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INTOLERANCE OF UNCERTAINTY, WORRY, AND PROBLEM-SOLVING:
IMPLICATIONS FOR GENERALIZED ANXIETY DISORDER

A Thesis Submitted to the Graduate School
In Partial Fulfillment of the Requirements
for the degree of
Master of Science

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INTOLERANCE OF UNCERTAINTY, WORRY, AND PROBLEM-SOLVING:
IMPLICATIONS FOR GENERALIZED ANXIETY DISORDER

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INTOLERANCE OF UNCERTAINTY, WORRY, AND PROBLEM-SOLVING: IMPLICATIONS FOR GENERALIZED ANXIETY DISORDER

An abstract of the Thesis by
Melissa Patrick

This study was conducted to examine the correlations between Generalized Anxiety Disorder (GAD), worry, intolerance of uncertainty (IU), and problem-solving. The Generalized Anxiety Disorder Questionnaire for DSM-IV (GADQ-IV), the Penn State Worry Questionnaire (PSWQ), the Intolerance of Uncertainty Scale (IUS), and the Problem-Solving Inventory (PSI) were used to assess the relationship between GAD, worry, IU, and problem-solving. While the GADQ-IV, PSWQ, and the IUS assessed generalized anxiety, worry, and intolerance of uncertainty as single constructs, the PSI assessed problem-solving in terms of problem-solving confidence, approach avoidance style, and personal control. Data of 86 students in general psychology classes at Pittsburg State University was used for the study. Results indicated a significant positive association between anxiety and IU; a significant positive association between worry and IU; and a negative correlation between problem-solving confidence and intolerance of uncertainty. No correlations were found between IU and approach-avoidance style during problem-solving or between IU and personal control during problem-solving. These results indicate a high probability that high levels of IU are related to high levels of anxiety and worry, and low problem-solving confidence. It is hoped that the findings of this study will encourage improved treatment for GAD that will include a decreased intolerance of uncertainty and increased problem-solving confidence.

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CHAPTER I

INTRODUCTION

Purpose of the Study

Intolerance of uncertainty (IU) is a dispositional characteristic reflecting negative beliefs pertaining to an uncertain world and the self (Koerner & Dugas, 2008); as well an individual's ability to endure uncertain situations and events (Koerner, 2014). In recent years, IU has been found to be linked to excessive worry; a characteristic of generalized anxiety disorder (GAD). High levels of IU has been found to be associated with other psychological disorders; however, high levels of IU are mostly reported by individuals with GAD (Koerner & Dugas, 2008). As a result, a current model of GAD has focused on defining IU as a construct for the development and maintenance of this disorder (Dugas, Gagnon, Ladouceur, & Freeston, 1998). High levels of worry in individuals have also been found to affect an individual's ability to problem-solve (Parkinson & Creswell, 2011) and individuals with high levels of IU have also been found to have more negative experiences when problem-solving (Dugas et al., 2004). It has also been suggested that high levels of IU can reduce an individual's confidence and perceived control (Parkinson & Creswell, 2011).

Generalized Anxiety Disorder is characterized by excessive and uncontrollable worry over multiple issues. In general, worry is a common and sometimes helpful human activity; however, worry can also be an unwanted and debilitating symptom that can lead to psychological dysfunction (Walkenhorst & Crowe, 2009). Worry experienced by individuals with GAD is significant and can lead to distress and impairment in many areas. According to the *Diagnostic and Statistical Manual of Mental Disorders – fifth edition*, excessive and uncontrollable worry is a core feature of GAD (DSM-5; American Psychiatric Association, 2013). Compared to other psychological disorders, worry is more commonly related to GAD (Walkenhorst & Crowe, 2009). GAD is a constantly changing construct due to the ongoing nosology changes of each edition of the DSM-5 (Kessler, Walters, & Wittchen, 2004). GAD is characterized by the inability to manage intense emotional reactions towards negative stimuli (McLaughlin et al., 2007). While there is no definite explanation for the development and maintenance of GAD, several current theoretical models have been proposed (Kessler, Walters, & Wittchen, 2004).

In an effort to understand how GAD is developed and maintained, theoretical models have been proposed throughout the decades. Currently, there are five generally accepted models of GAD, one of which includes the intolerance of uncertainty model. This model suggests that intolerance of uncertainty (IU), a negative response to uncertain or ambiguous stimuli or events, is a cognitive vulnerability for the development and maintenance of GAD. IU has been found to relate to worry, which is a key factor for GAD. Studies looking at worry and IU have also found relationships between these two

factors and stress, fear, avoidance, and problem-solving. Individuals with high levels of IU have a tendency to interpret aspects of problem-solving as threatening; this can lead to poor problem-solving abilities. Moreover, worry has been found to affect working memory, problem-solving confidence and perceived control.

While there has been a large body of research that has investigated the relationship between anxiety, worry, and IU, few studies have looked at the relationship between the constructs of anxiety and problem-solving. It is hoped that the findings of this study add to the depth of research that already exists on the relationship between anxiety, worry, and IU. It is also hoped that the findings of this study add to the growing research on the relationship between problem-solving and anxiety, worry, and IU.

CHAPTER II

REVIEW OF THE LITERATURE

Models of Generalized Anxiety Disorder

The current models of GAD suggest there are many potential and complex pathways which incorporate genetic, temperamental, and environmental factors which contribute to the development and maintenance of GAD, as well as the treatment of GAD (Kessler et al., 2004 & Behar, DiMarco, Hekler, Mohlman, & Staples, 2009). These factors are incorporated into five current models: The Avoidance Model, the Metacognitive Model, the Emotion Dysregulation Model, the Acceptance-Based Model, and the Intolerance of Uncertainty Model (Behar et al., 2009).

The Avoidance Model was developed by Borkovec et al., and is based on Mowrer's two-stage theory of fear which was developed in the 1940s; and also on work by Foa and Kozak in the 1980s on emotional processing (Behar et al., 2009). Mowrer's two-stage theory of fear suggests that fear which has been classically conditioned is then followed by operationally conditioned avoidance of fear cues. Lack of unreinforced exposure to the feared condition results in fear maintenance. Borkovec's research on

worry suggests that perceived threat and avoidant behavior are the mechanisms for anxiety (Borkovec, Alcaine, & Behar, 2004). The Avoidance Model suggests worry to be a verbal and thought based activity that activates emotional and somatic processes that lead to fear (Behar et al., 2009). Psychophysiological research has shown both GAD and worry to be associated with increased activation of the left frontal cortical region of the brain, providing evidence for the association between worry and anxious self-talk (Borkovec et al., 2004). Moreover, research suggests that a decrease in imagery and an increase in thinking occur with increased worry; this is thought to represent avoidance of imaginal processes. Therefore, avoidance of imagery is thought to be a mechanism that allows an individual to avoid somatic or emotional experiences (Walkenhorst & Crowe, 2009).

Additionally, the Avoidance Model suggests that worry helps an individual anticipate future outcomes, detect threat, and create solutions to a problem. Solutions to threat removal may come in the form of behavioral avoidance or minimization of negative events. If threat cannot be physically removed or minimized, worry is utilized as a cognitive attempt to solve problems and temporal avoidance is used to prevent negative future events from occurring (Borkovec et al., 2004). Worry can be seen as being helpful during problem-solving; a motivation for performance; and helpful in avoiding negative outcomes. Worry promotes an ineffective attempt at problem-solving and removal of perceived threats. At the same time, the individual learns to avoid emotional and somatic experiences that occur during these threatening events. Avoidance leads to negative reinforcement of worry; while at the same time, worry can become positively reinforced

when avoidance leads an individual to believe that negative events did not occur because he or she avoided the event. The Avoidance Model also suggests that development of GAD may be due to past traumatic events and insecure attachment styles. It has been proposed that insecure attachment can lead to a belief that there is danger in the world, which can lead to poor coping skills when faced with uncertain situations. The maintenance of GAD is thought to be due to poor interpersonal skills (Behar et al., 2009).

More recently Newman et al. (2014) proposed the Contrast Avoidance model. This model is used to describe worry maintenance of emotional dysregulation. This theory proposes that individuals use worry to maintain a state of vigilance and anxiety in order to prevent increases in negative emotions. Due to the attempts to prevent negative emotions, the individual may see chronic worry as helping to control emotions and prepare for future negative events. This model is used to explain worry as a defensive move for avoiding emotional experiences associated with stressful life events (Newman, Llera, Erickson, & Przeworski, 2014). Newman et al., found that worry, especially aspects that are emotionally arousing, may be used as an emotional defense mechanism against negative contrasts (2014). Worry can also be perceived as a mechanism for positive contrasts. Worrying about a negative event that does not occur can shift an individual's emotions from negative to positive; this creates a cycle in which chronic worry is negatively reinforced. Maintenance of negative emotions through worry might also be used to prevent future negative contrasts (Newman et al., 2014).

The Metacognitive Model was developed by Wells in the 1990s. Central to this theory are metacognitive appraisals and beliefs which are proposed to contribute to the

development and maintenance of GAD. Metacognitions are made up of cognitive processes, strategies, and knowledge involved in thinking regulation and appraisal. This model emphasizes the nature of worry being made up of catastrophizing thoughts which are sequential and mainly verbal. Worry is also emphasized as a coping strategy and can be distinguished from other negative thoughts. This model suggests that there are two types of worry that individuals with GAD may experience: *Type 1 worry* or verbal worry and *Type 2 worry* or meta-worry. *Type 1 worry* is worry about non-cognitive external and internal events (Wells, 2004). During this type of worry, activation of negative beliefs about worry occurs. Individuals with *Type 1 worry* believe that worry is a useful coping strategy when faced with anxiety-provoking situations (Behar et al., 2009). Threatening internal or external events, which can include information about sensations, cognitions, or emotions, are thought to trigger *Type 1 worry* as a means of coping. *Type 1 worry* remains active until the individual is either distracted from the anxiety-provoking event by another event, or until a more effective coping strategy is found. Moreover, worry can worsen emotional symptoms and can contribute to negative beliefs about worry and coping (Wells, 2004). It is believed that an increase or decrease in anxiety is dependent upon the resolution of the problem (Behar et al., 2009). Ineffective coping strategies often promote reinforcement of the belief that worry is uncontrollable and dangerous, which may then serve as a maintenance function for GAD (Behar et al., 2009). *Type 2 worry* occurs when an individual worries about *Type 1 worry*. This type of worry induces anxiety through over accentuated threat appraisals in which the individual may view worry as uncontrollable or even dangerous (Wells, 2004) and is thought to occur because

of ineffective avoidance strategies the individual performs in order to reduce their anxiety such as reassurance-seeking, checking behaviors, thought suppression, and distraction (Behar et al., 2009). In reality, these coping strategies are ineffective and may further contribute to the maintenance of worry. In addition, nonoccurrence of catastrophic events may be attributed to ineffective strategies such as the ones previously mentioned. Rapidly rising anxiety levels may be viewed as having failed to implement coping strategies. This information can send the individual back into *Type 1 worry* in an attempt to halt the worry process. If the individual is unsuccessful, he or she may experience a continuous cycling from one type of worry to the next (Wells, 2004).

The Emotion Dysregulation Model was developed by Mennin and colleagues in the early 2000s, and is based on emotion theory and the regulation of emotional states (Behar et al., 2009). This theory proposes that individuals with GAD endorse worry as a coping strategy to avoid thinking about emotional topics. The Emotion Dysregulation Model consists of four components which are thought to explain why individuals with GAD avoid emotional experiences (McLaughlin, Mennin, & Farach, 2007). The first component states that intense emotions or emotional hyperarousal is experienced by individuals with GAD. It has been assumed that emotions occur easily and quickly, creating a lower threshold for experiencing emotions. Due to this lower threshold, individuals may express emotions, especially negative emotions, more frequently. The second component states that these individuals have a poor understanding of their emotions compared to individuals without GAD. It has been suggested that these individuals may have deficits in identifying, describing, labeling, clarifying, assessing,

and applying information related to emotions (Behar et al., 2009; Mclaughlin et al., 2007). The third component states that these individuals have a more negative view of their emotions. They may see the consequences of negative, as well as positive emotions, as catastrophic (Mclaughlin et al., 2007). Feedback loops can form when the individual becomes overwhelmed, anxious, and uncomfortable in the face of strong emotions. Additionally, an individual may present with extreme hypervigilance towards threatening information and may increase attention toward or away from negative beliefs (Behar et al., 2009). The final component states that individuals with GAD have poor emotion regulation and management strategies which often results in excessive worry, suppression of emotions, or emotional outbursts which can worsen emotional states. Individuals may also be unable to fully manage or soothe themselves during experiences of negative emotions (Behar et al., 2009; Mclaughlin et al., 2007).

The Emotion Dysregulation Model attempts to understand why individuals with GAD react to certain situations with such intense emotions, and how the individual manages his or her emotions (Mclaughlin et al., 2007). As with the other models of GAD, worry is a main component; in the Emotion Dysregulation Model, worry contributes to the ineffective coping strategies of emotions (Behar et al., 2009). Worry is suggested to be a maladaptive strategy for managing emotions in which the individual controls or suppresses his or her emotions. This model also suggests that worry is bi-directional and is a response to intense or dysregulated emotions. The intensity of emotional reactions can increase and the effective management of intense emotions can decrease. Moreover, individuals with GAD may attempt to control or avoid reactions to intense emotions

(McLaughlin et al., 2007).

The Acceptance-Based Model was developed by Roemer and Orsillo in the early 2000s and is based on a commitment to clarify and further the development of cognitive behavioral therapy (CBT) for GAD. Additionally, this model overlaps with concepts from previously developed models (Treanor, Erisman, Salters-Pedneault, Roemer, & Orsillo, 2011) and involves four components: internal experiences, problematic relationship with internal experiences, experiential avoidance, and behavioral restriction (Behar et al., 2009). The first component involves the tendency to focus on threatening information (Treanor et al., 2011). In response to this information, negative reactions to internal experiences can occur; reactions may involve negative thoughts such as viewing emotional responses as extreme or undesirable. In addition, reactions may involve meta-emotions such as fear of fear. These responses can also lead to difficulties in monitoring, accepting, and interpreting emotions. The next component, problematic relationships with internal experiences, can consist of thoughts, feelings, or physiological reactions. Additionally, negative reactions to internal experiences can be perceived as a defining characteristic (Behar et al., 2009). The third component involves actively avoiding negative internal experiences perceived as threatening. The individual may worry about future events or more minor experiences in order to avoid more serious concerns. This type of avoidance can affect more than one area of an individual's life in an attempt to avoid unwanted experiences (Treanor et al., 2011). Finally, behavioral restriction includes reduced time spent engaging in valued and meaningful activities. Behavioral restriction may also reduce awareness of the present moment (Behar et al., 2009).

Additionally, this model proposes that individuals with GAD experience negative reactions to internal experiences and become motivated to avoid these experiences by actively engaging in worry processes. This cycle is continued through increased distress which triggers more negative internal experiences (Behar et al., 2009). The Acceptance-Based Model has also been used to develop Acceptance-Based Behavioral Therapy (ABBT). Studies have shown ABBT to be effective for addressing some of the components mentioned in the current models of GAD such as avoidance, intolerance of uncertainty, emotion regulation, mindfulness, and perceived control (Treanor et al., 2011).

Finally, the Intolerance of Uncertainty Model was developed by Dugas and colleagues in the 1990s. This model suggests that individuals view uncertain or ambiguous situations as stressful and intolerable, and respond to such situations with chronic worry. The IU model is one of the more popular models used to explain GAD due to a significant relationship between IU and worry. Studies have found IU to be highly related to worry; individuals who have experienced increased levels of IU are more likely to engage in worry (Behar et al., 2009). IU can be distinguished from worry by how IU and worry relate to other constructs. IU can be described as a filter an individual uses to view his or her environment, whereas worry can be described as a cognitive reaction to the occurrence of possible negative events. In addition, research by Dugas et al. (2004) found IU to precede worry. Studies have also found IU to be highly related to GAD symptoms. Compared with other anxiety disorders, IU has been found to be specific to GAD (Dugas et al., 2004). Moreover, IU has been proposed to be a

cognitive vulnerability for the development of GAD (Behar et al., 2009). In addition, individuals with high levels of IU often believe worry to be a helpful coping strategy and as protection against negative emotions, or as a preventive measure against negative outcomes. They may also view worry as a positive trait such as being conscientious and responsible. Studies have found IU to contribute to and maintain positive beliefs about worry (Dugas et al., 2004). Even though research has found a connection between IU and worry, there are many unanswered questions as to how IU can affect an individual's life.

Intolerance of Uncertainty

Uncertainty is experienced by all humans; however, the resolution of uncertainty can be more difficult for some individuals. For example, beliefs about the uncertainty of future events can be intolerable for some individuals due to his or her perception of an event as negative, stressful, or aversive (Grupe & Nitschke, 2011). An individual with a high level of IU is more likely to perceive future outcomes as threatening and unacceptable (Carleton, 2012). Furthermore, Dugas, Laugesen, & Bukowski (2012) found that individuals with high levels of IU are more likely to view ambiguous, rather than negative future events or stimuli as more threatening. These ambiguous events also have the tendency to produce excessive worry in individuals with high levels of IU (Dugas, et al., 2012). Other research has found that these reactions tend to be not only on a cognitive level, but on an emotional and behavioral one as well (Boswell, Thompson-Hollands, Farchione, & Barlow, 2013).

Before the concept of IU was developed, the construct of intolerance of ambiguity

(IA) was used to explain both the interpretation of ambiguous situations as threatening, and the tendency to respond to ambiguous stimuli with discomfort and avoidance. Birrell, Meares, Wilkinson, & Freeston (2011) have shown an evolution of research regarding worry, over time. In the 1980s, research focusing on worry processes found that individuals who worry had the tendency to interpret ambiguous events as threatening and were slower when making decisions in ambiguous situations. In the early 1990s, research found an association between ambiguity and uncertainty that lead to worry (Birrell, Meares, Wilkinson, & Freeston, 2011). Dugas, Letarte, Rhéaume, Freeston, and Ladouceur (1995) found a relationship between worry and problem solving. When participants were given categorization tasks, those with higher levels of worry were slower to respond when the stimuli were ambiguous and the correct response was unclear. These studies suggested that worriers presented with ambiguous, real-life problems may be affected by elevated evidence requirements (Dugas et al., 1995). Based on these findings, a model of GAD was proposed and IU was included as one of the constructs of the development and maintenance of GAD (Dugas, Gagnon, Ladouceur, & Freeston, 1998).

Studies carried out since the original development of the IU model of GAD have focused on defining IU as a construct for GAD. These studies found IU to be highly related to worry (Koerner & Dugas, 2008), which is a cognitive strategy used to control unknown experiences (Dugas, Gagnon, Ladouceur, & Freeston, 1998). An investigation by Birrell, Meares, Wilkinson, & Freeston (2011) found that as a participant's level of IU increased, worry also increased. The results of this study proposed that IU may be a

vulnerability factor for clinical worry (Birrell et al., 2011). Worry has been suggested to be used as a coping strategy in which it aids an individual in reducing distress in uncertain situations, while increasing perceived control over the future outcome of a situation. When a non-catastrophic event occurs, the individual falsely attributes worry as preventing a catastrophic event. When this occurs, worry processes and uncertainty of future outcomes are strengthened (Boswell, Thompson-Hollands, Farchione, & Barlow, 2013). Moreover, there is evidence to support specific brain region activity in response to uncertainty cues. Research looking at how IU relates to the areas of the brain found the anterior cingulate cortex (ACC) and the amygdala to be associated with the uncertainty (Grupe & Nitschke, 2011; Fergus, Bardeen, & Wu, 2013). The ACC has been found to activate when individuals anticipate aversive stimuli and also when regulating negative emotions. Positive association has been found between activation of the ACC in response to uncertain cues (Grupe & Nitschke, 2011). When presented with uncertainty cues, participant's experienced a significant increase in amygdala activity. IU was also found to be related to the prefrontal cortex. In response to uncertainty cues, activation in this area of the brain was found to decrease (Fergus, Bardeen, & Wu, 2013).

Besides having an association with worry, research has also shown IU to be associated with increased stress, fear, and avoidance (Dugas, Laugesen, & Bukowski, 2012). Research looking at IU and stress in relation to the development and maintenance of anxiety by Zlomke & Jeter (2014) found a relationship between IU and life events as an influencing factor for experiencing anxiety. The researchers found that IU also moderated the relationship between daily hassles and worry. This study concluded that

IU interacts with life events to influence anxiety and that individuals who have high levels of IU are more likely to demonstrate an inhibited response to daily hassles than individuals with low levels of IU (Zlomke & Jeter, 2014). It has also been suggested that worry leads to IU through reevaluation of danger in uncertain situations and a greater likelihood of the development of intolerance of uncertainty over time. A study by Dugas, Laugesen, & Bukowski (2012) looked at the link between IU, fear, and avoidance behaviors. Using an adolescent sample, the researchers found levels of anxiety to be consistent with threat interpretations of ambiguous information and avoidance behaviors. Previous studies have also found these biases and behaviors in adult populations (Dugas, Laugesen, & Bukowski, 2012).

Attentional bias may also act in such a way as to minimize negative events. Attentional processes that may be associated with IU and uncertainty-related attentional bias include facilitated engagement and disengagement difficulty. Facilitated engagement is the ability to detect threat stimuli more quickly than non-threat stimuli; while facilitated disengagement is the inability to disengage attention from threat stimuli as opposed to non-threat stimuli. Fergus, Bardeen, & Wu (2013) found that facilitated engagement toward uncertainty stimuli and IU are positively correlated; individuals with high levels of IU were able to identify uncertain stimuli at a faster rate when compared to neutral stimuli. Difficulty disengaging from uncertain stimuli was not found to be related to IU. These findings suggest that facilitated engagement is a specific attentional bias associated with IU (Fergus, Bardeen, & Wu, 2013). Research investigating biased expectancies and aversion responses to uncertainty found that when participants viewed

aversive pictures in an uncertain context, participants reported a higher negative impact.

Furthermore, this study suggests that when uncertainty is associated with aversive events, fear-related cues develop (Grupe & Nitschke, 2011). A study by Nelson & Shankman (2011), found a relationship between IU and startle response to uncertain threat. IU was found to be associated with startle magnitude when participants received a shock in an uncertain threat condition, but was not associated with startle magnitude during a predictable threat condition. They also found individual differences in IU to be negatively correlated with startle magnitude during the time between shocks during the uncertain threat condition, but not during the time between shocks in either the no shock or shock at any time conditions. IU may not influence threat response; rather, it could be specific to threatening situations which are uncertain. Furthermore, individuals high in IU were more likely to be inhibited when responding to aversive stimuli (Nelson & Shankman, 2011).

Recently, it has been suggested that IU is too broadly defined with little specificity (Rosen, Ivanova, & Knäuper, 2014). To help answer this concern, research revisited the measure of intolerance of ambiguity (IA) to determine if there was distinction between the constructs of IA and IU. Birrell, Meares, Wilkinson, & Freeston (2011) reviewed literature on previous studies and concluded that IA and IU are distinct, but overlapping constructs. It was determined that IA is the interpretation of a current situation while IU refers to the potentiality for negative future events to occur (Birrell, Meares, Wilkinson, & Freeston, 2011). Recent research has attempted to further define the distinction between IA and IU. A study by Rosen, Ivanova, & Knäuper (2014),

looked at the similarities and differences of IU, IA, uncertainty orientation (UO), and the need for cognitive closure (NCC). They found IU and IA to be similar in that uncertainty leads to cognitive, emotional, and behavioral consequences; however, they differ in that IU focuses on future events and IA on the present. IU was found to differ from both UO and NCC. IU focuses on the psychological effects of uncertainty while both UO and NCC focus on a desire, or motivation, to approach or avoid uncertainty. Further study of the distinction between these constructs would improve current psychometric measures and treatments (Rosen et al., 2014). Current cognitive-behavioral treatments based on the IU model of GAD has been developed, tested, and found to be effective in adult populations; however, few studies have examined the effectiveness of this treatment with children and adolescents. Treatment results in adult populations have shown that changes in IU can lead to changes in worry and monitoring behavior (Dugas, Laugesen, & Bukowski, 2012).

Finally, only recently has there been research on the construct of IU in relation to other psychological disorders. Earlier studies suggested that IU was a cognitive vulnerability for GAD only, with little relation to other disorders. Since IU has been found to be related to worry, it has been suggested that the construct is unique to the manifestation and maintenance of GAD and research has supported covariation of IU and worry and GAD. Moreover, IU levels have even been found to be distinguishable in individuals with mild to severe GAD. Even though high levels of IU are mostly reported by individuals with GAD (Koerner & Dugas, 2008), IU has been found to be present in other emotional disorders (Gentes & Ruscio, 2011). IU has been found in individuals

with obsessive compulsive disorder (OCD), panic disorder, social anxiety, health anxiety, and depression. With this in mind, IU should be considered a broad dispositional risk factor that contributes to the development and maintenance of a number of psychological disorders (Carleton, 2012). Studies have found specific components of IU to be associated with symptoms related to other psychological disorders. For instance, prospective and inhibitory anxiety are two factors that have been identified to exist within IU, and have since been relabeled as prospective IU (P-IU) and inhibitory IU (I-IU). P-IU is related to fear and anticipation of uncertainty and has been found to be associated with both GAD and OCD symptoms. It was also found to be a unique predictor of excessive worry; this is consistent with previous research which suggests that excessive worry leads to a fear of future uncertainty. I-IU is also related to the inability to take action in uncertain situations and has been found to be associated with social anxiety, panic disorder, agoraphobia, and depression (Mahoney & McEnvoy, 2012).

Since IU has been identified as a construct of not only GAD, but OCD as well, research on the relationship between IU and OCD has received more attention and is mostly due to the similarity between obsessions and compulsions in OCD and worry in GAD. Obsessions and compulsions reduce uncertain experiences while increasing a perception of control (Boswell, Thompson-Hollands, Farchione, & Barlow, 2013). IU has also been found to be associated with depression, particularly rumination. Empirically, the initiation and maintenance of rumination has been linked to uncertainty. It has been suggested that individuals ruminate to minimize ambiguity and lessen feelings of uncertainty (Gentes & Ruscio, 2011). A study by Liao & Wei (2011) found high levels of

rumination to be both a moderator and a mediator between IU and depression symptoms in women. This research suggests that rumination moderates or mediates IU and depression due to negatively biased thoughts, pessimistic thoughts, and predictions about uncertain events. These individuals may also be quick to access negative memories of uncertainty in situations. Low rumination was found to be a buffer for IU and symptoms of depression; this is thought to be due to the ability to actively manage uncertainty-related distress through the use of coping strategies and social support. Lastly, rumination was found to be a moderator for anxiety symptoms due to rumination increasing distress associated with uncertainty (Liao & Wei, 2011).

Components of Problem-Solving

Five distinct components of problem-solving have been identified and include problem orientation, problem definition and goal formulation, generation of alternative solutions, decision making, and solution implementation. Problem orientation is a response by an individual when faced with a problem, and the remaining four components refer to behavioral skills (D’Zurilla & Goldfried, 1971). Studies suggest that pathological worry is related to poor problem-solving abilities, not deficits in problem-solving (Luhmann et al., 2011). This means that high worriers have the ability to generate solutions to a problem but lack problem-solving abilities while implementing solutions (Davey, Jubb, & Cameron, 1996). In a research study on worry and problem-solving confidence, Davey et al. (1996), wanted to know if manipulating problem-solving confidence would have an influence on worry. Participants were asked to provide

solutions for scenarios and were given feedback on their attempts at problem-solving. The researchers used a catastrophizing interview technique to measure the depth of the participants' worry and also the length of time spent worrying. Forty undergraduate students from different Universities were randomly selected into one of four groups (reduced problem-solving confidence and no mood change, increased problem-solving confidence and no mood change, reduced problem-solving confidence and induced positive mood, increased problem-solving confidence and induced positive mood). It was hypothesized that reducing problem-solving confidence would result in a negative mood. A control group was used in which the participants' problem-solving confidence was also reduced but mood was positively induced (Davey et al., 1996).

In the study by Davey et al. (1996), the participants completed two scales which measured state anxiety and depression. Then they were given four real-life examples taken from the Means-Ends Problem-Solving Test and given false feedback about how they performed on this task. Participants in the reduced problem-solving groups were given lower scores and participants in the increased problem-solving groups were given higher scores. Positive mood was induced by telling the participants that the incentive they would receive upon completion of the study would be increased. Next, the participants completed the anxiety and depression scales again. They then completed scales measuring problem-solving confidence, control, and approach-avoidance style. Lastly, the participants listed three current worries; the first worry listed was used in a catastrophizing interview. This interview measured how badly they perceived the potential outcome to be and how many catastrophizing steps the participant stated. The

results of this study suggest that problem-solving confidence is related to worry. Participants whose problem-solving was reduced showed lower problem-solving confidence, while participants whose problem-solving was induced showed increased problem-solving confidence. Mood manipulation had no effect on mood change. The only significant effect on mood occurred when problem-solving confidence was reduced; these participants showed higher levels of anxiety. Moreover, problem-solving confidence may lead to catastrophic worrying as suggested by the results of this study. Participants in the confidence-reducing groups came up with more catastrophizing steps. These results are conclusive with earlier studies in which low levels of problem-solving confidence affect an individual's ability to problem-solve and also increase worry. Some of the limitations of this study include no differentiation between cognitive and response elements of anxiety and depression. Future studies should include multiple measurements of mood to identify the elements of catastrophic worry (Davey et al., 1996).

Worry and Problem-Solving

Studies have found a relationship between anxiety, worry, and problem-solving (Dugas et al., 1995). It has been suggested that worry maintains high levels of anxiety and excessive worry has been found to lead to attention dysregulation in individuals with GAD (Koerner, 2014). Attentional dysregulation can be manifested in ineffective problem-solving. High levels of worry in individuals can not only affect an individual's ability to problem-solve, but it can also affect confidence and perceived control

(Parkinson & Creswell, 2011). Parkinson and Creswell (2011), compared problem-solving skills and beliefs in children with both high and low levels of worry. Participants ranged from 8-11 years and consisted of 240 children who were placed in either a high worry group or a low worry group. Measures were given to assess worry, anxiety, and problem-solving. These measures included the Penn State Worry Questionnaire for Children (PSWQ-C), the Revised Children's Manifest Anxiety Scale (RCMAS), the Alternative Solutions Test (AST), and the Problem-Solving Inventory (PSI) adapted for children. The PSWQ-C was used to measure the extent and controllability of worry. The RCMAS was used to assess trait anxiety in children. The AST was used to measure the ability to generate solutions to hypothetical problems that are age appropriate. It also measures the effectiveness and level of planning solutions. Lastly, the PSI adapted for children assessed perceived problem-solving ability and style by measuring problem-solving confidence, approach-avoidance style, and perceived control. This study found that children who were high worriers tended to have negative beliefs about problem-solving. These beliefs manifested in low confidence and low perceived control when solving problems. The participants did not show problem-solving skill deficits in generating solutions, planning to solve problems, and completing solutions. Controls for anxiety suggest an association between worry and problem-solving confidence. High levels of worry were maintained through negative beliefs about problems and beliefs about problem-solving abilities (Parkinson & Creswell, 2011).

Other studies have found that worry has an effect on the performance of verbal working memory tasks. Efficiency on working memory tasks is thought to be reduced by

the effect that worry has on specific areas of the brain, including the central executive and the phonological loop. Research by Eysenck suggests a Processing Efficiency Theory of anxiety, which proposes that worry affects the working memory system through cognitive reduction; however, worry has also been found to function as a motivator. Efforts to perform anxious tasks may be enhanced as a way of compensating for cognitive reduction. While worry may motivate an individual to perform effectively, reaction time while problem-solving may be reduced. The limited capacity of working memory may be further affected by worry and the disruption of effective problem-solving (Walkenhorst & Crowe, 2009).

Individuals who worry also have a tendency to identify problems and any potential dangers by repeating the initial steps of a problem. Several studies have found that individuals who worry tend to be slower at solving problems when tasks involve ambiguous stimuli and unclear correct responses. These individuals tend to identify problems and potential dangers by repeating the initial steps of a problem. Furthermore, these studies have found that when individuals are faced with real-life concerns, regardless of whether they are ambiguous or not, individuals are usually slowed down by elevated evidence requirements; an individual prefers to gather more information before solving problems in order to be successful. Studies suggest that elevated evidence requirements may be related to IU (Dugas et al., 1995) since individuals with high IU may have a desire for requiring more information in order to reduce uncertainty and increase judgement accuracy (Luhmann et al., 2011).

Worriers also have a more difficult time finding and applying solutions to

problems. In addition, worriers tend to have more negative thoughts when problem-solving. This suggests a lack of confidence (Dugas et al., 1995). Individuals high in worry tend to have low perceived control over the process of problem-solving (Parkinson & Creswell, 2011; Davey et al., 1996). High worriers may also use coping strategies such as avoidance during the process of problem-solving. Avoidance has been found to be linked to IU and can lead to a decline in problem-solving performance (Davey et al., 1996). In addition, worry associated with high IU can lead to behavioral impairments called emotion-driven behaviors. These behaviors attempt to reduce distress by reducing uncertainty about negative future outcomes. These behaviors can be reinforcing in the short-term but are usually maladaptive in that they can maintain anxiety in the long-term (Luhmann et al., 2011). IU has been found to lead to poor problem orientation and vice versa. It is suggested that increased perceptions of uncertainty can lead to threat appraisal, low self-efficacy expectations during problem-solving, and negative outcome expectancies during problem-solving (Dugas, 1997). While pathological worry has been associated with ineffective problem-solving, non-pathological worry has been suggested to be associated with an improvement of analysis and definition of a problem (Stöber, Tepperwien, & Staak, 2000), and a cognitive style to seek out information (Davey et al., 1996).

Research on anxiety and problem-solving by Dugas et al. (1995), suggest that high worriers may be unable to perform under elevated evidence requirements. When an individual experiences elevated and intense fears of failing while performing a task, he or she may be hesitant to perform similar future tasks due to the fear of making a mistake. In

one of the earlier studies on problem-solving and worry, Dugas et al. (1995) wanted to know what the relationship between worry and problem-solving was. They hypothesized that worry and problem-solving would be negatively related. They also hypothesized that cognitive and affective factors, rather than behavioral deficits, would be more closely associated with limited problem-solving abilities. They used a sample of 122 college students who were registered in psychology courses. Worry self-measures were given: the Worry Domains Questionnaire (WDQ) and the Penn State Worry Questionnaire (PSWQ). The WDQ was used to measure worry themes in adults. Themes included relationships, lack of confidence, aimless future, work incompetence, financial, and physical threat. The PSWQ assesses a tendency to worry that is trait related. Both of these measures were translated into French and a pilot test was conducted. The participants were also given problem-solving measures: the Social Problem-Solving Inventory (SPSI) and the Problem-Solving Inventory (PSI). The SPSI measures social problem-solving ability such as problem orientation and problem-solving skills. The PSI measures three problem-solving constructs which are problem-solving confidence, approach-avoidance style, and personal control. Finally, the participants were given assessments to measure their mood state: the Beck Anxiety Inventory (BAI) and the Beck Depression Inventory (BDI). The BAI measures cognitive, affective, and somatic symptoms related to anxiety and the BDI measures symptoms related to depression (Dugas et al., 1995).

In the study by Dugas et al. (1995), assessments were given at 2 different periods in time. During the first administration, the participants were given the WDQ, PSWQ,

and SPSI at the beginning of psychology classes. Administration and completion took approximately 30 minutes. The second administration was given one month later. The participants completed the WDQ, PSWQ, SPSI, PSI, BAI, and BDI. Following the second administration, the researchers gave a short lecture on the study's procedure and goals. The results of this study found a positive relationship between poor problem-solving abilities and worry. They found that these poor abilities are most highly associated with problem orientation, or the attitude an individual has toward a problem, which occurs during the first stages of problem-solving. A lack of problem-solving skills was not found to be associated with worry. Even though the initial perception of a problem is associated with poor problem-solving, this does not mean that all problem-solving phases are unaffected. This initial perception can have an effect on attempts to operationally define a problem, generate solutions, making decisions, and utilize a plan of action. In addition, the results suggest that problem-solving orientation is related to excessive worry. With the sample used in this study, 15% scored higher than 60 on the PSWQ. The results of this study suggest that problem-solving training (PST) may be a useful strategy to include in treatment of generalized anxiety disorder (GAD). Elements of PST should focus on changing the perception of problems, increase motivation to problem solve, and increase perceived control in problematic situations (Dugas et al., 1995).

Worry and Problem-Solving Confidence

Increases in worry and lack of confidence during problem-solving tasks have also

been linked to high levels of avoidance behaviors. During tasks worriers may attempt to utilize more avoidance coping behaviors as an attempt to decrease confrontation of uncertain problems. This avoidance strategy often results in poor performance (Dugas et al., 1995). A study by Luhmann and Hajcak (2011) used decision tasks to examine how reward-based decision making was associated with worry and IU. They found high IU to be associated with avoidance when participants were left waiting in a state of uncertainty. The study also found participants high in IU preferred immediate, less valuable rewards to more valuable, delayed rewards. This study suggests these behaviors in decision making are maintained through negative reinforcement; participants' preference for immediate rewards could be due to the desire to reduce, or eliminate, unpleasant emotions that occur with waiting in a state of uncertainty. In another study, Parkinson and Creswell (2011) found high worry to be associated with poor problem-solving confidence and low perceived problem-solving control; however, problem-solving skills when deciding upon solutions, and effectively planning solutions, was not associated with worry. Moreover, levels of confidence during problem-solving, when reduced, can increase worry that is catastrophic in nature (Parkinson & Creswell, 2011).

Stöber et al. (2000), wanted to know how worriers address problem analysis. The researchers hypothesized that there would be an inverse relationship between worry and problem elaboration. Two studies were conducted. In the first study, participants consisted of 60 University students. Measures used in this study included the Worry Domains Questionnaire (WDQ) which assesses non-pathological worry. Based on answers from the WDQ, a problem elaboration chart was used in which six problems

were presented; one at a time. The problems consisted of two no-worry topics, two low-worry topics, and two high-worry topics. The participants were asked to write three antecedents for the problem and three negative consequences of the problem. These elaborations were rated for concreteness. A five-point scale was used to assess concreteness of an elaboration. The scale ranged from Abstract (1) to Concrete (5). Raters were blind to the experiment and aggregates were used across antecedents and consequences, raters, and topics. The results showed high reliability (Stöber et al., 2000).

In the second study, participants also consisted of 60 University students. This study also used the worry-topic selection from the first study and included the same six worry topics translated from the WDQ. A catastrophizing interview was also used and modified from Vasey and Borkovec's procedure. A one-step questioning procedure was used to replace the original two-step questioning procedure and asked the participants what he or she worried about the most in a given situation. The participants wrote down answers and the procedure was repeated until the participants could not think of any further answers, they repeated answers, or refused to continue giving answers. All steps of the questioning were rated for concreteness by blind raters and aggregated across steps, raters, and topics at each worry level. The reliability for this study was also high (Stöber et al., 2000).

Both of these current studies replicated and extended previous findings on the relationship between worry and problem elaboration. Both studies found worry to be related to problem elaborations in which participants expressed reduced concreteness. Participants who showed even low worry about a topic showed less concrete elaborations

than non-worriers. In addition, topics which were more worrisome produced the least concrete elaborations. Limitations to this study indicate a causal direction between worry and how concrete an open question was since the data are correlational (Stöber et al., 2000).

Intolerance of Uncertainty and Problem-Solving

IU has been proposed to be the mechanism which sets off a chain of worry, negative problem orientation, and avoidance in individuals with GAD. Studies on problem-solving and IU have found that individuals with high levels of IU tend to have more negative experiences when problem-solving. Negative problem orientation, which is awareness and evaluation of problems and the assessment of problem-solving skills, along with avoidance, has been found to lead to and maintain worry (Behar et al., 2009; Dugas et al., 2004). A negative problem orientation can influence problem appraisal and problem-solving abilities. Individuals with high levels of IU may see only uncertain parts of a problem and interpret these parts as threatening (Dugas et al., 2004). Poor problem-solving has been suggested to be due to lack of confidence which can also lead to the perception of certain problems being threatening to an individual. Additionally, an individual with high levels of IU may become easily frustrated when faced with a problem. Frustration can prompt the development of pessimistic feelings about efforts to problem-solve (Behar et al., 2009). IU has also been suggested to contribute to cognitive avoidance when mental images are perceived as threatening. An individual is thought to avoid mental images by blocking thoughts about negative problem-solving outcomes.

Worry is then reinforced through anticipation of negative outcomes while the individual simultaneously avoids threatening images (Dugas et al., 2004).

Poor abilities for problem-solving have been linked to an attentional bias for threat, or IU (Fergus, Bardeen, & Wu, 2013). Dugas et al. (1995) tested the relationship between worry and problem-solving and found that worry may be related to problem orientation, which is a reaction that encompasses cognitions, behaviors, and emotions to situations which are seen as problematic. Research on worry in both adults and adolescents has reported similar findings of a relationship between negative problem-solving orientation and worry. In addition, findings on childhood anxiety have reported that anxious children have fewer problem-solving thoughts and are less successful at producing problem-solving behaviors (Parkinson & Creswell, 2011).

Individuals high on IU may perceive problems as threatening which can then lead to a more negative problem-solving orientation (Zlomke & Jeter, 2014) and have a tendency to reduce uncertainty by taking longer to make judgements in situations that are ambiguous (Luhmann & Hajcak, 2011). Ultimately, this negative orientation can increase and maintain worry (Zlomke & Jeter, 2014). Dugas et al. (1995) did not find a relationship between worry and problem-solving skills that require searching for goal-related solutions, making decisions, and implementing the solutions. This suggests that behavioral problem-solving skills may be undermined by negative beliefs, appraisals, and expectations; however, individuals high in worry and IU tend to be slower at categorizing ambiguous and uncertain tasks when compared to individuals low in worry and IU (Dugas et al., 1995). Research by Dugas et al. (1995) also found worriers who have both

elevated evidence requirements and high IU related to problem-solving, repeatedly analyze initial steps of the problem-solving process. Problem-solving steps are repeated in order to identify the problem and any potential dangers. Steps are also repeated in an attempt to redefine the problem so the individual can eliminate ambiguous and uncertain elements. Research has found IU and worry to be linked to a desire for gathering more information in order to increase accurate judgements while performing a task. In addition, clinical levels of IU associated with worry have been found to contribute to behavioral impairments through the use of emotional behaviors designed to reduce negative outcomes (Luhmann & Hajcak, 2011).

Research has not only linked poor problem-solving to worry, but to IU as well. Numerous studies have looked at IU associated with the cognitive and affective disturbances related to GAD; however, there has not been much research on how behavioral disturbances are related to IU. Studies that have looked at behavioral disturbances found a relationship between IU and problem orientation (Luhmann et al., 2011). Moreover, ineffective problem-solving has been suggested to include both poor problem-solving confidence and perceived control (Dugas, Freeston, & Ladouceur, 1997). A study by Dugas et al., (1997) looked at the relationship between IU and problem orientation. The researchers hypothesized that IU and worry would not only relate to one another, but to problem orientation as well. They also hypothesized that problem orientation and worry would include IU in the relationship. Participants included 285 University students. Participants were divided into three groups. Measures used included the Penn State Worry Questionnaire (PSWQ) translated into French, the Intolerance of

Uncertainty Scale (IUS), the Social Problem-Solving Inventory – Abridged (SPSI-A), the Beck Anxiety Inventory (BAI), and the Beck Depression Inventory – Abridged (BDI-A). The PSWQ measures trait-like tendencies to worry. The IUS includes items about uncertainty, emotional and behavioral reactions to ambiguous situations, implications of being uncertain, and attempts to control the future. The SPSI-A measures social problem-solving ability; it includes problem orientation and problem-solving skills. The BAI measures intensity of cognitive, affective, and somatic anxiety symptoms. Finally, the BDI-A measures main depressive symptoms. The participants were administered all measures and took approximately 30 min to complete. Participants in the third group were re-administered the questionnaires 5 weeks later (Dugas et al., 1997).

The results of this study found that individuals who worry have no problem-solving skill deficits. They also found that IU in relationship to worry is partially related to emotional problem orientation, and emotional problem orientation in relationship to worry, is partially related to IU. Therefore, IU and problem orientation were found to be highly related to worry and to one another. Future research should include measurement of intolerance, emotional arousal, and uncertainty to test how these factors contribute to worry and poor problem orientation. Dugas et al. (1997) also suggest that causal modeling strategies should be used for investigating how the relationships between these variables mediate the prediction of worry (Dugas et al., 1997).

Problem-Solving and Perceived Control

While anxiety and worry have been suggested to be related to poor problem-

solving abilities, it has also been suggested that problem-solving could be a strategy used to reduce perceived threat and gain control over worry-related events (Frala, Leen-Feldner, Blumenthal, & Barreto, 2010). Perceived control of unpleasant emotional experiences has been found to be a risk factor in anxiety development and maintenance (Gallagher, Naragon-Gainey, & Brown, 2014). According to the triple vulnerabilities model for anxiety disorders, a lack of perceived control is a generalized psychological vulnerability in the development of anxiety disorders. Low perceptions of control have been suggested to contribute to immediate and long-term anxiety (Gallagher, Bentley, & Barlow, 2014). Perception of control is how one views the amount of control over internal emotions and stressful experiences (Gallagher, Naragon-Gainey, & Brown, 2014). Unexpected negative emotions or bodily reactions can increase anxiety levels, suggesting to the individual that these negative experiences are beyond his or her control, and a lack of perceived control ensues (Gallagher, Bentley, & Barlow, 2014). Furthermore, lack of perceived control occurs when individuals do not believe they have the ability to influence or regulate the outcome of internal threats such as emotional reactions, or external threats such as specific events. Lack of control also affects the individual's belief about being able to effectively manage negative events that may be anxiety provoking (Frala et al., 2010).

Frala et al. (2010) agree with early research which suggests that internal or external locus of control and self-efficacy is linked to anxiety; however, these constructs are relatively broad and perceived control has emerged as a more specific risk factor for anxiety. Moreover, low perceived control, relevant to anxious events, has been found to

increases anxiety due to a belief about the inability to influence threats in the environment (Frala et al., 2010). A meta-analysis by Gallagher, Bentley, and Barlow (2014) found perceived control to be associated with anxiety; GAD was found to have the strongest association out of the anxiety disorders. Additionally, a study by Frala et al. (2010) found beliefs about control over anxious events to be negatively related to GAD and worry; they also found the intensity of worry to be negatively associated with perceived control over anxious events. In addition, diminished perceived control has been shown to predict more severe GAD symptoms (Gallagher, Naragon-Gainey, & Brown, 2014). Frala et al. (2010) also found when events perceived as uncontrollable are related to anxiety, worry and GAD symptoms are likely to occur. Research suggests this may be due to the association between anxious events, GAD, and attentional biases for cues related to threat, such as ambiguity and negative events (Frala et al., 2010).

Looking into past research, Gallagher, Naragon-Gainey, & Brown (2014) found perceived control to mediate the relationship between negative early experiences, such as a lack of autonomy in childhood, and anxiety (Gallagher, Naragon-Gainey, & Brown, 2014). These early experiences can determine how differences in perceived control develop within individuals (Frala et al., 2010). Additionally, these experiences early in life can be later influenced by environmental stressors (Gallagher, Naragon-Gainey, & Brown, 2014) and over time, perceived control may become a fixed trait (Gallagher, Bentley, & Barlow, 2014). Increased distress in lack of perceived control, along with fear, could be due to lack of mastery over anxious events and emotions during childhood (Frala et al., 2010). Later in the developmental process, perceived control may moderate

anxiety through behavioral inhibition (Gallagher, Bentley, & Barlow, 2014); changes in perception may also change as beliefs and cognitions become more detailed and advanced with age (Frala et al., 2010). Finally, stressful events interpreted as uncontrollable may biologically influence the presentation of chronic anxiety; the belief that stressful events are uncontrollable may contribute to the maintenance of anxiety and worsening of symptoms (Gallagher, Bentley, & Barlow, 2014).

Conclusion

GAD is a common psychological disorder characterized by excessive and uncontrollable worry. While numerous GAD studies have been conducted, there is not one single model that explains how GAD is developed and maintained. However, current GAD models have addressed some understanding of multiple factors which may contribute to GAD. Many of the factors proposed in the current models are related and overlap and future research is moving towards an integrated model (Riskind, 2005). Riskind (2005) suggests that research should focus on identifying cognitive content that is specific to GAD. This can be done by looking at mechanisms of fear and neutralizing strategies such as danger schemas and threat-appraisal. A better understanding of cognitive, affect, and behavioral avoidance is also necessary. Integrated models should look at bi-directional causal loops and the impact that different contributing factors have on one another. In addition, the impact that interpersonal relationships have on GAD processes such as appraisals, worry, and emotional dysfunction needs to be looked at more closely. It is also suggested that research should find ways to integrate differences

between cognitive processes. Finally, an integrated model should look at evidence from an evolutionary and biopsychological perspective. According to these theories, defensive responses, or emotional cutoff strategies, in response to threat may explain excessive worry or avoidance seen in GAD (Riskind, 2005).

One of the most popular current models of GAD focuses on the construct of intolerance of uncertainty. IU is a relatively new concept and has been most recently defined as a dispositional characteristic pertaining to an individual's belief about the uncertainty of future events and the fear of this uncertainty. Historically, research focusing on worry found an association between ambiguity and uncertainty. The popularity of the IU model may be due to its significant relationship to worry. It is important that future studies continue to measure this relationship since both worry and IU have been associated with GAD more than any other psychological disorder. Studies looking at the association between IU and GAD have found IU to be associated with increased stress, fear, and avoidance. Even with the numerous studies on IU, researchers still believe that IU is too broadly defined and has little specificity. Attempts at determining the distinction between IU and similar constructs have been made; however, research is needed to further this distinction. Continued research looking at constructs of GAD such as IU and worry is needed to help further the development of improved psychometric measures and treatments for individuals with GAD. Cognitive-behavioral therapies that have been developed to target IU in individuals with GAD have proven successful but more research is needed on how these treatments can be applied to other psychological disorders in which an individual has high levels of IU. Even though IU is

most highly associated with GAD, research looking at the relationship between IU and other disorders has found relationships with OCD, panic disorder, social anxiety, health anxiety, and depressive disorders. There is still much to be understood about the construct of IU. Further understanding can only be accomplished with additional research using replication and novel studies.

Another understudied research area is the relationship between problem-solving and GAD. While high levels of IU and worry have been shown to affect an individual's ability to problem-solve, deficits in problem-solving have not been shown to be related to worry. Studies have found more negative experiences during problem-solving to occur in individuals with higher levels of IU. Avoidance is commonly used as a coping strategy by individuals with high levels of IU during the problem-solving process. This strategy has been found to lead to a decline in problem-solving performance. Individuals with high levels of IU also tend to repeat problem-solving steps in order to identify the problem and potential dangers, and to redefine the problem in order to eliminate ambiguous and uncertain elements that may appear during the problem-solving process. Finally, very little is known about the relationship between IU and problem-solving confidence. Problem-solving may be a strategy in itself to help the individual reduce perceived threat and gain control.

Hypotheses

The aim of the present study will measure the relationship between intolerance of uncertainty, problem-solving, worry, and anxiety. Greater understanding of variables

related to IU have implications for conceptualization and treatment of GAD.

Hypothesis 1. There will be a significant positive correlation between level of anxiety and intolerance of uncertainty.

Hypothesis 2. There will be a significant positive correlation between worry and intolerance of uncertainty.

Hypothesis 3. There will be a significant inverse correlation between intolerance of uncertainty and problem-solving confidence.

CHAPTER III

METHODOLOGY

Participants

A sample of 86 undergraduate students from Pittsburg State University signed up to participate in this study. Participants were enrolled in general psychology classes offered on campus; participants received class credit in partial fulfillment of course requirements. Participants consisted of 48 women (55.8%) and 38 men (44.2%) with a mean age of 19.79 years (range = 18-44). The sample was predominately White/Caucasian (68%), with the remaining sample identifying as Latino/Hispanic (7%), Asian (5%), Black/African-American (4%), and American Indian or Alaskan Native (1%). These demographics are reflective of the students enrolled at Pittsburg State University (White= 79%, Hispanic= .05%, Black= .04%, Asian= .01%, American Indian/Alaska Native= .01%, other= 10%).

Measures

Measures used included four questionnaires: the Generalized Anxiety Disorder Questionnaire for DSM-IV (GADQ-IV), the Penn State Worry Questionnaire (PSWQ), The Intolerance of Uncertainty Scale (IUS), and the Problem-Solving Inventory (PSI).

The Generalized Anxiety Disorder Questionnaire for DSM-IV (GADQ-IV) is a nine-item self-report measure that assesses full diagnostic criteria for GAD based on the *DSM-IV* (American Psychiatric Association, 1994). The GADQ-IV is comprised of five yes or no questions that assess for the excessiveness and uncontrollability of worry experienced by the individual. Also included in this measure is a space where participants can list the topics they worry most about. This list of worry topics was not assessed in this study. The GADQ-IV includes a checklist of six GAD related somatic symptoms. Also included in this measure are two questions, on a likert scale from 0 to 8 (0 being *None* and 8 being *Very Severe*), which assess the level of interference and distress from worry and physical symptoms (Rodebaugh, Holoway, & Heimber, 2008). The GADQ-IV has shown good concurrent validity. The GADQ-IV has been found to be highly correlated with the Penn State Worry Questionnaire (PSWQ) at .66. The GADQ-IV has shown good test-retest reliability of .64 over a 2 week period (Newman et al., 2002).

The Penn State Worry Questionnaire (PSWQ) is a 16 item self-report questionnaire that assesses for worry as a trait and is designed to measure different aspects of worry that is clinically significant. More specifically, the PSWQ measures worry over time and in different situations. The intensity, excessiveness, and uncontrollability of the worry experience and process is measured. The questions are

based on a five-item Likert scale ranging from 0 (not at all typical of me) to 5 (very typical of me). The PSWQ is a widely used measure that has demonstrated excellent psychometric properties which includes high internal consistency in clinical and non-clinical samples in the range of .86 -.95. The PSWQ has been found to be significantly correlated with anxiety and depression when measured with the State Trait Anxiety Inventory (STAI) and the Beck Depression Inventory (BDI). For the STAI, correlates have been found to be between .49 and .74 and for the BDI, correlates have been found to be around .36 (van Rijsoort, Emmelkamp, & Vervaeke, 1999). This measure has been shown to have good test-retest reliability of .92 (Meyer, et al., 1990). Changes in symptoms can be successfully tracked when re-administered at 8-10 weeks (Fresco et al., 2003).

The Intolerance of Uncertainty Scale (IUS) is a 27 item self-report measure used to assess intolerance of uncertainty in adults. The IUS has a four factor structure (uncertainty is stressful and upsetting, uncertainty leads to inability to act, uncertain events are negative and should be avoided, and being uncertain about the future is unfair). This measure has demonstrated excellent internal consistency of .94; the items measure the construct of intolerance of uncertainty. This measure has also shown good test-retest reliability of .74, changes can be tracked five weeks after the first administration. Finally, the IUS has good validity. The measure was found to correlate with other measures of worry and anxiety, as well as predictions of worry. Studies have found internal consistency to be greater than .90. The IUS also has good convergent validity and is correlated with the PSWQ and the Generalized Anxiety Questionnaire-IV (GADQ-IV).

Correlations range from .58 to .66 for the PSWQ and .51 to .69 for the GADQ-IV (Norton, 2005).

The Problem-Solving Inventory (PSI) is a 35 item self-report assessment designed to measure an individual's perceived ability to problem-solve, not his or her actual problem-solving skills. This assessment measures coping correlates which include affect, cognition, and behavior with real world problems. The PSI can be given individually or in a group setting. Three items are for research purposes only and are not scored. The 32 items that are scored are structured on a six-point Likert scale ranging from 1 (strongly agree) to 6 (strongly disagree). Positive appraisals of problem-solving ability are derived from low scores. The PSI consists of three scales based on the total score. These scales include problem-solving confidence (self-assurance while problem-solving) which has 11 items, approach-avoidance style (the tendency to approach or avoid activities that involve problem-solving) which has 16 items, and personal control (an individual's control of his or her emotions and behaviors during problem-solving) which has five items. The PSI has shown adequate internal consistency and good test-retest reliability. Scores range from .83 to .89 over 2 weeks, from .77 to .81 over 3 weeks, and from .44 to .65 after 2 years. This measure has also shown good concurrent validity when correlated with ratings of actual problem-solving skills as well as ratings of perceived level of satisfaction of problem-solving skills. Correlations range from -.24 to -.46. When correlated with the Rotter Internal-External Locus of Control Scale, the findings were significant, suggesting that individuals who positively rate their problem-solving skills also have a tendency to report having an internal locus of control (Camp, 1988). In addition, high PSI scores have

been found to correlate with higher pathological profiles on the Minnesota Multiphasic Personality Inventory (MMPI). The PSI has also been found to correlate with higher maladjustment found on the Symptom Checklist-90 (SCL-90) and the Cornell Medical index. The PSI also has good discriminant validity when correlated with other measures of aptitude and academic achievement (LoBello, 1988).

Procedure

Participants were recruited from undergraduate psychology courses to take part in this study investigating the relationship between intolerance of uncertainty, problem-solving, worry, and anxiety. All participants were informed of the purpose of this study and were provided with consent forms prior to completing a packet of paper questionnaires consisting of the GADQ-IV, the PSWQ, the IUS, the PSI, and a demographic/background sheet. Participants received class credit in partial fulfillment of course requirements. On average, participants completed the questionnaires in 15 minutes.

Method of Analysis

Pearson correlation coefficients, (*one-tailed tests*), were used to statistically analyze the data collected. Data from the GADQ-IV were processed with data from the IUS to find if there was a positive correlation. Data from the PSWQ were processed with data from the IUS to find if there was a positive correlation. Data from the IUS were

processed with data from the PSI to find if there were any correlations. IUS data were processed with each of the subscales of the PSI (problem-solving confidence, approach-avoidance style, and personal control) to find if there were any inverse correlations. Descriptive data were generated for gender, age, and ethnicity of the participants.

CHAPTER IV

RESULTS

Independent samples t-test (*two-tailed tests*), were used to compare gender differences and GADQ-IV, PSWQ, IUS, and PSI. The results of this study found a significant difference between gender and GADQ-IV total, $t(84) = 3.452$, $p < .001$ (males, $M = 8.8158$, $SD = 4.64906$; females, $M = 13.1667$, $SD = 6.57310$). Results of this study also found a significant difference between gender and PSWQ total, $t(84) = 6.018$, $p < .000$ (males, $M = 41.4474$, $SD = 11.45307$; females, $M = 58.1250$, $SD = 13.70452$). There was a significant difference between gender and IU total, $t(81) = 2.809$, $p < .006$ (males, $M = 56.1081$, $SD = 16.57271$; females, $M = 68.6522$, $SD = 22.72367$). A significant difference between gender and Problem-solving confidence was found, $t(83) = 2.362$, $p < .021$ (males, $M = 31.9737$, $SD = 4.58839$; females, $M = 29.5957$, $SD = 4.63756$). Finally, a difference was found between gender and personal control during problem-solving, $t(83) = 2.113$, $p < .005$ (males, $M = 16.1053$, $SD = 4.56656$; females, $M = 18.2553$, $SD = 4.74327$). The results found no significant differences between gender and approach avoidance during problem-solving and PSI total.

Pearson correlation coefficients, (*one-tailed tests*), were used to compare GADQ-IV scores to IU scores. A significant correlation was found between GADQ-IV and IUS,

$r(84) = .695, p < .000$. Pearson correlation coefficients, (*one-tailed tests*), were used to compare PSWQ to IUS. A significant correlation was found PSWQ and IUS, $r(84) = .709, p < .000$. Pearson correlation coefficients, (*one-tailed tests*), were used to compare IUS to PSI and subscales of the PSI. No correlation was found between IUS and PSI total score, $r(78) = .194, p < .043$. A significant correlation was found between problem-solving confidence subscale of the PSI and IUS, $r(80) = -.290, p < .004$. No correlation was found between approach avoidance style subscale of the PSI and IUS, $r(80) = .141, p < .103$. A significant positive relationship was found between personal control subscale of the PSI and IUS, $r(80) = .459, p < .000$.

TABLE 1
Gender, GADQ-IV total, PSWQ total, IUS total, PSI subscales, PSI total: Correlations and Descriptive Statistics (N=86)

Variables	1	2	3	4	5	6	7	8
1. Gender								
2. GADQ-IV	.352**	-						
3. PSWQ	.549**	.800**	-					
4. IUS	.298**	.695**	.709**	-				
5. PS	-.251*	-.215*	-.148	-.290**	-			
6. AA	-.036	.143	.113	.141	.297**	-		
7. PC	.226*	.406**	.496**	.459**	-.277**	-.248*	-	
8. PSI	-.021	.188*	.258**	.194*	.585**	.851**	.125	-
M	1.56	11.24	50.76	63.06	30.66	61.38	17.29	
109.57								
SD	.054	.665	1.637	2.311	.514	.987	.516	
1.194								

Note. *p < .05 and ** p < .01

TABLE 2

Descriptive Statistics of Gender

	Gender	N	Mean	Std. Deviation	Std. Error Mean
GADTotal	male	38	8.8158	4.64906	.75418
	female	48	13.1667	6.57310	.94875
WorryTotal	male	38	41.4474	11.45307	1.85793
	female	48	58.1250	13.70452	1.97808
IUTotal	male	37	56.1081	16.57271	2.72454
	female	46	68.6522	22.72367	3.35042
PSTotal	male	38	31.9737	4.58839	.74434
	female	47	29.5957	4.63756	.67646
AATotal	male	38	61.7368	9.33660	1.51460
	female	47	61.0851	8.99959	1.31272
PCTot	male	38	16.1053	4.56656	.74079
	female	47	18.2553	4.74327	.69188
PTotal	male	38	109.8158	11.46052	1.85914
	female	45	109.3556	10.48843	1.56352

TABLE 3.
Correlations of Anxiety, Worry, Intolerance of Uncertainty, and Problem-Solving

		Gender	GADTotal	WorryTotal	IUTotal	PSTotal	AATotal	PCTot	PTotal
Gender	Pearson Correlation	1	.352**	.549**	.298**	-.251*	-.036	.226*	-.021
	Sig. (1-tailed)		.000	.000	.003	.010	.372	.019	.425
	N	86	86	86	83	85	85	85	83
GADTotal	Pearson Correlation	.352**	1	.800**	.695**	-.215*	.143	.406**	.188*
	Sig. (1-tailed)	.000		.000	.000	.024	.096	.000	.044
	N	86	86	86	83	85	85	85	83
WorryTotal	Pearson Correlation	.549**	.800**	1	.709**	-.148	.113	.496**	.258**
	Sig. (1-tailed)	.000	.000		.000	.088	.151	.000	.009
	N	86	86	86	83	85	85	85	83
IUTotal	Pearson Correlation	.298**	.695**	.709**	1	-.290**	.141	.459**	.194*
	Sig. (1-tailed)	.003	.000	.000		.004	.103	.000	.043
	N	83	83	83	83	82	82	82	80
PSTotal	Pearson Correlation	-.251*	-.215*	-.148	-.290**	1	.297**	-.277**	.585**
	Sig. (1-tailed)	.010	.024	.088	.004		.003	.005	.000
	N	85	85	85	82	85	84	84	83
AATotal	Pearson Correlation	-.036	.143	.113	.141	.297**	1	-.248*	.851**
	Sig. (1-tailed)	.372	.096	.151	.103	.003		.011	.000
	N	85	85	85	82	84	85	84	83
PCTot	Pearson Correlation	.226*	.406**	.496**	.459**	-.277**	-.248*	1	.125
	Sig. (1-tailed)	.019	.000	.000	.000	.005	.011		.131
	N	85	85	85	82	84	84	85	83
PTotal	Pearson Correlation	-.021	.188*	.258**	.194*	.585**	.851**	.125	1
	Sig. (1-tailed)	.425	.044	.009	.043	.000	.000	.131	
	N	83	83	83	80	83	83	83	83

** . Correlation is significant at the 0.01 level (1-tailed).

* . Correlation is significant at the 0.05 level (1-tailed).

CHAPTER V

DISCUSSION

Interpretation of Scores

The goal of this study was to add to the literature regarding the relationship between IU, worry, anxiety, and problem-solving using the IUS, PSWQ, GADQ-IV, and PSI. The researcher had hoped to add to the literature of IU and problem-solving by looking at the relationship between IU and problem-solving confidence as lack of problem-solving confidence may impact an individual's intolerance of uncertain events and situations, and vice versa.

The first hypothesis of the study was that GADQ-IV would positively correlate to IUS. The first hypothesis was supported. A significant positive correlation was found between GADQ-IV and IUS, indicating individuals who reported more symptoms of GAD also reported increased levels of IU. The positive correlation between GADQ-IV and IUS adds to previous research findings on the relationship between high levels of anxiety and high levels of IU.

The second hypothesis stated there would be a positive correlation between PSWQ and IUS. The second hypothesis was supported as there was a significant positive

correlation between PSWQ and IUS. The positive correlation indicates that individuals with high levels of worry also have high levels of IU.

The third hypothesis stated that there would be an inverse correlation between PSI subscale of problem-solving confidence and IUS. The third hypothesis was supported as there was a significant inverse correlation between problem-solving confidence and IUS. The inverse correlation indicates that individuals with high levels of IU have lower levels of confidence when approaching a problem.

Although not originally hypothesized as a finding of this study, but consistent with previous findings, this study found a significant positive relationship between IUS and PSI subscale of personal control. The positive correlation indicates that individuals with high levels of IU have a more negative perception of themselves when approaching a problem.

Implications of Finding

Although this study has some limitations, these findings can be used to help advance our knowledge of how anxiety, worry, IU, and problem-solving confidence relate to one another. The findings of this study on the relationship between anxiety, worry, and IU confirm previous findings on the interrelationship of these variables. Moreover, the findings of this study on the relationship between IU and problem-solving confidence add to the small, but growing research in this area. This study also found a positive relationship between IU and personal control. Continued research in the area of problem-solving may lead to a better understanding of the variables related to anxiety,

worry, and IU.

Limitations of the Study

The current study has some limitations that should be addressed in future studies. The first limitation is that the population of undergraduate students used in this study may not generalize to a clinical population. Moreover, the ethnic make-up of the participants in this study does not reflect the ethnic make-up of the United States population. Another limitation is the sample size; future studies should include a larger sample size.

Another limitation of this study is the use of self-report measures. Even though many studies suggest that the GADQ-IV, PSWQ, IUS, and PSI are valid and reliable instruments, these questionnaires used in this study, may still have been affected by participant's limited awareness, random responding, or fixed responding. Finally, since the design of this study is correlational, causal effect cannot be implied.

Future Directions for Research

This study contributes to the existing literature on GAD, worry, IU, and problem-solving. Previous research on GAD suggests several current models which help to explain how GAD is developed and maintained. The current models of GAD have similar explanations and overlap with one another (Riskind, 2005). Future research is needed to identify cognitive content specific to GAD. Worry has been identified as a characteristic of GAD (Walkenhorst & Crowe, 2009). According to the DSM-5, Generalized Anxiety Disorder is characterized by excessive and uncontrollable worry

which can lead to significant distress and impairment (DSM-5; American Psychiatric Association, 2013). Worry has also been found to be more commonly related to GAD compared to other psychological disorders (Walkenhorst & Crowe, 2009).

According to the Intolerance of Uncertainty model of GAD, a significant relationship between IU, a dispositional characteristic pertaining to an individual's belief about the uncertainty of future events, and worry has been found (Birrell et al., 2011). Future studies should continue to measure the relationship between worry and IU; this may result in improved psychometric measures and treatments for individuals with GAD.

Since there has not been much research looking at the relationship between problem-solving and GAD, future studies should focus on this area. The few studies that have been conducted have found a relationship between high levels of IU and worry and poorer ability to problem-solve. Studies have found individuals with high levels of IU tend to repeat steps when problem-solving in an attempt to eliminate uncertainty during the problem-solving process (Parkinson & Creswell, 2011; Luhmann et al., 2011).

Finally, very little is known about the relationship between IU and problem-solving confidence. One study by Parkinson and Creswell (2011) suggest that individuals may use problem-solving as a strategy that helps to reduce perceived threat, and also to gain control. This study also found high worry to be associated with poor problem-solving confidence and low perceived problem-solving control (Parkinson & Creswell, 2011). Much research is needed in this area.

While this study has contributed to already existing research, due to the limitations found in this study, further research is needed. Replication of this study

should utilize clinical samples more representative of the national population. This study could be improved upon by including a clinical assessment for GAD to control for psychopathology. This study could also be improved upon by using an experimental design to assess problem-solving in anxiety-provoking situations. Implications of future research may lead to a more precise conceptualization of GAD and more successful evidence-based treatments for GAD including management of IU and problem-solving.

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APPENDIX

APPENDIX A
PARTICIPANT CONSENT FORM

TITLE OF PROJECT: Questionnaire Measures of Characteristics Associated with Anxiety

PRINCIPLE INVESTIGATOR: Melissa Patrick

FACULTY SUPERVISOR: Dr. Janet Smith

APPROVAL DATE: 6/6/2016

EXPIRATION DATE: 12/16/2016

SPONSOR: Pittsburg State University

INFORMED CONSENT

You are invited to participate in a study that will investigate the relationship between intolerance of uncertainty, worry, anxiety, and problem-solving. You were chosen for this study because you are a student at Pittsburg State University. There is no cost for participating in this study. Your participation in this study is entirely voluntary, and you may withdraw your consent at any time.

PURPOSE OF RESEARCH

The purpose of this study is to investigate the relationship between intolerance of uncertainty, problem-solving, worry, and anxiety to develop a greater understanding of the variables related to intolerance of uncertainty and what implications these variables have for the conceptualization and treatment of Generalized Anxiety Disorder.

ALTERNATIVES

These are the alternatives available to you:

1. You could choose to participate in the study.
2. You could choose not to participate in this study at this time, with the knowledge that you could reconsider and participate in this study in the future, if you still meet the study eligibility and the study is still underway.

PROCEDURES AND LENGTH OF STUDY

1. If you agree to participate, you will be asked to fill out several questionnaires that reflect your experiences with worry and problem-solving. It is estimated that your involvement in the study will take approximately 30 minutes.

BENEFITS AND RISKS FOR PARTICIPATION

1. The information you provide may have benefits for participants because they will have been part of a research study and because they will receive credit for research participation. The information provided may also have benefits for science because this study will look at the relationship between intolerance of uncertainty, worry, and problem-solving and what implications these variables may have for understanding generalized anxiety disorder. Based on these findings, we may be able to apply these findings to creating better assessments and treatments for generalized anxiety disorder.

WE CANNOT AND DO NOT GUARANTEE OR PROMISE THAT YOU WILL RECEIVE ANY BENEFITS FROM THIS STUDY.

2. The psychological risks of participation in this study are minimal. The potential psychological risk that exists is emotional distress when answering the questionnaires. If you experience any negative psychological effects we will provide you with contact information for the University Counseling Center.
3. There are no physical risks of participating in this study.

COMPENSATION

1. Completion of this study will fulfill research participation requirements for general psychology courses.

FREEDOM TO WITHDRAW WITHOUT PREJUDICE

1. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time. Your desire to withdraw from the investigation will not negatively impact your ability to fulfill requirements for general psychology courses.
2. At the discretion of the principle investigator, participants may be taken out of this study due to unanticipated circumstances (e.g., if distress becomes too severe).
3. Your name will not be associated in any way with the information collected about you or with the research findings from this study. The researcher(s) will use a study number instead of your name.

CONFIDENTIALITY STATEMENT

1. All the data you provide will be kept confidential. You will be identified by a code number only on all forms you complete. The data will be stored in a locked file cabinet in offices that have limited access so that they are available only to the appropriate professional staff on the project.
2. Any data that may be published in scientific journals will not reveal the identity of participants.
3. Your name will not be associated in any way with the information collected about you or with the research findings from this study. The researchers will use a study number instead of your name.

COMPENSATION OR MEDICAL TREATMENT AVAILABLE IF INJURY OCCURS

Only applies in research where more than minimal risk is involved.

In the event of injury, the Kansas Tort Claims Act provides for compensation if it can be demonstrated that the injury was caused by the negligent or wrongful act or omission of a state employee acting within the scope of his\her employment.

INVITATION TO QUESTION

1. If you have any questions, we expect you to ask us. If you have any additional questions later, please contact Janet Smith, Ph.D. at 620-235-4537.
2. If you are not satisfied with the manner in which this study is being conducted or if you have any questions concerning your rights as a study participant, please contact Jamie Wood, Ph.D., Chairperson, Committee for the Protection of Human Participants, Department of Psychology and Counseling, Pittsburg State University, 620-235-4526, or Gwen Murdock, Ph.D., Department of Psychology and Counseling, Pittsburg State University, 620-235-4524, or Brian A. Peery, Research and Grants Coordinator, 106 Russ Hall, Pittsburg State University, 620-235-4175.

TERMS OF PARTICIPATION

I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits or academic standing to which I may

otherwise be entitled.

I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.

Printed Name of the Participant

Signature of Participant

Date

Signature of Witness (Project Staff)

Date

APPENDIX B

DEMOGRAPHIC INFORMATION

TABLE 4

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	38	44.2	44.2	44.2
	female	48	55.8	55.8	100.0
	Total	86	100.0	100.0	

TABLE 5

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18	33	38.4	39.3	39.3
	19	31	36.0	36.9	76.2
	20	4	4.7	4.8	81.0
	21	5	5.8	6.0	86.9
	22	4	4.7	4.8	91.7
	23	1	1.2	1.2	92.9
	24	2	2.3	2.4	95.2
	26	1	1.2	1.2	96.4
	32	1	1.2	1.2	97.6
	33	1	1.2	1.2	98.8
	44	1	1.2	1.2	100.0
	Total		84	97.7	100.0
Missing	System	2	2.3		
Total		86	100.0		

TABLE 6
Ethnicity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	American Indian or Alaskan Native	1	1.2	1.2	1.2
	Asian	5	5.8	5.9	7.1
	Black or African American	4	4.7	4.7	11.8
	Latino or Hispanic	7	8.1	8.2	20.0
	White or Caucasian	68	79.1	80.0	100.0
	Total	85	98.8	100.0	
Missing	System	1	1.2		
Total		86	100.0		