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Use of Motivation Enhancement Therapy to Increase Intervention Utilization in a Population at High-Risk of Developing Anxiety Psychopathology

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USE OF MOTIVATION ENHANCEMENT THERAPY TO INCREASE INTERVENTION UTILIZATION IN A POPULATION AT HIGH-RISK OF DEVELOPING ANXIETY PSYCHOPATHOLOGY

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I dedicate this to my family and friends
for their unwavering support and encouragement
in my academic endeavors.

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ABSTRACT

Elevated levels of anxiety sensitivity (AS), the fear of anxiety and its consequences, places individuals at an increased risk for the development of anxiety disorders, especially panic disorder. It has shown that treating AS may reduce the future development of anxiety psychopathology. However, individuals high in AS may be unaware of the risks associated with this risk factor and, therefore, may tend to be ambivalent or unaware of interventions to reduce AS. The purpose of the current study was to enhance motivation to utilize a preventive intervention in a non-intervention seeking population with elevated levels of AS. Participants (N = 65) were randomized to one of two groups: (1) a motivational enhancement group (MET; N = 32) group, or (2) a psychoeducation control group (N = 33). Those in the MET group received MET focused on enhancing motivation to reduce AS, whereas those in the control group were informed of their elevated level of AS, received psychoeducation about health and general well-being, but did not receive MET. At the end of the study, all of the participants were given the option to receive a computerized intervention previously found to be effective at reducing AS (see Schmidt et al., 2007). Results revealed that all participants showed an increase in the importance and confidence to change anxiety after receiving high-risk feedback before starting the experimental session. Once they were in the experimental groups (i.e., MET or health focused control), results revealed that the MET group showed significantly higher levels of motivation on the self-report questionnaires than the control group. However, there was not a group difference in the completion of the AS intervention. Further, the MET condition was associated with a significant reduction in level of AS after completing the experiment session. Implications of the findings are discussed.

CHAPTER 1

INTRODUCTION

With 18% of the general population meeting diagnostic criteria for an anxiety disorder in any given year (Kessler, Chiu, Demler, Merikangas, & Walters, 2005), these conditions constitute one of the most prevalent forms of psychopathology. It has been estimated that the annual economic burden of anxiety disorders is approximately $42.3 (Greenberg, Sisitsky, Kessler, Finkelstein, Berndt, et al., 1999) to $46.6 billion dollars per year (DuPont, Rice, Miller, Shiraki, Rowlan, et al., 1996) in the 1990s. Given the prevalence and economic burden of anxiety disorders, identifying the potential risk factors, development of possible preventive interventions for these risk factors, and enhancing motivation to seek these preventive interventions are particularly important areas for the focus of research efforts. Advancement in the study of the risk factors and increasing motivation to engage in corresponding preventative approaches are crucial to the reduction of anxiety psychopathology and its associated costs.

Substantial efforts have been made in the identification of risk factors associated with the development of anxiety disorders. Research has shown that individuals at risk for the development of an anxiety disorder tend to inherit a genetic predisposition to the disorders. This genetic contribution has been identified in both familial (Hettema, Neale, & Kendler, 2001) and twin samples (Hettema, Annas, Neale, Kendler, & Fredrikson, 2003; Hettema, Prescott, Myers, Neale, et al. 2005), supporting the notion that having a family history of anxiety or mood disorders increases the risk for the development of anxiety psychopathology.

A considerable literature has also examined temperamental contributions that have been shown to increase the risk for the development of anxiety disorders. This research has shown

that temperamental factors, such as being high in negative affect, or neuroticism, tends to be elevated in those with anxiety and mood disorders (Brown, Chorpita, & Barlow, 1998; Clark & Watson, 1991; Clark, Watson & Mineka, 1994). Gershuny and Sher (1998) found that being high in neuroticism (e.g., negative affect) and low in extraversion predicted levels of anxiety and depression during a 3-year prospective study, thereby providing evidence that these personality dimensions may serve as predispositional factors placing individuals at risk for the development of anxiety and mood psychopathology.

Zinbarg and Barlow (1996) argued that negative affect represents a broad, general risk factor for the development of any anxiety or mood disorder, but that there may be specific risk factors that influence the expression of these disorders. A number of these risk factors are thought to be specific vulnerabilities placing individuals at an increased risk for the development of one anxiety disorder over another. That is, having a high level of negative affect may increase the risk for anxiety psychopathology, generally, while these specific vulnerabilities may partially determine which disorder develops. For example, disgust sensitivity, the tendency to experience disgust across a broad range of stimuli (e.g., dirt, spiders, blood; Olatunji & Deacon, 2008) has been found to be elevated in obsessive-compulsive disorder (Tolin, Woods, & Abramowitz, 2006) and specific-phobias (Olatunji & Deacon, 2008), and may function as a specific vulnerability for these disorders. Likewise, body vigilance, described as having heightened attention to changes in internal bodily sensations, has been found to be elevated in panic disorder (Schmidt, Lerew, & Trakowski, 1997), which may increase the risk or act as a maintaining factor for this disorder. Furthermore, discomfort intolerance, the inability to endure uncomfortable physical sensations (Schmidt & Lerew, 1998)

has been found to be elevated across several anxiety disorders (Schmidt, Richey, Cromer, & Buckner, 2007).

One of the most well-established vulnerability factors for anxiety psychopathology is anxiety sensitivity. Anxiety sensitivity (AS) is an individual difference variable that has been shown to place individuals at a high-risk of developing an anxiety disorder. AS is a trait-like characteristic in which a person fears the experience of anxiety and the potential psychological, somatic, or social consequences associated with the experience of anxiety (Taylor & Cox, 1998; Reiss, 1997; Reiss et al. 1986). A considerable number of studies have examined the relationship between AS and anxiety disorders, with much of this focusing on the relationship between AS and panic. Those with higher levels of AS show increased panic related responding as measured by exaggerated responding in hyperventilation studies (Brown, Smits, Powers, & Telch, 2003) and CO_2 challenge studies (Schmidt, 1999; Schmidt & Mallott, 2006; Zinbarg, Brown, Barlow, & Rapee, 2001). Moreover, it has been shown that being high in AS serves as a predisposition for the development of panic disorder (Schmidt, Lerew, & Jackson, 1997; 1999; Schmidt, Zvolensky, & Maner, 2006) and tends to maintain the disorder overtime. That is, those with high levels of anxiety sensitivity have an increased risk of developing panic disorder, thereby making AS a risk-factor for future development of this disorder.

In addition to panic, AS has also been linked with a number of other mental health conditions. For example, AS has been linked to social phobia (Zinbarg et al. 1997), generalized anxiety disorder (Rector, Szacum-Shimizu, & Leybman, 2007), post-traumatic stress disorder (Bernstein, Zvolensky, & Feldner, 2005), obsessive-compulsive disorder (Deacon & Abramowitz, 2006; Taylor, Koch, & McNally, 1992) and depression (Otto, Pollack, Fava, Uccello, & Rosenbaum, 1995; Taylor, Koch, Woody, & McLean, 1996). Importantly, treatment

outcome research has indicated that treating these disorders leads to reductions in AS at post-treatment (Otto & Reilly-Harrington, 1999; Smits, Tart, & Powers, 2008; Telch, Lucas, Schmidt, Hanna, Jaimez, Lucas, et al., 1993), thereby suggesting that AS not only plays an integral role in the development and maintenance of anxiety disorders, but may also be an important mechanism of change during the treatment of these disorders.

Another smaller literature has focused on the use of risk-factor interventions in preventing the development of anxiety disorders. A number of preventative approaches have been examined over recent years. Preventative approaches have ranged from providing psychoeducation to a broad range of individuals at an early age who may or may not be at-risk for anxiety problems (Barrett & Turner, 2001; Lowry-Webster, Barrett, & Dadds, 2001), provision of early interventions to those presenting with clinically subthreshold symptoms of anxiety disorders (e.g., individuals experiencing panic attacks but who do not meet criteria for a panic disorder diagnosis; Dadds, Holland, Laurens, Mullins, Barrett, et al.,1999; Gardenswartz & Craske, 2001), and providing interventions specifically aimed to ameliorate the risk-factors associated with the development of anxiety disorders with the intent to reduce risk, or intervene, before the development of debilitating anxiety problems (Gardenswartz & Craske, 2001; Schmidt et al. 2007). Specifically, the utility of treating AS to reduce the risk of subsequent development of anxiety disorders has begun to receive increased attention. One such study, conducted by Schmidt and colleagues (2007), investigated the effect of providing a brief intervention to reduce AS in those with high levels of AS over a course of 24-months. Those receiving the AS intervention were found to have lower rates of Axis I diagnoses at follow-up than those in the control condition. Smits and colleagues (2008) utilized another approach to reduce AS through the use of an exercise intervention, showing that lower levels of AS

mediated reductions in anxiety and depression, thereby providing further support that AS can be reduced through interventions designed to reduce this risk factor.

Providing interventions for risk factors varies dramatically from traditional provision of treatment services for diagnosed mental health conditions. One obvious difference is the tendency for individuals at-risk to be unaware that they have a risk factor until either the risk-factor is assessed for preventative reasons, such as a routine doctor visit, or the individual develops the condition which they were previously at-risk and, therefore, are no longer considered to be "at-risk". For example, individuals with high blood pressure are unlikely to be aware of their increased risk for heart disease unless this is assessed during routine medical checkouts or they develop heart disease. Unfortunately, a large proportion of individuals are unaware that they are at an increased risk for heart disease due to the relatively imperceptible effect elevated blood pressure has on daily activities. Like those with high blood pressure who are at an increased risk for heart disease, individuals high in AS, may also be unaware of their increased risk for anxiety psychopathology until they present for treatment of a developed anxiety condition. Individuals may have some awareness of their fear of anxiety symptoms, but are unlikely to be aware of the increased risks associated with these fears. Also, as in the case of those with high blood pressure, these individuals are also likely to generally function well in their daily lives without noticeable interference from AS until elevated symptoms of anxiety psychopathology emerge.

Given the association of AS with the development of anxiety psychopathology, and the effectiveness of interventions to reduce AS, it seems that enhancing motivation to seek these interventions in those high in AS may be the next logical step to advance this line of work. When considering this population it is important to remember that these individuals are not in

need of treatment in the same manner as someone presenting with a diagnosed mental health condition, however, these individuals could benefit from efforts aimed at increasing motivation to receive interventions effective for reducing AS. One open question in this line of research, however, is how to best motivate those with high levels of AS to utilize a preventive intervention. One approach is to borrow from the line of research utilizing motivational interviewing.

Motivational interviewing (MI; Miller & Rollnick, 2002) is a therapeutic approach focusing on the enhancement of intrinsic motivation to resolve ambivalence to change a problem behavior. The utility of adding motivational interviewing techniques to CBT to enhance motivation to seek treatment for anxiety disorders (Westra & Dozios, 2006; Westra, Arkowitz, & Dozois, 2009), has been examined in recent years. MI was originally developed to address the underlying treatment ambivalence and resistance often observed in problematic behaviors associated with substance use disorders. One of the main premises behind MI is that although people may recognize that they have problematic behaviors, they may be ambivalent, or unmotivated to change these behaviors. For example, a person with a substance use disorder may be aware of the negative impact their addiction has on their life, such as having difficulties with family or friends, or having trouble at work, but they may be unmotivated to change their behavior due to the reinforcing effects of their substance use. Likewise, a person high in anxiety sensitivity may be aware that their fear of anxiety related sensations limits their ability to engage in certain anxiety provoking situations (e.g., avoiding exercise because the physical sensations are similar to the experience of anxiety sensations), however, they may be ambivalent about changing their behavior due to the distress they experience when confronting their AS-related situations.

The focus of MI is likely to differ depending on whether the population of interest is comprised of individuals with diagnosed mental health disorders, or whether the population of interest is an indentified high-risk group, such as those high in anxiety sensitivity. For those with diagnosed mental health conditions, MI is likely to be used as an adjunct to current CBT approaches either as a pretreatment for initial treatment motivation or it may be integrated throughout ongoing treatment. For this population, MI may be effective in reducing some of the factors (e.g., low treatment utilization, low treatment compliance) interfering with motivation to seek and continue treatment. That is, the use of MI techniques in this population may not only enhance motivation to seek CBT, but may also improve treatment compliance in these populations. Preliminary results have suggested that incorporating MI techniques with CBT enhances treatment motivation in generalized anxiety disorder (Westra, Arkowitz, & Dozios, 2009; Westra & Phoenix, 2003), obsessive-compulsive disorder (Maltby & Tolin, 2005; Merlo, Storch, Lehmkuhl, Jacob, Goodman, et al., 2009), and comorbid social anxiety and alcohol use disorders (Buckner, Ledley, Heimberg, & Schmidt, 2008). Motivational enhancement therapy (MET; Miller, Zweben, DiClemente, & Rychtaril, 1992) is a brief treatment utilizing MI techniques. MET is different from MI in that in addition to the use of MI techniques, MET also includes providing diagnostic feedback (e.g., discussion of diagnosis or problem behavior and the potential treatment options available). MET has also been shown to increase motivation to seek treatment (Buckner & Schmidt, 2009) and to enhance treatment outcome in the anxiety disorders when combined with CBT (Buckner et al., 2008).

Little is known about the use of MI in those at-risk for the development of anxiety disorders. Because these high-risk individuals are likely to be unaware of their risk for the development of future problems increasing the awareness of risk and informing these

individuals about the potential consequences associated with this risk factor becomes the focus of MI/MET in hopes that this would enhance motivation to seek preventive interventions. Similar to studies using MI/MET to enhance motivation for treatment (see Buckner and Schmidt, 2009), using MI/MET as a precursor to seeking preventive interventions for high-risk populations is an important and novel approach to enhancing motivation in these at-risk populations, such as those high in AS. Correcting this risk factor, before the actual development of an anxiety disorder, could have a significant impact on the management of anxiety symptoms, allowing for early detection of anxiety problems and enhancement of intervention utilization, thereby providing an active and preventive approach to the early intervention of these disorders.

To date, no studies have examined the use of MI/MET to enhance motivation for a preventive intervention for those high in AS, at risk for the development of anxiety disorders. The primary purpose of this study is to examine this issue, being the first to study whether the use of motivational techniques is able to enhance motivation in a high AS subclinical population. Specifically, the current study will examine the use of motivational enhancement therapy to enhance motivation for a potentially beneficial preventative intervention in a high risk, non-treatment seeking subclinical population. First, it is predicted that those receiving MET will be more willing to utilize interventions designed to reduce risk than those not receiving the motivational enhancement component, as measured by (1) self-report measures, (2) scheduling an appointment to complete the ASAT intervention, and (3) completion of the ASAT intervention. Second, it is predicted that changes in motivation will be mediated by the effects of intervention condition on the primary outcomes.

CHAPTER TWO

METHOD

2.1 Participants

Participants were undergraduate students enrolled in an introductory psychology course at a large southern university. Participants were identified through an online screening program in which participants completed a battery of questionnaires to determine eligibility for ongoing studies. A total of 1,042 completed the online mass screening questionnaires. Of the 1,042 completing the questionnaires, 322 had AS levels of 25 or higher on the ASI. Participants meeting the ASI scores threshold received an email inviting them to participate in an "Anxiety Disorder Risk Factor Study." One hundred and eighteen individuals presented for the study. Upon arrival, participants were screened a second time to account for variability in AS ensuring that they were still demonstrating elevated levels of AS. Those with ASI score greater than or equal to 15 where allowed to participate. Of the 118 individuals presenting for the study, 53 did not meet the eligibility criteria, leaving a total of 65 individuals who were eligible to complete the study. A majority of the participants were female (70.8% females, 29.2% males), with a mean age of 18.70 (SD = 1.12). Sixty-eight percent of the participants were Caucasian, 14% Hispanic, 9% African American, 6% Asian, 1% and 3% Other (e.g., bi-racial).

Participants were excluded from participating if they had a history of a severe mental disorder such as bipolar disorder or a psychotic spectrum disorder (e.g., schizophrenia, schizoaffective disorder). Prior history of a severe mental disorder was determined through a mental history section in the demographics form. Of the 118 participants presenting for the study, 0 reported a history of a severe mental disorder. Participants were also assessed for

anxiety disorder diagnoses using the anxiety disorder module of the Structured Clinician Interview for the *DSM-IV* (SCID; Spitzer, Gibbons, & Williams, 1995). Five participants were diagnosed with an anxiety disorder (1 panic disorder, 2 social anxiety disorder, and 2 generalized anxiety disorder). These individuals were eligible to participate in the study.

2.2 Measures

2.2.1 Demographics

An experimenter-developed form was used to gather demographic information, mental health history, and family history of mental health disorders. The family history form contains a list all mood and anxiety disorders. Participants are asked to indicate whether anyone in their family has been diagnosed with an anxiety or mood disorder and to specify the disorder and their relationship to the individual.

2.2.2 Clinician Administered Measures

2.2.2.1 Anxiety disorders. The anxiety disorder module of the Structured Clinician Interview for the *DSM-IV* (SCID; Spitzer et al., 1995) was administered to assess for the presence of current or past anxiety disorder diagnoses in the sample.

2.2.3 Self-report Measures

2.2.3.1 Anxiety sensitivity. Anxiety sensitivity was measured through the *Anxiety Sensitivity Index* (ASI; Reiss & McNally, 1985). The ASI is a 16-item scale measuring the potential harmful consequences of anxiety related symptoms. The ASI consists of three subscales corresponding to the three lower-order factors of the hierarchical AS structure (see Zinbarg, Barlow, & Brown, 1997). The subscales are: (1) physical concerns (e.g. "It scares me when I feel shaky", (2) cognitive concerns (e.g. " When I cannot keep my mind on a task, I worry that I might be going crazy", and (3) social concerns (e.g.," It is important for me not to

appear nervous"). Respondents are asked to indicate the degree to which they agree or disagree with the items on a 5-point Likert Scale (0 = *very little*, 4 = *very much*).

2.2.3.2 Depression symptoms. The Iowa Depression and Anxiety Scale (IDAS; Watson, O'Hara, Simms, Kotov, Chmielewski, et al., 2007) was used to assess for depression and anxiety symptoms. The IDAS is a 64-item scale designed to assess specific dimensions of depression and symptoms of anxiety that frequently present with depressive symptoms. The IDAS is comprised of two broad scales: General Depression and Dysphoria, and 10 subscales: Suicidality, Lassitude, Insomnia, Appetite Loss, Appetite Gain, Ill Temper, Well-Being, Panic, Social Anxiety, and Traumatic Intrusions. For each item, respondents were asked to indicate how much they have experienced each item over the past two weeks on a 5-point Likert scale (1 = *not at all*, 3 = *moderately*, 5 = *extremely*). Sample items include: "*I felt fidgety restless*", "*I felt depressed*", "*I felt like I had a lot of energy*", and "*I slept more than usual*".

2.2.4 Measurement of Treatment Seeking Behavior

The Treatment Seeking Form (TSF) is an experimenter developed, 2-item, questionnaire developed to assess baseline level of interest and perceived need of treatment. Each participant answered the following questions on a 10-point Likert scale*): "On a scale of 0 to 10 (0 = not at all, 5 = moderately, 10 = extremely), what is your current interest in receiving treatment for mental health problems*." and "*What is you current need to receive treatment for your existing mental health problems" (0 = no need, do not have any mental health problems that I need help with, 10 = definitely need help for mental health problems).* This form was used to ensure that participants were not treatment seeking before beginning the study. Individuals rating their interest in treatment above a 5 were excluded from participating in the study.

2.2.5 Measurement of Motivation

2.2.5.1 Motivation. Motivation to receive an intervention to change anxiety sensitivity was assessed using the University of Rhode Island Change Assessment (URICA; McConnaughy, Prochaska, & Velicer, 1983). The URICA consists of 32 items, with 8 items for each subscale measuring the four stages of change. These subscales include: (1) Precontemplation, (2) Contemplation, (3) Action, and (4) Maintenance. This measure was adapted to assess motivation for receiving an intervention to change anxiety sensitivity. Although the URICA was originally created for use with a substance use populations, this scale has been used to assess motivation and readiness to change in number of conditions, including anxiety disorders (see Dozios et al., 2004; Buckner & Schmidt, 2009). Because the items of URICA refer to a generic problem, the items were altered to specify anxiety sensitivity as the problem behavior. The changes of the URICA were the same as those changes used in Buckner and Schmidt (2009) with the identified problem behavior being changed from social anxiety to anxiety sensitivity.

2.2.5.2 Intervention options questionnaire. The Intervention Options Questionnaire is an experimenter developed questionnaire created to assess a participant's interest in various intervention options that could be made available through the anxiety clinic. Participants read the following instructions: "Please rate your interest in the following intervention options on a scale of 1 to 5 (1 = first choice, 5 = last choice)". Respondents were given the following choices to rank: (1) receive a phone call from the anxiety clinic offering individual treatment, (2) receive a phone call from the anxiety clinic offering group treatment, (3) return to the lab to receive an online, computerized intervention program, (4) be given an access code to complete the online computerized intervention outside of the lab (e.g., at home), or (5) no intervention. This

questionnaire was used to assess level of motivation to receive different forms of intervention if they were made available.

2.2.5.3 Importance/confidence to change (ICCF). The importance of changing one's potentially maladaptive behaviors and the degree to which one believes they can change are two key components of measuring motivation in MI. To measure these constructs, participants were asked to indicate the importance and their perceived confidence in their ability to change their level of anxiety or nervousness or their level of anxiety sensitivity. Participants completed two versions of the ICCF. The first version included two questions asking about importance and confidence to change anxiety or nervousness with the following 2 questions: (1) "How important is it for you to change your level of anxiety or nervousness" (0 = *not important*, 10 = *extremely important*) and (2) "How confident are you in your ability to change your level of anxiety or nervousness?" (0 = *not confident*, 10= *extremely confident*). This version of the scale was completed at baseline and allowed for a baseline assessment of motivation before receiving the high-risk feedback or completing the experimental session. After receiving the high-risk feedback, the participants completed the 5-item version of the ICCF that included initial two questions plus three AS related items. These items included: (1) "How motivated are you to attend the intervention to reduce your anxiety sensitivity?" (0 = *not motivated*, 10 = *extremely motivated*), (2) "How important is it for you to change your level of anxiety sensitivity" (0 = *not important*, 10 = *extremely important*), and (3) "How confident are you in your ability to change your level of anxiety sensitivity?" (0 = *not confident*, 10 = *extremely confident*). This version was also re-administered at post-experiment to assess for change in motivation after they high-risk feedback to post-experiment. The questions used in the ICCF are consistent with the importance and confidence ruler techniques used Miller and Rollick's MI approach (2002).

2.3 Procedure

See Figure 1 for the subject flow chart and an outline of the procedures for the experimental groups.

2.3.1 Pre-experiment

Upon arrival to the laboratory eligible participants were consented, and randomized to either the experimental group, MET, or the control group (see Figure 1 for a flow-chart of the study). All participants completed the baseline self-report questionnaires and were administered the anxiety disorder module of the SCID and the SDS by a clinician. Upon completion of the SCID, participants received the following psychoeducation about their level of anxiety sensitivity (adapted from Buckner, 2007):

> "Based on your responses to the online questionnaires, it appears that you have a clinically significant level of anxiety sensitivity. By clinically significant, we mean that your level of anxiety sensitivity is higher than that of the general population which places you at an increased risk for developing significant problems with anxiety. Anxiety sensitivity can be defined as the fear of anxiety and anxiety related consequences. For example, people with anxiety sensitivity commonly report that they fear the experience of anxiety related sensations (e.g., racing heart, shaking, sweating) because they fear that something may be wrong with them. Research has shown that the being high on anxiety sensitivity places you at an increased risk for the future development of an anxiety disorder, like panic disorder. Just like the way smoking increasing the risk for developing cancer, and having high cholesterol increases the risk of heart disease, being high in anxiety sensitivity places you at an increased risk for developing an anxiety disorder. The good news is that there are effective interventions for your vulnerability.

Cognitive behavioral therapy, or CBT, is an effective form of treatment for the anxiety disorders. CBT is also effective in reducing levels of anxiety sensitivity. In CBT, emotions are viewed to be linked with our thoughts (cognitions) and behaviors (show participant the CBT triangle handout). As can be seen from this diagram, our thoughts can influence our feelings and behaviors. One of the main goals of CBT is to alter these maladaptive thoughts that contribute to your feelings of anxiety. At the end of this study, you be given the option to return to the laboratory at a later date to receive a brief form of CBT designed to reduce levels of anxiety sensitivity."

2.3.2 Experimental Conditions

2.3.2.1 Experimental group (MET). Participants first received feedback about their risk status regarding anxiety sensitivity. After receiving the feedback, the therapist administered the ICCF to assess for pre-MET importance and confidence in changing AS. After completing the ICCF, the remainder of the experimental session focused on the use of MET. Participants received a manualized form of MET, adapted from the first session in Buckner's (2007) MET treatment manual. The session of MET focused on enhancing motivation to utilize ASAT, a brief AS intervention (see Schmidt et al. 2007), to learn techniques to reduce their current level of anxiety sensitivity and to potentially prevent the development of future anxiety disorders. The nature of anxiety sensitivity was discussed, including providing the participant with an anxiety sensitivity handout that provides examples of the social concerns, physical concerns, and cognitive concerns dimensions of AS. Specifically, the therapist provided diagnostic feedback, comparing the participant's level of anxiety sensitivity with the norm level in the population. Each participant received an individualized graph showing their level of AS in comparison to the norms of the general population. The participants were then asked to discuss

their own experience of anxiety sensitivity. After the providing information about the nature of AS and AS as a risk factor, the therapist explored the participant's life with and without elevated anxiety sensitivity. This discussion focused on the life goals, focusing on short and long-term goals and how anxiety sensitivity may or may not interfere with those goals. Next, the therapist explored the pros and cons of participating in an AS intervention. Each participant completed an individualized list of pros and cons of completing the AS intervention. Finally, the session concluded with the creation of a change plan (e.g., schedule an intervention appointment, return for the computerized CBT intervention offered at the end of the study). At the end of the study, participants were given the option to return for a brief, 30 minute computerized form of CBT called Anxiety Sensitivity Amelioration Training (ASAT) designed to reduce levels of anxiety sensitivity (see Schmidt et al. 2007). Participants were given a handout with the number for the anxiety clinic and instructed to call within the next week to receive the free intervention. Participants had two weeks to schedule the intervention. After one week, each participant who did not schedule an appointment received an email reminding them that they had one more week to call to schedule an appointment for the intervention if they were interested. Participants also received copies of the handouts from the session. The participants then completed a final battery of questionnaires. Upon completion, participants were debriefed and dismissed.

2.3.2.2 Psychoeducation group. Participants in the control group completed the baseline self-report questionnaires in the beginning of the session. Upon completion of the questionnaires, the control participants met with a clinician to complete the Anxiety Disorder module of the SCID and then received the same AS psychoeducation as the experimental group (e.g., being told that they are high in AS and that AS places them at risk for the development of anxiety disorders), however MET was not provided to this group. After receiving the feedback,

the therapist administered the ICCF to assess for importance and confidence in the ability to change their AS. To control for differences in session time from the experimental and control groups, the control participants received psychoeducation from the same clinicians providing MET to the MET group. The psychoeducation focused on nutrition, exercise, and general well-being (i.e., stress reduction, sleep habits). Upon completion of the psychoeducation session, participants were given the option to return to the laboratory for a brief, 30 minute computerized form of CBT called Anxiety Sensitivity Amelioration Training (ASAT) designed to reduce levels of anxiety sensitivity (see Schmidt et al. 2007). Participants were given a handout with the number to the anxiety clinic and will be instructed to call and arrange a time to receive the free intervention within the following week. Participants had two weeks to schedule the intervention. After one week, each participant who did not already schedule an appointment received an email reminding them that they had one more week to call to schedule an appointment for the intervention if they were interested. Participants also received copies of the handouts from the session. The participants then completed a final battery of questionnaires. Upon completion, participants were debriefed and dismissed.

2.3.3 Outcome Measures

The primary motivational outcomes for this study include: (1) self-report levels of motivation, (2) scheduling an appointment for the ASAT intervention, and (3) completion of the ASAT intervention. Table 1 shows the administration timeline for the self-report questionnaires used in the analyses.

CHAPTER 3

RESULTS

3.1. Primary Analyses

3.1.1 Overview

To examine the primary hypothesis that the MET group would report higher levels of motivation to utilize the AS intervention than the health focused control group, separate analyses were conducted to examine the results from the self-report questionnaires and the behavioral measures of motivation (e.g., scheduling an appointment, completing the ASAT intervention). First, separate linear regression equations were computed to examine group differences in motivation from pre to post-experiment on the self-report questionnaires (i.e. URICA, ICCF). Second, binary logistic regression equations were used to assess for group differences in scheduling an appointment for the ASAT intervention and completion of the ASAT intervention. Third, if Baron and Kenny's (1986) requirements for examining mediation are established in the initial analyses, additional analyses examining the potential mediating variables (i.e., motivation, anxiety symptoms) in the association between experimental group and completion of the ASAT intervention will be examined. Fourth, secondary analyses were conducted to examine changes in AS from baseline to post-intervention. Finally, it should be noted that because there was a small number of subjects with an anxiety disorder diagnosis (N = 5), the complete analyses were conducted twice. First, the analyses were conducted without controlling for an anxiety disorder diagnosis. The second series of analyses added anxiety disorder diagnoses as a covariate to control for this variable in the analyses. Because the results revealed that having an anxiety disorder diagnosis was not a significant covariate in the analyses

and because there were no differences in the results after controlling for an anxiety disorder diagnosis, results are reported from the initial series of analyses. Table 2 shows the descriptive statistics from pre to post-experiment for the primary outcome measures used in the analyses.

3.1.2 Motivation

First, to examine overall level of motivation, Four linear regression equations were computed to assess the effect of experimental condition on the four subscales of the URICA. Separate regression equations were computed for the Precontemplation, Contemplation, Action, and Maintenance subscales of the URICA. For each equation, experimental condition (MET or Control) was entered as the predictor and either the follow-up Precontemplation, Contemplation, Action, or Maintenance subscales were entered as the dependent variable. The corresponding baseline total score for the subscale was entered as a covariate to control for baseline levels of motivation in the analyses. Contrary to predictions, experimental condition was not a significant predictor of the URICA Precontemplation, Contemplation, or Action subscales (Precontemplation, $\beta = .04$, $p = ns$; Contemplation, $\beta = .09$, $p = ns$; Action, $\beta = .03$, $p = ns$). However, there was a significant effect for experimental group on the URICA Maintenance subscale. Specifically, the first step of the regression model account for 68.2% ($F(1, 54) = 118.86$, $p < .001$) of the variance in the model. As expected, the URICA Maintenance subscale score at baseline was a significant predictor of the URICA Maintenance at follow-up ($\beta = .83$, $p < .001$). After adding experimental group in the second step, the regression model accounted for 70.3% ($F(2, 53) = 66.01$, $p < .001$). Consistent with predictions, experimental group score was a significant predictor $\beta = .19$, $p < .05$), although the direction of the effect was opposite of the expectations, with the control group reporting higher scores of the URICA at follow-up than MET group ($\beta = .16$, $p < .05$).

Finally, a Readiness for Change Index (RCI) was computed by subtracting the mean Precontemplation scores from the sum of the means for the remaining three subscales of the URICA (i.e., Contemplation, Action, and Maintenance scales) which provides an additional approach to examining the overall pattern of scores as an index of motivation. The procedure used to calculate the RCI score was the same procedure described in Vogel, Hansen, Stiles, & Gotestam (2006). A linear regression equation with experimental group as the predictor and RCI index at follow-up was created to examine differences in motivation at follow-up. Baseline RCI score was entered as a covariate in the regression equation to control for baseline differences in motivation. Contrary to predictions, experimental condition was not a significant predictor of the RCI at follow-up ($\beta = .13$, $p = ns$).

3.1.3 Importance and Confidence to Change

3.1.3.1 Post high-risk feedback. To assess for changes in motivation after providing high-risk feedback, a series of paired-sample t-tests were performed to evaluate the baseline and post high-risk feedback change in importance and confidence to change anxiety as measured by the ICCF – Importance and ICCF- Confidence variables. As expected, there was a statistically significant increase in ICCF importance to change anxiety from pre ($M = 5.05$, $SD = 2.06$) to post high-risk feedback ($M = 6.00$, $SD = 1.83$), $t(59) = -4.16$, $p < .001$. The mean increase in ICCF – Importance was .95 ($SD = 1.82$), showing an increase in self-report importance to change anxiety after receiving the high-risk feedback. The eta square statistic (.21) indicated a large effect size based on Cohen's (1988) guidelines.

A paired samples t-test was performed to evaluate change in confidence to change anxiety after receiving the high-risk feedback. As expected, there was a statistically significant increase in ICCF confidence to change anxiety from pre ($M = 6.10$, $SD = 2.06$) to post high-risk

feedback (M = 6.58, SD = 1.84), $t(59)$ = - 2.42, $p < .05$. The mean increase in ICCF – Confidence was .48 (SD = 1.55), thereby showing that self-report confidence to change anxiety increased after receiving high-risk feedback. The eta square statistic (.08) indicated a moderate effect size (Cohen, 1988). See Korte and Schmidt (in press) for additional details.

3.1.3.2 Post-intervention. *Importance and confidence to change anxiety.* To examine the importance to change anxiety a linear regression equation was computed with experimental condition entered as the predictor and the post-experiment importance to change anxiety variable entered as the dependent variable. The baseline importance to change anxiety variable was also entered in the equation to control for the baseline level of importance to change anxiety. The first step of the hierarchical regression model accounted for 62.4% of the variance (F (1, 58) = 98.77, $p < .001$. Unsurprisingly, baseline the ICCF-Importance to change anxiety variable was significantly associated with the post-intervention ICCF-Importance to attend the AS intervention (β = .79, $p < .001$), in the first step of the model. After experimental condition was entered in the second step, the final model accounted for 62.1% of the variance (F (2, 57) = 49.33, $p < .001$). Contrary to predictions, experimental condition was not a significant predictor of the ICCF- Importance to change anxiety at post-intervention, although there was a trend toward significance (β = -.13, $p < .11$).

To examine the confidence to change anxiety a linear regression equation was computed with experimental condition entered as the predictor and the post-experiment confidence to change anxiety variable entered as the dependent variable. The baseline confidence to change anxiety variable was entered in the equation to control for the baseline level of confidence to change anxiety. The first step of the hierarchical regression model accounted for 84.6% of the variance (F (1, 58) = 325.02, $p < .001$. Baseline ICCF-Confidence to change anxiety variable

was significantly associated with the post-intervention ICCF-Confidence (β = .92, p < .001), in the first step of the model. After experimental condition was entered in the second step, the final model accounted for 86.9% of the variance (F (2, 57) =196.50, p < .001). As expected, adding the experimental condition in the second step of the model, revealed experimental condition to be a significant predictor of the ICCF-Confidence to change anxiety at post-intervention, above and beyond baseline the baseline ICCF-Confidence to change anxiety accounting for unique variance (β = -.16, p < .001) in the regression model, thereby showing that there was a significant group difference in confidence to change anxiety with the MET condition being more confident to change anxiety than the control group at post-experiment.

Importance and confidence to change AS. To examine the importance to change AS a linear regression equation was computed with experimental condition entered as the predictor and the post-experiment importance to change AS variable entered as the dependent variable. The baseline importance to change AS variable was also entered in the equation to control for the baseline level of this variable. The first step of the hierarchical regression model accounted for 61.1% of the variance (F (1, 63) = 101.70, p < .001. Unsurprisingly, baseline the ICCF-Importance to change AS variable was significantly associated with the post-intervention ICCF-Importance to change anxiety (β = .79, p < .001), in the first step of the model. After experimental condition was entered in the second step, the final model accounted for 62.1% of the variance (F (2, 62) = 53.34, p < .001). Contrary to predictions, adding the experimental condition in the second step of the model, revealed experimental condition was not a significant predictor of the ICCF- Importance to change AS, although there was a trend toward significance (β = -.13, p = .10).

To examine the confidence to change AS, a linear regression equation was computed with experimental condition entered as the predictor and the post-experiment confidence to change AS variable entered as the dependent variable. The baseline confidence to change AS variable was entered in the equation to control for the baseline level of this variable. The first step of the hierarchical regression model accounted for 70.5% of the variance (F (1, 63) = 154.02, $p < .001$. Baseline the ICCF-Confidence to change AS variable was significantly associated with the post-intervention ICCF- Confidence to change AS ($\beta = .84$, $p < .001$), in the first step of the model. After experimental condition was entered in the second step, the final model accounted for 72.8% of the variance (F (2, 62) = 86.54, $p < .001$). Consistent with predictions, adding the experimental condition in the second step of the model, revealed experimental condition to be a significant predictor of the ICCF- Confidence to change AS at post-intervention, above and beyond baseline the baseline ICCF-Confidence accounting for unique variance ($\beta = -.16$, $p < .05$) in the regression model.

Motivation to attend the ASAT intervention. We also examined motivation to attend the AS intervention. Once again, a linear regression equation was computed with experimental condition entered as the predictor and the post-experiment motivation to attend the AS intervention entered as the dependent variable. The baseline motivation to attend the AS intervention variable was also entered as a covariate to the equation to control for the baseline level of this variable. The first step of the hierarchical regression model accounted for 58.8% of the variance (F (1, 58) = 85.18, $p < .001$. Unsurprisingly, baseline the ICCF-Motivation variable was significantly associated with the post-intervention ICCF-Motivation to attend the AS intervention ($\beta = .77$, $p < .001$), in the first step of the model. After experimental condition was entered in the second step, the final model accounted for 66.9% of the variance (F (2, 57) =

60.67, $p < .001$). As expected, adding the experimental condition in the second step of the model, revealed experimental condition to be a significant predictor of the ICCF-Motivation to attend the AS intervention at post-intervention, above and beyond baseline the baseline ICCF-Motivation accounting for unique variance ($\beta = -.30$, $p < .001$) in the regression model, thereby providing evidence that there is a significant group difference in motivation to attend the AS intervention with the MET condition being more motivated than the control group. Table 3 reports the full results of the regression model for the ICCF variables.

3.1.4 Intervention Options

We also conducted exploratory analyses examining the change in intervention option preferences using the IOQ to assess for changes in intervention preferences from baseline to post-intervention by experimental group. Participant's were asked to rank their preferences (1st choice to 5th choice) on five different intervention options: (1) no intervention, (2) return to lab to receive the ASAT intervention, (3) receive online access code to complete the ASAT intervention online, (4) receive a call for individual intervention, and (5) receive a call for group intervention. Based on the design of the study, we were most interested in observing changes in the experimental groups from pre to post-experiment on three first options (no intervention, return to lab for ASAT, and complete ASAT online). We examined changes in the intervention options by group from pre to post-experiment, by examining the percent of individuals in each group listing the three options as their first or second choice for intervention. Percentages for participants selecting the intervention option as either their first or second choice were combined to allow for comparison between the MET and health focused control.

First, we examined the baseline to post-experiment change in intervention preference on the option to return to the lab to receive the ASAT intervention. At baseline, approximately

19% of individuals in the MET group and 20.6% in the health focused control group reported returning to the lab for ASAT would be their first or second intervention choice. At post-experiment, this rate increased to 51.6% in the MET group and 29.4% in the health focused control demonstrating a larger increase in interest to return to the lab for the ASAT intervention in the MET group. Second, we examined the change in intervention preferences from baseline to post-experiment in the option to receive an access code to complete the ASAT intervention online. At baseline, 51.7% in the MET group and 64.7% in the health focused control group reported completing the intervention online would be their first or second choice for the intervention. This percentage increased to 87.1% for the MET group, reflecting a 35.5% increase while the health focused control group percent was 73.5%, reflecting an 8.8% increase at post-experiment. Finally, we were also interested in observing the change in those reporting that no intervention would be their first or second intervention choice. At baseline, 65.5% of those in the MET group and 73.5% of those in the control group indicated that no intervention would be their first or second choice for intervention option. At post-experiment, 45.2% in the MET group and 61.8% in the control group reported receiving no intervention as their first or second choice, indicating 20.3% decrease in MET group and 11.7% decrease in the control group or the preference to receive no intervention. Taken together these finding suggest that while both groups show an increase in the percent of those interested in the ASAT intervention, the MET group shows a larger increase than the control group. Likewise, both groups show a decrease in their preference of no intervention, however, this decrease was larger for the MET group than the control group. See Figure 2 for a visual representation of the findings.

To examine whether there were statistically significant group differences in the distribution of ranked choices on the IOQ items, a series of independent samples Mann-Whitney

U tests were computed on the IOQ no intervention item, the online ASAT item, and the item to receive ASAT in the lab. At baseline, there were no significant differences in the distributions of the ranked choices between the MET and the control condition on the 3 IOQ items (all *p's = ns*). At post-experiment, there was a significant group difference in the distributions on the IOQ item of returning to the lab for the ASAT intervention ($p < .05$). The largest group difference in the distributions of ranked choices was for the first choice option. Specifically, 8 of the participants in the MET group indicated that returning to the lab for the ASAT intervention was their first choice intervention option. In contrast, only 1 participant in the control group reported returning to the lab as their first choice. However, there was not a significant difference in the ranked choice distributions between the experimental groups on the IOQ no intervention item or the IOQ item to receive the online ASAT option.

3.1.5 Behavioral Analyses

Logistic regression analyses were computed to predict whether condition (MET or Control) was predictive of (1) scheduling an ASAT appointment and (2) completion of the ASAT intervention. Contrary to expectations, group was not a significant predictor of scheduling an appointment ($B = .40$, S.E. = .70, Wald = .278, $p = ns$) or a significant predictor of completing the ASAT intervention ($B = .15$, S.E. = .72, Wald = .044, $p = ns$). Of the MET participants, 12.9% (4 of 32) scheduled an appointment and 12.9% (4 of 32) completed the ASAT intervention. Likewise, of the health focused control condition participants 17.6% (6 of 33) scheduled an appointment and 14.7% (4 of 33) completed the ASAT intervention.

3.1.6 Mediation Analyses

According to Baron and Kenny (1986) to perform a test of mediation, there must be a significant direct effect of the independent variable on the dependent variable. Because there

was not a significant direct effect of experimental condition on (1) calling the clinic to schedule an appointment or (2) completing the AS intervention, the requirement for testing mediation were not met. For this reason, mediation analyses examining the levels of motivation (URICA scores) or symptoms of anxiety or depression (IDAS scores) as mediating variables were not conducted.

3.2 Secondary Analyses

We also examined whether experimental condition would have an effect on AS symptoms. A hierarchical linear regression equation was computed to test the hypothesis that experimental condition (i.e., MET) would be a significant predictor in the reduction of anxiety sensitivity after the experimental session. Post-intervention ASI score was used as the criterion variable. Baseline ASI was entered in Block 1 to control for baseline levels of AS. Experimental condition was entered as the predictor in Block 2 to assess for the effect of experimental condition on post-intervention AS symptoms. Table 4 reports the full results of the regression model. The first step of the hierarchical regression model accounted for 71.9% of the variance (F (1, 63) = 164.68, $p < .001$. Unsurprisingly, baseline ASI was significantly associated with the post-intervention ASI ($\beta = .84$, $p < .001$), in the first step of the model. After experimental condition was entered in the second step, the final model accounted for 73.9% of the variance (F (2, 62) = 91.70, $p < .001$). As expected, adding the experimental condition in the second step of the model, revealed experimental condition to be a significant predictor of the ASI score at post-intervention, above and beyond baseline ASI accounting for unique variance ($\beta = .16$, $p < .05$) in the regression model, thereby providing evidence that the MET condition was a significant predictor in reduction of AS symptoms.

Additionally, three linear regression analyses were computed to assess the effect of experimental condition the three subfactors of AS. Separate regression equations were computed for the cognitive concerns, physical concerns, and social concerns subscales of the ASI. For each equation, the post-intervention cognitive concerns, physical concerns, or social concerns subscale score was used as the criterion variable. The corresponding baseline ASI subscale was entered in Block 1 to control for baseline levels of the AS subscale. Finally, experimental condition was entered as the predictor in Block 2 to assess for the effect of experimental condition on post-intervention AS.

The first regression equation examined the effect of experimental condition on the cognitive concerns subscale of the ASI. The first step of the hierarchical regression model accounted for 57.4% of the variance (F (1, 63) = 87.41, $p < .001$. Unsurprisingly, baseline ASI was significantly associated with the post-intervention ASI ($\beta = .75$, $p < .001$), in the first step of the model. After experimental condition was entered in the second step, the final model accounted for 61.2% of the variance (F (2, 62) = 51.56, $p < .001$). As expected, adding the experimental condition in the second step of the model, revealed experimental condition to be a significant predictor of the ASI score at post-intervention, above and beyond baseline ASI accounting for unique variance ($\beta = .21$, $p < .01$) in the regression model, thereby providing evidence that the MET condition was a significant predictor in the reduction of AS symptoms.

The same approach was used for the hierarchical linear regression equations computed to examine the effect of experimental condition (i.e., MET, health control) on the physical concerns and social concerns subscales of the ASI. Separate regression equations were computed for each subscale with the post-intervention subscale entered as the dependent variable, baseline subscale score entered in the first block and experimental condition entered in the second block of the

equation. The results revealed the physical concerns and social concerns subscale were not significant predictors (β= .10, p = *ns*; β= .07, p = *ns*; respectively; see table 1 for the complete results of the regression models).

To ensure these effects were not confounded by the presence of a small sample of individuals with an anxiety disorder diagnosis, a second series of hierarchical regression analyses were performed to evaluate the effect of experimental condition in the change of AS after dropping the data from the 5 participants with anxiety disorder diagnoses. As expected, the results followed the same pattern as the original set of analyses with experimental condition being a significant predictor of reduction in the ASI total score (β= .18, $p < .05$) and ASI cognitive concerns subscale (β= .26, $p < .01$). Experimental condition was not a significant predictor of change in the physical concerns and social concerns subscales of the ASI (β= .12, p = *ns*; β= .08, p = *ns*; respectively).

Taken together, these findings show the experimental group is predictive of the change in the ASI total score and the ASI cognitive concerns subscale. Specifically, the MET group was predictive of change in overall AS and the cognitive concerns subscale of AS. In contrast, the physical concerns and social concerns subscales of the ASI were not significant predictors of this association.

CHAPTER 4

DISCUSSION

The findings from the present study demonstrate that MET is effective at increasing motivation to change AS. Interestingly, the results show that the use of high-risk feedback is effective in increasing two factors of motivation – importance to change and confidence to change – in those high in AS. It is notable that this increase in motivation occurred before individuals entered the experimental condition. Upon completing the experimental condition, the MET group displayed further enhancement in their confidence to change anxiety and confidence to change AS. However, importance to change AS was not significant, thereby suggesting that the MET condition had a stronger impact on the participant's perceived ability to change AS than the perceived importance of changing AS. Additionally, the MET group showed enhanced motivation to attend the ASAT intervention at post-intervention. However, this increase in motivation did not translate to group differences in the behavioral measures of motivation (i.e., attending the ASAT intervention), thereby suggesting that MET is effective at increasing self-report motivation to change anxiety and AS, but that it was not effective in producing the desired behavioral changes.

Interestingly, results of the present study also show that the use of a single session of MET to be effective in reducing AS. The MET group showed a reduction in AS symptoms (7.23 points for the MET group; 4.42 points for the control group) that is similar to the decrease reported in other AS intervention studies. For instance, Smits et al. (2008) performed a meta-analysis of AS interventions and reported a mean change of 6.92, (*SD* = 2.54) on the ASI in the active condition and a 4.32 point change (*SD* = 3.61) in the control condition in "at-risk"

samples. Thus, the level of post-intervention reduction in AS after the MET session in the present study is similar to the post-intervention reduction when utilizing other CBT techniques.

As with any study, the findings of the present investigation should be considered in light of its limitations and considerations for future studies in this area. First, it is possible that the increases in motivation observed after providing the high-risk feedback may have confounded the results. Given the findings, it seems plausible that the use of high-risk feedback without MET may be sufficient to produce motivational changes in a group of those with elevated AS, thereby limiting the strength of the effects observed in the MET group. Future research should examine this issue further. One possibility might be to alter the feedback given to the groups in that the MET group would receive the high-risk feedback, while the control group would receive a variation of the feedback that did not include information about their elevated level of AS. Because individuals in the control group would no longer be informed of their AS, we would expect that those in the control group would no longer show enhanced motivation at this stage, thereby providing a stronger test of the change in motivation between the two groups.

Second, it is also notable that the while the use of the ICCF revealed significant findings, use of the URICA did not seem to be effective in measuring the changes in motivation in this group. It is notable that the URICA has not been used with at-risk samples and therefore may not be appropriate for measuring motivational changes in this population. Development of a measure designed to assess for changes in the awareness of risk and changes in motivation to alter risk status is important to ensure motivational changes are being captured in our assessment tools.

A third limitation of the present study was the limited accessibility of the ASAT intervention. The study was designed to test whether the MET group would be motivated to

return to the lab to receive that ASAT intervention. This design was modeled after other studies using MET to increase motivation to schedule a treatment session for those with anxiety disorders (Buckner & Schmidt, 2009). While this design worked well for a clinical population, it is possible that this may not be the best approach for those with elevated AS who may not be experiencing the same degree of impairment as those with a diagnosed condition. As discussed by Lau and Rapee (2011) in order for a preventative intervention to be utilized, it must be easily accessible. With this in mind, it seems that altering the accessibility of the intervention is an important next step in this area of study. Perhaps by providing the participants with the option to complete the intervention directly after the experimental session or providing them with the option to complete the intervention online would significantly increase the number of participants who choose to complete the intervention. Finally, given the findings that the MET condition was effective at reducing AS, it is possible that because the participants experienced a reduction in their AS symptoms at post-experiment, they may have felt that further intervention was not necessary, which may partially explain the low level of completing the AS intervention.

Despite these limitations, the results of the present study are encouraging. As with any new area of research, we are able to learn from the limitations of prior investigations to inform future projects in the area. Since completion of this study, our laboratory has implemented some of the changes discussed above. Although preliminary, the initial results from this pilot investigation are encouraging with approximately 50% of individuals in the active group completing the intervention.

Increasing motivation in those at high risk for anxiety psychopathology is a crucial factor to consider in the prevention of anxiety disorders. It is plausible that many individuals in this population are unaware of their elevated risk for anxiety psychopathology, unaware of effective

interventions to reduce risk, or unmotivated to change their risk-status before they develop problematic symptoms of anxiety. These preliminary results may potentially open the door for a new and exciting approach in anxiety prevention research. Use of motivational enhancement strategies as an adjunct to preventive interventions may help bridge the gap in our existence of effective interventions, but difficulty with disseminating these interventions due to a lack of awareness of risk or low motivation to change risk status in populations at-risk for anxiety psychopathology.

Table 1. *Timeline for the Administration of Self-report Measures*

Measures	Screening	Baseline	Post High-risk Feedback	Post-experiment
Demographics		X		
SCID-Anxiety Module		X		
ASI	X	X		X
IDAS		X		X
URICA		X		X
ICCF		X	X	X

Note. ASI = Anxiety Sensitivity Index, SCID = Structured Clinical Interview for the DSM-IV, IDAS = Iowa Depression and Anxiety Scales, URICA = University of Rhode Island Change Assessment, ICCQ = Importance and Confidence of Change Questionnaire.

Table 2. *Pre and Post-Intervention Means and Standard Deviations for the Primary Outcome Measure*s

	MET			Control		
Measure	Pre	Post-feedback	Post	Pre	Post-feedback	Post
ICCF						
ICCF-Importance Anxiety	4.71 (2.07)	6.00 (1.71)	5.77 (2.30)	5.35 (2.07)	6.00 (1.97)	6.10 (2.21)
ICCF-Confidence Anxiety	6.25 (1.87)	6.62 (1.43)	6.86 (1.43)	6.00 (2.25)	6.55 (2.17)	6.45 (2.19)
ICCF-Importance AS	–	5.96 (1.73)	5.77 (2.30)	–	5.67 (2.01)	5.70 (1.94)
ICCF-Confidence AS	–	6.61 (1.44)	7.03 (1.47)	–	6.55 (2.17)	6.48 (2.05)
ICCF-Motivation for Intervention	–	4.32 (2.06)	5.54 (2.08)	–	4.77 (2.08)	4.58 (2.28)
URICA						
URICA – Precontemplation	19.87 (4.04)	–	17.77 (5.15)	21.47 (4.66)	–	19.21 (4.94)
URICA – Contemplation	27.06 (3.98)	–	27.13 (5.23)	25.53 (5.90)	–	27.47 (5.44)
URICA – Action	24.65 (4.42)	–	24.77 (5.19)	23.62 (6.72	–	24.56 (6.51)
URICA – Maintenance	19.90 (5.72)	–	19.37 (6.04)	18.73 (5.59)	–	20.03 (5.95)

Note. ICCF = Importance and Confidence Form, URICA = University of Rhode Island Change Assessment Scale.

Table 3. *Regression Model for Importance and Confidence to Change Anxiety and AS, and Motivation to Attend the AS Intervention*

Scale	*t*	*ß*	*p*
Dependent Variable: Post-experiment ICCF – Importance to change anxiety			
Variance explained: 62.4%			
Block 1			
Post-Feedback ICCF-Importance	9.93	.79	.000
Variance explained: 62.1%			
Block 2			
Condition	-.77	-.06	.446
Dependent Variable: Post-experiment ICCF – Confidence to change anxiety			
Variance explained: 84.6%			
Block 1			
Post-Feedback ICCF – Confidence	17.84	.92	.000
Variance explained: 86.9%			
Block 2			
Condition	-3.34	-.16	.001
Dependent Variable: Post-experiment ICCF – Importance to change AS			
Variance explained: 61.1%			
Block 1			
Post Feedback ICCF-Importance	10.09	.79	.000
Variance explained: 62.1%			
Block 2			
Condition	-1.64	-.13	.107
Dependent Variable: Post-experiment ICCF – Confidence to change AS			
Variance explained: 70.5%			
Block 1			
Post-Feedback ICCF- Confidence	12.41	.84	.000
Variance explained: 72.8%			
Block 2			
Condition	-2.50	-.16	.015
Dependent Variable: Post-experiment ICCF – Motivation to attend AS Intervention			

Table 3 – continued

Scale	*t*	*ß*	*p*
Variance explained: 58.8%			
Block 1			
Post-Feedback ICCF –Motivation	9.23	.77	.000
Variance explained: 66.9%			
Block 2			
Condition	-3.90	-.30	.000

Note. ICCF = Importance and Confidence to Change Form, $N = 65$

Table 4. *Regression Model for Post-Intervention Reduction in Anxiety Sensitivity*

Scale	*t*	*ß*	*p*
Dependent Variable: Post-experiment ASI			
Variance explained: 71.9%			
Block 1			
Baseline ASI	165.68	.84	.001
Variance explained: 73.9%			
Block 2			
Condition	91.70	.16	.018
Dependent Variable: Post-experiment ASI – Cognitive Concerns			
Variance explained: 58.1%			
Block 1			
Baseline ASI - Cognitive	9.35	.76	.000
Variance explained: 61.2%			
Block 2			
Condition	2.68	.21	.010
Dependent Variable: Post-experiment ASI – Physical Concerns			
Variance explained: 65.9%			
Block 1			

Table 4 – continued

Scale	*t*	*β*	*p*
Baseline ASI - Physical	11.21	.81	.000
Variance explained: 66.4%			
Block 2			
Condition	1.39	.10	.170
Dependent Variable: Post-experiment ASI – Social Concerns			
Variance explained: 77.7%			
Block 1			
Baseline ASI - Social	14.32	.88	.000
Variance explained: 77.8%			
Block 2			
Condition	1.14	.07	.260

Note. ASI = Anxiety Sensitivity Index, *N* = 65

Table 5. *Pre and Post-Intervention Change in AS by Condition*

	MET		Control	
	Pre	Post	Pre	Post
Total Sample				
ASI total	26.59 (8.24)	19.36 (8.73)	28.12 (8.93)	23.70 (9.73)
ASI Physical Concerns	14.38 (5.52)	9.97 (5.63)	14.61 (5.44)	11.42 (5.44)
ASI Cognitive Concerns	3.78 (3.22)	2.63 (2.73)	4.03 (3.22)	3.94 (2.72)
ASI Social Concerns	8.44 (2.11)	6.78 (2.54)	9.48 (2.31)	8.33 (3.02)
ASI Total Percent Change		27%		16%

Note. ASI = Anxiety Sensitivity Index, *N* = 65.

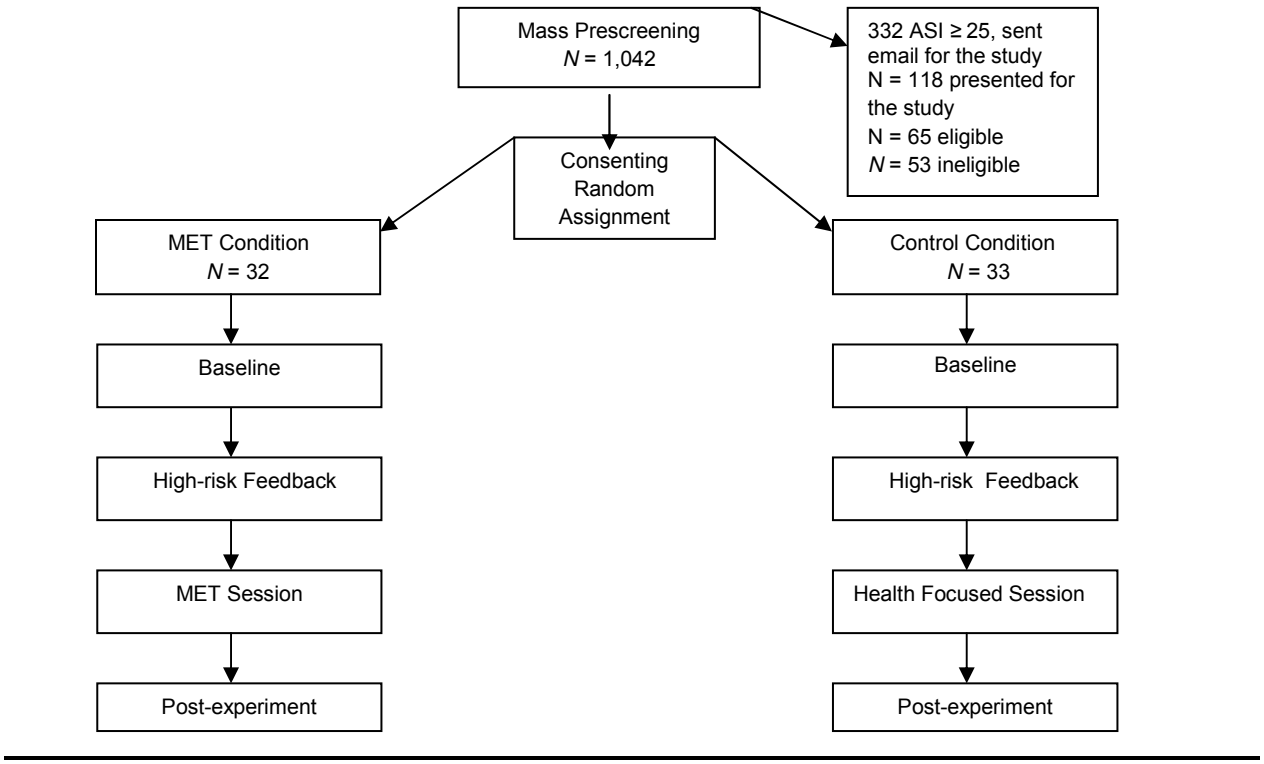

Figure 1. *Subject flow chart for the experimental and control groups.*

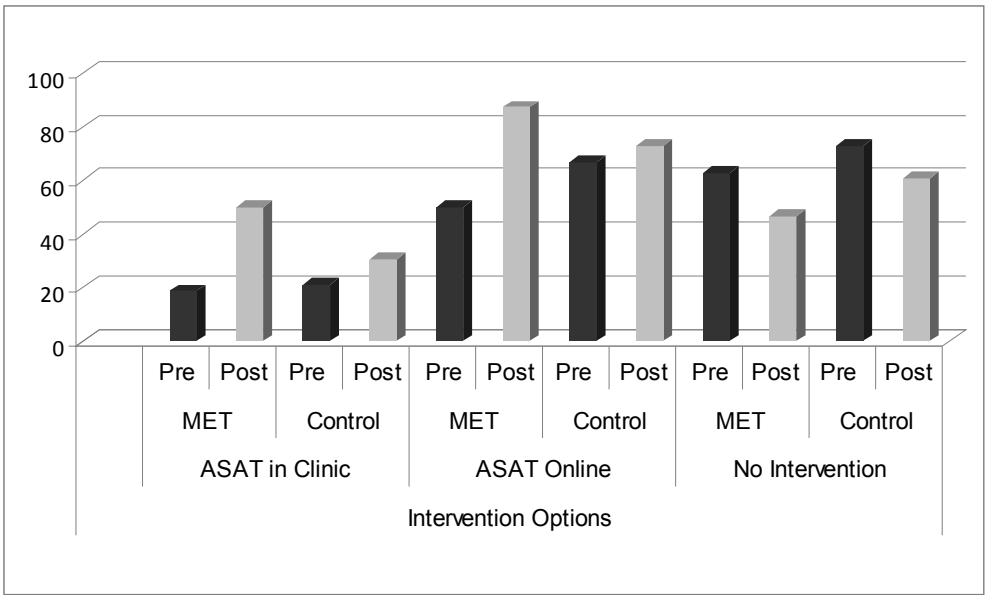

Figure 2. *Changes in preference of intervention options from pre to post-experiment by experimental condition. MET = Motivation Enhancement Treatment, ASAT = Anxiety Sensitivity Amelioration Treatment.*

APPENDIX A

HUMAN SUBJECTS RESEARCH APPROVAL LETTER AND CONSENT FORM

The Florida State University
Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 · FAX (850) 644-4392

RE: APPROVAL MEMORANDUM

Date: 10/8/2012

To: Kristina Korte

Address: Psychology Department, 1107 West Call St., Tallahassee, Fl 32301
Dept.: PSYCHOLOGY DEPARTMENT

From: Thomas L. Jacobson, Chair

Re: Re-approval of Use of Human subjects in Research
Anxiety Disorders Risk Study

Your request to continue the research project listed above involving human subjects has been approved by the Human Subjects Committee. If your project has not been completed by 2/13/2013, you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the committee.

If you submitted a proposed consent form with your renewal request, the approved stamped consent form is attached to this re-approval notice. Only the stamped version of the consent form may be used in recruiting of research subjects. You are reminded that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report in writing, any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor are reminded of their responsibility for being informed concerning research projects involving human subjects in their department. They are advised to review the protocols as often as

necessary to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

Cc:
HSC No. 2012.9130

INFORMED CONSENT FORM

ANXIETY DISORDERS RISK STUDY

I, _____, being 18 years of age or older, freely and voluntarily and without undue inducement or any element of force, fraud, deceit, duress, or other form of constraint or coercion, consent to be a participant in the above named research project, to be conducted at the Florida State University by Kristina Korte, a graduate student in psychology, and Dr. Brad Schmidt, Ph.D., Professor of Psychology. Listed below are the procedures to be followed in this research and their purposes, any risks, discomfort, and benefits associated with participation in this study, and the measures which will be taken to ensure confidentiality of the information obtained.

Procedures for the research: I understand that if I participate in the project, I will be asked to fill out questionnaires and speak with a clinician about my current mood, thoughts, and beliefs. If I should reveal that I am a threat either to myself or others, I understand that the experimenter will approach me to ensure my safety and may provide me with referral information. I understand that the purpose of this study is to discuss some risk factors associated with anxiety disorders and my experience of anxiety. I understand that if I meet the eligibility criteria for the study, the total time commitment will be approximately two hours. I understand that people who are eligible to participate in this study are randomly placed into either an experimental or a control group. Both groups will receive information about anxiety, risk factors associated with anxiety disorders, and general health and well-being information, although this information will vary slightly in each group. Because this is an experiment, the differences between the groups cannot be revealed at this point in time, but I am aware that this technique has been used in research for many years. I understand that this study involves completion of some questionnaires focusing on my mood, anxiety, and personality traits. I am aware that after completing the questionnaires, I will meet with a clinician who will ask me about my experience of anxiety and anxiety related symptoms that I may or may not be experiencing. I am aware that after the interview the clinician will then start the experimental session, in which I will be provided with information on anxiety and its risk factors and information pertaining to general health and well-being. Although I may feel uncomfortable discussing my mood, thoughts, and beliefs, this study involves no known risks to my health or well-being. I understand that I will be asked to participate in this experiment for one session, which will require one trip to the laboratory. I will be compensated by receiving two (2) research credits for my time. If I do not meet the eligibility criteria, I know that will not be able to participate in the remainder of the study, but I will still be entitled to the one (1) research credit for my time.

Potential risks or discomforts: I understand there is minimal risk involved in this study, although some individuals may be uncomfortable describing their current mood, thoughts, and beliefs. I understand I may experience some anxiety and frustration in anticipation and during

the experimental procedures. However, such situations should not be any more anxiety-provoking than situations commonly experienced in day-to-day life. The research assistant and clinician will be available to talk with me about any discomfort I may experience while participating. I have the right to refuse or discontinue participation at any time. If I decide to stop participation, I will still be entitled to the one (1) research credit for my time.

Potential benefits to you or others: I have not been given any guarantee that I will benefit from my participation in this study. I may derive benefit from the self-assessment as it may increase my awareness of my risk for anxiety. I will also be provided referrals to appropriate clinical services (e.g., FSU Psychology Clinic, FSU Counseling Center) if I would like to seek treatment. I may also develop a better understanding of research methodology and will be providing researchers with valuable insight.

Confidentiality: I understand my participation is totally voluntary and I may stop participation at any time. All my answers to the questions will be kept confidential, and my confidentiality will be protected to the full extent allowed by law. My name will not appear on any of the results and only group findings will be reported. I understand that, because this is an anonymous study, the administrator will not be able to link my responses to me and initiate counseling, if needed. I may, however, inquire about referral sources if I wish, and the experimenter will be able to provide me with that information. All data will be destroyed on or before January 21st, 2021.

I understand that this consent may be withdrawn at any time without prejudice, penalty or loss of benefits to which I am otherwise entitled. I have been given the right to ask any inquiry concerning the study. Questions, if any, have been answered to my satisfaction. I understand that I may contact Kristina Korte, Florida State University, Department of Psychology, [redacted], or her supervisor, Norman B. Schmidt, Ph.D., [redacted], for answers to questions about this research or my rights. Group results will be sent to me upon my request. I understand that if I have any questions about my rights as a participant in this research, or if I feel I have been placed at risk, I can contact the Chair of the Human Subjects Committee, Institutional Review Board, through the Vice President for the Office of Research at (850) 644-8633.

I have read and understand this consent form. By choosing freely and voluntarily to participate in the study as described here I indicate my informed consent:

_____ _____

(Participant Signature) (Date)

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BIOGRAPHICAL SKETCH

Kristina graduated from the University of Iowa with a B. A. degree in Psychology. In 2007, she received a M. A. degree in Psychology from Boston University. While at Boston University, Kristina volunteered at The Center for Anxiety and Related Disorders and worked on several research studies focusing on the nature anxiety disorders. After completing her M.A., she worked at the National Center for PTSD at the Boston VA, where she worked as a project coordinator and diagnostician on projects involving combat veterans with PTSD. Kristina subsequently entered a doctoral program in clinical psychology at Florida State University in 2009. Her research interests focus on the nature, measurement, and treatment anxiety and its related disorders. She is also interested in identifying prospective risk factors, developing preventative interventions, and creating novel strategies to enhance intervention utilization in populations at-risk for developing anxiety disorders.