INTEGRATING ACCEPTANCE AND COMMITMENT THERAPY PROCESSES WITH INFORMATION-PROCESSING THEORY IN ANXIOUS EARLY ADOLESCENTS

by

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# TABLE OF CONTENTS

Abstract ............................................................................................................................................. xii

CHAPTER I: STATEMENT OF THE PROBLEM ................................................................. 1

CHAPTER II: REVIEW OF THE LITERATURE ............................................................. 4
  Anxiety: Definition and Epidemiology ................................................................. 4
  Social Information-Processing Theory ............................................................... 7
    Measurement of social-information processing ........................................... 10
    I-P theory and anxiety in youth ................................................................. 10
    I-P and Latinxs ......................................................................................... 13
  Relational Frame Theory and ACT Processes ............................................... 14
    Cognitive fusion/defusion ........................................................................ 16
    Mindfulness and acceptance .................................................................... 18
    Experiential avoidance ............................................................................. 19
    Measurement of ACT processes in youth ................................................. 19
    ACT processes and anxiety in youth ......................................................... 20
      Anxiety and mindfulness/acceptance ..................................................... 21
      Anxiety and cognitive fusion/defusion ................................................... 25
      Anxiety and experiential avoidance ....................................................... 27
    ACT and Latinxs ....................................................................................... 28
  Application of ACT Processes to the Information Processing of Anxious Youth .................................................................................................................................................................................. 30
    Mindfulness and encoding ....................................................................... 30
    Mindfulness/acceptance and interpretation ............................................. 32
    Mindfulness and response access ............................................................ 33
    Cognitive fusion/defusion and response selection .................................. 35
    Experiential avoidance and response selection ....................................... 36
    ACT processes, I-P, and Latinxs ............................................................... 38
  Summary of the Literature and Purpose of the Study .................................. 38
    Purpose of the study ................................................................................ 40
  Study Hypotheses ......................................................................................... 40

CHAPTER III: METHODOLOGY .................................................................................. 50
  Participants ................................................................................................. 50
  Measures .................................................................................................... 53
    Anxiety ..................................................................................................... 53
    Mindfulness ............................................................................................. 53
    Social cognitive processes, avoidance, acceptance, and cognitive fusion/defusion .................................................. 54
  Procedure ................................................................................................... 56
    Recruitment and data collection .............................................................. 56
    Coding the COELE-R ........................................................................... 57
CHAPTER IV: RESULTS

Analytical Procedure

Preliminary Analyses

Main Analyses

Hypothesis A: Mindfulness and acceptance will be negatively associated with threat interpretation

Across situations

Per situation

Hypothesis B: Mindfulness and acceptance will partially mediate the association between threat interpretation and anxiety

Across situations

Per situation

Hypothesis C: Mindfulness and acceptance will moderate the association between threat interpretation and anxiety

Across situations

Per situation

Hypothesis D: Mindfulness will be positively associated with number of solutions

Across situations

Per situation

Hypothesis E: Avoidance will be positively associated with anxiety

Across situations

Per situation

Hypothesis F: Cognitive fusion will be positively associated with anxiety

Across situations

Per situation

Hypothesis G: Mindfulness and acceptance will be negatively associated with avoidance

Across situations

Per situation

Hypothesis H: Mindfulness and acceptance will be negatively associated with cognitive fusion

Across situations

Per situation

Hypothesis I: Mindfulness and acceptance will partially mediate the association between avoidance and anxiety

Across situations

Per situation

Hypothesis J: Mindfulness and acceptance will partially mediate the association between cognitive fusion and anxiety

Across situations

Per situation
LIST OF TABLES

Tables.

Table 1. Sample Demographics Summary .................................................................51

Table 2. Frequency Counts for ACT Codes Using Question 5 of the COELE-R .................................................................60

Table 3. Means and Standard Deviations of Main Study Variables Across and Per Situation ..............................................................................................................62

Table 4. Descriptive Statistics and Bivariate Correlations Across Situations ..........................................................................................................................65

Table 5. Bivariate Correlations for Social Relationships/Peer (Situation 1 of the COELE-R) ........................................................................................................66

Table 6. Bivariate Correlations for School/Teacher (Situation 2 of the COELE-R) ........................................................................................................67

Table 7. Bivariate Correlations for Personal Harm (Situation 3 of the COELE-R) ........................................................................................................68

Table 8. Across Situations: Mindfulness and Acceptance as Moderators of Threat Interpretation and Anxiety ..............................................................................77
LIST OF FIGURES

Figures.

Figure 1. Study hypotheses .................................................................45

Figure 2. Across situations: Mindfulness and acceptance as mediators of the association between threat interpretation and anxiety .........................71

Figure 3. By situation: Mindfulness mediates the association between threat interpretation and anxiety only in social situations .......................73

Figure 4. By situation: Acceptance does not mediate the association between threat interpretation and anxiety ..................................................74

Figure 5. Across situations: Mindfulness moderates the association between threat interpretation and anxiety ..................................................75

Figure 6. Across situations: Mindfulness buffers the positive association between threat interpretation and anxiety ..........................................76

Figure 7. Across situations: Mindfulness and acceptance as mediators of the association between avoidance and anxiety ..........................81

Figure 8. Across situations: Mindfulness and acceptance as mediators of the association between cognitive fusion and anxiety ....................83

Figure 9: By situation: Mindfulness mediates the association between cognitive fusion and anxiety only in social situations .......................85

Figure 10: By situation: Acceptance does not mediate the association between cognitive fusion and anxiety ..............................................86
LIST OF APPENDICES

Appendices.

Appendix A. Revised Children’s Anxiety and Depression Scale ................124
Appendix B. Child Acceptance and Mindfulness Measure ......................128
Appendix C. Children’s Opinions of Everyday Life Events-Revised.........130
Appendix D. Adapted COELE-R Coding Manual.................................133
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ABSTRACT

The social information-processing (I-P) model states that cognition assumes several cognitive steps (encoding, interpretation, response access, and selection). It has been shown that anxious youth display deficits or distortions at various stages of the social I-P model. In response to ambiguous situations, they show threat perception and interpretation biases, choose maladaptive responses, and engage in greater levels of avoidance than do non-anxious youth. Acceptance and Commitment Therapy (ACT) is an empirically-supported treatment for anxious youth. It aims to increase mindfulness, acceptance, and cognitive defusion, and to decrease experiential avoidance. The mechanisms explaining the effectiveness of ACT processes suggest that they counteract automatic biased responses (which are characteristic of anxious children) during I-P stages. Specifically, research shows a strong association between mindfulness and attention, and between attention and decision-making. Therefore, it is likely that decreased mindfulness during the initial stages of I-P (i.e., during the encoding and interpretation phases) would predict ineffective solutions and explain associations between ineffective solutions and anxiety. The goal of this study was to examine ACT processes at various stages of the social I-P model to gain insight into the role that
mindfulness, cognitive fusion/defusion, acceptance, and avoidance play during adolescents’ cognitive experiences in hypothetical situations. Self-report data of ACT variables, I-P variables, and anxiety were collected from 288 middle-school students of primarily Latinx backgrounds (87%). Findings indicated that across situations, mindfulness played a significant role in associations between youths’ I-P and anxiety; however, when characteristics of specific situations were considered, mindfulness was negatively related to threat interpretation and to maladaptive responses only in social situations. The results from this study highlight the protective role of mindfulness for anxious adolescents who tend to automatically interpret ambiguous social situations as threatening. Future mindfulness intervention researchers should strongly consider including measures of social adjustment when studying Latinx early adolescents, and clinicians should consider implementing mindfulness strategies with adolescents who struggle socially.

*Keywords*: social information-processing, anxiety, ACT, early adolescence
CHAPTER I

Statement of the Problem

Adolescence is a critical phase for the development of mental disorders, particularly internalizing disorders. This is largely because adolescents are prone to being emotionally reactive, impulsive, and susceptible to peer influence (Lee et al., 2014; Polanczyk, Salum, Sugaya, Caye, & Rohde, 2015). Notably, during adolescence, the brain is still developing and is highly plastic (Lee et al., 2014). Therefore, adolescence invites neural malleability that is largely guided by experiences, and those experiences develop ingrained cognitive patterns (Crick & Dodge, 1994).

Emerging research suggests that adolescents from minority cultural backgrounds are at increased risk for anxiety. Specifically, Latinx youth generally display more anxiety symptoms than do children from other cultural backgrounds (Martinez, Polo, & Carter, 2012; Varela et al., 2004). This may be due in part to Latinx youth’s exposure to a variety of cultural stressors including acculturative stress (i.e., the tension experienced when adjusting to a new culture; Suarez-Morales, Dillon, & Szapocznik, 2007). Because Latinx youth comprise a substantial portion of youth in the U.S. (18.3%; Census Bureau, 2018) and because these individuals are at increased risk for anxiety, there is a significant need for clinical research that focuses on anxiety in Latinx adolescents in the U.S.

In order to improve interventions for Latinx adolescents, the first necessary step is to develop a better understanding of their social cognitive processing and how their cognitions lead to specific behavioral responses. Studying social information-processing is particularly relevant to adolescents, for whom social interactions play a major role in adjustment outcomes (La Greca & Lopez, 1998). In an effort to clarify associations
between youths’ cognitions and behaviors, theorists have proposed the social information-processing (I-P) model (Dodge, 1986; Crick & Dodge, 1994). The social information-processing (I-P) model is a cognitive model that has been applied to anxious youth (Beck & Clark, 1997). It assumes that social information is processed through a series of cognitive stages before a behavioral response is produced. To date, there are only a few studies focusing on the social I-P of Latinx youth. However, the available research shows that Latinx children and adolescents who display high levels of worry tend to show threat interpretation biases during the interpretation phase and to choose ineffective solutions during the response selection phase (Suarez-Morales & Bell, 2006). These findings suggest that there is a need for research that identifies appropriate coping strategies for Latinx youth who display social information-processing deficits and high anxiety-levels.

Acceptance and commitment therapy (ACT) is a third wave cognitive therapy, which signifies that it focuses on the function rather than the content of thoughts and behaviors. ACT includes several therapeutic strategies including *mindfulness* (nonjudgmentally paying attention to the present moment), *acceptance* (awareness and embrace of thoughts and feelings), and *cognitive defusion* (the ability to see thoughts as verbal processes instead of truths) and aims to reduce *experiential avoidance* and *cognitive fusion* (entanglement with thoughts). These strategies have been shown to alleviate psychopathological symptoms in youth, particularly youth with anxiety disorders (Fung, Guo, Jin, Bear, & Lau, 2016; Swain, Hancock, Hainsworth, & Bowman, 2013).
It is likely that mindfulness, acceptance, cognitive fusion/defusion, and avoidance are related to several of the social information-processing stages in Latinx anxious youth. For example, anxious adolescents’ threat perception and interpretation biases during the encoding and interpretation phases of the social I-P model (Daleiden & Vasey, 1997) may be counteracted by mindfulness. Although ACT has been shown to benefit anxious youth, no study has examined ACT processes in relation to anxious youths’ social I-P. An examination of the association between ACT processes and social I-P theory would distinguish the therapeutic strategies that are effective during specific stages of adolescents’ social I-P. The purpose of this study will be to examine ACT in the context of social I-P theory using novel measurement strategies in a high-risk sample of primarily Latinx early adolescents.
CHAPTER II
Review of the Literature

Anxiety: Definition and Epidemiology

There are various forms of anxiety with corresponding clinical diagnoses. However, anxiety is generally characterized by “anticipation of future threat,” and it is typically associated with avoidant responses (American Psychiatric Association, 2013, p. 189). Anxiety disorders are distinguished from one another by the specific “objects or situations that induce fear, anxiety, or avoidance” and by associated thoughts (American Psychiatric Association, 2013, p. 189). For example, separation anxiety disorder is characterized by excessive fear of “separation from home or attachment figures,” social anxiety disorder is marked by intense fear of “social situations in which the individual may be scrutinized by others,” and generalized anxiety disorder presents as “excessive anxiety and worry” about various topics (American Psychiatric Association, 2013, pp. 191, 202, and 222). Anxiety that is disproportionate to the severity of the situation or that transcends what is considered age-appropriate is diagnosable.

Anxiety disorders are the most prevalent form of psychopathology in youth, suggesting that they begin manifesting themselves at an early age (Beesdo, Knappe, & Pine, 2009). A recent survey conducted by the Centers for Disease Control and Prevention (CDC, 2019) shows that 7% of youth had a diagnosable anxiety disorder in 2016-2017. Additionally, having ever been diagnosed with an internalizing disorder in childhood increased from 5.4% in 2003 to 8% in 2007 and to 8.4% in 2011-2012 (CDC, 2019).
Various epidemiological factors including age, gender, and ethnicity, contribute to differences in anxiety. Research shows that anxiety manifests differently throughout development (Beesdo et al., 2009). Different developmental periods call for varying stressors; therefore, the type of anxiety disorder that is likely to manifest depends on age. For example, separation anxiety disorder is likely to begin in childhood because of this time-period’s emphasis on the parent-child relationship. However, social anxiety disorder is more likely to begin and peak in early adolescence due to this period’s emphasis on peer relationships. Beyond this time, in later adolescence, generalized anxiety disorder and panic disorder are more prevalent, as adolescents begin to focus on increased responsibilities that come in early adulthood (Beesdo et al., 2009).

Early adolescents are at a particularly vulnerable time, both socially and academically, as they adjust following the transition from elementary school to middle school and prepare to transition into high school. Because academics and social issues are at the forefront of adolescents’ triggers of anxiety (Horowitz & Graf, 2019), middle school is prime time for the development or exacerbation of anxiety symptoms. Various studies have shown that middle school is a “trigger for the emergence of psychopathology and maladjustment” (McLaughlin, Hilt, & Nolen-Hoeksema, 2007, p. 802). For example, the onset of social phobia, panic disorder, and generalized anxiety disorder typically occurs in early adolescence (see McLaughlin et al., 2007, for a review).

Gender differences in the prevalence of anxiety disorders have also been found. According to the American Psychiatric Association (2013), females are twice as likely as males to have an anxiety disorder. This makes sense, considering that girls are more likely than boys to “feel tense or nervous about their day,” “feel a lot of pressure to look
good,” and worry about getting accepted into the college of their choice (Horowitz & Graf, 2019).

Prevalence rates of anxiety also differ by ethnicity. Latinx adolescents generally report higher anxiety symptoms than other ethnic groups. Varela and colleagues (2009) showed that Mexican and Latin American children report higher anxiety levels than European American children. Other researchers have shown that Latinx adolescents are more likely to display clinically significant levels of social anxiety and separation anxiety than Caucasian and African American adolescents (Ohannessian, McCauley, & Cheeseman, 2017).

Studies focusing on anxiety in Latinx adolescents have shown that anxiety and age are negatively correlated such that younger adolescents (typically in middle school) show peak anxiety levels. For example, Glover, Pumariega, Holzer, Wise, and Rodriguez (1999) found that age was negatively associated with anxiety such that Latin American seventh graders (aged 11-12) exhibited the highest levels of anxiety. Similarly, Ingles, La Greca, Marzo, Garcia-Lopez, & Garcia-Fernandez (2010) studied social anxiety rates in 1570 Spanish adolescents aged 14-17, and they found that girls and younger adolescents reported higher social anxiety than boys and older adolescents.

Further, La Greca, Ingles, Lai, and Marzo (2015) studied social anxiety symptoms in 1,191 Hispanic adolescents (70% of whom indicated that Spanish was their first language). La Greca et al. (2015) also found that social anxiety symptoms decreased with age in their Hispanic sample. They attributed this finding to the fact that younger adolescents experience a more difficult transition (from middle school to high school), and this leads to increased social anxiety. The authors add that this transition may be
particularly difficult for Latin American youth as school drop-out rates tend to be significantly higher in this population than in other cultural groups (Wheelock & Miao, 2005; as cited in La Greca et al., 2015). The consistent finding that early adolescents/middle school students display higher anxiety-levels than later adolescents highlights the importance of studying anxiety in this age-group.

Beyond this, strong associations between social processes and anxiety in middle school calls for research that focuses on these factors in Latinx youth. For example, Motoca, Williams, and Silverman (2012) studied associations between anxiety, peer interactions, and social skills in a primarily Latinx sample of 297 children and adolescents. They found that anxiety was positively associated with negative peer interactions and that social skills mediated the association between anxiety and negative peer interactions. Therefore, peer interactions are likely to play a significant role in the development and maintenance of anxiety symptoms in Latinx youth. Overall, findings highlight the connection between social influences and anxiety for Latinx early adolescents and suggest that zoning in on these factors in clinical research would be a worthy endeavor.

**Social Information- Processing Theory**

The social information-processing model was developed in response to research showing low correlations between cognition and behavior (Dodge, 1986). In an attempt to clarify these findings, Dodge (1986) challenged the assumption that cognition constitutes a single factor. He argued that cognition assumes several factors or cognitive steps. Additionally, he emphasized situation-specificity and referred to Mischel’s (1968) personality theories suggesting that “antisocial [children] do not behave in antisocial
ways in all situations” (p. 80). Therefore, Dodge (1986) aimed to elucidate how social cognitions lead to specific social behaviors (that may vary across situations) in order to predict children’s adjustment outcomes.

Dodge (1986) theorized that children’s social information-processing follows four cognitive steps (encoding, interpretation, response access, and selection) followed by a behavioral response (enactment). During the encoding phase, children are presented with a stimulus or situation and they “focus on and encode particular cues in the situation” (Crick & Dodge, 1994, p. 74). Once the situation is encoded, children develop an inference about the situation. For example, if an aggressive child encodes that a ball hit him, he might then interpret the situation as a classmate initiating a fight. After interpreting the situation, children retrieve several possible solutions from long-term memory (response access) and choose one solution (selection). The solution is then behaviorally manifested through the enactment phase.

Dodge’s (1986) original social information-processing theory was revisited and revised in later research (Crick & Dodge, 1994). Crick and Dodge’s (1994) model is similar to Dodge’s (1986) original model, but it includes an additional step (goal development) before the response access phase and it does not assume the linear nature that Dodge’s (1986) model assumes. Moreover, Crick and Dodge (1994) break down each step into several sub-processes. For example, they explain that during the interpretation phase, children (a) use a filtered lens that is largely influenced by their past experiences, (b) review past goals and how effective those goals were, (c) infer others’ intentions, (d) evaluate their self-efficacy in terms of their ability to successfully enact their selection in the past, and (e) attach meaning to their current and past related
experience (Crick & Dodge, 1994, p. 76). Crick and Dodge (1994) also emphasize how emotions contribute to each social cognitive process. For example, in addition to the encoding of environmental cues, it is also likely that children inadvertently encode emotional cues. Moreover, goals and behaviors can be influenced by emotions. For example, feelings of anger are likely to lead to aggressive goals and responses. Therefore, Crick and Dodge (1994) explain that Dodge’s (1986) original model was oversimplified and that it inaccurately inferred causality. They emphasize that the revised model accounts for those limitations by showing that social cognitions are not necessarily linear and that they are both complex and intertwined with emotions.

Importantly, both models emphasize the relevance of situational specificity. Crick and Dodge (1994) explain that the structure of social information-processing differs between familiar and novel situations. That is, children’s processing in familiar circumstances is automatic whereas novel situations invite more conscious or reflective processing. Rabiner, Lenhart, and Lochman (1990) applied this difference to rejected non-aggressive boys when they showed that these boys “process information adequately under reflective circumstances but inadequately under automatic conditions” (as cited in Crick & Dodge, 1994, p. 79). Therefore, Rabiner and colleagues (1990) suggested that maladjusted children have poorer processing capabilities when the situation is familiar and pulls for an automatic response (as cited in Crick & Dodge, 1994). This is likely because maladjusted (e.g., aggressive or anxious) children may rely on past maladaptive behavioral responses (Beck & Clark, 1997). Crick and Dodge (1994) compare children’s learned responses to a marble rolling down a muddy and drying hill. At first, the marble will roll down several paths, but during repeated trials the marble will stick to previously
formed paths and cause them to become more deeply entrenched. Crick and Dodge (1994) explain that “with repeated trials, the path will become smoother and deeper, and the marble will roll more rapidly” (p. 81). Therefore, past social cognitive processes and behavioral responses become increasingly automatic, regardless of how effective they might be.

**Measurement of social information-processing.** Social information processes are likely to appear abstract without appropriate forms of measurement. Crick and Dodge (1994) state that the most common way to capture the social information-processing model is by presenting children with hypothetical situations. With this method, children are presented with vignettes of hypothetical situations and are asked about various steps of processing. Research that has included these open-ended measures has shown that when compared to controls, maladjusted children deviate from typical cognitive and behavioral responses. Crick and Dodge (1994) propose three explanations for these deviations: (a) memory deficits interfere with maladjusted children’s ability to accurately recall information, (b) selective attention causes maladjusted children to disregard other telling cues in their social environment, and (c) automatic processing and responding predominates, even when the situation may be somewhat novel (“because they believe they already have the situation ‘figured out’”) (p. 83). Therefore, children and adolescents suffering from psychopathological symptoms will probably jump to conclusions and selectively attend to specific cues in their environments instead of absorbing the whole context.

**I-P theory and anxiety in youth.** The components of social information-processing theory have been studied in samples of anxious youth. Research has shown
that children and adolescents with anxiety have deficits at various stages of the information-processing model (Daleiden & Vasey, 1997). For example, it has been shown that anxious children selectively attend to threatening cues during the encoding phase (Daleiden & Vasey, 1997; Vasey, Daleiden, Williams, & Brown, 1995). In their application of the information-processing model to anxious individuals, Beck and Clark (1997) explain that although the encoding phase (or the orienting mode) is typically processed relatively quickly, people who are anxious have an orienting mode that is “excessively tuned to detect negative stimuli” (p. 52). This suggests that anxious children are primed to detect threat.

It is also likely that anxious children’s attentional intensity is impaired (Daleiden & Vasey, 1997). Therefore, anxious youth use less information from their environments to make decisions. This supports the notion that encoding in anxious individuals is automatic. Beck and Clark (1997) describe automaticity as “effortless,” “involuntary,” “relatively fast,” and “stereotypic,” and say that it involves “minimal analysis” (p. 50). They argue that “the goal in the treatment of anxiety is to deactivate the more automatic primal threat mode and to strengthen more constructive reflective modes of thinking” (p. 49). Relatedly, distractibility tends to be higher in anxious children (Daleiden & Vasey, 1997) and might be another factor contributing to their automatic responses. Given these automatic and reflexive cognitive processes, it is likely that anxious children would benefit from interventions that specifically target the encoding phase.

Children with anxiety also show deficits or distortions during the interpretation phase (Daleiden & Vasey, 1997). For example, Chorpita, Albano, and Barlow (1996) found that compared to a nonclinical group, clinically anxious children who were
presented with ambiguous situations were more likely to interpret them as threatening.

Similarly, Suarez-Morales and Bell-Dolan (2001) studied worry (the cognitive component of anxiety) and cognitive processes in 277 children in grades 5 and 6. They assessed cognitive processing with the Children’s Opinions of Everyday Life Events (COELE), which is an open-ended vignette-based questionnaire. The COELE (which has been revised; COELE-R, Suarez-Morales & Bell, 2006) resembles other commonly used measures of social cognitive processing (Crick & Dodge, 1994) and it captures the interpretation, response access, and selection phases of Dodge’s (1986) I-P model.

Suarez-Morales and Bell-Dolan (2001) presented children with clearly threatening situations and with ambiguous situations. They found that unlike non-worriers, children with high levels of worry found both ambiguous and unambiguous situations to be threatening. Moreover, worriers were more likely to believe that the event was likely to occur to them. Relatedly, Muris, Meesters, Smulders, and Mayer (2005) studied associations between various psychopathological symptoms and threat perception in typically developing children, aged 8 to 12. They found that anxiety uniquely contributed to threat perception above and beyond the effects of depression and aggression. This highlights the robust association between anxiety and threat perception.

Muris, Merckelbach, and Damsma (2000) also presented children with vignettes; however, their goal was to determine how quickly it takes for anxious children to judge a story as threatening. Muris et al. (2000) presented 252 children aged 8 to 13 with ambiguous stories of social situations and asked them to indicate when they found the story to be scary. Their results showed that socially anxious children judged ambiguous stories as scary more quickly than did non-anxious children. Therefore, anxious youth are
likely to jump to conclusions and automatically perceive a situation (regardless of whether it is actually threatening) as threatening.

Concerning the response access and selection phases, research suggests that although anxious children produce a similar number of solutions during the response access phase as do non-anxious children, the solutions that they choose tend to be ineffective. For example, Suarez-Morales and Bell (2006) found that in fifth graders, worry was related to ineffective solution-choices; however, response access did not differ between worriers and non-worriers. Daleiden and Vasey (1997) clarified that the coping strategies most commonly displayed by anxious children during the selection phase are avoidance and distraction. Therefore, although children who are anxious are able to produce several solutions to a problem, the solutions that they choose are likely to reinforce their anxiety in the long term.

**I-P and Latinxs.** Past research points to the significance of social experiences to adolescents, especially to Latinx adolescents (McLaughlin et al., 2007), and to the impressionability of the developing adolescent brain (Lee et al., 2014). Therefore, the study of Latinx adolescents’ social cognitive processes merits more attention than it is currently receiving. Based on the few studies focusing on Latinx youths’ social information-processing, Latinx children and adolescents who display high levels of worry tend to show threat interpretation biases during the interpretation phase and to choose ineffective solutions during the response selection phase (Suarez-Morales & Bell, 2006).

Further, in an extension of Barrett, Rapee, Dadds, and Ryan (1996), which was an I-P study with a largely Caucasian sample, Varela et al. (2004) studied the transmission of threat interpretation from parents to children in a Latinx sample. The researchers
presented European American, Mexican American, and Mexican parents and children with ambiguous situations (e.g., *On the way to school, you begin to feel funny in your stomach*) and the families were instructed to discuss each situation. Varela et al. (2004) found that Mexican and Mexican American parents gave more somatic non-anxious interpretations of ambiguous situations than did European American parents. Moreover, it was found that Mexican and Mexican American children reported higher levels of worry than did European American children. Therefore, Latinx parents tended to attribute the symptoms in ambiguous situations to somatization and their children were more anxious. Notably, Varela et al. (2004) also found that children’s assimilation was negatively associated with worry symptoms. Altogether, these findings point to the significance of culture in the study of children’s I-P.

**Relational Frame Theory and ACT Processes**

Acceptance and commitment therapy was developed through the lens of relational frame theory (RFT). RFT resulted from a philosophical worldview called *functional contextualism*, which assumes that psychological events involve the “interactions of whole organisms in and with a context” (Hayes, Strosahl, & Wilson, 2012, p. 32). Functional contextualism emphasizes that “context includes both history and situations as they relate to behavior” and that “it is not possible to have a response without stimulation or stimulation without a response” (Hayes et al., 2012, p. 33). Therefore, there is a focus on “the whole event,” where individuals “act in context.” The notion that behavior does not exist in a vacuum is highlighted by this worldview. Because context is so important, functional contextualists deny that there are “truths” and assert that instead, knowledge is practical. For example, after being shown a painting of a building and then a blueprint of
the same building, functional contextualists would argue that both images could be “true” representations of the building, depending on the context (Hayes et al., 2012). In a situation where a painting might be useful, that image is the “true” image, and in a situation where a blueprint would be more practical, the blueprint is the “true” image. This suggests that there are no universal truths and it introduces flexibility to cognition.

Blackledge (2003) explains the components of RFT through Lang’s (1985) fear network. According to Lang, the contents of the fear network, which include stimulus propositions (e.g., fear), response propositions (e.g., running away), and meaning propositions (e.g., dangerous), are all interconnected and are stored in long-term memory. For example, if someone is in a wooded area this could be enough to lead to fear and running away because of the meaning that is indirectly linked to the wooded area (danger). According to Blackledge (2003), “components of the network can be learned through direct experience … through instruction … and through modeling” (p. 422). Blackledge (2003) applies Lang’s model to RFT by emphasizing that the components relate in specific ways to one another. For example, ‘fear’ can be considered a cause of ‘running away’ (a causal relationship), but ‘snake’ equals ‘danger’ (a coordinated relationship). Moreover, ‘snake’ is included in a wooded area, so this is a hierarchical relationship.

Blackledge (2003) explains that although the ability to relate information in this way can be helpful, it can also be detrimental when this process gets “out of control” (p. 425). This can happen through excessive derived relational responding, when stimuli are consistently mentally related even though there has been no environmental reinforcer to support the relationship. For example, if someone was told that snakes were dangerous
(and danger is coordinately related to fear), that person can become afraid as a result of the indirect association between snake and fear. Therefore, although this individual has never been taught to be afraid of snakes, he or she may develop a phobia as a result of derived relational responding. Moreover, hierarchical relationships can change the function of stimuli. For example, if a child who once enjoyed playing in the woods was told that the woods contained snakes and that child already has a fear of snakes, this is likely to result in a transformation of the wooded area’s functions (Blackledge, 2003, p. 427). Whereas the woods may have been viewed as fun and harmless before the introduction of the snake stimulus, they are now viewed as dangerous.

All of these relationships highlight the power of language and how “words come to share the functions of a wide variety of experiences and events” (Blackledge, 2003, p. 427). Specific ACT strategies target the literality of thoughts. Hayes, Luoma, Bond, Masuda, and Lillis (2006) propose that psychopathology occurs when the meaning attributed to thoughts stunts psychological growth. He refers to this as psychological inflexibility and the goal of ACT is to increase psychological flexibility. In line with this, research has shown that psychological flexibility predicts a lower likelihood of having a disorder. Psychological flexibility can be achieved by increasing cognitive defusion, mindfulness, and acceptance, and by decreasing experiential avoidance (see Hayes et al., 2006 for a review).

**Cognitive fusion/defusion.** Intervening with the literality attributed to language is done through specific ACT techniques including cognitive defusion. Cognitive fusion, which is the target of change for cognitive defusion, “refers to excessive or improper regulation of behavior by verbal processes” and occurs when “people’s behavior is
guided more by their inflexible verbal networks than by the contingencies of
reinforcement in their environment” (Hayes et al., 2006, p. 6). The focus of cognitive
defusion is on the context of thought rather than on the content of thought (how someone
is thinking as opposed to what someone is thinking). Therefore, whereas cognitive fusion
relates to enmeshment with thoughts and by equating thoughts to literal truths, cognitive
defusion techniques aim to create distance between the client and his or her thoughts
(Greco, Lambert, & Baer, 2008; Sole et al., 2015). This is done by changing clients’
relationship with their thoughts. With cognitive defusion, clients are taught to accept and
live with their thoughts instead of trying to suppress or change them. Cognitive defusion
strategies are driven by the notion that individuals are more likely to hold a thought
lightly if they remove the meaning and personalization tied to unhelpful thoughts.
Therefore, teaching clients to notice their thoughts for what they are -- just thoughts (e.g.,
“I’m noticing I’m having the thought that no one loves me,” instead of, “No one loves
me”) – defuses them from their thoughts and reduces the struggle and distress associated
with their thoughts.

A specific example of a cognitive defusion technique is the “leaves on a stream”
exercise (Harris, 2009). During the leaves on a stream exercise, clients are asked to
imagine leaves flowing down a stream and are asked to place each of their passing
thoughts onto a leaf, allowing each leaf to pass naturally. This activity targets the
acceptance and observation of thoughts. It creates distance between the client and the
thought because the client is asked to visualize it on a leaf (which is separate from him-
or herself). Therefore, the goal of cognitive defusion techniques is to change a fused
relationship with thoughts into a relationship that tests the literality of language.
Mindfulness and acceptance. Mindfulness is another strategy included in ACT. Kabat-Zinn (1994) defines mindfulness as “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (as cited in Hayes & Greco, 2008, p. 4). Mindfulness stems from Eastern religious traditions and differs from Western ideologies in important ways. Follette, Palm, and Pearson (2006) note that in Buddhist traditions, mindfulness is used as a tool to cope with negative emotions, and this coping style is in contrast to typical Western strategies. They explain that whereas Western traditions emphasize controlling and eradicating negative emotions, Eastern traditions involve more of a passive acceptance of these private experiences.

Notably, mindfulness actually aligns with children’s inherent cognitive processing. The Buddhist concept of “beginner’s mind” reflects mindfulness through children’s ability to be open, to be receptive, and to be ready to learn (O’Brien & Murrell, 2008, p. 17). Langer (2000) explains that mindfulness opposes mindlessness, which is characterized by automatic responding that is largely shaped by past experiences (Hayes & Greco, 2008). Therefore, mindfulness is likely to counteract excessive automaticity in cognitive processing.

Importantly, mindfulness requires acceptance. Acceptance involves the awareness and embrace of thoughts and feelings (Hayes et al., 2006). Acceptance could be incorporated into treatment for anxiety by having anxious children sit with their anxiety and learn to accept it instead of struggling to eradicate it. This process has been described by Harris (2009) as turning off the “struggle switch” instead of constantly battling with thoughts and emotions.
**Experiential avoidance.** *Experiential avoidance,* which is considered the opposite of acceptance, refers to individuals’ attempts to avoid internal and external experiences. Therefore, experiential avoidance may “refer to thought suppression, emotion avoidance, or distraction from unpleasant interoceptive or physiological cues, as well as avoidance of all contexts associated with these unwanted experiences” (Coyne, Cheron, & Ehrenreich, 2008, p. 38). ACT processes including mindfulness, acceptance, and cognitive defusion directly counteract avoidance. Therefore, all ACT processes are in the service of reducing the avoidance of private and public events.

**Measurement of ACT processes in youth.** The measures developed to assess ACT processes include Likert-type self-report questionnaires. These questionnaires have been used in research and as measures of progress in therapy. Among the few available measures of ACT processes are the Avoidance and Fusion Questionnaire for Youth (AFQ-Y) and the Child Acceptance and Mindfulness Measure (CAMM) (Greco et al., 2008; Greco, Baer, & Smith, 2011). The AFQ-Y is a 17-item measure of cognitive fusion (e.g., “The bad things I think about myself must be true”), avoidance (e.g., “I push away thoughts and feelings that I don’t like”), and behavioral ineffectiveness (e.g., “I do worse in school when I have thoughts that make me feel sad”) designed for children and adolescents. The CAMM compliments the AFQ-Y by focusing on acceptance and mindfulness. Children and adolescents rate 10 items that target internal experiences (e.g., “I pay close attention to my thoughts”), awareness (e.g., “I walk from class to class without noticing what I’m doing”), and acceptance (e.g., “I get upset with myself for having certain thoughts”) (Coyne et al., 2008, p. 48). Items are added to produce an overall mindfulness score. Research has shown that CAMM scores are negatively
associated with AFQ-Y scores, supporting the validity of these measures (Coyne et al., 2008).

It is important to note that there are currently no open-ended measures of ACT processes in youth. Although vignettes have been included as measures of information processing, they have not been studied in the context of mindfulness, acceptance, cognitive defusion, cognitive fusion, and avoidance in youth. Vignettes are informative in the assessment of youths' coping repertoires because they are designed to resemble specific, realistic situations and because they require children to spontaneously describe their reactions. Therefore, research focusing on ACT processes through vignettes would be informative.

**ACT processes and anxiety in youth.** Various components addressed in ACT including mindfulness, cognitive defusion, and avoidance have been studied in samples of adults and children (e.g., Bergomi, Strohle, Michalak, Funke, & Berking, 2013; Tan & Martin, 2016). Although there is a growing body of ACT process research that specifically focuses on anxiety in youth, most of the available research includes adult samples. Moreover, the availability of studies with children and adolescents varies across ACT strategies. For example, it appears that the number of adult mindfulness studies largely outweighs the number of mindfulness studies in youth. A review of the literature suggests that most of the available research on mindfulness in youth consists of cross-sectional trait-mindfulness research and of small-scale mindfulness-based therapy studies. Similarly, there is a general scarcity of research on cognitive defusion and the majority of the available literature is on adults (e.g., Arch, Wolitzky-Taylor, Eifert, & Craske, 2012). Therefore, a great deal of the current understanding of cognitive defusion
as an intervention strategy and as a mechanism of change stems from adult research. Conversely, there is an abundance of research on anxiety and avoidance in children and adolescents (e.g., Venta, Sharp, & Hart, 2012). Thus, the link between experiential avoidance and anxiety in youth has been heavily substantiated. Because distinct ACT components have been studied to different degrees in youth, comprehensive research that covers several ACT processes in anxious youth is warranted.

**Anxiety and mindfulness/acceptance.** It appears that most of the mindfulness research in youth consists of cross-sectional trait-mindfulness studies and of small-scale intervention studies. Overall, findings suggest that trait-levels of mindfulness are negatively correlated with anxiety and that mindfulness-based interventions produce decreases in anxiety. For example, Tan and Martin (2016) studied cross-sectional associations between mindfulness/acceptance (as measured by the CAMM) and adjustment outcomes in 106 adolescents. Specifically, they found that mindfulness was negatively associated with stress, anxiety, and depression. They also found positive associations between mindfulness and resiliency and between mindfulness and self-esteem. Researchers have also shown that both trait-levels of mindfulness and mindfulness-based interventions are negatively correlated with anxiety-related automatic thoughts (Frewen, Evans, Maraj, Dozois, & Paridge, 2007). Furthermore, dispositional mindfulness is more strongly associated with improved quality of life and reductions in internalizing symptoms than is cognitive reappraisal (Chambers et al., 2014). These findings suggest that mindfulness is likely to serve a unique and protective function for adolescents.
Indeed, mindfulness has been shown to moderate the association between daily stressors and adjustment outcomes. For example, Bergomi et al. (2013) found that mindfulness buffered the association between unavoidable distressing experiences and psychological well-being in teens and adults. They explain that mindfulness opposes avoidance and promotes a nonjudgmental acceptance of experiences. Therefore, remaining mindful in the face of unavoidable stressors is likely to reduce psychopathology symptoms.

Moreover, Calvete, Orue, and Sampedro (2017) found that the acting with awareness subscale of dispositional mindfulness moderated the longitudinal association between stressors and psychological symptoms in 1257 adolescents. Similarly, Marks, Sobanski, and Hine (2010) studied protective and risk factors for anxiety in 317 Australian high schoolers. Their results showed that dispositional mindfulness attenuated the association between daily hassles and anxiety. They contrasted this with dispositional rumination’s tendency to exacerbate the association between daily hassles and anxiety. Marks et al. (2010) explain that mindfulness and rumination are two opposing cognitive coping strategies. They state that rumination is a “tendency to focus repetitively on symptoms of distress and their possible causes and consequences” (p. 831) and contrast this with mindfulness, which is present-focused and nonjudgmental. Therefore, mindfulness (which counteracts rumination) appears to serve a protective factor in the face of stressors that produce anxiety in teens.

Clinical trials have also been conducted to pilot test the efficacy of mindfulness-based interventions in youth. For example, Semple, Reid, and Miller (2005) conducted a 6-week mindfulness-based clinical trial with five children aged 7 to 8. They found that
overall, the intervention led to clinical improvements in anxiety. Similarly, Jennings and Jennings (2013) piloted a brief mindfulness intervention for adolescents. The intervention included four 50-minute sessions over the course of three weeks. Jennings and Jennings (2013) found that teens’ anxiety was reduced by 30%, and that this decrease was probably due to cognitive processes tied to mindfulness. Results from pre- and post-Beck Anxiety Inventories showed that teens’ cognitive subscale decreased by 55%, whereas their physiological subscale decreased by only 11%. The authors concluded that cognitive changes probably produced decreases in anxiety symptoms.

Other researchers sought to determine the potential mechanisms underlying the effectiveness of mindfulness-based interventions. For example, Roberts-Wolfe, Sacchet, Hatings, Roth, and Britton (2012) hypothesized that mindfulness’ effectiveness in decreasing symptoms can be attributed to its effects on emotional memory. They found that undergraduates who participated in a mindfulness meditation course remembered more positively-valenced words than did controls who attended a nonspecific course (e.g., a music course). Moreover, remembering positive words was positively associated with well-being and negatively associated with depression and anxiety. The authors suggest that mindfulness affects emotional information processing (by causing people to pay attention to more positive information), which in turn, affects clinical symptoms.

Researchers have argued that mindfulness works through increases in attention. For example, Roberts-Wolfe et al. (2012) highlight the association between mindfulness and attention. They explain that “meditation training is associated with better performance on a wide range of prefrontally mediated attention tasks” (p. 2). Therefore, mindfulness probably has a direct neurological connection to increased attention in youth.
This notion has been supported by intervention research showing that mindfulness training leads to improvements in attention in elementary schoolers (Napoli, Krech, & Holley, 2005). However, Hayes and Greco (2008) warn that there is a need for more research on the link between mindfulness training and improved attention in youth. Despite this, they propose that the automaticity displayed by anxious children is likely to be counteracted with mindfulness practices.

Altogether, the available research shows that mindfulness is negatively associated with anxiety, and that this is likely due to cognitive factors. Further support of the relevance of cognitive factors is displayed through adult research that has examined the specific components of mindfulness in relation to anxiety. Cash and Whittingham (2010) studied associations between the five facets of mindfulness (observe, describe, act with awareness, nonjudge, and nonreact) and anxiety in adults. They found that the nonjudge facet of mindfulness was negatively associated with anxiety. Cash and Whittingham (2010) describe nonjudge as the “ability to refrain from judging one’s own cognitions, emotions, and bodily sensations” (p. 180). This finding highlights the pertinent cognitive aspect of anxiety and it suggests that teaching individuals with anxiety to view their internal worlds in a nonjudgmental and accepting way can be highly beneficial.

Although there is a need for more mindfulness research with youth, the current state of the literature shows that mindfulness is likely to be a protective factor for children and adolescents and that being mindful opposes being mind-full (Tan & Martin, 2016). Therefore, mindfulness probably produces reductions in anxiety through cognitive process changes (by altering the way that children and adolescents interact with internal
and external stimuli) that allow them to slow down and nonjudgmentally absorb information.

**Anxiety and cognitive fusion/defusion.** Although there is some research examining associations between cognitive defusion and anxiety in youth, the majority of research includes adult samples. The available research on children and adolescents has shown that anxiety and cognitive fusion (the opposite of cognitive defusion) are positively correlated. For example, in the development of the Cognitive Fusion Questionnaire for adolescents, Sole et al. (2015) found that cognitive fusion was positively associated with anxiety sensitivity (fear of anxiety symptoms) in 308 Catalan adolescents. Similarly, Greco et al. (2008) found a positive association between cognitive fusion, anxiety, and somatic complaints using the AFQ-Y. These findings suggest that teens who have the capability to defuse from their thoughts tend to have lower anxiety symptoms than those who do not.

Although the state of the child literature on cognitive defusion and anxiety is lacking, there is a richer body of literature in adults. Most of the research on cognitive defusion in adults has examined it in relation to CBT and ACT. Hayes and Greco (2008) state that although it has been assumed that cognitive therapy works through direct cognitive change (by helping clients to change the content of their thoughts), some research suggests that it actually works through changes in the client’s relationship to his or her thoughts (which occurs with cognitive defusion). In support of this notion, Arch et al. (2012) studied longitudinal associations between anxiety sensitivity and cognitive defusion in 67 adult outpatients receiving either ACT ($n = 32$) or CBT ($n = 35$) (p. 469). All the participants were diagnosed with at least one anxiety disorder (11% also had a
major depressive disorder). Arch et al. (2012) compared associations between anxiety-sensitivity (which is theoretically directly addressed in CBT through a change in the content of cognitions), cognitive defusion (which is an ACT strategy that aims to change the context of cognitions), and outcomes in the ACT and CBT groups. As expected, ACT showed a greater increase in cognitive defusion than did CBT. However, unexpectedly, cognitive defusion mediated the association between both treatment conditions and worry, quality of life, behavioral avoidance, and depression. Therefore, cognitive defusion explained the effectiveness of both ACT and CBT across various outcomes. Conversely, anxiety sensitivity was only a significant mediator when worry was the outcome. Notably, anxiety sensitivity is more theoretically relevant to worry than it is to other outcomes, such as depression. However, it is important to consider that an ACT strategy was a significant mediator across outcomes for both treatment modalities.

Moreover, ACT actually led to greater decreases in anxiety sensitivity than did CBT (Arch et al., 2012). These results highlight the explanatory mechanisms accounting for treatment effectiveness and show that cognitive defusion accounts for a significant portion of the variance in improvement as a result of both CBT and ACT. This invites the question, “What about CBT provokes cognitive defusion in clients?” It is likely that simply the act of distancing oneself from cognitions during cognitive restructuring (a process-oriented technique) is leading to reductions in symptoms (Arch et al., 2012).

In a similar study focusing on anxiety and depression in 174 adult outpatients (about 47% of their sample had an anxiety disorder and about 35% had depression), Forman et al. (2012) examined the mediators of cognitive therapy (CT) and ACT. They found evidence for differential mediators and for overlapping mediators (mediators
shared across treatment modalities). Forman et al.’s (2012) results indicated that whereas cognitive and affective change strategies mediated outcomes in the CT group, acceptance strategies mediated outcomes in the ACT group. Moreover, they replicated Arch et al.’s (2012) results showing that cognitive defusion mediated outcomes for both treatment modalities. Cognitive defusion and behavioral activation each mediated the association between CT and outcomes and between ACT and outcomes. Therefore, both ACT and CT led to increases in cognitive defusion, which led to decreased symptoms.

Relatedly, Hayes-Skelton and Graham (2012) found that, in a cross-sectional dataset, decentering (which is similar to cognitive defusion) fully accounted for the association between cognitive reappraisal and social anxiety. They also found that decentering partially mediated the association between mindfulness and social anxiety. Hayes-Skelton and Graham (2012) suggest that although there are other explanatory mechanisms for the negative association between mindfulness and social anxiety, decentering appears to be the main reason that cognitive reappraisals work for those who are socially anxious. The authors suggest that “it may not necessarily be a shift in the cognitions that is important for reappraisal, but rather the mental process through which reappraisal occurs” (p. 326).

**Anxiety and experiential avoidance.** Anxiety and avoidance have a cyclical relationship and several studies have shown that anxiety is both predictive of and correlated with avoidance in youth. For example, Vent et al. (2012) used the AFQ-Y to show that high levels of experiential avoidance predicted the presence of an anxiety disorder in 111 inpatient adolescents, even after controlling for depression. Relatedly, Dickson and MacLeod (2004) distinguished between adolescents who were high on both
depression and anxiety (whom they referred to as mixed adolescents) and those who were only high on anxiety. They found that mixed adolescents generated more avoidance plans than controls and that anxious adolescents generated both avoidance goals and plans. They explained that from a neurobiological perspective, the behavioral inhibition system (BIS) (which is related to avoidance behaviors and is punishment-driven) and the behavioral activation system (BAS) (which is related to approach behaviors and is reward-driven) are opposing motivational systems (Gray, 1982, as cited in Dickson & MacLeod, 2004). Dickson and MacLeod (2004) state that their results support the notion that anxious individuals have an overactive BIS. They suggest that highly anxious adolescents have a goal system that is largely motivated by avoidance.

Similarly, Dickson, Ciesla, and Reilly (2012) studied the temporal relationship among daily levels of anxiety and avoidance over the course of seven days. They found that adolescents who showed cognitive and behavioral avoidance displayed increases in anxiety. Therefore, consistent avoidance predicts increases in anxiety. Moreover, Simon and Verboon (2016) found that experiential avoidance was positively associated with various anxiety symptoms including symptoms of panic disorder, generalized anxiety disorder, social anxiety disorder, separation anxiety disorder, obsessive-compulsive disorder, post-traumatic stress disorder, and specific phobia in a school sample of children aged 8 to 10. Altogether, these findings show that children and teens who are highly anxious premeditatedly produce goals and plans to avoid anxiety-provoking situations, and that their avoidance perpetuates their anxiety.

**ACT and Latinxs.** Although there are few studies specifically focusing on ACT and Latinxs, the available evidence suggests that ACT strategies (particularly
mindfulness) are effective in treating Latinx youth. For example, one study showed that a 12-week mindfulness intervention with Latin American middle school students led to significant decreases in externalizing and internalizing problems (Fung et al., 2016). Researchers have also shown that in this population, psychological inflexibility is consistently positively associated with depression, anxiety, and stress, and negatively associated with mindfulness and life satisfaction (e.g., Flynn, Berkout, & Bordieri, 2016).

Some researchers have argued that ACT strategies including mindfulness and acceptance are likely to be particularly beneficial to Latinx individuals because these strategies alleviate somatic distress and are likely to reduce attentional bias to threat (Hinton, Pich, Hofmann, & Otto, 2013). This is probably true considering that Latinx adolescents display higher rates of somatization than individuals from other cultural groups (McLaughlin et al., 2007; Varela et al., 2004).

It is likely that stressful experiences encountered by Latinxs influence mindfulness. Indeed, one study focusing on peer victimization during early adolescence with a relatively large Latinx subsample (34%) showed that peer victimization predicted decreases in mindfulness over the course of four months (Riggs & Brown, 2017). Therefore, negative peer experiences during early adolescence appear to influence dispositional mindfulness in Latinxs. This finding is particularly relevant to Latinx adolescents because others have shown that Latinx adolescent females are particularly vulnerable to experiencing reputational victimization (McLaughlin et al., 2007). Overall, it is apparent that in Latinx adolescents, ACT processes (particularly mindfulness) are negatively associated with internalizing symptoms and psychosocial stressors.
Application of ACT Processes to the Information Processing of Anxious Youth

In line with RFT, information-processing is related to the literality attributed to internal language processes. For example, if an anxious child sees another child laughing and interprets that event as “he is laughing at me,” this child can either brush the thought off as “just a thought” or attribute meaning to the thought and consequently view the stimulus as threatening. The maladaptive cognitive and behavioral responses displayed by adolescents with anxiety at each stage of the social information-processing model may be addressed by specific ACT processes. The next few sections will focus on the application of specific ACT processes, specifically mindfulness, acceptance, cognitive fusion/defusion, and experiential avoidance to various stages of the social I-P model, in particular encoding, interpretation, response access, and response selection.

**Mindfulness and encoding.** Attention is relevant to the encoding stage of the social information-processing model because if attention is impaired during this phase, subsequent phases (interpretation, response access, selection, and enactment) are likely to be adversely affected. There is strong empirical support for the claim that anxious youth display deficits in attention (Daleiden & Vasey, 1997).

Mindfulness is a process that can mitigate the negative effects that anxiety has on attention. Walsh, Balint, Smolira, Frederickson, and Madsen (2009) described mindfulness as “a state of enhanced attention to, and awareness, of, what is taking place in the present” (p. 94). Therefore, to be mindful is to be attentive, and when anxious children are presented with demanding and stressful situations, their attentional resources are not functioning properly (Daleiden & Vasey, 1997). Anxious children are more likely than non-anxious children to be too distracted to absorb important information in their
environment (Daleiden & Vasey, 1997). Because mindfulness promotes attentional control, it is likely that being mindful during the early stages of social information-processing would disrupt the domino effect that overcrowded or “mind-full” attentional resources can have on subsequent behavioral plans and responses.

Researchers have proposed that mindfulness works to reduce anxiety through increases in attentional control. For example, Semple, Reid, and Miller (2005) proposed “that the primary mechanism of mindfulness is self-management of attention” (p. 380). Walsh et al. (2009) confirmed this hypothesis in adults. They found that attentional control partially mediated the association between trait anxiety and mindfulness. Therefore, the negative association between anxiety and mindfulness is partially accounted for by control over attentional resources.

Other researchers have shown that mindfulness decreases maladaptive automatic cognitive processes and increases data-driven processing, which would be beneficial during the encoding stage. For example, Wimmer, Bellingrath, and von Stockhausen (2016) showed that preteens in a Mindfulness-Based Stress Reduction group displayed higher levels of cognitive inhibition (which they define as “the ability to suppress automatic responses if they interfere with current demands”) and greater data-driven information processing (as opposed to schema-based processing) post-treatment when compared to controls (p. 3). These findings suggest that mindfulness can improve early adolescents’ ability to objectively register environmental cues.

Learning how to regain attentional control can be particularly beneficial to anxious youth, who are primed to detect threat (Beck & Clark, 1997). Because of their biased attention to threat, anxious children and teens constantly face stressful
circumstances. It has been shown that anxiety in demanding situations is likely to negatively impact performance (Rothlin, Horvath, Birrer, & Holtforth, 2016). Notably, there is a lack of research focusing on associations between mindfulness and threat attention bias in anxious youth. However, mindfulness is likely to serve a protective function for the effects that anxiety can have on performance in demanding situations. For example, Rothlin et al. (2016) showed that in athletes, mindfulness buffers the effect of anxiety on performance-delivery. Therefore, individuals who are anxious can still perform well in demanding situations if they engage in mindfulness (Rothlin et al., 2016). Researchers have attributed these findings to the forgiving effects that mindfulness can have on working memory capacity during stressful periods (Rothlin et al., 2016). Because working memory can be overwhelmed by worries, learning how to ground oneself and be mindful can minimize distraction and prevent poor performance. These authors also found that anxiety mediated the association between trait-mindfulness and performance-delivery. Trait-mindfulness was associated with lower levels of anxiety, which was in turn associated with better performance-delivery in demanding situations (Rothlin et al., 2016). Although this research was conducted with adults, it suggests that attentional resources can be limited in demanding situations, but mindfulness attenuates the negative influence that stress has on performance.

**Mindfulness/acceptance and interpretation.** It is likely that the open, nonjudgmental, objective, and attentive nature of mindfulness would oppose the threat perception bias present in anxious youth. To date, there is no research assessing the relationship between mindfulness and threat interpretation. However, there is research showing a negative association between anxiety and mindfulness (e.g., Tan & Martin,
2016) and a positive association between anxiety and threat interpretation (e.g., Suarez-Morales & Bell-Dolan, 2001). Because mindfulness contains several of the characteristics that anxious children lack (e.g., attentiveness and objectivity), it is likely that mindfulness accounts for at least some of the association between anxiety and threat interpretation. Moreover, mindfulness might serve a protective function for anxious children who are at risk for faulty interpretations. Therefore, in addition to serving as an explanatory mechanism for the association between anxiety and threat interpretation, mindfulness might also buffer the effects of anxiety on threat interpretation.

**Mindfulness and response access.** Researchers have argued that “mindfulness enhances emotion regulation and cognitive performance” (Bellinger, DeCaro, & Ralston, 2015, p. 123). Because the response access phase requires children and adolescents to come up with various solutions under stressful circumstances, it is likely that a boost in emotion regulation and cognitive performance would be helpful. Several studies have shown that mindfulness enhances cognitive performance under stressful circumstances. For example, Bellinger et al. (2015) found that mindfulness indirectly predicted math test performance via decreased levels of anxiety for problems that required greater cognitive resources. Because children who are on edge in the midst of a stressful situation may have clouded cognitive performance, mindfulness is likely to be beneficial for problem-solving. In fact, Argus and Thompson (2008) found a positive association between mindful awareness and social problem-solving in depressed adults. These findings suggest that mindfulness is helpful during the problem-solving process and that it may even increase the number of solutions that youth produce during the response access phase.
It is likely that mindfulness improves problem-solving through increased cognitive flexibility. Greenberg, Reiner, and Meiran (2012) found an association between mindfulness and cognitive rigidity. They used an experimental design in which people who were and people who were not exposed to mindfulness training were asked to solve complex problems. However, each set of complex problems included “traps” (sets of problems that could be solved more simply). Greenberg et al. (2012) found that individuals with exposure to mindfulness displayed lower levels of cognitive rigidity (as evidenced by their ability to solve the simpler problems with simpler formulas instead of sticking with the same complex formula that was used for the complex problems). The authors explain this phenomenon by suggesting that mindfulness reduces the “tendency to overlook novel and adaptive ways of responding due to past experience” (p. 1). Therefore, mindfulness likely fosters the open-mindedness and creativity that is needed to develop inventive solutions to a problem. Like Crick and Dodge’s (1994) analogy of a marble rolling down a muddy and drying hill, Greenberg et al. (2012) refer to “the tendency to develop and perseverate in the use of mental or behavioral sets” as a result of the blinding effects of experience (p. 1). Mindfulness appears to contribute to the ability to consider alternatives.

Mindfulness probably increases cognitive flexibility through its emphasis on the present. Ostafin and Kassman (2012) distinguish between insight and noninsight problems. According to these researchers, insight problems “are those in which the use of past experience leads to an impasse” whereas noninsight problems “are those which involve logic” and require the integration of past experience (p. 1032). They argue that mindfulness should increase the ability to solve insight problems or “Aha” moments.
because mindfulness prevents people from getting “hung up on ideas…or memories,” and increases an open orientation to the present moment (p. 1032). Ostafin and Kassman (2012) found that in undergraduates, mindfulness was positively correlated with the ability to solve insight problems. Moreover, mindfulness training predicted improvements in insight problem-solving. These findings apply to the response access stage of the social information-processing model because youth are frequently faced with novel problems to solve during this phase. Being mindful is likely to equip children and teens with the ability to have “Aha” moments and to develop several innovative solutions to a problem.

**Cognitive fusion/defusion and response selection.** Unlike mindfulness, which is related to attention and creativity, cognitive fusion and defusion are probably more relevant to later stages of the I-P model. Researchers have argued that verbally-mediated strategies are not optimal for the early stages of the I-P model because of the nature of encoding and interpretation as automatic and unconscious (Beck & Clark, 1997). Therefore, whereas mindfulness seems to be more closely related to the early stages of the I-P model (including encoding, interpretation, and response access), cognitive defusion is likely related to the later stages (response selection and enactment).

The limited research on cognitive defusion in anxious children and adolescents shows that youth who fuse with their thoughts experience higher levels of anxiety (e.g., Sole et al., 2015). It is noteworthy that the available research focuses on the opposite of cognitive defusion—cognitive fusion. Therefore, there is a shortage of research focusing on the efficacy of cognitive defusion in children and adolescents. Moreover, no studies have examined the frequency of the use of cognitive defusion in youth. That is, how
many adolescents spontaneously use cognitive defusion when they are faced with a problem? This information would be useful to practitioners because it would determine how intuitive this skill is and whether it needs to be explicitly taught. In addition, no study has examined cognitive defusion through an open-ended questionnaire. The available research on cognitive defusion in youth uses Likert-type scales that assess cognitive defusion. Using an open-ended questionnaire would allow researchers to determine (a) the frequency of spontaneous use of cognitive defusion compared to cognitive fusion, (b) the types of cognitive defusion strategies that children spontaneously use the most, and (c) the specific contexts in which youth choose to use cognitive defusion strategies. It is apparent that there is a need for more research on cognitive defusion in youth.

**Experiential avoidance and response selection.** Like cognitive defusion, experiential avoidance can be applied to the types of responses that children select. The decision to avoid anxiety-provoking situations has been extensively studied in adolescents. Researchers have established that anxious adolescents tend to avoid, and that their avoidance only perpetuates their anxiety (e.g., Dickson et al., 2012). They have also shown that anxious adolescents deliberately create anxious goals and plans (Dickson & MacLeod, 2004).

Moreover, findings have specifically shown that anxious youth tend to choose avoidant responses during the selection phase of the social information-processing model. For example, Barrett et al. (1996) presented anxious, oppositional, and non-clinical children and early adolescents with ambiguous scenarios and asked them to interpret the situation and to develop a plan. The researchers had the children work individually and
then with their families to decide what they would do in each situation. Findings showed that when compared to controls, anxious and oppositional children were more likely to interpret the ambiguous prompts as threatening. Moreover, anxious and oppositional children differed in the plans they developed to address each situation. Relative to controls, anxious children created more avoidant plans and oppositional children produced more aggressive plans. Barrett et al. (1996) also found that when parents were involved in the selection-making, children’s selection to respond with avoidance strengthened. Therefore, parents served to exacerbate anxious children’s tendency to avoid what they perceived to be threatening situations.

The negative effects of avoidance on long-term outcomes are clear. First, research has plainly shown that although avoidance may appear helpful in the short-term, it only perpetuates anxiety in the long-term. For example, avoidance has been shown to increase levels of anxiety over the course of 8 months (Whiteside, Gryczkowski, & Ale, 2013). Beyond this, avoidance predicts and explains a variety of other negative outcomes. Jacobson and Newman (2014) showed that anxiety in adolescence predicted increases in depression 12-14 years later, and that this association was partially mediated by levels of avoidance. Therefore, avoidance was a significant part of the explanation for the development of depression over the course of years. Avoidance has also been shown to be associated with increased levels of loneliness and social exclusion in youth (Gazelle & Rudolph, 2004; Johnson, LaVoie, Spenceri, & Mahoney-Wernli, 2001).

Overall, the available research contributing to the understanding of avoidance during the selection phase of the information-processing model suggests the following: (a) avoidance and anxiety have a strong bidirectional association (e.g., Dickson et al.,
2012), (b) anxious children specifically develop avoidance plans during the selection phase (Dickson & MacLeod, 2004), and (c) avoidance leads to a variety of poor outcomes (e.g., Gazelle & Rudolph, 2004). These factors have led ACT therapists to identify avoidance as the antithesis to psychological flexibility. Altogether, ACT strategies attempt to counteract avoidance through openness, acceptance, nonjudgmental awareness, and committed action. Because avoidance can be maladaptive and intertwined with anxiety, strategies that help anxious youth to confront anxiety-provoking situations are likely to be beneficial.

**ACT processes, I-P, and Latinxs.** Although there are growing bodies of literature focusing independently on ACT and on I-P with Latinxs, to date, there are no studies integrating the two with this population. Considering the available research showing that social interactions (e.g., peer victimization) are associated with ACT processes (e.g., mindfulness) in Latinx adolescents, it would be beneficial to add to this literature and examine associations between ACT variables and social cognitive processes (Riggs & Brown, 2017). As discussed, anxious children display deficits at various stages of the social I-P model (Daleiden & Vasey, 1997), and Latinx youth are at increased risk for the development of anxiety (Martinez et al., 2012). Therefore, an integration of the study of social I-P and ACT processes in Latinx youth (particularly adolescents) would be a valuable contribution to the literature and to clinical practice.

**Summary of the Literature and Purpose of the Study**

The social I-P model clarifies associations between youths’ cognitions and behaviors (Dodge, 1986; Crick & Dodge, 1994). According to this theory, social I-P follows four cognitive steps (encoding, interpretation, response access, and selection)
followed by a behavioral response (enactment). Social I-P is typically studied by presenting participants with vignettes and by having them interpret and develop responses to different types of situations (Crick & Dodge, 1994). When this procedure was used in samples of anxious youth, it was shown that children with anxiety display deficits at various stages of the social I-P model. Specifically, anxious youth tend to display threat perception and interpretation biases and to choose maladaptive solutions, probably due to impairments in attentional intensity (Daleiden & Vasey, 1997).

ACT is an empirically-supported therapy that emphasizes the role of context in both our private and public situational experiences. ACT processes including cognitive defusion, cognitive fusion, mindfulness, acceptance, and experiential avoidance have been studied in youth, albeit to a much smaller extent than in adult samples. Researchers have shown that certain ACT strategies such as mindfulness improve attention in youth (e.g., Napoli et al., 2005). It has also been established that children with anxiety display deficits in attention and that these deficits are tied to their tendency to use less information from their environments to make decisions (Beck & Clark, 1997). Therefore, it would be a worthwhile endeavor to determine whether specific ACT strategies are associated with particular stages of social I-P in anxious youth. A comprehensive examination of the association between ACT processes and social I-P theory would distinguish the therapeutic strategies that are effective during specific stages of adolescents’ social I-P. This type of study would also begin to clarify whether and how teaching specific strategies (e.g., mindfulness) would prevent deficits in the very early stages of I-P (i.e., encoding and interpretation), and in turn lead to choosing adaptive solutions later in the sequence.
Beyond these factors, research on ACT processes in anxious adolescents is scarce, especially research on culturally-diverse adolescents. Because Latinx youth are at a higher risk for the development of anxiety in comparison to other cultural groups (Martinez et al., 2012), there is a significant need for anxiety research that focuses on this population. Moreover, the available research with children and teens has been confined by the few ACT questionnaires that are available. It appears that the use of ACT questionnaires has been limited to closed-ended Likert-type scales. Therefore, it remains unclear how many children and adolescents spontaneously use these strategies when they are faced with a stressor and whether specific ACT strategies are more likely to be used at different stages of an encounter and in varying contexts.

**Purpose of the study.** The purpose of this study was to examine how specific ACT processes (mindfulness, acceptance, cognitive defusion, cognitive fusion, and experiential avoidance) relate to the social information-processing model and anxiety in Latinx early adolescents.

**Study Hypotheses**

Study hypotheses are depicted in Figure 1. The following relationships were proposed for the *interpretation phase*:

A. **Mindfulness and acceptance will be negatively associated with threat interpretation.** The literature review did not yield any studies focusing on associations between mindfulness, acceptance, and threat interpretation. However, it is likely that the open, nonjudgmental, objective, and attentive nature of mindfulness and acceptance would oppose biased threat interpretation in youth.
B. *Mindfulness and acceptance will partially mediate the association between threat interpretation and anxiety.* Although there is a lack of research specifically focusing on mindfulness and threat interpretation in anxious youth, studies have shown that mindfulness and acceptance are negatively associated with anxiety (e.g., Tan & Martin, 2016) and that anxiety is positively associated with threat interpretation (e.g., Suarez-Morales & Bell-Dolan, 2001). Therefore, it is possible that mindfulness and acceptance serve as explanatory mechanisms for the association between threat interpretation and anxiety.

C. *Mindfulness and acceptance will moderate the association between threat interpretation and anxiety.* Past researchers have shown that in adults, mindfulness attenuates the negative effects that anxiety has on performance in demanding situations (Rothlin et al., 2016). This is probably because mindfulness practices increase data-driven processing, which requires attentional resources (Wimmer et al., 2016). Because mindfulness contains many of the characteristics that anxious children lack (i.e., attentiveness and objectivity), it probably also serves as a protective factor for the association between threat interpretation and anxiety (Hayes & Greco, 2008; Roberts-Wolfe et al., 2012). Additionally, a passive acceptance of emotions and of the situation is likely to buffer the detrimental effects of biased threat interpretation on anxiety through the ability to be nonjudgmental (Cash & Whittingham, 2010).

The following hypothesis is proposed for the *response access* phase:
D. Mindfulness will be positively associated with number of solutions. Although researchers have not specifically examined the association between mindfulness and number of solutions in youth, research does indicate that mindfulness boosts cognitive resources (e.g., Bellinger et al., 2015). The cognitive flexibility associated with mindfulness lends to better social problem-solving in adults (Argus & Thompson, 2008; Greenberg et al., 2012). Therefore, it was proposed that mindfulness would be associated with an increased number of solutions during the response access phase.

Additionally, for the response selection phase, the following hypotheses will be examined:

E. Avoidance will be positively associated with anxiety. Researchers have shown that anxious youth specifically choose avoidance strategies during the selection phase of the social I-P model (Barrett et al., 1996). Therefore, it was expected that this finding would be replicated in this study.

F. Anxiety will be negatively associated with cognitive defusion and positively associated with cognitive fusion. It has been established that cognitive fusion is positively associated with anxiety (Greco et al., 2008), and because cognitive fusion opposes cognitive defusion (Gillanders et al., 2014), it was hypothesized that anxiety would be negatively associated with cognitive defusion.

G. Mindfulness and acceptance will be negatively associated with avoidance. Researchers have explained that experiential avoidance “falls on the opposing end of psychological acceptance” (Greco et al., 2008, p. 94). Moreover,
mindfulness involves acceptance and has been shown to be negatively correlated with the AFQ-Y, which is a questionnaire that addresses avoidance strategies (Greco et al., 2008). Therefore, it was predicted that both mindfulness and acceptance would be inversely related to avoidance.

H. *Mindfulness and acceptance will be positively associated with cognitive defusion and negatively associated with cognitive fusion.* Researchers have shown that mindfulness and acceptance are negatively associated with cognitive fusion (Greco et al., 2008). Therefore, it was proposed that these results would also emerge in this study.

I. *Mindfulness and acceptance will partially mediate the association between avoidance and anxiety.* Several studies have supported the notion that anxiety and avoidance are positively related, possibly due to anxious individuals’ overactive behavioral inhibition system (Dickson and MacLeod, 2004). However, the explanatory mechanisms behind the association between anxiety and avoidance are still being clarified. Because it has been shown that anxiety is negatively associated with mindfulness and acceptance (Tan & Martin, 2016) and because mindfulness and acceptance are likely to be negatively associated with avoidance (Bergomi et al., 2013), it was predicted that mindfulness and acceptance will account for at least some of the association between avoidance and anxiety.

J. *Mindfulness and acceptance will partially mediate the association between cognitive defusion/fusion and anxiety.* In addition to the negative association between mindfulness and anxiety, mindfulness and acceptance have also been
shown to be negatively associated with cognitive fusion (Greco et al., 2008). Therefore, it was predicted that mindfulness and acceptance will mediate the association between cognitive defusion/fusion and anxiety.
Figure 1. Study hypotheses.

**Interpretation Phase**

*A*: Mindfulness and acceptance will be negatively related to threat interpretation.

```
Mindfulness / Acceptance  -  Threat Interpretation
```

*B*: Mindfulness and acceptance will partially mediate the association between threat interpretation and anxiety.

**Total Effect Model**

```
Threat Interpretation  +  Anxiety
```

**Mediation Model**

```
Mindfulness / Acceptance  -  +  Threat Interpretation  +  Anxiety
```

- +
C: Mindfulness and acceptance will moderate the association between threat interpretation and anxiety.

**Moderation Model**

**Response Access Phase**

*D*: Mindfulness will be positively associated with number of solutions.
Response Selection Phase

E: Avoidance will be positively associated with anxiety.

\[ \text{Avoidance} \xrightarrow{+} \text{Anxiety} \]

F: Cognitive Fusion will be positively associated with anxiety.

\[ \text{Cognitive Fusion} \xrightarrow{+} \text{Anxiety} \]

G: Mindfulness and acceptance will be negatively associated with avoidance.

\[ \text{Mindfulness/Acceptance} \xleftarrow{-} \text{Avoidance} \]

H: Mindfulness and acceptance will be negatively associated with cognitive fusion.

\[ \text{Mindfulness/Acceptance} \xleftarrow{-} \text{Cognitive Fusion} \]
I: Mindfulness and acceptance will partially mediate the association between avoidance and anxiety.

**Total Effect Model**

```
Avoidance → + → Anxiety
```

**Mediation Model**

```
Avoidance ← - ─ Mindfulness/Acceptance ─ + ─ Anxiety
```


J: Mindfulness and acceptance will partially mediate the association between cognitive fusion and anxiety

**Total Effect Model**

Cognitive Fusion → Anxiety

**Mediation Model**

Mindfulness/Acceptance

Anxiety → Cognitive Fusion

Anxiety → Mindfulness/Acceptance

Mindfulness/Acceptance → Cognitive Fusion
CHAPTER III

Methodology

Participants

Participants included 288 students in grades 6 through 8, drawn from a previous study on the role of cognitive and cultural factors in adolescents’ anxiety and depression. Students were enrolled in one of two public middle schools in South Florida. The sample was primarily Latinx (87%), female (64%), U.S.-born (60%), and low-income (44.8% of parents reported earning a yearly income that was less than $25,000 and 30.2% earned between $25,000 and $55,000). Of the 100 youth who were not U.S.-born, 86 identified as Cuban (30% of the total sample). Most of the participants (74.3%) resided in Spanish-speaking homes and had parents who were not born in the U.S. (83% of fathers and 81% of mothers were foreign-born). The majority of foreign-born parents were born in Cuba (62% of fathers and 56% of mothers). Fifty-three percent of mothers and 45% of fathers reported having a vocational or college degree and most of the parents (71% of fathers and 56% of mothers) were working full-time. Families ranged from 2-10 members. See Table 1 for a summary of sample demographics.
Table 1

Sample Demographics Summary

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (%) OR Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>12.18 (1.03)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>101 (35.1%)</td>
</tr>
<tr>
<td>Female</td>
<td>185 (64.2%)</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>3 (1%)</td>
</tr>
<tr>
<td>White</td>
<td>20 (6.9%)</td>
</tr>
<tr>
<td>Latinx</td>
<td>249 (86.5%)</td>
</tr>
<tr>
<td>Biracial</td>
<td>3 (1%)</td>
</tr>
<tr>
<td>Other</td>
<td>5 (1.7%)</td>
</tr>
<tr>
<td>Child Nationality</td>
<td></td>
</tr>
<tr>
<td>American</td>
<td>171 (59.4%)</td>
</tr>
<tr>
<td>Cuban</td>
<td>86 (29.9%)</td>
</tr>
<tr>
<td>Other Latinx Countries</td>
<td>19 (6.6%)</td>
</tr>
<tr>
<td>Father Nationality</td>
<td></td>
</tr>
<tr>
<td>American</td>
<td>17 (5.9%)</td>
</tr>
<tr>
<td>Cuban</td>
<td>177 (61.5%)</td>
</tr>
<tr>
<td>Other Latinx Countries</td>
<td>46 (17.01%)</td>
</tr>
<tr>
<td>Mother Nationality</td>
<td></td>
</tr>
<tr>
<td>American</td>
<td>26 (9%)</td>
</tr>
<tr>
<td>Cuban</td>
<td>161 (55.9%)</td>
</tr>
<tr>
<td>Other Latinx Countries</td>
<td>62 (21.53%)</td>
</tr>
<tr>
<td>Child Immigration Status</td>
<td></td>
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<tr>
<td>U.S. Born</td>
<td>173 (60.1%)</td>
</tr>
<tr>
<td>Immigrant</td>
<td>89 (30.9%)</td>
</tr>
<tr>
<td>Language at Home</td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td>185 (64.2%)</td>
</tr>
<tr>
<td>English</td>
<td>50 (17.4%)</td>
</tr>
<tr>
<td>Both</td>
<td>29 (10.1%)</td>
</tr>
<tr>
<td>Number of Years in the U.S.</td>
<td></td>
</tr>
<tr>
<td>0-5 years</td>
<td>39 (13.54%)</td>
</tr>
<tr>
<td>6-10 years</td>
<td>41 (14.24%)</td>
</tr>
<tr>
<td>Over 10 years</td>
<td>9 (3.03%)</td>
</tr>
<tr>
<td>Number of People at Home</td>
<td>4.18 (1.30)</td>
</tr>
<tr>
<td>Mother’s Work Status</td>
<td></td>
</tr>
<tr>
<td>Full Time</td>
<td>161 (55.9%)</td>
</tr>
<tr>
<td>Part Time</td>
<td>38 (13.2%)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>69 (24%)</td>
</tr>
<tr>
<td>Father’s Work Status</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Full Time</td>
<td>205 (71.2%)</td>
</tr>
<tr>
<td>Part Time</td>
<td>18 (6.3%)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>16 (5.6%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mother’s Education Status</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary School</td>
<td>3 (1.04%)</td>
</tr>
<tr>
<td>Middle School</td>
<td>4 (1.39%)</td>
</tr>
<tr>
<td>High School</td>
<td>101 (35.07%)</td>
</tr>
<tr>
<td>Some College</td>
<td>44 (15.3%)</td>
</tr>
<tr>
<td>Associate’s Degree</td>
<td>23 (8%)</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>52 (18.1%)</td>
</tr>
<tr>
<td>Vocational School</td>
<td>12 (4.2%)</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>16 (5.6%)</td>
</tr>
<tr>
<td>Doctorate Degree</td>
<td>6 (2.1%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Father’s Education Status</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary School</td>
<td>2 (0.69%)</td>
</tr>
<tr>
<td>Middle School</td>
<td>7 (2.43%)</td>
</tr>
<tr>
<td>High School</td>
<td>111 (38.54%)</td>
</tr>
<tr>
<td>Some College</td>
<td>46 (16%)</td>
</tr>
<tr>
<td>Associate’s Degree</td>
<td>10 (3.5%)</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>39 (13.5%)</td>
</tr>
<tr>
<td>Vocational School</td>
<td>21 (7.3%)</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>10 (3.5%)</td>
</tr>
<tr>
<td>Doctorate Degree</td>
<td>2 (0.7%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family Income</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Below $10,000</td>
<td>50 (17.4%)</td>
</tr>
<tr>
<td>$10,000-24,999</td>
<td>79 (27.4%)</td>
</tr>
<tr>
<td>$25,000-39,999</td>
<td>45 (15.6%)</td>
</tr>
<tr>
<td>$40,000-54,999</td>
<td>42 (14.6%)</td>
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<td>$55,000-69,999</td>
<td>18 (6.3%)</td>
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<tr>
<td>$70,000-84,999</td>
<td>12 (4.2%)</td>
</tr>
<tr>
<td>$85,000-99,999</td>
<td>6 (2.1%)</td>
</tr>
<tr>
<td>$100,000-114,999</td>
<td>6 (2.1%)</td>
</tr>
<tr>
<td>Over $130,000</td>
<td>2 (0.7%)</td>
</tr>
</tbody>
</table>
Measures

Anxiety. Anxiety was assessed with the *Revised Children’s Anxiety and Depression Scale* (RCADS; Chorpita, Yim, Moffitt, Umemoto, & Francis, 2000; see Appendix A), which includes 47 items on a scale from 0 (*never*) to 3 (*always*) assessing anxiety and depressive symptoms. One item assessing suicidality was excluded for liability reasons. The RCADS produces total scores for anxiety, depression, specific anxiety disorders, and a total scale score. The total anxiety scale was used for this study. Cronbach’s alpha coefficients in the original non-clinical standardization sample ranged from .71 to .85 (Chorpita et al., 2000). Moreover, convergent and discriminant validity have been established (Chorpita et al., 2000). RCADS subscales have been shown to positively correlate with relevant subscales on the Revised Children’s Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985) and on the Children’s Depression Inventory (CDI; Kovacs, 1980), supporting convergent validity. Also, constructs that were expected to be less related than others (e.g., correlations between depression and anxiety in comparison to correlations between anxiety subscales) were weakly correlated, supporting discriminant validity. The RCADS has been validated with diverse samples of clinical and non-clinical children and adolescents including those from Caucasian, Japanese American, Filipino, Latin American, and Australian backgrounds (Chorpita et al., 2000; Chorpita, Moffitt, & Gray, 2005; de Ross, Gullone, & Chorpita, 2002). In this sample, the alpha coefficient for the total anxiety scale was excellent (α = .94).

Mindfulness. The *Children’s Acceptance and Mindfulness Measure* (CAMM; Greco et al., 2011; see Appendix B) was administered to measure teens’ levels of mindfulness. Participants rated 10 items assessing levels of nonjudgmental present-
moment awareness characterized by cognitions, emotions, and behaviors (e.g., At school, I walk from class to class without noticing what I’m doing). On the CAMM, scales range from 0 (never true) to 4 (always true) with lower scores representing higher levels of mindfulness. For this study, items were reverse-scored so that higher scores relayed higher levels of mindfulness. The initial standardization sample evidenced excellent internal consistency (α = .94) and demonstrated convergent and discriminant validity (Greco et al., 2011). Greco et al. (2011) found that the CAMM was positively associated with favorable outcomes including quality of life, academic competence, and social skills and that it was negatively correlated with unfavorable outcomes including somatic complaints, internalizing symptoms, and externalizing behavior. These associations remained significant after controlling for thought suppression (as measured by the White Bear Suppression Inventory; Wegner & Zanakos, 1994) and psychological inflexibility (as measured by the AFQ-Y). Although the CAMM has not been validated in a Latinx sample, it has been validated in several other groups including samples consisting of individuals from Italian, Portuguese, Dutch, French, and Catalan-speaking Spanish backgrounds (Bruin, Zijlstra, & Bogels, 2013; Cunha, Galhardo, & Pinto-Gouveia, 2013; Dion, Paquette, Daigneault, Godbout, & Hebert, 2017; Saggino et al., 2017; Vinas, Malo, Gonzalez, Navarro, & Casas, 2015). The Cronbach’s alpha in these data was α = .89, suggesting good internal consistency.

**Social cognitive processes, avoidance, acceptance, and cognitive fusion/defusion.** Threat interpretation, number of solutions, avoidance, acceptance, cognitive fusion, and cognitive defusion were assessed with the Children’s Opinions of Everyday Life Events-Revised (COELE-R; Suarez-Morales & Bell, 2006; see Appendix
C). The COELE-R is an open-ended vignette-based questionnaire that has been used in the literature to capture youths’ social information processing during the interpretation, response access, and selection phases of Dodge’s (1986) I-P model. For this study, three vignettes were used from the original COELE-R to simplify and condense the questionnaire. Similar procedures have been used in prior research (e.g., Barrett et al., 1996). Each of the three hypothetical situations represented a scenario that is likely to be present in children’s daily lives (e.g., One day, before starting the lesson, your teacher asks you to stay after class). Participants were asked to write what they thought happened in each situation. They were also asked to rate how threatening they viewed each situation (1 = not at all; 5 = extremely) and how likely they thought each situation was to happen to them (1 = not at all; 5 = very likely). Additionally, they were asked to list what they could think or do in each situation and how they would actually respond. In the past, interrater reliability coefficients for the COELE-R (with coding guided by Ayers’ (1996) conceptualization) have been acceptable ($\alpha = .71-.80$; Suarez-Morales & Bell, 2006).

To examine threat interpretation, the continuous variable highlighting the degree of threat perceived by youth was used. Further, to study number of solutions, the number of unique solutions listed was considered. This study will also use the COELE-R to measure avoidance, acceptance, cognitive fusion, and cognitive defusion. Although the COELE-R has been coded for behavioral and cognitive avoidance in the past (Suarez-Morales & Bell, 2006), no study has used the COELE-R or any other open-ended measure to study acceptance and cognitive fusion/defusion in youth. Therefore, an adapted coding system was developed to analyze these variables in an open-ended format (see Appendix D for the adapted coding manual). The manual developed for this study
includes five categories: Experiential Avoidance (EA), Cognitive Fusion (CF), Cognitive Defusion (CD), Acceptance (A), and Other Coping Response (OCR). Each category was operationalized based on the available literature, and the manual includes examples of possible responses to the COELE-R that would fit each category. After responses were coded using ACT-consistent codes, a continuous proportion score was calculated for the question assessing response access, in which the frequency of each category was divided by the total number of responses. For example, if a child listed a total of four responses in response to the question, “If this happened to you, what could you do?” and three of those responses were EA responses, then his proportion score for EA would be 0.75. Therefore, the prevalence of a specific category relative to the total number of responses in the response access phase was used to test the relevant hypotheses.

Procedure

The archival dataset that was used in this study was derived from a research project that focused on how cognitive and cultural factors contribute to anxiety and depression in youth. The parent study was funded by Nova Southeastern University’s (NSU) President’s Research and Development Grant, which was awarded to Dr. Lourdes Suarez-Morales in 2013. NSU’s Institutional Review Board (IRB) and the Miami Dade Public School District IRB approved the parent study before data collection. IRB approval was received for the secondary data analysis involved in the current study.

Recruitment and data collection. During recruitment and data collection, parent consent and child assent were required for participation. Trained research assistants (R.A.s) administered questionnaires in a group format (in the library or in the cafeteria of the participating schools) during an agreed-upon time with the principal. R.A.s read
instructions aloud, answered questions, and informed participants that they can withdraw from the study at any time. Due to the large number of Latinx participants, items on questionnaires were presented in both English and Spanish. Participants were compensated with a $5 gift card to Target at the end of the study and they were also entered into a raffle to win a $50 gift card.

**Coding the COELE-R.** To identify and code ACT processes including cognitive fusion/defusion, acceptance, and avoidance, a coding manual following the format of the original COELE-R manual was developed (see Appendix D). Two independent coders were trained to categorically code Questions 4 and 5 of the COELE-R (i.e., questions assessing response access and selection, see Appendix C for a copy of the COELE-R) using the five categories in the manual (EA, CF, CD, A, and OCR). Coders included two graduate R.A.s with limited knowledge about Acceptance and Commitment Therapy and who were blind to this researcher’s hypotheses. Training included nine meetings between this researcher and the R.A.s. During the first meeting, this researcher reviewed the manual with the R.A.s and administered 10 sample COELE-Rs drawn from the available data to practice coding. After practicing, R.A.s were assigned questionnaires to code independently. Twenty percent of the cases were assigned to both R.A.s to assess inter-rater reliability. R.A.s were deemed ready to score after reaching percent agreement of at least .80 (after the first round of independent coding, percent agreement was 87.5). Disagreements were resolved in a group format. R.A.s were trained to code Question 5 (which had one response to code) before they were trained to code Question 4 (which had several responses to code). Interrater reliability coefficients for both Questions 4 (κ = .78) and 5 (κ = .70) were good.
After responses were coded and good interrater reliability was established, the data were ready to be analyzed. However, it was determined that there were too few Cognitive Defusion (CD) codes for this variable to be studied statistically. After reviewing responses to Question 1 (“What do you think happened in this situation? Write down the first thought that comes to your mind.”), several of the responses reflected cognitive defusion, especially for Situation 3 (One night, you wake up suddenly thinking that you heard a noise in the living room, but all is quiet) (e.g., some children wrote, “My mind was playing tricks on me”). Therefore, the R.A.s met for a tenth meeting, where they added CD codes derived from responses to Question 1. However, even after adding these responses as CD codes, the number of CD codes was still too low (number of individuals who had CD codes per situation ranged from 0 to 35 out of the 288 participants). Because these codes were virtually absent, the cognitive defusion variable was removed from analyses (and cognitive fusion remained).

Percentage scores (derived from Question 4; each type of response was divided by the total number of responses) were used to assess associations between ACT variables and other continuous variables throughout tests of the main study hypotheses. In contrast to Question 4 (If this happened to you, what could you do? List all the things you can think or do in this situation), which provided a continuous percentage score, Question 5 asked participants to pick only one solution (What would you actually do if you were in this situation?). Because data from Question 5 were categorical, they were more amenable to determining frequencies of ACT variables. Therefore, Question 5 was only used to determine frequencies of ACT variables in the data and to preliminarily assess for
gender differences in frequencies. See Table 2 for frequency counts (overall and within gender) of ACT codes for Question 5.

Using Question 5 as a reference for frequency counts, for Situation 1, 29.5% of participants listed acceptance (A) as their one solution, 11.5% chose experiential avoidance (EA), 6.6% chose cognitive fusion (CF), and the rest picked another response (OCR). For Situation 2, 41.3% chose A, 11.8% chose CF, 2.8% picked EA, and the rest chose another response. For Situation 3, 26% chose A, 12.2% chose CF, 11.1% chose EA, and the rest chose another response. A series of 2 (gender) x 4 (ACT coping strategy) chi square tests were conducted to examine potential interactions between gender and ACT coping strategies in each situation. However, no chi square differences were significant. Therefore, using Question 5, gender was equally distributed across coping strategies.
Table 2

Frequency Counts for ACT Codes Using Question 5 of the COELE-R

<table>
<thead>
<tr>
<th>ACT Variable</th>
<th>Situation 1 (Social Rel/Peer)</th>
<th></th>
<th></th>
<th>Situation 2 (School/Teacher)</th>
<th></th>
<th></th>
<th>Situation 3 (Personal Harm)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Total</td>
<td>Boys</td>
<td>Girls</td>
<td>Total</td>
<td>Boys</td>
<td>Girls</td>
<td>Total</td>
</tr>
<tr>
<td>Experiential Avoidance (EA)</td>
<td>7</td>
<td>26</td>
<td>33</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>13</td>
<td>19</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>(6.9%)</td>
<td>(14.1%)</td>
<td>(11.5%)</td>
<td>(5%)</td>
<td>(1.6%)</td>
<td>(2.8%)</td>
<td>(12.9%)</td>
<td>(10.3%)</td>
<td>(11.1%)</td>
</tr>
<tr>
<td>Cognitive Fusion (CF)</td>
<td>8</td>
<td>10</td>
<td>19</td>
<td>11</td>
<td>22</td>
<td>34</td>
<td>11</td>
<td>24</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>(7.9%)</td>
<td>(5.4%)</td>
<td>(6.6%)</td>
<td>(10.9%)</td>
<td>(11.9%)</td>
<td>(11.8%)</td>
<td>(10.9%)</td>
<td>(13%)</td>
<td>(12.2%)</td>
</tr>
<tr>
<td>Acceptance (A)</td>
<td>26</td>
<td>59</td>
<td>85</td>
<td>36</td>
<td>83</td>
<td>119</td>
<td>28</td>
<td>47</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>(25.7%)</td>
<td>(31.9%)</td>
<td>(29.5%)</td>
<td>(35.6%)</td>
<td>(44.9%)</td>
<td>(41.3%)</td>
<td>(27.7%)</td>
<td>(25.4%)</td>
<td>(26%)</td>
</tr>
<tr>
<td>Other Coping Response</td>
<td>60</td>
<td>90</td>
<td>150</td>
<td>49</td>
<td>77</td>
<td>126</td>
<td>49</td>
<td>94</td>
<td>144</td>
</tr>
<tr>
<td>(OCR)</td>
<td>(59.4%)</td>
<td>(48.6%)</td>
<td>(52.1%)</td>
<td>(48.5%)</td>
<td>(41.6%)</td>
<td>(43.8%)</td>
<td>(48.5%)</td>
<td>(50.8%)</td>
<td>(50%)</td>
</tr>
</tbody>
</table>

Note. Frequencies were derived from Question 5 on the COELE-R: “What would you actually do if you were in this situation (write only one?)” Percentages are represented within group (e.g., 6.9% of boys chose EA for Situation 1). There were no significant chi square differences for gender x coping. Therefore, gender was equally distributed across coping strategies.
CHAPTER IV

Results

Analytical Procedure

Preliminary analyses were conducted to examine associations between all study variables and measures of central tendency for threat interpretation, number of solutions, anxiety, mindfulness, cognitive fusion, acceptance, and avoidance. Specifically, Pearson correlations as well as means and standard deviations for all study variables were computed. Bivariate correlations between the main study variables and demographic variables including age and income were also examined. Additionally, gender differences were tested with independent samples t-tests with the continuous percentage scores derived from Question 4 (therefore, significance tests assessed for significant mean differences in percentage scores between boys and girls for each ACT variable).

To test study hypotheses, a series of bivariate correlation, linear regression, moderation, and mediation analyses were conducted (see Figure 1 for a depiction of hypotheses). Data were analyzed with IBM SPSS v.25 and with PROCESS (Hayes, 2017), which is a macro that tests mediation and moderation using bootstrapped confidence intervals. The setting used to test mediation and moderation analyses included 5000 bootstrapped samples and a significance level of $\alpha = .05$. PROCESS provides a total effect (the regression analysis between the independent and dependent variable), a direct effect (which is the path from the independent variable to the dependent variable, controlling for the mediator), and an indirect effect (which is the mediation effect). Total, direct, and indirect effects are reported in the text and in corresponding figures.
Preliminary Analyses

Preliminary analyses including means, standard deviations, and independent samples t-tests (using Question 4 from the COELE-R) are included in Table 3. Bivariate correlations between all study variables are depicted in Tables 4-7. Table 4 depicts correlations across situations and Tables 5-7 depict correlations by situation.

Table 3

Means and Standard Deviations of Main Study Variables Across and Per Situation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Across Situations</th>
<th>Situation 1</th>
<th>Situation 2</th>
<th>Situation 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Total</td>
<td>Boys</td>
</tr>
<tr>
<td>Exp. Avoidance (EA)</td>
<td>0.31</td>
<td>0.27</td>
<td>0.29</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>(0.37)</td>
<td>(0.34)</td>
<td>(0.36)</td>
<td>(0.26)</td>
</tr>
<tr>
<td>Cognitive Fusion (CF)</td>
<td>0.32</td>
<td>0.26</td>
<td>0.25</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>(0.44)</td>
<td>(0.48)</td>
<td>(0.47)</td>
<td>(0.14)</td>
</tr>
<tr>
<td>Acceptance (A)</td>
<td>0.71</td>
<td>0.78</td>
<td>0.75</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>(0.70)</td>
<td>(0.61)</td>
<td>(0.64)</td>
<td>(0.32)</td>
</tr>
<tr>
<td>Threat Interpretation</td>
<td>7.30</td>
<td>7.02</td>
<td>7.12</td>
<td>1.58</td>
</tr>
<tr>
<td></td>
<td>(2.62)</td>
<td>(2.36)</td>
<td>(2.46)</td>
<td>(0.85)</td>
</tr>
<tr>
<td>Number of Solutions</td>
<td>6.08</td>
<td>6.38</td>
<td>6.26</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>(2.20)</td>
<td>(2.02)</td>
<td>(2.09)</td>
<td>(0.96)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>25.39</td>
<td>33.34</td>
<td>30.53</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>(16.22)</td>
<td>(18.93)</td>
<td>(18.38)</td>
<td>(0.96)</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>31.27</td>
<td>27.50</td>
<td>28.83</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(7.75)</td>
<td>(9.61)</td>
<td>(9.17)</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. Means and standard deviations for ACT variables are based on percentage scores derived from Question 4 on the COELE-R. RCADS and CAMM variables were the same between situations. Significant mean differences between genders are denoted by different subscripts.
In the past, means on the COELE-R were derived from six situations, instead of the three situations that were used in the current study, therefore not allowing a comparison between the two samples. Suarez-Morales and Bell (2006) reported the following means and standard deviations for the threat interpretation rating of the COELE-R using six situations: $M_{\text{overall sample}} = 15.13$, $SD_{\text{overall sample}} = 5.41$; $M_{\text{Latinx subsample}} = 15.94$, $SD_{\text{Latinx subsample}} = 5.58$. Previously reported means and standard deviations for mindfulness and anxiety slightly differed from the ones in the current study. Specifically, mindfulness scores were relatively higher in this study than in past research (CAMM mindfulness score: $M = 22.73$, $SD = 7.33$; Greco et al., 2011) and anxiety scores were somewhat lower than in past research (RCADS Total Anxiety: $M = 33.02$, $SD = 19.06$; Chorpita et al., 2005). Notably, the cited study for the RCADS (which included a mean for Total Anxiety for the whole sample) had a clinical sample. Therefore, it makes sense that the anxiety scores in this community sample were lower than anxiety scores in a clinical sample.

Preliminary analyses also tested for gender differences in mindfulness, anxiety, number of solutions, threat interpretation, experiential avoidance, cognitive fusion, and acceptance. See Table 3 for means and standard deviations of all study variables within gender. Significant gender differences emerged for mindfulness and anxiety. Specifically, girls evidenced higher anxiety scores than boys, $t(284) = 3.57$, $p < .001$. However, boys displayed higher levels of mindfulness than girls, $t(244.67) = -3.60$, $p < .001$. Across situations, girls and boys did not differ on number of solutions, threat interpretation ratings, avoidance, acceptance, or cognitive fusion. Similarly, when each situation was analyzed separately, there were no significant gender differences for threat interpretation
or number of solutions. Girls and boys also did not differ on levels of avoidance nor did they differ on acceptance per situation. However, in Situation 2 (school/teacher), girls had higher cognitive fusion scores than boys, \( t(257.34) = 1.99, p = .05 \).

An assessment of bivariate correlations of variables calculated across situations (see Table 4) revealed significant positive associations between the following (bivariate correlations that were not targeted by hypotheses are listed here): threat interpretation and (a) number of solutions, (b) avoidance, and (c) cognitive fusion; between number of solutions and (a) avoidance, (b) cognitive fusion, and (c) anxiety; between cognitive fusion and anxiety; and between acceptance and age. Moreover, significant negative correlations emerged between number of solutions and acceptance and between mindfulness and age. See Tables 5-7 for situation-specific correlations.
Table 4

_Descriptive Statistics and Bivariate Correlations Across Situations_

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Threat Interpretation</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of Solutions</td>
<td>.16**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mindfulness</td>
<td>-.22**</td>
<td>-.19**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Acceptance</td>
<td>-.31**</td>
<td>-.18**</td>
<td>.01</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Avoidance</td>
<td>.24**</td>
<td>.20**</td>
<td>-.09</td>
<td>-.23**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Cognitive Fusion</td>
<td>.28**</td>
<td>.18**</td>
<td>-.13*</td>
<td>-.27**</td>
<td>.02</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Anxiety</td>
<td>.43**</td>
<td>.16**</td>
<td>-.70**</td>
<td>-.12*</td>
<td>.11</td>
<td>.19**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>8. Age</td>
<td>-.11</td>
<td>.07</td>
<td>-.15*</td>
<td>.22**</td>
<td>-.05</td>
<td>.01</td>
<td>.05</td>
<td>-</td>
</tr>
<tr>
<td>9. Income</td>
<td>.05</td>
<td>.04</td>
<td>.02</td>
<td>.02</td>
<td>.05</td>
<td>.03</td>
<td>-.02</td>
<td>-.06</td>
</tr>
</tbody>
</table>

_Note._ Associations that were targeted by hypotheses are boldfaced. Income was rated on a Likert-type scale ranging from 0 (Below $10,000) to 9 (Over $130,000). *p < .05, **p < .01.
Table 5

_Bivariate Correlations for Social Relationships/Peer (Situation 1 of the COELE-R)_

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Threat Interpretation</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of Solutions</td>
<td>.14*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mindfulness</td>
<td>-.20**</td>
<td>-.13*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Acceptance</td>
<td>-.19**</td>
<td>-.10</td>
<td>.02</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Avoidance</td>
<td>.03</td>
<td>.15*</td>
<td>-.02</td>
<td>-.26**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Cognitive Fusion</td>
<td>.17**</td>
<td>.33**</td>
<td>-.14*</td>
<td>-.16**</td>
<td>-.05</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Anxiety</td>
<td>.29**</td>
<td>.10</td>
<td>-.70**</td>
<td>-.08</td>
<td>.01</td>
<td>.14*</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>8. Age</td>
<td>-.05</td>
<td>.14*</td>
<td>-.15*</td>
<td>.14*</td>
<td>-.01</td>
<td>.05</td>
<td>.05</td>
<td>-</td>
</tr>
<tr>
<td>9. Income</td>
<td>-.02</td>
<td>.04</td>
<td>.02</td>
<td>.04</td>
<td>-.05</td>
<td>.08</td>
<td>-.02</td>
<td>-.06</td>
</tr>
</tbody>
</table>

Note. Associations that were targeted by hypotheses are boldfaced. Mindfulness (measured with the CAMM) and anxiety (measured with the RCADS) variables were the same between situations.

*p < .05, **p < .01
Table 6

*Bivariate Correlations for School/Teacher (Situation 2 of the COELE-R)*

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Threat Interpretation</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of Solutions</td>
<td>0.21**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mindfulness</td>
<td>-0.24**</td>
<td>-0.20**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Acceptance</td>
<td>-0.20**</td>
<td>-0.29**</td>
<td>-0.04</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Avoidance</td>
<td>0.07</td>
<td>0.26**</td>
<td>-0.10</td>
<td>-0.19**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Cognitive Fusion</td>
<td>0.33**</td>
<td>0.25**</td>
<td>-0.12*</td>
<td>-0.30**</td>
<td>-0.07</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Anxiety</td>
<td>0.38**</td>
<td>0.17**</td>
<td>-0.70**</td>
<td>-0.06</td>
<td>0.07</td>
<td>0.21**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>8. Age</td>
<td>-0.12*</td>
<td>-0.05</td>
<td>-0.15*</td>
<td>0.16**</td>
<td>0.04</td>
<td>-0.03</td>
<td>0.05</td>
<td>-</td>
</tr>
<tr>
<td>9. Income</td>
<td>0.06</td>
<td>-0.01</td>
<td>0.02</td>
<td>0.03</td>
<td>0.01</td>
<td>-0.01</td>
<td>-0.02</td>
<td>-0.06</td>
</tr>
</tbody>
</table>

*Note.* Associations that were targeted by hypotheses are boldfaced. Mindfulness (measured with the CAMM) and anxiety (measured with the RCADS) variables were the same between situations.

*p < .05, **p < .01
Table 7

Bivariate Correlations for Personal Harm (Situation 3 of the COELE-R)

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Threat Interpretation</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of Solutions</td>
<td>.11</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mindfulness</td>
<td>-.06</td>
<td>-.09</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Acceptance</td>
<td>-.39**</td>
<td>-.07</td>
<td>.03</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Avoidance</td>
<td>.27**</td>
<td>.12</td>
<td>-.07</td>
<td>-.20**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Cognitive Fusion</td>
<td>.29**</td>
<td>-.05</td>
<td>-.04</td>
<td>-.26**</td>
<td>-.15*</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Anxiety</td>
<td>.25***</td>
<td>.09</td>
<td>-.70**</td>
<td>-.09</td>
<td>.13*</td>
<td>.05</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>8. Age</td>
<td>-.06</td>
<td>.05</td>
<td>-.15*</td>
<td>.11</td>
<td>-.08</td>
<td>.01</td>
<td>.05</td>
<td>-</td>
</tr>
<tr>
<td>9. Income</td>
<td>.06</td>
<td>.07</td>
<td>.02</td>
<td>-.04</td>
<td>.12*</td>
<td>.02</td>
<td>-.02</td>
<td>-.06</td>
</tr>
</tbody>
</table>

Note. Associations that were targeted by hypotheses are boldfaced. Mindfulness (measured with the CAMM) and anxiety (measured with the RCADS) variables were the same between situations.

*p < .05, **p < .01.
Main Analyses

Analyses are described by hypothesis. Data were first analyzed across situations (scores for Situations 1, 2, and 3 were added before running analyses) and were then analyzed by situation (all analyses were rerun using scores from only Situation 1 and then the same procedure was used for Situations 2 and 3). Each scenario was treated separately to account for contextual differences that may lead to separate responses. Based on a functional contextualism framework and with the notion of “[acting] in context,” different contexts may pull for different reactions at varying levels of effectiveness (Hayes et al., 2012).

Hypothesis A: Mindfulness and acceptance will be negatively associated with threat interpretation. To test Hypothesis A, two bivariate correlations were conducted: one between mindfulness and threat interpretation and another between acceptance and threat interpretation.

Across situations. When scores were totaled across situations, Hypothesis A was fully supported. Both mindfulness and acceptance were negatively associated with threat interpretation bias (see Table 4).

Per situation. For Situation 1 (social relationships/peer), Hypothesis A was fully supported in that both mindfulness and acceptance were negatively correlated with threat interpretation (see Table 5). Similarly, for Situation 2 (school/teacher), Hypothesis A was also fully supported. Both mindfulness and acceptance were significantly negatively associated with threat interpretation bias (see Table 6). For Situation 3 (personal harm), Hypothesis A was partially supported. Although acceptance was negatively associated with threat interpretation, mindfulness was not (see Table 7).
Hypothesis B: Mindfulness and acceptance will partially mediate the association between threat interpretation and anxiety. For Hypothesis B, two mediation analyses were conducted. First, the total effect between threat interpretation and anxiety was examined. Although some researchers have argued that a significant total effect is required to test for mediation (Baron & Kenny, 1986), recent statistical methods including the use of bootstrapped confidence intervals to test for the significance of indirect effects allow for inferences about indirect effects even in the absence of a significant total effect (Hayes, 2009). Therefore, mediation/indirect effect results are reported even when the total effect was nonsignificant. A significant indirect effect for both mediation analyses would support the prediction that both mindfulness and acceptance mediate the association between threat interpretation and anxiety.

Across situations. Across situations, Hypothesis B was partially supported in that mindfulness mediated the association between threat interpretation and anxiety, but acceptance was not a significant mediator (see Figure 2). When mindfulness was the mediator, there was a significant total ($\beta = .43, SE = .05, p < .001$), direct ($\beta = .29, SE = .04, p < .001$), and indirect effect ($\beta = .14, SE = .04, p < .001$). However, when acceptance was the mediator, the indirect effect was nonsignificant ($\beta = -.01, SE = .02, p = .82$).
Figure 2. Across situations: Mindfulness and acceptance as mediators of the association between threat interpretation and anxiety.

**Total Effects Model**

\[ r^2 = 0.18^{**} \]

\[
\text{Threat Interpretation} \rightarrow \text{Anxiety} \quad 0.43(0.05)^{**}
\]

**Mediation Model**

**Mindfulness:** \( \beta = 0.14^{**}, SE = 0.04, 95\% BCI: 0.07, 0.21 \)

**Acceptance:** \( \beta = -0.01, SE = 0.02, 95\% BCI: -0.04, 0.03 \)

\[
\text{Threat Interpretation} \rightarrow \text{Mindfulness/Acceptance} \rightarrow \text{Anxiety} \\
-0.22(0.06)^{**} / -0.31(0.06)^{**} \quad -0.64(0.04)^{**} / 0.01(0.06)_{\text{SE}} \quad r^2 = 0.57^{**} / 0.18^{**}
\]

**Note.** \( n = 286 \). Standardized path coefficients are given. Standard errors are shown in parentheses. Results for mindfulness as a mediator are to the left of the slash and results for acceptance as a mediator are on the right of the slash.

*\( p < 0.05 \), **\( p < 0.01 \)
Per situation. For Situation 1 (social relationships/peer) and Situation 2 (school/teacher), mindfulness mediated the association between threat interpretation and anxiety (see Figure 3; Sit.1 total effect: $\beta = .29$, $SE = .06$, $p < .001$, direct effect: $\beta = .16$, $SE = .04$, $p < .001$, indirect effect: $\beta = .13$, $SE = .04$, $p < .001$; Sit. 2 total effect: $\beta = .38$, $SE = .05$, $p < .001$, direct effect: $\beta = .23$, $SE = .04$, $p < .001$, indirect effect: $\beta = .15$, $SE = .04$, $p < .001$). However, for Situation 3 (personal harm), mindfulness did not significantly mediate (indirect effect: $\beta = .04$, $SE = .04$, $p = .32$) the association between threat interpretation and anxiety.

When examining acceptance per situation, acceptance did not mediate the association between threat interpretation and anxiety in any of the situations (see Figure 4; Sit.1 indirect effect: $\beta = .01$, $SE = .01$, $p = .64$; Sit. 2 indirect effect: $\beta = -.01$, $SE = .01$, $p = .84$; Sit.3 indirect effect: $\beta = -.01$, $SE = .03$, $p = .84$).
Figure 3. By situation, Mindfulness mediates the association between threat interpretation and anxiety only in social situations.

**Total Effects Model**

\[ r^2 = .09^{* * *}, .14^{* * *}, .06^{* * *} \]

<table>
<thead>
<tr>
<th>Threat Interpretation</th>
<th>Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>.29 (.06)^{* * <em>}, .38 (.05)^{</em> * <em>}, .26 (.06)^{</em> * *}</td>
<td></td>
</tr>
<tr>
<td>S1  S2  S3</td>
<td></td>
</tr>
</tbody>
</table>

**Mediation Model**

\[ S1: \beta = .13^{* * *}, SE = .04, 95\% BCI: .05, .22 \]
\[ S2: \beta = .15^{* * *}, SE = .04, 95\% BCI: .08, .23 \]
\[ S3: \beta = .04_{se}, SE = .04, 95\% BCI: -.04, .12 \]

<table>
<thead>
<tr>
<th>Threat Interpretation</th>
<th>Mindfulness</th>
<th>Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>-.20 (.06)^{* * <em>}, -.24 (.06)^{</em> * *}, -.06 (.06)_{se}</td>
<td>-.67 (.04)^{* * <em>}, -.65 (.04)^{</em> * <em>}, -.69 (.04)^{</em> * *}</td>
<td>.16 (.04)^{* * <em>}, .23 (.04)^{</em> * <em>}, .21 (.04)^{</em> * *}</td>
</tr>
<tr>
<td>S1  S2  S3</td>
<td>S1  S2  S3</td>
<td>S1  S2  S3</td>
</tr>
</tbody>
</table>

*Note. n = 286. Standardized path coefficients are given. Standard errors are shown in parentheses. Results for situations are shown consecutively from left to right.*

*p < .05, **p < .01
Figure 4. By situation: Acceptance does not mediate the association between threat interpretation and anxiety.

**Total Effects Model**

\[ r^2 = .09**/.14**/.06** \]

**Mediation Model**

S1: \( \beta = .01_{\text{SE}} \; SE = .01, 95\% \text{ BCI} = .01, .03 \)
S2: \( \beta = .01_{\text{SE}} \; SE = .01, 95\% \text{ BCI} = .03, .02 \)
S3: \( \beta = .01_{\text{SE}} \; SE = .03, 95\% \text{ BCI} = .06, .05 \)

\[ r^2 = .09**/.14**/.06** \]

Note. \( n = 286 \). Standardized path coefficients are given. Standard errors are shown in parentheses. Results for situations are shown consecutively from left to right.

*\( p < .05 \), **\( p < .01 \)
**Hypothesis C**: Mindfulness and acceptance will moderate the association between threat interpretation and anxiety. Hypothesis C is a follow-up to Hypothesis B. A significant interaction between (a) threat interpretation and mindfulness and between (b) threat interpretation and acceptance would support Hypothesis C.

**Across situations.** Across situations, Hypothesis C was partially supported. In line with hypotheses, mindfulness significantly buffered the association between threat interpretation and anxiety (threat interpretation X mindfulness interaction $\beta = -.09, SE = .04, p = .03$; see Figure 5 and Table 8). Therefore, as mindfulness increased, the association between threat interpretation and anxiety became significantly weaker (see Figure 6). However, contrary to hypotheses, acceptance actually exacerbated the association between threat interpretation and anxiety (threat interpretation X acceptance interaction $\beta = .13, SE = .06, p = .03$; see Table 8). Thus, as acceptance increased, the association between threat interpretation and anxiety became stronger.

*Figure 3. Across situations: Mindfulness moderates the association between threat interpretation and anxiety.*

Note. $n = 286$. Standardized path coefficients are given. Standard errors are shown in parentheses.

*p < .05, **p < .01
Figure 6. Across situations: Mindfulness buffers the positive association between threat interpretation and anxiety.
Table 8

Across Situations: Mindfulness and Acceptance as Moderators of Threat Interpretation and Anxiety

<table>
<thead>
<tr>
<th>DV: ANXIETY</th>
<th>$\beta$</th>
<th>$SE$</th>
<th>$p$</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderator: Mindfulness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threat Interpretation</td>
<td>.30</td>
<td>.04</td>
<td>&lt;.001</td>
<td>.22, .38</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>-.63</td>
<td>.04</td>
<td>&lt;.001</td>
<td>-.71, -.55</td>
</tr>
<tr>
<td>Threat Int. x Mindfulness</td>
<td>-.09</td>
<td>.04</td>
<td>.03</td>
<td>-.17, -.01</td>
</tr>
</tbody>
</table>

$R^2 = .58$

$F(3, 282) = 127.55, p < .001$

<table>
<thead>
<tr>
<th>Moderator: Acceptance</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Threat Interpretation</td>
<td>.46</td>
<td>.06</td>
<td>&lt;.001</td>
<td>.35, .57</td>
</tr>
<tr>
<td>Acceptance</td>
<td>.04</td>
<td>.06</td>
<td>.45</td>
<td>-.07, .16</td>
</tr>
<tr>
<td>Threat Int. x Acceptance</td>
<td>.13</td>
<td>.06</td>
<td>.02</td>
<td>.02, .24</td>
</tr>
</tbody>
</table>

$R^2 = .20$

$F(3, 282) = 23.32, p < .001$
Per situation. Unlike the significant results that were found across situations, neither mindfulness (Sit. 1 threat interpretation X mindfulness interaction $\beta = -0.06, SE = 0.04, p = .13$; Sit. 2 threat interpretation X mindfulness interaction $\beta = 0.02, SE = 0.04, p = .71$; Sit. 3 threat interpretation X mindfulness interaction $\beta = -0.06, SE = 0.04, p = .15$) nor acceptance (Sit. 1 threat interpretation X acceptance interaction $\beta = 0.12, SE = 0.07, p = .08$; Sit. 2 threat interpretation X acceptance interaction $\beta = -0.01, SE = 0.06, p = .98$; Sit. 3 threat interpretation X acceptance interaction $\beta = 0.09, SE = 0.07, p = .20$) significantly moderated the association between threat interpretation and anxiety in Situation 1 (social relationships/peer), Situation 2 (school/teacher), and Situation 3 (personal harm). Therefore, mindfulness and acceptance did not change the association between threat interpretation and anxiety in any individual situation.

Hypothesis D: Mindfulness will be positively associated with number of solutions. To test Hypothesis D, a bivariate correlation was conducted. A significant positive correlation would support the prediction that children who are more mindful develop a greater number of possible solutions.

Across situations. Across situations, Hypothesis D was contradicted. Although mindfulness and number of solutions were significantly correlated, the association was negative instead of positive (see Table 4). Therefore, children who were more mindful listed fewer (not more) solutions.

Per situation. Consistent with the result found across situations, mindfulness was negatively associated with number of solutions for Situations 1 (social relationships/peer) and 2 (school/teacher) (see Tables 5 and 6). In contrast to Situations 1 and 2, for Situation
3 (personal harm), mindfulness was not significantly associated with number of solutions (see Table 7).

**Hypothesis E: Avoidance will be positively associated with anxiety.**

Hypotheses E-H were tested with bivariate correlations.

**Across situations.** Across situations, avoidance was not significantly associated with anxiety, although there was a positive trend ($p = .055$; see Table 4).

**Per situation.** Similarly, for Situation 1 (social relationships/peer) and Situation 2 (school/teacher), avoidance was not correlated with anxiety (see Tables 5 and 6). Unlike Situations 1 and 2, there was a significant positive correlation between avoidance and anxiety for Situation 3 (personal harm), so Hypothesis E was supported for Situation 3 (see Table 7).

**Hypothesis F: Cognitive fusion will be positively associated with anxiety.** A bivariate correlation was conducted to test Hypothesis F.

**Across situations.** In line with hypotheses, cognitive fusion was positively correlated with anxiety (see Table 4).

**Per situation.** Similarly, for Situations 1 (social relationships/peer) and 2 (school/teacher), cognitive fusion was positively associated with anxiety (see Tables 5 and 6). However, for Situation 3, cognitive fusion and anxiety were not significantly correlated (see Table 7).

**Hypothesis G: Mindfulness and acceptance will be negatively associated with avoidance.** Hypothesis G would be supported by negative correlations between (a) mindfulness and avoidance and (b) acceptance and avoidance.
Across situations. Across situations, acceptance (but, not mindfulness) was significantly negatively associated with avoidance (see Table 4).

Per situation. The results for Situations 1 (social relationships/peer), 2 (school/teacher), and 3 (personal harm) resembled those found across situations. Acceptance (but, not mindfulness) was negatively associated with avoidance (see Tables 5-7).

Hypothesis H: Mindfulness and acceptance will be negatively associated with cognitive fusion. Further, support for Hypothesis H would be demonstrated by negative correlations between (a) mindfulness and cognitive fusion and (b) acceptance and cognitive fusion.

Across situations. Hypothesis H was fully supported in that both mindfulness and acceptance were significantly negatively correlated with cognitive fusion (see Table 4).

Per situation. Similarly, for Situations 1 (social relationships/peer) and 2 (school/teacher), both mindfulness and acceptance were negatively correlated with cognitive fusion (see Tables 5 and 6). Conversely, in Situation 3 (personal harm), acceptance was negatively associated with cognitive fusion, but mindfulness was not (see Table 7).

Hypothesis I: Mindfulness and acceptance will partially mediate the association between avoidance and anxiety. Hypothesis I was assessed with two mediation analyses (one with mindfulness as a mediator and another with acceptance as a mediator). Support for Hypothesis I would be demonstrated by significant indirect effects for each mediation analysis.
**Across situations.** The total effect for Hypothesis I (between avoidance and anxiety) was nonsignificant (total effect: $\beta = .12, SE = .06, p = .06$; see Figure 7). Despite this, mindfulness and acceptance were tested as mediators. Neither mindfulness (indirect effect: $\beta = .07, SE = .04, p = .12$) nor acceptance (indirect effect: $\beta = .02, SE = .01, p = .14$) mediated the association between avoidance and anxiety.

*Figure 7.* Across situations: Mindfulness and acceptance as mediators of the association between avoidance and anxiety.

**Total Effects Model**

- Avoidance → Anxiety $\beta = .12(06)_{ec}$

**Mediation Model**

- Mindfulness: $\beta = .07, SE = .04, 95\%\text{ BCI: }-.02, .16$
- Acceptance: $\beta = .02, SE = .01, 95\%\text{ BCI: }-.01, .05$

Mindfulness/Acceptance → Avoidance $-.09(.06)_{ae}/-.23(.06)^{**}$

Mindfulness/Acceptance $\rightarrow$ Anxiety $-.69(.04)^{**}/-.10(.06)_{ae}$

$\chi = .49^{**}/.02^*$

**Note.** $n = 286$. Standardized path coefficients are given. Standard errors are shown in parentheses. Results for mindfulness as a mediator are to the left of the slash and results for acceptance as a mediator are on the right of the slash.

* $p < .05$, ** $p < .01$
**Per situation.** Consistent with what was found across situations, the total effect for Hypothesis I (between avoidance and anxiety) was nonsignificant (Sit. 1 total effect: $\beta = .01, SE = .06, p = .89$; Sit. 2 total effect: $\beta = .07, SE = .06, p = .24$) in Situations 1 (social relationships/peer) and 2 (school/teacher). However, mindfulness and acceptance were still tested as mediators. Neither mindfulness (Sit. 1 indirect effect: $\beta = .01, SE = .04, p = .76$; Sit. 2 indirect effect: $\beta = .07, SE = .05, p = .08$) nor acceptance (Sit. 1 indirect effect: $\beta = .02, SE = .02, p = .19$; Sit. 2 indirect effect: $\beta = .01, SE = .01, p = .42$) mediated the association between avoidance and anxiety.

Unlike Situations 1 and 2, there was a significant positive association between avoidance and anxiety for Situation 3 (personal harm). Both mindfulness and acceptance were tested as mediators. However, neither mindfulness (Sit. 3 indirect effect: $\beta = .05, SE = .04, p = .27$) nor acceptance (Sit. 3 indirect effect: $\beta = .01, SE = .01, p = .33$) significantly mediated the association between avoidance and anxiety.

**Hypothesis J: Mindfulness and acceptance will partially mediate the association between cognitive fusion and anxiety.** Similarly, to test Hypothesis J, two mediation analyses were conducted. Significant indirect effects for each mediation analysis (when mindfulness is the mediator and when acceptance is the mediator) would support this hypothesis.

**Across situations.** Mindfulness significantly mediated the association between cognitive fusion and anxiety (see Figure 8; total effect: $\beta = .19, SE = .06, p < .01$, direct effect: $\beta = .10, SE = .04, p = .02$, indirect effect: $\beta = .09, SE = .04, p = .02$). Contrary to hypotheses, acceptance did not mediate this association (indirect effect: $\beta = .02, SE = .02, p = .26$).
Figure 8. Across situations: Mindfulness and acceptance as mediators of the association between cognitive fusion and anxiety.

**Total Effects Model**

Cognitive Fusion \[ \rightarrow \] Anxiety

\[ r = .04^{**} \]

**Mediation Model**

Mindfulness: \( \beta = .09^*, SE = .04, 95\% \text{BCI: .01, .18} \)
Acceptance: \( \beta = .02_{m}, SE = .02, 95\% \text{BCI: -.01, .05} \)

Cognitive Fusion \[ \rightarrow \] Mindfulness/Acceptance

\[ \beta = .04^{**}, SE = .06 \]

Mindfulness/Acceptance \[ \rightarrow \] Anxiety

\[ \beta = .04^{**}, SE = .07 \]

\[ r^2 = .57^{**}, .04^{**} \]

Note. \( n = 286 \). Standardized path coefficients are given. Standard errors are shown in parentheses. Results for mindfulness as a mediator are to the left of the slash and results for acceptance as a mediator are on the right of the slash.

\( *p < .05, **p < .01 \)
**Per situation.** Consistent with results across situations, for Situations 1 (social relationships/peer) and 2 (school/teacher), mindfulness was a significant mediator of the association between cognitive fusion and anxiety (see Figure 9; Sit. 1 total effect: \( \beta = .14, SE = .06, p = .02 \), Sit. 1 direct effect: \( \beta = .04, SE = .04, p = .31 \), Sit. 1 indirect effect: \( \beta = .10, SE = .04, p = .02 \); Sit. 2 total effect: \( \beta = .21, SE = .06, p < .001 \), Sit. 2 direct effect: \( \beta = .13, SE = .04, p < .01 \), Sit. 2 indirect effect: \( \beta = .08, SE = .04, p = .04 \)), but acceptance was not a significant mediator of this association (see Figure 10; Sit. 1 indirect effect: \( \beta = .01, SE = .01, p = .36 \); Sit. 2 indirect effect: \( \beta = .01, SE = .02, p = .99 \)).

Unlike Situations 1 and 2, there was not a significant total effect between cognitive fusion and anxiety for Situation 3 (personal harm) (Sit. 3 total effect: \( \beta = .05, SE = .06, p = .37 \)). However, mindfulness and acceptance were nonetheless tested for indirect effects. Neither mindfulness (Sit. 3 indirect effect: \( \beta = .02, SE = .04, p = .55 \)) nor acceptance (Sit. 3 indirect effect: \( \beta = .02, SE = .02, p = .23 \)) mediated this association.
Figure 9. By situation, Mindfulness mediates the association between cognitive fusion and anxiety only in social situations.

**Total Effects Model**

\[
\begin{align*}
\text{Cognitive Fusion} & \rightarrow \text{Anxiety} \\
& \quad \beta = .14(0.06)/.21(0.06)/.05(0.06)_{SE} \\
& S1 \quad S2 \quad S3
\end{align*}
\]

\[
\hat{r}^2 = .02**/0.05**/01_{SE}
\]

**Mediation Model**

\[
\begin{align*}
S1: \beta &= .10^*, SE = .04, 95\% \text{BCI: } 0.2, 19 \\
S2: \beta &= .08^*, SE = .04, 95\% \text{BCI: } 0.1, 18 \\
S3: \beta &= .02_{SE}, SE = .04, 95\% \text{BCI: } -0.6, 11
\end{align*}
\]

\[
\begin{align*}
\text{S1} & \quad \text{S2} & \quad \text{S3} \\
-14(0.06)_{SE}/-12(0.06)_{SE}/-04(0.06)_{SE} & \rightarrow & \quad \text{Mindfulness} \\
& \rightarrow & \quad \text{Cognitive Fusion} \\
& \rightarrow & \quad \text{Anxiety} \\
& \quad \beta = -.69(0.04)**/-.66(0.04)**/-.70(0.04)** \\
& S1 \quad S2 \quad S3
\end{align*}
\]

\[
\hat{r}^2 = .49**/51**/49**
\]

*Note. n = 286. Standardized path coefficients are given. Standard errors are shown in parentheses. Results for situations are shown consecutively from left to right.*

*p < .05, **p < .01*
Figure 10. By situation: Acceptance does not mediate the association between cognitive fusion and anxiety.

**Total Effects Model**
\[ r^2 = .2^* / .04^{**} / .01_{SE} \]

Cognitive Fusion \[ .14(.06) / .21(.06)^{**} / .05(.06)_{SE} \]
S1 S2 S3
Anxiety

**Mediation Model**
S1: \[ \beta = .01_{SE}, SE = .01, 95\% BCI: -.01, .03 \]
S2: \[ \beta = .01_{SE}, SE = .01, 95\% BCI: -.04, .04 \]
S3: \[ \beta = .02_{SE}, SE = .02, 95\% BCI: -.02, .06 \]

Acceptance
S1 S2 S3
Cognitive Fusion \[ -.16(.06)^{**} / -.30(.06)^{**} / -.26(.06)^{**} \]
S1 S2 S3
Anxiety \[ -.06(.05)^{*} / .01(.06)^{**} / .08(.06)_{SE} \]

\[ r^2 = .02^{*} / .04^{**} / .01_{SE} \]

*Note. n = 286. Standardized path coefficients are given. Standard errors are shown in parentheses. Results for situations are shown consecutively from left to right.*

* \( p < .05 \), ** \( p < .01 \)
CHAPTER V

Discussion

The goal of this study was to examine associations between social information-processing (I-P) variables (i.e., threat interpretation and number of solutions), ACT processes (i.e., cognitive fusion/defusion, mindfulness, acceptance, and experiential avoidance), and anxiety in Latinx early adolescents. The overarching hypothesis driving study predictions was that mindfulness/acceptance would explain and moderate associations between functioning at early (threat interpretation bias) and later stages (coping responses) of I-P and anxiety. Importantly, this study was likely the first to assess ACT variables with an open-ended questionnaire using vignettes with youth. The vignettes described different types of situations (social relationships/peer, school/teacher, and personal harm), which allowed assessment of hypotheses both across and by situation. Assessing situational differences is valuable in a study focusing on ACT due to ACT’s emphasis on contextual specificity. Using an open-ended questionnaire also allowed for the exploration of youths’ spontaneous production of ACT-related responses.

Exploration of How ACT Variables Play a Role in Youths’ I-P

Several notable findings emerged after testing hypotheses. The following sections delineate study findings per ACT variable to highlight the roles that mindfulness, acceptance, avoidance, and cognitive fusion play during adolescents’ I-P.

Mindfulness

Mindfulness, threat interpretation, and anxiety. As expected, mindfulness was shown to play a significant role in associations with threat interpretation and anxiety when the data were analyzed across situations. Several cognitive models, including the I-
P model of anxiety (Beck & Clark, 1997), agree that individuals with anxiety display threat perception and interpretation biases (see Waters & Craske, 2016, for a review). Research has supported these models by showing strong associations between threat perception, threat interpretation, and anxiety (e.g., Suarez-Morales & Bell-Dolan, 2001). The results from this study replicated previous findings by showing a significant positive association between threat interpretation and anxiety.

Additionally, mindfulness was negatively associated with threat interpretation, and mindfulness both mediated and moderated the association between threat interpretation and anxiety. To my knowledge, this was the first study to examine the association between threat interpretation and mindfulness in adolescents. The findings suggest that mindfulness both explains and buffers the positive association between threat interpretation and anxiety. Therefore, being mindful is likely to counteract the tendency of anxious individuals to automatically judge ambiguous situations as threatening.

The results from the current study suggest that the concept of mindfulness can be a protective factor for threat interpretation bias in social I-P and its association with anxiety in early adolescents. Moreover, past researchers have shown that mindfulness is negatively associated with anxiety (e.g., Tan & Martin, 2016), that anxiety is positively associated with threat interpretation (e.g., Suarez-Morales & Bell-Dolan, 2001), and that mindfulness is associated with improved attention (Napoli et al., 2005). Attentiveness and objectivity (two of the main characteristics of mindfulness) are likely to lead adolescents to slow down and gather more information from their environments before determining whether an ambiguous situation is threatening. Therefore, it was unsurprising that mindfulness both explained and buffered the association between threat interpretation and
anxiety. The results suggest that across different types of situations, mindfulness plays a significant role during the early phases of social information-processing.

**Mindfulness and number of solutions.** The literature shows that mindful individuals tend to be flexible and adept social problem-solvers (Argus & Thompson, 2008; Greenberg et al., 2012). Therefore, it was originally hypothesized that mindfulness would be positively associated with number of solutions. However, when the data were analyzed across situations, the results showed that instead of being positively associated with number of solutions during the response access phase, mindfulness was negatively associated with number of solutions.

In retrospect and upon close examination of the data, the finding that mindfulness is negatively associated with number of solutions is not so surprising. Mindfulness can still be associated with increased problem-solving while leading to fewer, more selective and mindful solutions. That is, number of solutions does not equal quality of solutions. It may be that mindful individuals spend more time thinking through potential solutions and end up writing fewer solutions after problem-solving through the best options. In fact, an examination of the bivariate correlations shows that all adaptive coping strategies (mindfulness and acceptance) were negatively associated with number of solutions while maladaptive coping strategies (cognitive fusion and avoidance—and even threat interpretation and anxiety) were positively associated with number of solutions. Therefore, writing more solutions was associated with poorer quality of response-choices.

Past research specifically examining associations between number of solutions and anxiety has shown that anxious youth do not significantly differ from non-anxious youth in number of solutions listed (e.g., Barrett et al., 1996; Suarez-Morales & Bell,
2006), but that worriers tend to choose ineffective solutions (Suarez-Morales & Bell, 2006). Therefore, it remains unclear whether the number of solutions variable representing the response-access phase of social I-P is characteristic or meaningful as a determinant of adjustment. A future direction would be to control for the quality of responses while analyzing the association between number of solutions and mindfulness.

**Mindfulness’ role in social situations.** The results revealed important differences by situation when each situation was studied independently. It appears that mindfulness only plays a significant role in adolescents’ I-P in social situations. Therefore, like the results found across situations, for Situations 1 (social relationships/peer) and 2 (school/teacher), mindfulness continued to show a negative association with threat interpretation bias and cognitive fusion. Mindfulness also significantly explained the association between threat interpretation bias and anxiety. Additionally, it mediated the association between cognitive fusion and anxiety. Therefore, associations between I-P variables and anxiety as an adjustment outcome were repeatedly explained by mindfulness levels in the social situations.

Several studies point to a distinctively strong relationship between mindfulness skills and social adjustment in adolescence. For example, researchers have shown that mindfulness interventions lead to improvements in social skills and relationships (e.g., Wisner & Starzec, 2015). These improvements in social outcomes are probably mostly due to mindfulness interventions’ effects on greater data-driven processing (Wimmen et al., 2016). The automaticity and “minimal analysis” that mindfulness combats is likely helpful in social situations, which are fast-paced (Beck & Clark, 1997, p. 50). In an effort to bridge the gap between the study of mindfulness and the study of social relationships,
Pratscher and colleagues (2017) coined the term *interpersonal mindfulness*, which they described as “mindfulness during interpersonal interactions” that “includes awareness of self and others, accompanied with the qualities of nonjudgmental and nonreactive presence” (p. 1206). They argue that although mindfulness is typically practiced alone, the goal is to bring it into everyday life. This is especially relevant to adolescents, who are typically engaged in social interactions. In their study with undergraduate students, interpersonal mindfulness was positively associated with friendship quality, even after controlling for trait mindfulness (Pratscher et al., 2017). Altogether, the available research and the findings from the current study point to mindfulness as an especially relevant and useful resource to adolescents for social adjustment.

**Acceptance**

Like mindfulness, acceptance is an ACT variable that is characterized by an open embrace of internal and external experiences. Therefore, it was also expected to mediate and moderate the association between threat interpretation and anxiety. Interestingly, acceptance was generally not a significant mediator or moderator throughout tests of study hypotheses. However, acceptance significantly moderate the association between threat interpretation and anxiety across situations, albeit in the opposite direction than predicted (it exacerbated the association rather than buffered it). This was a puzzling finding. However, upon examination of bivariate associations, it appears that acceptance was negatively correlated with threat interpretation, but not significantly associated with anxiety. Because acceptance should theoretically be negatively associated with anxiety, it is possible that in this study, exhibiting high levels of both threat interpretation bias and acceptance was actually maladaptive and produced higher levels of anxiety. Maybe
individuals who interpreted situations as threatening, but who chose to accept those threatening situations were inherently more anxious because they chose a passive form of coping despite their high levels of threat detection and physiological arousal. Therefore, instead of truly accepting the situation and making peace with not having control over it, these individuals simply marinated in their cognitive threat-detection and nervousness. It will be worthwhile for future researchers to also (in addition to the open-ended questionnaire) administer a Likert-type scale that specifically assesses acceptance to determine how open-ended responses can be coded in a way that accounts for the various complexities of acceptance (e.g., its cognitive, physiological, emotional, and behavioral components).

Additionally, it was predicted that mindfulness and acceptance would be negatively associated with avoidance. However, this hypothesis was partially supported (acceptance was negatively associated with avoidance, but mindfulness was not). This prediction was based on research that showed that mindfulness and psychological inflexibility, determined by high cognitive fusion and avoidance scores, were negatively correlated (Greco et al., 2008). Importantly, both of these measures are unidimensional, so it is difficult to tease apart specific associations (e.g., the CAMM does not produce independent mindfulness and acceptance subscales—it only provides an overall mindfulness scale). Because this may have been the only study to assess acceptance separately from mindfulness, the findings suggest that maybe the acceptance piece of mindfulness is what drives the negative association between mindfulness and avoidance. To further clarify this point, the available research on associations between mindfulness, acceptance, and avoidance is limited by the fact that it included measures that produce
unidimensional constructs (i.e., one measure, the AFQ-Y, produces a “psychological inflexibility” score rather than producing a fusion and an avoidance subscore, and another measure, the CAMM, produces an overall “mindfulness” score rather than producing mindfulness and acceptance subscores). Therefore, it is difficult to tease apart associations between specific variables such as avoidance and acceptance. These findings highlight the usefulness of multifaceted measures in disentangling these relationships.

Finally, the hypothesis that acceptance would mediate the association between avoidance and anxiety was not supported both across and per situation. This was surprising, considering past findings that have shown significant associations between mindfulness/acceptance, avoidance, and anxiety. However, it is notable that this was the first study to independently assess unique associations between acceptance (as opposed to a combination of mindfulness and acceptance) and these variables in Latinx youth. It is also noteworthy that there was not a significant correlation between avoidance and anxiety in most instances. It may be that the way avoidance was coded contributed to the lack of significant findings in this sample.

**Cognitive Fusion**

In line with previous findings, it was hypothesized that cognitive fusion would be positively associated with anxiety (Greco et al., 2008). The fact that this hypothesis was supported in these data suggests that the coding of cognitive fusion was probably valid. Further, as expected, cognitive fusion was negatively associated with both mindfulness and acceptance. Cognitive fusion (becoming enmeshed with thoughts and taking them on as literal truths) inherently opposes mindfulness and acceptance, which involve open-mindedness and nonjudgmental attentiveness. The replication of these findings in the
current study bolsters what has been previously found (Greco et al., 2008), and extends past findings via the measurement of cognitive fusion and acceptance with an open-ended questionnaire. Additionally, the findings suggest that previous findings with cognitive fusion replicate in a sample of Latinx early adolescents. This is important, as most of the available research on ACT processes in Latinx youth has focused on mindfulness.

Examining the results by situation revealed that associations with cognitive fusion differed between situations. It is unclear why cognitive fusion was associated with anxiety in Situations 1 and 2, but not in Situation 3. Perhaps responses such as “get my dad’s gun” (which were coded CF for Situation 3) reflected empowerment and confidence rather than enmeshment with or believability of thoughts (that there must have been a robber in the house). In contrast, for Situation 1 (social relationships/peer), a response such as “my friend doesn’t like me anymore” (which was coded CF) may have reflected a greater degree of vulnerability, and was therefore associated with more anxiety. Overall, the findings suggest that future researchers should continue to consider contextual differences in associations between anxiety and ACT variables.

It should also be determined whether other measures of adjustment (e.g., aggression) are associated with any of these responses, and whether these variables can explain the associations found in the current study. For example, responses such as “get my dad’s gun” or “get a bat” may have been listed by individuals who score higher on externalizing rather than internalizing problems. Each of these clarifications would lead to refinements in the understanding of how ACT variables relate to youths’ information-processing in specific situations.
In an attempt to expand on the role of mindfulness to later stages of the social I-P model, mindfulness was also tested as a mediator of the association between cognitive fusion and anxiety. Past researchers have shown that cognitive fusion (measured with the AFQ-Y) is negatively associated with mindfulness (measured with the CAMM) and that both mindfulness and cognitive fusion are associated with anxiety (Greco et al., 2008). The results across situations show that mindfulness mediates the positive association between cognitive fusion and anxiety, but that acceptance does not. These results are informative as previous research with youth has not distinguished between mindfulness and acceptance in associations with cognitive fusion. The findings highlight that mindfulness continues to play a lasting role throughout the I-P sequence. Because the data in this study are cross-sectional, it will be important to determine whether mindfulness plays a predictive role by reducing children’s threat interpretation bias and, in turn, explaining their future solution-choices (e.g., responses that reflect cognitive fusion) and adjustment outcomes.

**Avoidance**

Contrary to hypotheses, avoidance was not significantly associated with anxiety when the data were analyzed across situations. However, there was a strong positive trend \( (p = .055) \). The literature has established a consistent link between avoidance and anxiety (Barrett et al., 1996); therefore, the nonsignificant association in these data was surprising. It is important to note that when the situations were studied independently, only Situation 3 (personal harm) showed a significant association between avoidance and anxiety. Therefore, it appears that in this sample, the link between avoidance and anxiety was context-dependent. There was something about experiential avoidance within the
context of being alone at home and hearing a noise that aroused anxiety; whereas avoidance in both social contexts was not associated with anxiety. It may be that trying to avoid or suppress negative emotions or the potential problem (e.g., by hiding under the covers or trying to ignore emotions) led to amplified anxiety in the solitary situation due to fewer distractors and greater opportunity to focus on anxious affect.

According to Hayes (2004), control is the main problem from an ACT perspective. He explains that “deliberately not thinking of something usually fails because the rule (“don’t think of x”) contains the avoided item” (p. 653). Therefore, it is likely that for Situation 3, adolescents pictured themselves repeatedly trying to suppress negative thoughts and emotions, and doing this was associated with higher anxiety.

**Examination of Frequency Counts of ACT Variables**

The descriptive statistics derived from Question 5 on the COELE-R [What would you actually do if you were in this situation? (write only one)] showed some interesting variations by gender and situation. Although frequency counts were generally not significantly different (for Questions 4 or 5), it is still informative to review the descriptive statistics because no other study has used an open-ended measure to code ACT coping strategies in adolescents.

First, across situations, acceptance was the most frequently chosen coping strategy (this was particularly true for girls, who generally chose acceptance more often than boys). This suggests that adolescents typically choose adaptive coping strategies to deal with difficult situations. This is consistent with research showing that healthy adolescents (when compared to clinically-referred adolescents) generally choose effective
coping strategies in the face of stress (Seiffgne-Krenke, Weidemann, Fentner, Aegenheister, & Poeblau, 2001).

In terms of maladaptive coping strategies, frequency counts of avoidance versus fusion differed by situation. For Situation 1 (social relationships/peer), avoidance was chosen more frequently than cognitive fusion (especially by girls). Therefore, in the situation where adolescents were asked to imagine that they did not receive an invitation to a party, most adolescents chose to avoid confrontation or their internal experiences instead of dwelling on their negative feelings and becoming enmeshed with their negative cognitions. This is consistent with research showing that relational victimization is positively associated with avoidance in adolescence (Storch, Brassard, & Masia-Warner, 2003). It is likely that individuals who interpreted Situation 1 as a form of relational victimization (exclusion from a social event) tended to rely on (or use) avoidant responses.

Results differed for Situation 2 (school/teacher), where participants were more likely to choose fusion over avoidance. For this situation, adolescents were asked to imagine that their teacher told them to stay after class. The fact that more individuals chose fusion makes sense considering that there would have been consequences for avoiding the teacher. It is apparent that adolescents strategically chose solutions depending on the situation, which highlights the relevance of situation-specificity.

Why was defusion virtually absent from youth responses? Unlike the other ACT variables, which were present for each situation, cognitive defusion responses were rarely listed. Notably, these responses were most common for Situation 3 (personal harm). Cognitive defusion, which is defined as the ability to distance oneself from one’s
thoughts so that they are viewed as just mental processes rather than overwhelming truths (Harris, 2009), is typically measured in youth via Likert-type scales (e.g., with the Avoidance and Fusion Questionnaire for Youth; AFQ-Y). There are a few obstacles to measuring cognitive defusion in this way. The AFQ-Y includes items that capture cognitive fusion and experiential avoidance and it produces an overall measure of psychological inflexibility. Therefore, it fails to tease apart cognitive fusion and avoidance. Most importantly, its items assess cognitive fusion rather than cognitive defusion. Although cognitive defusion is conceptualized as the opposite of cognitive fusion (Sole et al., 2015), it is unclear whether these two constructs lie on opposite ends of a continuum or whether they should actually be treated and measured independently. Because there is an absence of cognitive defusion measures in youth, the coding system developed for this study was based on the adult literature. This begs the question of how cognitive defusion actually manifests in children and adolescents. Although there are ACT intervention strategies tailored to adolescents (e.g., the DNA-V model; Hayes & Ciarrochi, 2015) that include cognitive defusion in them, there is an absence of research that specifically tests the effectiveness of these strategies. This is probably due to a lack of understanding of cognitive defusion and how it manifests or how it can be taught in different age groups.

The results from this study suggest that cognitive defusion is not a coping strategy that comes naturally to early adolescents. Because studies have not independently measured fusion and defusion in youth, it is uncertain whether youth in this specific age group are already consciously applying cognitive defusion strategies in their daily lives. The findings of this study suggest that early adolescents are probably not already
applying these strategies and that cognitive defusion is a clinical strategy that can be helpful to youth, but needs to be explicitly taught.

Further, because there was no research exploring the frequency of spontaneous cognitive defusion responses prior to this study, it is unclear whether the way that cognitive defusion was coded affected the results. That is, although the coding manual resulted in good interrater reliability, it may be that the CD code was not valid. However, it is important to note that all other codes were expectedly present in adolescents’ responses and that each of the codes in the coding manual was carefully constructed as a result of an extensive review of the ACT literature.

Beyond this, it is important to recognize that the majority of CD codes were found for Situation 3 (after open-ended responses from the interpretation phase were added as coping strategies to Question 4), which was a non-social, solitary situation (personal harm). For example, responses such as “I think that I made up the sound in my mind,” and “My imagination made me hear something,” were coded CD. Why were these responses only present for Situation 3 (personal harm)? It is probable that whereas solitary situations call for more reflective processing, the fast pace of social situations pulls for more automatic processing (so, adolescents rely on fewer cognitive or “verbally-mediated” strategies during social situations; Beck & Clark, 1997, p. 50).

It is also important to note that the number of CD codes substantially grew after adding participants’ responses from a question targeting the interpretation phase of social I-P (What do you think happened in this situation? Write down the first thought that comes to your mind). Therefore, it may be that CD is a process that more frequently occurs during the interpretation phase rather than during the response access or selection
phases. Altogether, these factors shed a novel light on a construct that has received very little attention in the child and adolescent literature.

**Implications for the Measurement of ACT Processes**

The use of an open-ended measure that thoroughly assesses various ACT strategies was an important contribution to the youth ACT literature. Although intervention research on ACT and other mindfulness-based therapies is in a state of active growth, the measurement literature appears to be at a relative standstill.

Remarkably, mindfulness has the largest research-base and attention of all the ACT strategies, and even mindfulness is currently suffering from a shortage of valid and reliable measures in youth (Goodman, Madni, & Semple, 2017). Although there has been growth in the development of trait-mindfulness measures (see Pallozzi, Wertheim, Paxton, & Ong, 2016 for a review) for children and adolescents, all of these measures appear to be closed-ended measures with Likert-type scales assessing a unidimensional construct of mindfulness (this includes the CAMM, which was the measure employed in the current study).

Several researchers have argued that studying mindfulness as a multi-faceted construct (as it has been studied in adults) would also be beneficial for youth because it would distinguish which specific characteristics of mindfulness relate to certain outcomes (Goodman et al., 2017; Pallozzi et al., 2016). Developing multifactorial measures of mindfulness would also clarify which facets of mindfulness serve as mechanisms of change for specific mindfulness-based interventions (Goodman et al., 2017). Goodman et al. (2017) argue that this is especially true from a developmental framework because
children’s cognitive capacities are continuously changing, so it follows that certain aspects of mindfulness would be more accessible at different developmental periods.

Beyond the shortage of mindfulness measurement studies in youth, there are very few measures that specifically target cognitive fusion and experiential avoidance. Similar to mindfulness questionnaires, the few available measures (e.g., the Avoidance and Fusion Questionnaire for Youth and the Cognitive Fusion Questionnaire; Greco et al., 2008; Sole et al., 2015), are closed-ended Likert-types scales with single factors (e.g., psychological inflexibility or cognitive fusion). Further, it appears that no available measures explicitly assess cognitive defusion. The results from the current study suggest that it would be worthwhile to distinguish between the measurement of cognitive fusion and cognitive defusion. Altogether, it is evident that further research on the measurement of ACT processes in youth is warranted.

**Implications for Clinical Practice and Future Intervention Research**

Although there is a growing literature on ACT for children and adolescents, there are several limitations to the available literature that invite future research opportunities. In a thorough review of the literature on mindfulness interventions for adolescents, Tan (2016) found that there is about one published RCT of a clinical mindfulness intervention, and that the majority of the available research consists of longitudinal feasibility studies. Moreover, most of these studies did not include pre-, mid-, or post-treatment measures of mindfulness (they assessed changes in youths’ symptoms such as anxiety). Although testing for changes in symptoms is important, the goal of a mindfulness intervention is to increase mindfulness, so it is surprising that intervention studies are not testing for improvements in mindfulness. Tan (2016) states that the limited
intervention research testing for changes in mindfulness can be explained by the shortage of measurement research. Therefore, as researchers develop and refine mindfulness measures for youth, more intervention research will include these measures. Tan (2016) also notes that at the time of publication, there were no comparison studies with adolescents. Therefore the goals for future research on mindfulness interventions for youth should be to test for the efficacy and effectiveness of these interventions via RCTs, comparison studies, and changes in mindfulness.

Further, most of the available mindfulness interventions originated from adult programs. Developmental considerations are important as the cognitive capabilities of adolescents differ from those of adults (Tan, 2016). Although Tan’s (2016) review focused on mindfulness interventions, this information is even more relevant to other ACT practices such as cognitive defusion. Because the literature focusing on specific ACT strategies in youth is nascent, it is unclear which ACT strategies are most appropriate for children and adolescents. Although the results from this study do not speak to this directly, they do suggest that early adolescents do not intuitively use cognitive defusion as a coping strategy to the same degree that they might use mindfulness, acceptance, and other forms of coping.

The findings from this study also clarify the situations in which mindfulness is most likely to be helpful to early adolescents. Specifically, mindfulness was most relevant to associations between youths’ I-P and anxiety in social situations. This suggests that teaching children and early adolescents mindfulness skills as a prevention strategy would assist in disrupting the domino effect that overcrowded or “mind-full” attentional resources can have on subsequent behavioral plans and responses, particularly
in social interactions. Future mindfulness intervention researchers should strongly consider including measures of social adjustment when studying early adolescents and clinicians should consider implementing mindfulness strategies with adolescents who struggle socially.

Finally, the potential for cultural adaptations will be important to consider in further developments of ACT interventions for youth. Culturally-sensitive third-wave intervention research is currently in its embryonic phase with only a handful of studies examining these interventions in Latinxs (e.g., Fung et al., 2016; Hinton et al., 2013). Determining whether and how to tailor interventions to Latinx youth is crucial, considering their higher risk for anxiety (Martinez et al., 2012). The results from this study and from the available literature suggest that using ACT strategies, particularly mindfulness to cope with social difficulties, can be especially beneficial to Latinx early adolescents. It will be a worthy endeavor to examine associations between culturally-sensitive variables (e.g., familismo, somatization, and acculturative stress) and intervention outcomes in this particular group. For example, there is a growing research-base on the effects of maternal mindfulness on youth outcomes (e.g., Siu et al., 2016). Incorporating this research into intervention research with Latinx youth would be relevant due to the cultural emphasis on the family in this population (Varela et al., 2004).

Altogether, the growth of ACT research in children and adolescents appears promising, but there remains a lot of opportunity for refinement. Specifically, researchers should shift their focus from feasibility or preliminary studies to RCTs with comparisons to other treatments (e.g., cognitive behavior therapy). Researchers should also include
developmental and cultural considerations while delineating these intervention programs. Finally, it appears that contextual differences make a statement in early adolescence by speaking to mindfulness’ relevance to social relationships. This calls for a need for more mindfulness intervention research that focuses on adolescents’ social adjustment. The findings also suggest to clinicians working with early adolescents that mindfulness skills can be taught as a prevention strategy to address ineffective social information-processing. Targeting the very early phases of social information-processing (i.e., the encoding and interpretation phases) by teaching mindfulness skills to youth is likely to decrease ineffective solution-choices and lead to improvements in social interactions.

**Limitations and Future Directions**

Despite the clear strengths of this study including the large, culturally-diverse sample, the inclusion of novel measurement strategies, and the broad assessment of various associations between I-P theory and ACT, there were several limitations that should be addressed in future research. First, and most importantly, the cross-sectional nature of the data limit inferences of predictability. However, it is important to note that it can be difficult to study longitudinal relationships in youths’ I-P using vignettes. Although social I-P typically uses terminology such as “phases” and “stages,” these phases are not necessarily sequential (Crick & Dodge, 1994). Therefore, moment-to-moment real-life interactions and the use of experimental designs can be used to infer causal relationships between I-P and ACT variables in future research.

Moreover, this study appears to have been the first to measure several ACT variables via an open-ended questionnaire in youth. The fact that the coding manual resulted in good interrater reliability and that several of the predicted bivariate
correlations were significant in the expected direction brings credence to this particular measure. However, future researchers should attempt to replicate these findings to substantiate the reliability and validity of the measure used in the current study. This is particularly true because cognitive defusion was not coded enough times to include this variable in analyses. These results suggest that this variable deserves more research attention in this particular population.

Another limitation of this study is that it did not compare between cultural groups and this should be an important future direction for research. However, it is notable that this study is one of a handful of research that focus on ACT processes in Latinx youth. There is also a shortage of ACT methodological research that is culturally sensitive. Researchers have argued that third-wave processes, such as mindfulness, likely manifest themselves differently across cultures; therefore, developing culturally-sensitive measures is imperative. For example, Goodman et al. (2017) explain that “many current practices and assessments of mindfulness… are not conceptualized within a biopsychosocial model or framed within a religious, spiritual, or cultural context” (p. 1411). For Latinx youth, it may be that greater somatization somehow influences these internal processes (McLaughlin et al., 2007). Comparison studies would be an important addition to the literature, because they would reveal significant differences in the manifestation of these processes. For example, a comparison study might show that in comparison to other cultural groups, Latinx youth generally display lower levels of mindfulness due to a greater tendency to somaticize their emotions.

Finally, it is important to note that all the available ACT measures for youth (including the open-ended measure in this study) rely on children’s own self-report.
Using self-report measures can be advantageous, especially in older youth such as adolescents, because some research has pointed to discrepancies in parent- and child-reports of internal phenomena (e.g., Briggs-Gowan, Carter, & Schwab-Stone, 1996). However, for very young children, self-report measures are limiting, and adults are typically responsible for rating their symptoms and behaviors. Beyond this, researchers have argued that even research on adolescents and older children would benefit from others’ reports on ACT processes such as mindfulness. For example, Goodman et al. (2017) argue that only using self-report to assess mindfulness can be problematic because individuals who are less mindful likely have less insight into their internal processes, and are thus less likely to report accurately on their mindfulness levels.

Notably, recent adult research shows that close others can accurately report on one’s behavioral aspects of mindfulness. Specifically, May and Reinhardt (2018) assessed self-other agreement using the Five-Facet Mindfulness Questionnaire in 129 undergraduates and close others. They found that there was a high level of agreement between self- and other-reports of mindfulness, suggesting that close others can accurately report on mindfulness. These findings are promising to the child methodological literature and suggest that parents and teachers should be able to rate young children’s mindfulness levels.

Additionally, the current study solely focused on anxiety as a correlate of ACT and I-P variables. Originally, I-P theory was based on aggressive cognitive and behavioral responses in youth (Dodge, 1986), and ACT intervention studies have shown improvements in aggressive behavior (Twohig, Hayes, & Berlin, 2008). It follows that ACT strategies such as mindfulness are also likely to be helpful in decreasing aggressive
cognitive and behavioral responses to different situations. Future researchers should determine whether the results from the current study generalize to adolescents with externalizing problems.

**Conclusion**

Altogether, the current study addressed several unanswered questions, but it focused on a very specific population. Additional ACT and I-P research with samples consisting of youth from various age-groups and cultural backgrounds would assist in an evaluation of age and cross-cultural differences. Further, the results from the current study and the state of the literature suggest that there is vast opportunity for the expansion of ACT research in youth. More research on the plausibility of assessing ACT variables with open-ended measures would be worthwhile, especially to determine the spontaneous use of ACT processes in different cultures and age-groups. Other research areas that deserve our attention include the development of cognitive defusion measures in youth, a focus on culturally-sensitive measurement, and an exploration into parent- and teacher-reports of ACT processes in youth. The goal of any research study is to venture through unopened doors in an effort to explore even more doors that are yet to be opened. The results from the current study shed a significant light on clinical strategies that are likely to be beneficial at specific stages of youths’ information-processing.
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doi:10.1016/j.brat.2016.11.001


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Appendix A

Revised Children’s Anxiety and Depression Scale
Please put a circle around the word that shows how often each of these things happen to you. There are no right or wrong answers.

<table>
<thead>
<tr>
<th>Item</th>
<th>Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
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</thead>
<tbody>
<tr>
<td>1. I worry about things</td>
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<td>2. I feel sad or empty</td>
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<td>3. When I have a problem, I get a funny feeling in my stomach</td>
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<td>4. I worry when I think I have done poorly at something</td>
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<td>5. I would feel afraid of being on my own at home</td>
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<td>6. Nothing is much fun anymore</td>
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<td>7. I feel scared when I have to take a test</td>
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<td>8. I feel worried when I think someone is angry with me</td>
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<td>9. I worry about being away from my parents</td>
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<td>10. I get bothered by bad or silly thoughts or pictures in my mind</td>
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<td>11. I have trouble sleeping</td>
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<td>12. I worry that I will do badly at my school work</td>
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<td>13. I worry that something awful will happen to someone in my family</td>
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<td>14. I suddenly feel as if I can't breathe when there is no reason for this</td>
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<td>15. I have problems with my appetite</td>
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<td>16. I have to keep checking that I have done things right (like the switch is off, or the door is locked)</td>
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<td>17. I feel scared if I have to sleep on my own</td>
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<td>18. I have trouble going to school in the mornings because I feel nervous or afraid</td>
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<td>19. I have no energy for things</td>
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<td>20. I worry I might look foolish</td>
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<td>21. I am tired a lot</td>
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<tr>
<td>22. I worry that bad things will happen to me</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>23. I can't seem to get bad or silly thoughts out of my head</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
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<tr>
<td>24. When I have a problem, my heart beats really fast</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
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<tr>
<td>25. I cannot think clearly</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
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<tr>
<td>26. I suddenly start to tremble or shake when there is no reason for this</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
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<tr>
<td>27. I worry that something bad will happen to me</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>28. When I have a problem, I feel shaky</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>29. I feel worthless</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>30. I worry about making mistakes</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
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<tr>
<td>31. I have to think of special thoughts (like numbers or words) to stop bad things from happening</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>32. I worry what other people think of me</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
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<tr>
<td>33. I am afraid of being in crowded places (like shopping centers, the movies, buses, busy playgrounds)</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>34. All of a sudden I feel really scared for no reason at all</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>35. I worry about what is going to happen</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>36. I suddenly become dizzy or faint when there is no reason for this</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>37. I feel afraid if I have to talk in front of my class</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>38. My heart suddenly starts to beat too quickly for no reason</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>39. I feel like I don’t want to move</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>40. I worry that I will suddenly get a scared feeling when there is nothing to be afraid of</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>41. I have to do some things over and over again (like washing my hands, cleaning or putting things in a certain order)</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>42. I feel afraid that I will make a fool of myself in front of people</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>Question</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-------</td>
<td>-----------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>43. I have to do some things in just the right way to stop bad things from happening</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44. I worry when I go to bed at night</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45. I would feel scared if I had to stay away from home overnight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46. I feel restless</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* In this sample, the alpha coefficient for the total anxiety scale was excellent

$(\alpha = .94)$. 
Appendix B

Children’s Acceptance and Mindfulness Measure
CAMM
We want to know more about what you think, how you feel, and what you do. Read each sentence. Then, circle the number that tells how often each sentence is true for you.

<table>
<thead>
<tr>
<th></th>
<th>Never True</th>
<th>Rarely True</th>
<th>Sometimes True</th>
<th>Often True</th>
<th>Always True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I get upset with myself for having feelings that don’t make sense.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. At school, I walk from class to class without noticing what I’m doing.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I keep myself busy so I don’t notice my thoughts or feelings.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I tell myself that I shouldn’t feel the way I’m feeling.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. I push away thoughts that I don’t like.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. It’s hard for me to pay attention to only one thing at a time.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. I think about things that happened in the past instead of thinking about things that are happening right now.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. I get upset with myself for having certain thoughts.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. I think that some of my feelings are bad and that I shouldn’t have them.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. I stop myself from having feelings that I don’t like.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

*Note.* The Cronbach’s alpha in these data was $\alpha = .89$, suggesting good internal consistency.
Appendix C

Children’s Opinions of Everyday Life Events-Revised
1) One of your close friends tells you that another one of your friends is having a birthday party next Saturday. He received an invitation in the mail and you have not received an invitation.

1. What do you think happened in this situation? (Write down the first thought that comes to your mind)

____________________________________________________________________________

____________________________________________________________________________

2. How scary/threatening is this situation for you? (circle one)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all</td>
<td>mild</td>
<td>moderate</td>
<td>severe</td>
<td>extremely</td>
</tr>
</tbody>
</table>

3. How likely do you think this is to happen to you? (circle one)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all</td>
<td>somewhat likely</td>
<td>very likely</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. If this happened to you, what could you do? List all the things you can **think or do** in this situation. (not just what you think you **should** do).

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

5. What would you actually do if you were in this situation? (write only one)

____________________________________________________________________________

____________________________________________________________________________

2) One day before starting the lesson, your teacher asks you to stay after class.

1. What do you think happened in this situation? (Write down the first thought that comes to your mind)

____________________________________________________________________________

____________________________________________________________________________

2. How scary/threatening is this situation for you? (circle one)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all</td>
<td>mild</td>
<td>moderate</td>
<td>severe</td>
<td>extremely</td>
</tr>
</tbody>
</table>

3. How likely do you think this is to happen to you? (circle one)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all</td>
<td>somewhat likely</td>
<td>very likely</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. If this happened to you, what could you do? List all the things you can think or do in this situation. (not just what you think you should do).

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

5. What would you actually do if you were in this situation? (write only one)
______________________________________________________________________________

3) One night, you wake up suddenly thinking that you heard a noise in the living room, but all is quiet.

1. What do you think happened in this situation? (Write down the first thought that comes to your mind)

______________________________________________________________________________
______________________________________________________________________________

2. How scary/threatening is this situation for you? (circle one)

1 not at all 2 mild 3 moderate 4 severe 5 extremely

3. How likely do you think this is to happen to you? (circle one)

1 not at all 2 somewhat likely 3 very likely

4. If this happened to you, what could you do? List all the things you can think or do in this situation. (not just what you think you should do).

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

5. What would you actually do if you were in this situation? (write only one)
______________________________________________________________________________
Appendix D

Adapted Coding Manual for the COELE-R
Each solution will be rated according to the following five categories:

1) Experiential Avoidance (EA)
2) Cognitive Fusion (CF)
3) Cognitive Defusion (CD)
4) Acceptance (A)
5) Other Coping Response (OCR)

1) Experiential Avoidance (EA): includes attempts to suppress, avoid, or escape unwanted thoughts, feelings, or situations (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996).

- Includes:
  - Attempts to **not think about the situation**
    - Examples: “try to think about something else;” “ignore it;” “try to forget about it”
  - Attempts to **avoid negative emotions**
    - Examples: “try not to worry about it;” “try to be happy”
  - Behavioral attempts to **avoid a situation instead of confronting the problem**
    - Examples: “stop talking to the friend who didn’t invite me;” “get under my bed;” “I would make an excuse to leave”

- Does **NOT** include:
  - Going with the flow; not doing anything about the problem (e.g., “go on like nothing happened;” “stay after class;” “stay in my room;” see Acceptance)

2) Cognitive Fusion (CF): describes responses in which the person becomes entangled in and overwhelmed by his/her thoughts to the point that thoughts are likely to interfere with effective behavior (Gillanders et al., 2014; Greco et al., 2008).

- Includes:
  - Believing thoughts
    - Examples: “my friend doesn’t like me anymore;” “I’m in trouble”
  - Reacting behaviorally and/or emotionally to thoughts
    - Examples: “I would freak out and get a bat to see if anything is there;” “get my dad’s gun” (in response to the thought that there is a robber in the house)
  - Over-analyzing situations
    - Examples: “I would spend hours thinking about what to do;” “pick apart the situation;” “I would hope I didn’t do anything wrong”
  - Evaluating and judging thought-content
    - Examples: “I would tell myself that it is wrong to think that way”

- Does **NOT** include:
  - Avoidance behaviors in response to fused thoughts (see Experiential Avoidance); recognizing thoughts as just thoughts (e.g., “I would tell myself it’s all in my head;” see Cognitive Defusion)
3) **Cognitive Defusion (CD):** includes responses in which people try to distance themselves from their thoughts (Gillanders et al., 2014). Thoughts, images, and memories are observed and are recognized as mental events rather than overwhelming truths, and this leads to effective action (Harris, 2009).

   - **Includes:**
     - Observation of thoughts
     - Example: “Notice my thoughts”
     - Recognition of thoughts as ‘just thoughts’
     - Examples: “Tell myself it’s just a thought;” “Tell myself it’s all in my head”
     - Acceptance of thoughts
     - Example: “Tell myself it’s okay to think this way”

   - **Does NOT include:**
     - Attempts to alter the form of thoughts (i.e., cognitive restructuring; positive thinking); attempts to alter the frequency of thoughts (Hayes et al., 2006); acceptance of emotions and of the situation (see Acceptance)

4) **Acceptance (A):** involves the active and aware embrace of unpleasant material without trying to alter or avoid it (Coyne et al., 2011; Hayes et al., 2006).

   - **Includes:**
     - Acceptance of emotions
     - Examples: “Tell myself it’s okay to feel this way;” “It’s okay to feel afraid”
     - Acceptance of the situation
     - Examples: “Go on like nothing happened;” “Stay after class;” “Stay in my room”

   - **Does NOT include:**
     - Acceptance of thoughts (see Cognitive Defusion); avoidant responses (e.g., “ignore it;” see Experiential Avoidance)

5) **Other Coping Response (OCR):** any response that does not fit one of the above categories