict PTSD intrusion symptom severity.
    b. It is hypothesized that cognitive fusion will predict lack of contact with the present moment.
    c. It is hypothesized that lack of contact with the present moment will predict PTSD intrusion symptom severity.
    d. It is hypothesized that lack of contact with the present moment will mediate the relationship between cognitive fusion and PTSD intrusion symptom severity.
3. Experiential Avoidance and Lack of Contact with the Present Moment
    a. It is hypothesized that experiential avoidance and lack of contact with the present moment will be moderately related.

b. It is hypothesized that experiential avoidance and lack of contact with the present moment will both significantly and uniquely contribute to PTSD intrusion symptom severity.
c. It is hypothesized that experiential avoidance will uniquely mediate the relationship between cognitive fusion and PTSD intrusion symptom severity when lack of contact with the present moment is accounted for.
d. It is hypothesized that lack of contact with the present moment will uniquely mediate the relationship between cognitive fusion and PTSD intrusion symptom severity when experiential avoidance is accounted for.

Methods

Participants

The final sample consisted of 308 participants, 220 from the online community and 88 from the undergraduate research subject pool at UMSL. Age of participants ranged from 18- to 70-years-old, with a mean age of 32-years-old. Two hundred and thirty-seven participants (77%) identified as female, 58 (19%) identified as male, and 13 (4%) identified as transgender or genderqueer. Participants largely identified as heterosexual (N = 224; 73%) and Caucasian (N = 237; 77%), with 83 participants (27%) identifying as belonging to a sexual minority and 64 participants (21%) identifying as belonging to a racial minority.

One hundred and forty-seven participants (48%) identified as single, 84 (27%) identified as married or in a domestic partnership, 30 (10%) identified as divorced, 19

(6%) identified as separated or widowed, and 28 (10%) identified as living with someone. The majority of participants endorsed earning over $50,000 per year (*N* = 93; 30%). Fifty-seven participants (19%) endorsed earning between $30,001 and $50,000 per year, 35 (11%) endorsed earning between $20,001 and $30,000 per year, 44 (14%) endorsed earning between $10,001 and $20,000 per year, 35 (11%) reported earning between $5,001 and $10,000 per year, and 44 (14%) reported earning less than $5,000 per year.

The sample was primarily composed of participants reporting about trauma symptoms in relation to a rape or sexual assault (*N* = 162; 53%). Additional endorsed trauma types include a sudden or violent unexpected death, domestic violence, physical abuse or assault, torture, witnessing of violent death, witnessing of robbery, animal attack, life threatening injury, and exposure to trauma during work as a firefighter or within law enforcement. Please see Table 1 for more information about participants' endorsement of trauma types on the PCL-S.

Table 1

Specified Trauma Type on PCL-S

Trauma Type	*N*	%
Sexual abuse	162	52.6
Unexpected Death – Sudden or Violent	40	13.0
Death of Other – No Further Details (but endorsed experiencing or witnessing a sudden	26	8.4

violent death on the LEC)		
Abuse – Unspecified (but endorsed experiencing physical and/or sexual abuse on the LEC)	25	8.1
Domestic Violence	20	6.5
Physical Abuse/Assault	20	6.5
Torture	2	0.6
Witnessed Violent Death	3	1.0
Witnessed Robbery	1	0.3
Firefighter/Law Enforcement	1	0.3
Animal attack	1	0.3
Life Threatening Injury	1	0.3

Average PCL-S total scores were calculated to determine the average PTSD total symptom severity of the sample. PCL-S total scores ranged from 20 to 85, M = 56.79, SD = 16.01. The average PCL-S score in this sample was above the clinical cut-off score of 50 (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996), indicating that participants, in general, were experiencing clinically significant symptoms of posttraumatic stress. On the other hand, 108 of the 308 participants had PCL-S total scores under 50.

Many participants endorsed experiencing multiple trauma types on the Life Events Checklist (LEC). Two hundred and thirty-nine participants endorsed either experiencing or witnessing physical assault, 121 endorsed experiencing or witnessing assault with a weapon, 220 endorsed experiencing or witnessing sexual assault, 198

endorsed experiencing, witnessing, or hearing about a sudden violent death, and 13 endorsed experiencing combat. Of the above five trauma types, 5 participants endorsed all 5 types, 68 participants endorsed 4 types, 90 participants endorsed 3 types, 87 participants endorsed 2 types, and 49 participants endorsed 1 type. On average, participants endorsed 2.60 of the above 5 trauma categories from the LEC.

Participants from the two recruitment sources were combined in the final sample because the samples complement each other in terms of demographic variables, such as age, racial identity, and income level, as well as range of symptom severity, offering a greater variance than either recruitment source sample alone.

Measures

Demographics. Each participant completed a brief demographic questionnaire including information concerning age, gender, marital status, and income level. All questionnaire items are listed in Appendix A.

The Life Events Checklist (LEC; Blake et al., 1995). The LEC lists many types of potentially traumatic experiences (e.g., natural disaster, physical assault) and asks participants to indicate whether or not they have experienced, witnessed, or learned about each type of experience at any point during their lifetime.

The PTSD Checklist–Specific Version (PCL-S; Weathers, Huska, & Keane, 1991). This 17-item self-report measure assesses DSM-IV-TR symptoms of posttraumatic stress disorder in response to an identified "stressful life experience." Participants are requested to indicate "how much" they have been bothered by the symptoms in the past month by selecting a response on a scale that ranges from 1 (*not at all*) to 5 (*extremely*). Sample items are "Feeling *jumpy* or easily startled?" and

"Avoiding *thinking about* or *talking about* the stressful experience or avoiding *having feelings* related to it?" Total scores range from 17 to 85, with higher scores representing greater severity of symptoms. The PCL-S has demonstrated good internal consistency (α = .94), and total scores highly correlate (r = .93) with a clinician-administered assessment of PTSD symptom severity within a sample of adult survivors of motor vehicle accidents and sexual assaults (Blanchard et al., 1996). The PCL-S has also demonstrated test-retest reliability (r = .96) over a 3-day period in a sample of Vietnam veterans (Weathers, Litz, Herman, Huska, & Keane, 1993).

The Cognitive Fusion Questionnaire (CFQ; Gillanders et al., 2013). The 7 items of the CFQ assess self-reported cognitive fusion. Cognitive fusion is conceptualized as a one-dimensional construct and participants' scores fall on a continuum that ranges from cognitive fusion to cognitive defusion. Items are responded to on a scale ranging from 1 (*never true*) to 7 (*always true*). A total score ranges from 0 to 49, with higher numbers representing greater levels of cognitive fusion. Sample questions include "I find it easy to view my thoughts from a different perspective" and "I get so caught up in my thoughts that I am unable to do the things that I most want to do." The CFQ has demonstrated good test-retest reliability (r = .80, $p < .001$) in convenience samples of young adults and healthy adults in the community (Gillanders, et al., 2013). Good internal consistency (α = .88 - .93) has also been found in samples of caregivers of people with dementia, adults with multiple sclerosis, clients participating in mental health services in the United Kingdom, and employees of the public sector in the United Kingdom (Gillanders et al., 2013). As predicted, the CFQ is highly correlated with measures of burnout, automatic thoughts, and

rumination in prison service officers, mental health services clients in the United Kingdom, adults with and without histories of depression (Gillanders et al., 2013). Responses from populations of adults with multiple sclerosis, young adults, and health adults in the community show moderate correlations with quality of life and life satisfaction (Gillanders et al., 2013). Lastly, responses on the CFQ did not significant relate to socially desirable responses for a sample of community-living healthy adults (Gillanders et al., 2013).

The Acceptance and Action Questionnaire – II (AAQ-II; Bond et al., 2011)**.** The AAQ-II is a 7-item self-report scale that measures levels of experiential avoidance. Experiential avoidance is a continuous one-dimensional construct and participants' scores fall within a continuum that ranges from experiential acceptance to experiential avoidance. Participants respond to items on a 1 (*never true*) to 7 (*always true*) scale. Sample questions include "I'm afraid of my feelings," "My painful experiences and memories make it difficult for me to live a life that I would value," and "I worry about not being able to control my worries and feelings." Total scores range from 0 to 49, with higher numbers representing greater amounts of experiential avoidance. The AAQ-II has demonstrated good internal consistency (α = .78 - .88) and test-retest reliability (r = .81 at 3-months and r = .79 at 12-months in samples of United States undergraduate students and employees of a retail bank and financial services organization in the United Kingdom (Bond et al., 2011). Concurrent validity has been established through positive correlations with depressive symptoms, symptoms of anxiety, and general symptoms of psychopathology in undergraduate students in the United States, adults seeking outpatient mental health treatment at an

urban hospital for substance misuse, United Kingdom employees of a retail bank and financial services organization, and Dutch adults with mild to moderate symptoms of anxiety and depression (Bond et al., 2011; Fledderus, Oude Voshaar, Ten Klooster, & Bohlmeijer, 2012). As theorized, United States undergraduate students responses on the AAQ-II, along with the responses of adult employees in the United Kingdom, significantly correlate with a measure of thought suppression, a specific form of experiential avoidance (Bond et al., 2011). And lastly, responses on the AAQ-II were not related to socially desirable responses in the sample of United Kingdom financial services employees (Bond et al., 2011).

The Mindful Attention and Awareness Scale (MAAS; Brown & Ryan, 2003)**.** The MAAS is a 15-item self-report measure of the frequency of attention and awareness to and of present-moment experiences, or lack of contact with the present moment. Items have a response scale that ranges from 1 (*almost always*) to 6 (*almost never*). Total scores of the one-dimensional construct are obtained by computing the mean of the responses and range from 1 to 6, with higher scores representing less lack of contact with the present moment and more contact with the present moment. Sample items include "I find it difficult to stay focused on what's happening in the present" and "I tend not to notice feelings of physical tension or discomfort until they really grab my attention." The MAAS has demonstrated good internal consistency within samples of college students, adult cancer patients, and adults from 48 states in the U.S. (α = .82 and α = .87). Four-week test-retest reliability was also good (r = .81, p < .0001) and the MAAS has demonstrated convergent validity through its positive associations with mindfulness toward behavior, awareness of inner experiences, and

positive affect, as well its negative associations with rumination, social anxiety, symptoms of depression, symptoms of general anxiety, anger, and negative affect in samples of undergraduate students and adults in the northeastern United States (Brown & Ryan, 2003).

Procedure

Participants were recruited from two sources: the undergraduate research participant pool at the University of Missouri-St. Louis and advertisements posted to internet sites, such as Craigslist and community support websites for individuals exposed to trauma. Community support websites included www.havoca.org, www.pandys.org, www.malesurvivor.org, www.myptsd.com, and www.psychforums.com. The recruitment ad was titled, "Online study seeking people who have experienced stressful life event" and indicated that participants would "complete a brief series of questionnaires online," after which they could opt to enter into a drawing for a $25 Amazon gift card. The ad indicated that a participant would be eligible for the study if they were 18 years of age or older and had experienced a stressful life event.

Participants were eligible for the study if they were 18 years of age or older, had experienced at least one Criterion A traumatic event (per the DSM-5) occurring prior to the one month period before their participation in this study, indicated that they were completing the PCL-S in reference to a criterion A event, and completed each of the measures in the survey.

Eligible participants were asked to read an informed consent statement and indicate whether they agreed to participate before completing study measures. Following the informed consent, all participants completed a series of demographics

questions (Appendix A), the Life Events Checklist (Appendix B), the PTSD Checklist-Specific Version (Appendix C), the Cognitive Fusion Questionnaire (Appendix D), the Acceptance and Action Questionnaire-II (Appendix E), and the Mindful Attention and Awareness Scale (Appendix F). After all measures were completed, internet-recruited participants were directed to a separate web page and offered the opportunity to submit an e-mail address for entry into a raffle to win one of four $25 gift certificates to Amazon. Participants' email addresses were collected separately from their survey responses so as to maintain participant confidentiality. All participants from the undergraduate research participant pool at the University of Missouri – St. Louis were offered 0.5 course credits for completing the survey.

Participants were determined to have experienced a Criterion A traumatic event if they indicated that they were completing the PCL-S in reference to a Criterion A event, such as "rape," "domestic violence," or "witnessed a murder," and had endorsed experiencing the corresponding trauma type on the LEC. Some participants who completed the survey were excluded from eligibility in the study because they did not complete the question on the PCL about their reference trauma, they indicated that they have not experienced trauma, their reference trauma was not Criterion A (i.e., "heart attack of husband"), their response was not interpretable (i.e., "homell"), or they did not provide enough detail to determine whether or not the event was Criterion A (i.e., "accident" rather than "life-threatening car accident").

Results

Quantitative analyses were conducted using the Statistical Packages for the Social Sciences (SPSS). A priori power analyses for the proposed analyses (medium

effect size, power = .80, alpha = .05) indicated a sample size of 85 (Cohen, 1992; Fritz & MacKinnon, 2007).

Missing Data Strategy. A total of 1,073 participants (673 from the online community and 400 from the UMSL subject pool) began the survey, but many dropped out before completing the trauma symptom measure, the PCL-S. As participants' eligibility for the study was determined, in part, by the trauma that they referenced at the beginning of the PCL-S, and the intrusion symptom items from the PCL-S make up the outcome variable for the study, all participants who did not complete the PCL-S were eliminated (N = 188). Additionally, participants who did not at least begin each questionnaire were eliminated. Sixteen participants were removed because they exited the survey prior to beginning the CFQ and 32 participants were removed because they exited prior to beginning the MAAS, the last questionnaire. At this point, the sample consisted of 837 participants, 453 from the online community and 384 from the subject pool at UMSL.

Eligibility for Study. Some participants who completed the survey were excluded from eligibility in the study because they indicated that they have not experienced trauma or their response was not interpretable. Additional participants were excluded because their reference trauma was not Criterion A or because they did not provide enough detail to determine whether or not the event was Criterion A. Next, participants whose identified trauma did not occur more than 30 days prior to their participation in the study, who were not 18 years of age or older, and who did not endorse the trauma on the Life Events Checklist corresponding to their reference trauma on the PCL-S were excluded. At this point, the eligible sample consisted of

315 participants, 224 from the online community and 91 from the undergraduate research subject pool at UMSL.

Due to the online data collection method there was a greater likelihood that participants may take the study multiple times or may select response options without reading or considering the corresponding item text. Thus, the dataset was scanned for repeated IP addresses. Five IP addresses were each found to be repeated once and random number generators were used to determine which five of the ten paired responses would be deleted. The dataset was also visually screened for participants who answered using all high or low responses to survey questions. No such response sets were found.

Preliminary Analyses. Z-scores were generated for each measure total score to assist in the detection of univariate outliers and no outliers were detected; all z-scores were between -3.0 and 3.0. Mahalanobis distances were generated to detect multivariate outliers. Two participants violated the criterion Mahalanobis distances and were deleted, one for the combination of the CFQ and AAQ-2 total scores and one for the combination of the CFQ and MAAS total scores.

Univariate normality was examined through inspection of skewness and kurtosis statistics, Kolmogorov-Smirnov statistics with Lilliefors significance corrections, and visual inspection of histograms. Total scores on the CFQ and AAQ-2 were moderately negatively skewed, PTSD intrusion symptom severity scores from the PCL-S were slightly negatively skewed, and MAAS total scores were approximately symmetrical. The total scores for all dependent variables except for the CFQ were platykurtic; total scores on the CFQ were mesokurtic.

Bivariate scatterplots indicated that most measure pairs demonstrated linear relationships. It is possible that linear analyses slightly underestimated the strength of the relationships between the AAQ-2 total score and the PCL-S intrusion symptom severity score and the MAAS total score and the PCL-S intrusion symptom severity score. Lastly, plots of the standardized residuals by the standardized predicted values were examined for homoscedasticity. A plot for the CFQ and MAAS total scores demonstrated slight heteroscedasticity, although all other plots demonstrated homoscedasticity.

Covariates. Age, gender identity, sexual identity, race, marital status, income level, and recruitment source were all examined for their impact on the three dependent variables (experiential avoidance, lack of contact with the present moment, and PTSD intrusion symptoms), to determine whether or not they would be used as covariates within the primary analyses. A Pearson correlation was used to examine the relationship between age and each of the dependent variables. One-way between-subjects MANOVA's were used to examine the relationship between each of the additional potential covariates and the dependent variables.

Age and sexual identity both impacted PTSD intrusion symptom severity [r = .15, p = .009 and F (1,305) = 9.07, p = .003, respectively], with older participants reporting more severe intrusion symptoms and participants identifying as sexual minorities endorsing greater intrusion symptom severity than participants identifying as heterosexual. Sexual identity also impacted experiential avoidance [F (1,305) = 11.32, p = .001], with participants identifying as sexual minorities endorsing greater experiential avoidance than participants identifying as heterosexual.

Hypothesis 1a: Cognitive Fusion and PTSD intrusion symptom severity. It was expected that cognitive fusion would predict PTSD intrusion symptom severity. A simple linear regression was conducted and cognitive fusion was found to predict PTSD intrusion symptom severity when accounting for age and sexual identity, F (1,303) = 109.13, p < .001, η_p^2 = .27. Cognitive fusion, age, and sexual identity predicted approximately 31% of the variance in PTSD intrusion symptom severity, while cognitive fusion alone predicted approximately 27% of the variance.

Hypothesis 1b: Cognitive Fusion and Experiential Avoidance. It was expected that cognitive fusion would predict experiential avoidance. A simple linear regression was conducted and cognitive fusion predicted experiential avoidance when accounting for sexual identity, F (1,304) = 509.81, p < .001, η_p^2 = .64. Cognitive fusion and sexual identity predicted approximately 64% of the variance in experiential avoidance; cognitive fusion alone also predicted 64% of the variance in experiential avoidance.

Hypothesis 1c: Experiential Avoidance and PTSD Intrusion Symptom Severity. It was expected that experiential avoidance would predict PTSD intrusion symptom severity. A simple linear regression was conducted and experiential avoidance did predict PTSD intrusion symptom severity when accounting for age and sexual identity, F (1,303) = 83.51, p < .001, η_p^2 = .22. Experiential avoidance, age, and sexual identity predicted approximately 26% of the variance in PTSD intrusion symptom severity, while experiential avoidance alone predicted approximately 24% of the variance.

Hypothesis 1d: Mediation of Cognitive Fusion and PTSD Intrusion Symptom Severity by Experiential Avoidance. It was expected that experiential avoidance would mediate the relationship between cognitive fusion and PTSD intrusion symptom

severity. This hypothesis was tested by a bias-corrected bootstrap confidence interval (Preacher & Hayes, 2004). Cognitive fusion did indirectly influence PTSD intrusion symptom severity through experiential avoidance, after controlling for the impact of sexual identity on both experiential avoidance and PTSD intrusion symptom severity. A bias-corrected bootstrap confidence interval for the indirect effect (ab = .09), based on 1,000 bootstrap samples was between 0.15 and 0.28. Age was not used as a covariate for intrusion symptom severity due to limitations within the PROCESS macro.

Hypothesis 2a: Cognitive Fusion and PTSD Intrusion Symptom Severity. Please see Hypothesis 1a.

Hypothesis 2b: Cognitive Fusion and Lack of Contact with the Present Moment. It was expected that cognitive fusion would predict lack of contact with the present moment. A simple linear regression was conducted and cognitive fusion predicted lack of contact with the present moment, F (1, 306) = 44.60, p < .001, η_p^2 = .13. Cognitive fusion predicted 13% of the total variance in lack of contact with the present moment.

Hypothesis 2c: Lack of Contact with the Present Moment and PTSD Intrusion Symptom Severity. It was expected that lack of contact with the present moment would predict PTSD intrusion symptom severity. A simple linear regression was conducted and lack of contact with the present moment predicted PTSD intrusion symptom severity, F (1,303) = 13.89, p < .001, η_p^2 = .05. Lack of contact with the present moment, age, and sexual identity predicted approximately 10% of the variance in intrusion symptom severity, while lack of contact with the present moment alone predicted approximately 5% of the variance.

Hypothesis 2d: Mediation of Cognitive Fusion and PTSD Intrusion Symptom Severity by Lack of Contact with the Present Moment. It was expected that lack of contact with the present moment would mediate the relationship between cognitive fusion and PTSD intrusion symptom severity. This hypothesis was tested by a bias-corrected bootstrap confidence interval (Preacher & Hayes, 2004). Lack of contact with the present moment did not mediate the relationship between cognitive fusion and PTSD intrusion symptom severity, after controlling for the impact of sexual identity on PTSD intrusion symptom severity. A bias-corrected bootstrap 95% confidence interval for the indirect effect (ab = .01), based on 1,000 bootstrap samples was between -0.01 and 0.03.

Hypothesis 3a: Experiential Avoidance and Lack of Contact with the Present Moment. It was expected that experiential avoidance and lack of contact with the present moment would be moderately related. This hypothesis was tested using Pearson's correlation coefficient. The AAQ and MAAS were significantly correlated (r = -.37, p < .001, ρ = 0.37).

Hypothesis 3b: Experiential Avoidance, Lack of Contact with the Present Moment, and PTSD Intrusion Symptom Severity. It was expected that experiential avoidance and lack of contact with the present moment would both significantly and uniquely contribute to PTSD intrusion symptom severity. The results of a multiple regression, with age and sexual identity as covariates, indicated that experiential avoidance had a significant and unique impact in the model, F (1,302) = 67.22, p < .001, but lack of contact with the present moment did not, F (1,302) = 0.71, p = 0.40.

The four-predictor model was able to account for approximately 26% of the total variance of PTSD intrusion symptom severity.

Hypothesis 3c: Mediation of Cognitive Fusion and PTSD Intrusion Symptom Severity by Experiential Avoidance, when Lack of Contact with the Present Moment is Accounted for. It was expected that experiential avoidance would mediate the relationship between cognitive fusion and PTSD intrusion symptom severity when lack of contact with the present moment was accounted for. This hypothesis was tested using bias-corrected bootstrap confidence intervals with the alternate potential mediator entered as a covariate (Preacher & Hayes, 2008). Experiential avoidance did not mediate the relationship between cognitive fusion and PTSD intrusion symptom severity, after controlling for age, sexual identity, and lack of contact with the present moment on PTSD intrusion symptom severity. A bias-corrected bootstrap 95% confidence interval for the indirect effect (ab = .06) based on 1,000 bootstrap samples was between -0.005 and 0.14. The impact of sexual identity on experiential avoidance was not controlled for due to limitations within the PROCESS macro.

Hypothesis 3d: Mediation of Cognitive Fusion and PTSD Intrusion Symptom Severity by Lack of Contact with the Present Moment, when Experiential Avoidance is Accounted for. It was expected that lack of contact with the present moment would mediate the relationship between cognitive fusion and PTSD intrusion symptom severity when experiential avoidance was accounted for. This hypothesis was tested using bias-corrected bootstrap confidence intervals with the alternate potential mediator entered as a covariate (Preacher & Hayes, 2008). Lack of contact

with the present moment did not mediate the relationship between cognitive fusion and PTSD intrusion symptom severity, after controlling for age, sexual identity, and experiential avoidance. A bias-corrected bootstrap 95% confidence interval for the indirect effect (*ab* = .003) based on 1,000 bootstrap samples was between -0.02 and 0.03. The impact of sexual identity on experiential avoidance was not controlled for due to limitations within the PROCESS macro.

Discussion

This study examined the relationships between three of the behavioral processes within the psychological flexibility model (cognitive fusion, experiential avoidance, and lack of contact with the present moment) and PTSD intrusion symptoms. This study offers important contributions to the literature, as it is the first study, known to this author, to examine the relationship between cognitive fusion and symptoms of posttraumatic stress, as well as the relationship between lack of contact with the present moment and symptoms of posttraumatic stress. Additionally, this study examined two proposed mediation models, which have not been previously examined, including the relative strength of the proposed mediators, and did so within a sample of participants experiencing symptoms of posttraumatic stress.

Cognitive Fusion, Experiential Avoidance, and PTSD Intrusion Symptoms

Cognitive fusion was found to predict PTSD intrusion symptom severity within this sample. Although cognitive fusion has previously been found to positively relate to symptoms of anxiety and depression (Gillanders et al., 2013), this is the first study, known by this author, to test the proposed relationship between cognitive fusion and PTSD intrusion symptom severity since the publication of the Cognitive Fusion

Questionnaire (CFQ) in 2013. The results of this study are consistent with recently published data demonstrating a positive significant relationship between cognitive fusion and PTSD total symptom severity (Nitzan-Assayag, Aderka, & Bernstein, 2015). This finding implies that, when trauma-exposed individuals tend to take their thoughts as literal truths, they have more intense and more frequent PTSD intrusion symptoms.

Cognitive fusion may be associated with PTSD intrusion symptom severity because taking thought content literally also likely means that trauma-related thought content will be taken at face value. That is, rather than acknowledging that their minds are producing trauma-related thoughts, individuals who are cognitively fused may behave as if their trauma-related thought content is "true" or "real." The thought "I am not safe" comes to serve the function of alerting the thinking individual that they are literally unsafe, leading to further hypervigilant behaviors intended to secure safety. Cognitively fused individuals may then engage in avoidance behaviors designed to get away from their uncomfortable trauma-related thoughts and feelings, which would increase the frequency and intensity of PTSD intrusion symptoms.

Cognitive defusion techniques may be helpful in reducing PTSD intrusion symptom severity. Such techniques are designed to assist individuals in temporarily weakening the meaning that words hold for them, and, potentially, weakening the relationship between their thoughts and behavior (Blackledge, 2015). One group of cognitive defusion techniques operates by violating social norms of speech. For example, it is expected that thoughts will be delivered in a manner that is congruent with their thought content. Angry thoughts are typically delivered with rapid and loud

speech, while sad thoughts are often spoken in a low volume at a slow rate. Thus, clients can be asked to speak their thoughts while imitating the voice of a cartoon character or to sing a troubling thought to a jovial tune (Hayes, Strosahl, Bunting, Twohig, & Wilson, 2004; Hayes et al., 1999), both of which violate social conventions regarding speech.

Cognitive fusion also predicted experiential avoidance. This finding is consistent with initial data suggesting that cognitive fusion and experiential avoidance are strongly and positively correlated (Gillanders et al., 2013); however, this is the first known study to examine the hypothesis within a sample of trauma-exposed individuals experiencing symptoms of posttraumatic stress. It appears that relating to one's thoughts at face value, as though the thoughts are literal truths, leads to avoidance of uncomfortable thoughts, feelings, and sensations. The process of thinking allows humans to generalize fear experienced during a traumatic experience to other potential experiences or stimuli that are perceived as similar to those present during their trauma. If trauma-related thoughts such as "I can't trust anyone" or "I am not safe anywhere" are taken as literal truths then individuals' behaviors will likely align with their thoughts. These individuals will refrain from forming close relationships and will isolate or engage in hypervigilant behaviors. When they continue to experience distressing thoughts and emotions while isolating and attempting to protect themselves, then they will likely attempt to escape their own internal experiences. Cognitive defusion techniques may be useful for these individuals, as cognitive defusion will assist them in creating willingness to have their thoughts and hold their

thoughts lightly, so that they are then freed up to engage in values-congruent rather than emotion-congruent actions.

Experiential avoidance was also found to predict PTSD intrusion symptom severity, a finding that is consistent with those of many previous studies demonstrating a moderate and positive relationship between the two constructs (Gold, Feinstein, Skidmore, & Marx, 2011; Kumpula et al., 2011; Meyer & Morissette, 2013; Rosenthal, Rasmussen Hall, Palm, Batten, & Follette, 2008). It has been well demonstrated that avoidance of an internal stimulus, such as a thought or image, leads to a "rebound" effect, whereby the unwanted stimulus occurs with greater frequency and intensity (Nixon et al., 2009; Wenzlaff et al., 1991). Studies of participants experiencing symptoms of PTSD have indicated that suppression of trauma-related thoughts or images also lead to a "rebound effect" of the thought or image (Amstadter & Vernon, 2006; Shipherd & Beck, 2000; Wisco et al., 2013).

Experiential acceptance, or willingness, to have and make space for internal experiences of thoughts, emotions, sensations, and memories, has been associated with less overall PTSD symptom severity (Kashdan et al., 2009; Meyer & Morissette, 2013; Thompson & Waltz, 2010). Willingness to make contact with uncomfortable and painful internal experiences may lead to lowered PTSD intrusion symptom severity through the absence of active attempts to change internal experiences; that is, the absence of avoidance strategies would also eliminate the rebound effect. It is also possible that willingness, or acceptance, may allow for lowered PTSD intrusion symptom severity by making room for clients to engage in, or benefit from, exposure

to traumatic material, such as in Prolonged Exposure Therapy (PE; Foa, Hembree, & Rothbaum, 2007; Thompson, Luoma, & LeJeune, 2013).

Evidence-based treatments for PTSD, such as Cognitive Processing Therapy (CPT; Resick & Schnicke, 1992) and PE, have demonstrated efficacy in reducing PTSD symptoms through randomized controlled trials (Chard, 2005; Edna B Foa et al., 2005; Monson et al., 2006). However, dropout rates from CPT and PE within Veteran samples have ranged from approximately 38 to 50% (Kehle-Forbes, Meis, Spoont, & Polusny, 2016; Miles & Thompson, 2016) and many clients who do complete treatment do not respond with the expected reduction in PTSD symptoms (Hagenaars, van Minnen, & Hoogduin, 2010). It may be important to focus on building experiential acceptance prior to, or concurrently with, the use of evidence-based exposure techniques for PTSD, to enhance clients' willingness to remain in treatment through exposures and to increase clients' level of engagement during, and subsequent benefit from, exposures.

Also as expected, experiential avoidance was found to mediate the relationship between cognitive fusion and PTSD intrusion symptom severity. It appears that cognitive fusion is associated with increased PTSD symptom severity through its relationship with experiential avoidance. When individuals are fused with their thought content then they are more likely to engage in attempts to change and alter their thoughts – in emotionally driven behaviors. The significant results in relation to this mediation model highlight the important role of experiential avoidance in maintaining PTSD intrusion symptoms and the potential utility of cognitive defusion techniques to facilitate experiential acceptance, or willingness.

Explicit cognitive defusion exercises are not currently included in the evidence-based treatments for PTSD. Such exercises may assist in facilitating willingness to engage with trauma-related material by providing clients with distance from their thoughts, including their thoughts about themselves in relation to the trauma. It is likely that negative beliefs about self (e.g., "I am a bad person") are activated when individuals diagnosed with PTSD encounter trauma-related material. For individuals who are cognitively fused, associated emotion-driven behaviors may include hiding, or isolating, from others, including therapists, in attempts to reduce shame, or self-harm behaviors in attempts to reduce anger. As clients experiencing shame-related thoughts might be expected to withhold those thoughts from their therapists, it has been recommended that therapists treating PTSD specifically assess for the presence of shame. Once shame-related thoughts have been identified then cognitive defusion techniques could be introduced in a compassionate manner. For example, one cognitive defusion exercise consists of the client writing a thought about themselves that often "grabs" them on a nametag and then wearing it on their shirt (Hayes et al., 1999). The therapist does not ask the client to attempt to alter their thinking in any way, but just to wear the nametag. Wearing the nametag could be useful in that it is bringing the client in contact with their trauma-related thought or it could be assisting the client in seeing that the thought is separate from their "self," thereby increasing their willingness to engage with trauma-related material via a less-threatening vantage point.

Cognitive Fusion, Lack of Contact with the Present Moment, and PTSD Intrusion Symptoms

This study found that cognitive fusion was significantly associated with lack of contact with the present moment. The results indicate that cognitive fusion, or taking one's thoughts as literal truths, can significantly predict the extent to which one's attention is rooted in the present moment. It is possible that taking thoughts literally also equates to more time spent inside the process of thinking, or "lost" in thoughts. When someone is lost in, or fused with, their thoughts, it could be said that their attention is directed towards stimuli that are not actually occurring in the present moment. Much thought content consists of evaluations, review of past events, and predictions regarding the future, none of which can be objectively located in the present. The thought itself, a product of the process of thinking, however, is occurring in the present moment. People whose attention is directed toward the present moment may take note of their thoughts by acknowledging that the thoughts are present. The act of distancing oneself from thought content by acknowledging the present moment process of thinking may allow for a relationship with thoughts that includes contact with the present moment.

The finding that cognitive fusion is significantly associated with lack of contact with the present moment has important implications for treatment. There are many exercises to assist with thought defusion, and one of those exercises, called the "having a thought" technique, simply involves beginning each sentence with the words, "I'm having the thought that…" (Hayes et al., 1999). The exercise is intended to allow the client to relate to their thoughts from an observer perspective, rather than from within the thought, as if the thought mirrors reality. It is also possible, given these findings, that other cognitive defusion techniques, even those that do not

explicitly foster an observer perspective, may assist clients in making contact with the present moment. For example, the "word repetition" or "milk" exercise, consists of asking a client to quickly and loudly repeat a word to which they have attached meaning until the client briefly loses contact with the meaning of the word and focuses on the sounds coming out of their mouth and the sensations in their body as they repeat the word (Hayes et al., 1999).

Also as hypothesized, lack of contact with the present moment was significantly associated with PTSD intrusion symptom severity. This finding is consistent with previous research indicating that there is a significant and negative relationship between lack of contact with the present moment and PTSD total symptom severity (Bernstein et al., 2011; Smith et al., 2011; Vujanovic et al., 2013). There is a large body of literature supporting the role of avoidance in the maintenance of PTSD intrusion symptoms (Kumpula et al., 2011; McFarlane, 1992; Michael et al., 2005; Steil & Ehlers, 2000). It appears that lack of contact with the present moment may lead to increased PTSD intrusion symptom severity, as it is difficult to engage in "acceptance" of internal experiences, or thoughts, emotions, and sensations, occurring in the present moment when attention is directed away from the present. A person can lose contact with the present moment because a trauma memory has grabbed hold of their attention, because they are experiencing a flashback, because they are worrying about the potential for harm in the future, because they are distracting themselves with external stimuli, or because they are engaged in an emotional numbing or thought suppression technique. Recent studies have found that assisting clients in increasing their present moment awareness, through learning and practicing mindfulness

techniques, decreases PTSD intrusion symptom severity (Possemato et al., 2016; Wahbeh, Goodrich, Goy, & Oken, 2016).

Lastly, it was hypothesized that lack of contact with the present moment would mediate the relationship between cognitive fusion and PTSD intrusion symptom severity. Lack of contact with the present moment did not mediate the relationship between cognitive fusion and PTSD intrusion symptom severity, after controlling for the impact of age and sexual identity on PTSD intrusion symptom severity. This is the first known study, to this author, to examine the hypothesis that lack of contact with the present moment mediates the relationship between cognitive fusion and PTSD intrusion symptom severity.

It is also important to look at the size of the associations between lack of contact with the present moment, cognitive fusion, and PTSD intrusion symptom severity. Although there was a significant association between cognitive fusion and lack of contact with the present moment, the size of the association was small. A similar small, but significant, association was found between lack of contact with the present moment and PTSD intrusion symptom severity. Overall, one main theme throughout this set of findings was that lack of contact with the present moment was weakly associated with the other constructs within its hypothesized relationships.

One potential explanation for these weak relationships is that this sample was too small to detect the full effect of lack of contact on the present moment on the dependent variables when covariates were included in the analyses. Although post hoc power analyses indicated that power was equivalent to 1.00 for all analyses, a priori power analyses indicate that, if the expected effect size were small, then the sample

size would need to range from 320 to 600 participants to detect the effect (Cohen, 1992).The lack of consistency in the findings of studies examining the relationship between lack of contact with the present moment and PTSD symptom severity may also be attributed to low sample sizes (Bernstein et al., 2011; Smith et al., 2011; Vujanovic et al., 2013).

It is also possible that the weak relationships between lack of contact with the present moment, cognitive fusion, and PTSD intrusion symptom severity are due to poor external validity of the MAAS, the measure used within this study to capture lack of contact with the present moment. The MAAS was validated on university students, adults in the community via a mail order survey, cancer patients, and community members of a Zen meditation center (Brown & Ryan, 2003). Although correlational data between the MAAS and measures of well-being and psychopathology were published in the validation study, the authors did not provide mean total scores for the measures used within the study. Thus, it is not possible to speak to the severity of the symptomatology of their sample in relationship to the sample within this study. A separate study examining the relationship between the MAAS and PTSD symptom severity found significant but small relationships between the MAAS and PTSD symptom severity; the average total PTSD symptom severity of their sample appears to be lower than the same for this sample (Bernstein, Tanay, & Vujanovic, 2011).

A third possible explanation is that lack of contact with the present moment, as a phenomenon, is difficult to measure through self-report due its very nature. That is, when someone is not in contact with the present moment, they are also not observing their lack of contact with the present moment and cannot accurately report on it later.

Research has demonstrated that individuals who self-endorse greater attention towards and awareness of the present moment show greater concordance between their implicit and explicit emotional states (Brown & Ryan, 2003). However, additional research is needed to determine whether or not self-report of contact with present moment converges with behavioral, physiological, or observational data of such contact.

Experiential Avoidance, Lack of Contact with the Present Moment, and PTSD Intrusion Symptom

As proposed within this study, experiential avoidance and lack of contact with the present moment were significantly associated. This result is consistent with the assumption contained within the psychological flexibility model, that these two constructs are both overlapping and partially unique. Although previous findings have demonstrated a moderate correlation between experiential avoidance and lack of contact with the present moment (Baer et al., 2006; Herzberg et al., 2012; Latzman & Masuda, 2013; Masuda & Tully, 2012; McCracken & Gutiérrez-Martínez, 2011), this study is the first known to this author to do so within a sample of participants experiencing symptoms of posttraumatic stress.

Contrary to expectations, experiential avoidance and lack of contact with the present moment did not both significantly and uniquely contribute to PTSD intrusion symptom severity. Experiential avoidance had a significant and unique impact in the model, but lack of contact with the present moment did not. It is important to consider that experiential avoidance may play a larger role in the development and maintenance of PTSD intrusion symptom severity than that of lack of contact with the present moment. One study conducted within a sample of undergraduate students experiencing

sub-threshold PTSD symptoms found that experiential avoidance and thought suppression, a form of experiential avoidance, were both more strongly related with PTSD avoidance symptom severity than any facets of contact with the present moment, including the tendency to observe one's experience, describing or putting words to one's experience, and acting with awareness (Thompson & Waltz, 2010). Theorists have surmised that experiential acceptance, the opposite of experiential avoidance, may have greater predictive power over symptoms of psychopathology than awareness, or contact with the present moment.

It is possible that experiential avoidance, that is, active attempts to avoid unwanted internal stimuli, predicts PTSD symptom severity above and beyond that predicted by lack of contact with the present moment because it is the active attempts to avoid the present moment that maintain the PTSD symptoms themselves. Perhaps a person can lose contact with the present moment, including internal stimuli, and not experience intrusive recurrences of the internal stimuli with which they lost contact. In this case, lack of contact with the present moment could be conceptualized as a passive process, while experiential avoidance would be characterized by active attempts to avoid. Active internal experiential avoidance strategies could take the form of thought suppression, emotional numbing, or dissociation.

There is a large body of literature suggesting that acceptance, or willingness to have ones' private internal experiences is associated with improved mental health outcomes (Baer et al., 2008; Latzman & Masuda, 2013; McCracken et al., 2011; Osman, Lamis, Bagge, Freedenthal, & Barnes, 2015; Sahdra, Shaver, & Brown, 2010; Smith et al., 2011). Experiential acceptance could be considered the corollary to

experiential avoidance (Hayes, Strosahl, Bunting, et al., 2004; Hayes et al., 2012). If experiential avoidance plays a more important role in the development and maintenance of PTSD intrusion symptoms than lack of contact with the present moment, then exercises including experiential acceptance components, in addition to components consisting of awareness, observation, or noticing of internal experiences, should provide a greater reduction in PTSD intrusion symptom severity than exercises consisting solely of observation components.

It is also possible that both experiential avoidance and lack of contact with the present moment significantly and uniquely relate to PTSD intrusion symptom severity, but that the size of the effect for lack of contact with the present moment is smaller than that of experiential avoidance – that is, too small to be detected within the current sample size with two covariates.

Also contrary to expectations, experiential avoidance did not mediate the relationship between cognitive fusion and PTSD intrusion symptom severity after controlling for lack of contact with the present moment. Given that experiential avoidance and lack of contact with the present moment were moderately related and lack of contact with the present moment did not significantly or uniquely contribute to PTSD intrusion symptom severity beyond the variance contributed by experiential avoidance, it is possible that there was some redundancy between the two mediators. Lack of contact with the present moment and experiential avoidance both incorporate inattention to the present moment. If lack of contact with the present moment is conceptualized as having an additional passive component and experiential avoidance is conceptualized as having an additional active component, then experiential

avoidance may be a stronger mediator, in part, because of its active component. Regardless, it appears that including experiential avoidance, and just experiential avoidance, as a mediator in this model is most parsimonious.

Lastly, lack of contact with the present moment did not mediate the relationship between cognitive fusion and PTSD intrusion symptom severity when accounting for experiential avoidance. These results are not surprising in light of prior results indicating that lack of contact with the present moment did not mediate the relationship between cognitive fusion and PTSD intrusion symptom severity and that lack of contact with the present moment did not significantly and uniquely contribute to PTSD intrusion symptom severity alongside experiential avoidance.

Age, Sexual Identity, and PTSD Intrusion Symptom Severity

Age and sexual identity were both associated with PTSD intrusion symptom severity, such that older and sexual minority participants reported greater intrusion symptom severity than younger and heterosexual participants. Sexual identity also impacted experiential avoidance, with participants identifying as sexual minorities endorsing greater experiential avoidance than participants identifying as heterosexual.

The results of this study also highlight the importance of collecting information regarding participants' sexual identities. Previous literature has documented that sexual minority individuals experience higher exposure to trauma and are at higher risk for the development of PTSD than heterosexual individuals (Balsam, Huang, Fieland, Simoni, & Walters, 2004; Balsam, Rothblum, & Beauchaine, 2005; D'Augelli, Grossman, & Starks, 2006; Lehavot & Simpson, 2014; Roberts, Rosario, Corliss, Koenen, & Austin, 2012). Consistent with previous literature (Gold et al.,

2011; Weiss, Garvert, & Cloitre, 2015), sexual minority participants in this study demonstrated higher levels of experiential avoidance and PTSD intrusion symptom severity than heterosexual participants. It will be important for future researchers to collect information on sexual identity when examining trauma symptomatology.

Age was used as a covariate in this study as older participants endorsed greater levels of PTSD intrusion symptom severity than younger participants. Existing research regarding the impact of age on PTSD symptom severity demonstrates mixed findings. A study of Veterans of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) indicates that lower age is associated with higher PTSD symptom severity in men and that age is not significantly related to PTSD symptom severity in women (Janke-Stedronsky et al., 2015). Studies have also found no relationship between age and PTSD symptom severity (Ali, Dunmore, Clark, & Ehlers, 2002; Gil, 2005; Smith et al., 2011; Tull et al., 2004; Ullman & Filipas, 2001).

The mean age of participants in this study was significantly different between the two recruitment sources. The student subject pool sample was significantly younger than the online community sample (please see Supplemental Analyses section). Although age was significantly related to PTSD intrusion symptom severity in the total sample, that was not the case when each recruitment source was treated as its own sample. The lack of a significant relationship between age and PTSD intrusion symptom severity in either the student subject pool sample or the online community sample, when examined individually, could be due to low variance within the age of participants in the sample or it could be due to the higher PTSD intrusion symptom severity in the online community sample.

It is possible that these findings are generalizable to populations formally diagnosed with PTSD. The average PTSD total symptom severity within this sample was above the clinical cut-off score of 50, indicating that the total symptom severity was consistent with that typically found in populations diagnosed with PTSD (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). Future research examining the relationships between cognitive fusion, experiential avoidance, lack of contact with the present moment, and PTSD intrusion symptom severity, within participants formally diagnosed with PTSD, is needed to provide further support for the generalizability of the findings within this study.

Limitations

This study contains several limitations. The use of retrospective self-report measures introduces a larger likelihood of measurement error than the use of clinician-administered interviews. It is possible that avoidance leads individuals to underreport their symptoms of posttraumatic stress. It is also possible that the ability to report accurately on the behavioral processes of cognitive fusion, experiential avoidance, and lack of contact with the present moment interacts with the processes themselves, such that individuals with higher levels of the processes experience greater difficulty with accurate reports. In the future, it will be important to supplement self-report inventories with behavioral measures.

The measures in this study were administered in the same order to all participants. Therefore, order effects cannot be ruled out as contributing to the results. Fatigue effects, in particular, may have caused participants to respond more haphazardly to items at the end of the study, as compared to those at the beginning of

the study. It will be important to randomize the order in which these measures are presented in subsequent research.

The cross-sectional design of the study limits the inferences that can be made from the data. For example, it is impossible to deduce whether cognitive fusion causes experiential avoidance, lack of contact with the present moment, or PTSD intrusion symptom severity. Likewise, it is not possible to determine whether lack of contact with the present moment or experiential avoidance cause higher PTSD intrusion symptom severity. Longitudinal assessment and treatment outcome studies are needed to test the hypothesized causal relationships between the behavioral processes and PTSD intrusion symptom severity and between the behavioral processes themselves; those results may influence the delivery of therapy.

Age and sexual identity were both related with PTSD intrusion symptom severity, such that older and sexual minority participants reported greater intrusion symptom severity than younger and heterosexual participants. Sexual identity also impacted experiential avoidance, with participants identifying as sexual minorities endorsing greater experiential avoidance than participants identifying as heterosexual. However, due to limitations within the PROCESS macro used to test the proposed mediation models, the impact of sexual identity on experiential avoidance was not controlled for within the 4 analyses that utilized the macro.

This sample was composed of participants recruited through two separate mechanisms. Those recruited through the UMSL student subject pool reported less severe symptoms of PTSD than participants recruited from the online community. Although combining the two samples afforded greater variance within all of the

dependent variables, including PTSD intrusion symptom severity, it is also possible that the differences between the samples impacted the results within this study. For example, age was significantly associated with PTSD intrusion symptom severity within the total sample, but not within each recruitment source sample. It is possible that the relationship between the two variables within the total sample is largely accounted for by the significant difference in PTSD intrusion symptom severity within the two recruitment source samples.

It should also be noted that the current sample contained both individuals experiencing clinically significant levels of posttraumatic stress (PCL-S Total score > 50) and individuals with sub-threshold symptoms (PCL-S total score < 50; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). On the one hand, the average PTSD total symptom severity within this study was above the clinical cut-off score of 50. On the other hand, 108 of the 308 participants had PCL-S total scores under 50. Thus, participants in this study could be conceptualized as either comparable to or higher functioning than a clinical sample. It will be important to replicate and expand upon this research within clinical samples, to test the generalizability of these findings.

Lastly, participants provided information about their exposure to traumatic events on both the LEC and the PCL-S. Participants were determined to have experienced a Criterion A traumatic event if they indicated that they were completing the PCL-S in reference to a Criterion A event, such as “rape,” “domestic violence,” or “witnessed a murder,” and had endorsed experiencing the corresponding trauma type on the LEC. In some cases, such as when a participant identified the heart attack of a loved one as their traumatic event on the PCL-S, it was clear that the event did not

meet Criterion A. However, in other cases, such as when a participant wrote "abuse" on the PCL-S and had endorsed experiencing sexual abuse and domestic violence on the LEC, it was possible that the participant was referring to an instance of sexual or physical abuse on the PCL-S. Thus, when a participant identified abuse as their Criterion A event on the PCL-S and also endorsed a Criterion A-related instance of abuse on the LEC the participant was included in the sample. Future studies incorporating a clinician-administered interview for PTSD, such as the CAPS, would better ensure that participants meeting eligibility requirements were included and those who did not were excluded.

Future Research

The psychological flexibility model places equal importance on the role of lack of contact with the present moment and experiential avoidance in the development and maintenance of PTSD intrusion symptom severity. However, it appears that experiential avoidance has a stronger relationship to PTSD intrusion symptoms than lack of contact with the present moment. There are numerous important questions to ask a result of this research: 1). Does experiential avoidance mediate the relationship between lack of contact with the present moment and PTSD intrusion symptom severity? 2). In what direction are the relationships between cognitive fusion, experiential avoidance, lack of contact with the present moment, and PTSD intrusion symptom severity? 3). Is it possible to differentiate between lack of contact with the present moment that includes active attempts to avoid internal experiences and lack of contact with the present moment without active attempts to avoid? 4). Do exercises consisting of both awareness and acceptance of present moment trauma-related

internal experiences have a greater impact than exercises solely focused on awareness (e.g., observing and describing internal experiences) in terms of reducing PTSD intrusion symptom severity? Additionally, future researchers should be certain to collect information regarding their participants' sexual identities, as exposure to traumatic experiences and PTSD symptom severity can differ depending on sexual identity.

Conclusions

The present study provides support for many of the proposed relationships within the psychological flexibility model, within a sample of trauma-exposed participants experiencing symptoms of posttraumatic stress. Cognitive fusion, experiential avoidance, and lack of contact with the present moment were all significantly associated with PTSD intrusion symptom severity. Cognitive fusion was also significantly associated with experiential avoidance and lack of contact with the present moment. Experiential avoidance mediated the relationship between cognitive fusion and PTSD intrusion symptom severity, while lack of contact with the present moment did not. Future research should focus on the strength and direction of the relationships between lack of contact with the present moment, experiential avoidance, and PTSD intrusion symptom severity.

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Appendix A

Demographic Questionnaire

1. What is your age in years? _____

2. Which of the following best describes your present gender identity?
   a) Male
   b) Female
   c) Transgender
   d) Intersex
   e) Genderqueer
   f) You don't have an option that applies to me. I identify as (*Please specify*): _____

3. Which of the following best describes your present sexual identity?
   a) Gay
   b) Lesbian
   c) Heterosexual
   d) Bisexual
   e) Pansexual
   f) Queer
   g) Questioning
   h) You don't have an option that applies to me. I identify as (*Please specify*): _____

4. What is your racial origin?
   a) African American or Black
   b) White
   c) Native Hawaiian or Pacific islander
   d) Asian
   e) American Indian or Alaska Native
   f) Multiracial
   g) You don't have an option that applies to me. I identify as (*Please specify*): _____

5. What is your Ethnic origin?
   a) Hispanic or Latina _____
   b) Not Hispanic or Latina _____

6. How many years of education have you completed?
   For example: _____

Completion of:	# Of Years
Grade school	8
High school	12
College	16
2 years of high school	10

7. Choose the level of education that is most applicable to you: _____
   a) Graduate or professional training (degree obtained)
   b) Partial graduate or professional training
   c) College graduate (degree obtained)
   d) Partial college training (include technical schooling beyond high school)
   e) High school graduate (graduate of technical or trade school)
   f) Partial high school (10^{th} grade through partial 12^{th} grade)
   g) Elementary school (6^{th} grade or less)

8. What is your current occupation? (State if more than one)

   _____

9. How many hours per week (during a normal week) are you employed? (if there is more than one occupation give total of all hours)

   _____

10. Are you currently serving in the armed forces/are you a veteran? _____

11. What is your current marital status? _____
    a) Single
    b) Married
    c) Domestic partnership
    d) Separated
    e) Divorced
    f) Living with someone
    g) Widowed

12. What is your current annual household income level? _____
    a) Less than $5000
    b) $5,001 – 10,000
    c) $10,001 – 20,000
    d) $20,001 – 30,000
    e) $30,001 – 50,000
    f) More than $50,000

13. Who do you currently live with? (Please list relationship to yourself, gender, and age but do not include the individuals' names)

Relationship to you, gender	Age

Appendix B

Life Events Checklist (LEC)

Listed below are a number of difficult or stressful things that sometimes happen to people. For each event check one or more of the boxes to the right to indicate that: (a) it *happened to you* personally, (b) you *witnessed it* happen to someone else, (c) you *learned about it* happening to someone close to you, (d) you're *not sure* if it fits, or (e) it *doesn't apply* to you.

Be sure to consider your *entire life* (growing up as well as adulthood) as you go through the list of events.

Event	Happened to me	Witnessed it	Learned about it	Not sure	Doesn't apply
1. Natural disaster (for example, flood, hurricane, tornado, earthquake					
2. Fire or explosion					
3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash)					
4. Serious accident at work, home, or during recreational activity					
5. Exposure to toxic substance (for example, dangerous chemicals, radiation)					
6. Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)					
7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)					

8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)					
9. Other unwanted or uncomfortable sexual experience					
10. Combat or exposure to a war-zone (in the military or as a civilian)					
11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)					
12. Life-threatening illness or injury					
13. Severe human suffering					
14. Sudden violent death (for example, homicide, suicide)					
15. Sudden, unexpected death of someone close to you					
16. Serious injury, harm, or death you caused to someone else					
17. Any other very stressful event or experience					

Appendix C

PTSD Checklist – Specific Version (PCL-S)

The event you experienced was: (*please specify event*) _____.

This event occurred on: (*please specify date)* _____.

Instructions: Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

1	2	3	4	5
Not at all	A little	Moderately	Quite a bit	Extremely

1. Repeated, disturbing *memories, thoughts,* or *images* of the stressful experience? 1 2 3 4 5
2. Repeated, disturbing *dreams* of the stressful experience? 1 2 3 4 5
3. Suddenly *acting* or *feeling* as if the stressful experience *were happening again* (as if you were reliving it)? 1 2 3 4 5
4. Feeling *very upset* when *something reminded you* of the stressful experience? 1 2 3 4 5
5. Having *physical reactions* (e.g., heart pounding, trouble breathing, sweating) when *something reminded you* of the stressful experience? 1 2 3 4 5
6. Avoiding *thinking about* or *talking about* the stressful experience or avoiding *having feelings* related to it? 1 2 3 4 5
7. Avoiding *activities* or *situations* because *they reminded you*

of the stressful experience? 1 2 3 4 5

8. Trouble *remembering important parts* of the stressful experience? 1 2 3 4 5
9. *Loss of interest* in activities that you used to enjoy? 1 2 3 4 5
10. Feeling *distant* or *cut off* from other people? 1 2 3 4 5
11. Feeling *emotionally numb* or being unable to have loving feelings for those close to you? 1 2 3 4 5
12. Feeling as if your *future* will somehow be *cut short?* 1 2 3 4 5
13. Trouble *falling* or *staying asleep?* 1 2 3 4 5
14. Feeling *irritable* or having *angry outbursts?* 1 2 3 4 5
15. Having *difficulty concentrating?* 1 2 3 4 5
16. Being "*super-alert"* or watchful or on guard? 1 2 3 4 5
17. Feeling *jumpy* or easily startled? 1 2 3 4 5

Appendix D

Cognitive Fusion Questionnaire

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1. My thoughts cause me distress or emotional pain. 1 2 3 4 5 6 7
2. I get so caught up in my thoughts that I am unable to do the things that I most want to do. 1 2 3 4 5 6 7
3. I over-analyse situations to the point where it's unhelpful to me. 1 2 3 4 5 6 7
4. I struggle with my thoughts. 1 2 3 4 5 6 7
5. I get upset with myself for having certain thoughts. 1 2 3 4 5 6 7
6. I tend to get very entangled in my thoughts. 1 2 3 4 5 6 7
7. It's such a struggle to let go of upsetting thoughts even when I know that letting go would be helpful. 1 2 3 4 5 6 7

Appendix E

Acceptance and Action Questionnaire - II

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1. My painful experiences and memories make it difficult for me to live a life that I would value. 1 2 3 4 5 6 7
2. I'm afraid of my feelings. 1 2 3 4 5 6 7
3. I worry about not being able to control my worries and feelings. 1 2 3 4 5 6 7
4. My painful memories prevent me from having a fulfilling life. 1 2 3 4 5 6 7
5. Emotions cause problems in my life. 1 2 3 4 5 6 7
6. It seems like most people are handling their lives better than I am. 1 2 3 4 5 6 7
7. Worries get in the way of my success. 1 2 3 4 5 6 7

Appendix F

Mindful Attention and Awareness Scale

Below is a collection of statements about your everyday experience. Using the 1–6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be.

1	2	3	4	5	6
almost always	very frequently	somewhat frequently	somewhat infrequently	very infrequently	almost never

1. I could be experiencing some emotion and not be conscious of it until some time later. 1 2 3 4 5 6

2. I break or spill things because of carelessness, not paying attention, or thinking of something else. 1 2 3 4 5 6

3. I find it difficult to stay focused on what's happening in the present. 1 2 3 4 5 6

4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way. 1 2 3 4 5 6

5. I tend not to notice feelings of physical tension or discomfort until they really grab my attention. 1 2 3 4 5 6

6. I forget a person's name almost as soon as I've been told it for the first time. 1 2 3 4 5 6

7. It seems I am "running on automatic" without much awareness of what I'm doing. 1 2 3 4 5 6

8. I rush through activities without being really attentive to them. 1 2 3 4 5 6

9. I get so focused on the goal I want to achieve that I lose touch with

what I am doing right now to get there. 1 2 3 4 5 6

10. I do jobs or tasks automatically, without being aware of what I'm doing. 1 2 3 4 5 6

11. I find myself listening to someone with one ear, doing something else at the same time. 1 2 3 4 5 6

12. I drive places on "automatic pilot" and then wonder why I went there. 1 2 3 4 5 6

13. I find myself preoccupied with the future or the past. 1 2 3 4 5 6

14. I find myself doing things without paying attention. 1 2 3 4 5 6

15. I snack without being aware that I'm eating. 1 2 3 4 5 6