THE INFLUENCE OF REAPPRAISING ANXIETY ON RISK-TAKING

A Thesis
by
EVA EBERT

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Abstract

THE INFLUENCE OF REAPPRAISING ANXIETY ON RISK-TAKING

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The literature suggests that individuals with higher levels of anxiety tend to take fewer risks. With the knowledge that there are positive risks that aid in everyday functioning, the decline in risk-taking by those with anxiety could be of concern. Reappraising anxiety as beneficial has been shown to increase subsequent performance on a variety of tasks. The purpose of this study was to examine whether having participants reappraise their anxiety as beneficial would influence their willingness to take more risks in a subsequent task. Participants were randomly assigned to either a reappraisal condition or a control condition. Participants in the reappraisal condition were given instructions to view their anxiety as beneficial in order to perform best. Participants in the control condition were given neutral instructions. Anxiety was measured using the State Trait Anxiety Inventory (STAI) and the Depression Anxiety Stress Scale (DASS-21). The Balloon Analogue Risk Task (BART) measured risk-taking. It was hypothesized that 1) higher levels of anxiety would be associated with lower levels of risk-taking, 2) participants in the reappraisal condition would take more risks than participants in the control condition, 3) the reappraisal instructions

would have a greater influence on participants with higher anxiety and, 4) the reappraisal group would better learn the differences in the explosion probabilities for the three different color balloons. Results indicated that higher levels of anxiety were associated with lower levels of risk-taking. However, participants' risk-taking did not differ across the reappraisal and control conditions. Further research is needed to determine if reappraising anxiety as beneficial is a successful strategy for increasing risk-taking.

Keywords: risk-taking, anxiety, reappraisal

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The Influence of Reappraising Anxiety on Risk-Taking

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Abstract

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Keywords: risk-taking, anxiety, reappraisal

Introduction

The Influence of Reappraising Anxiety on Risk-Taking

Taking risks is a part of everyday life. People take risks in their social lives, their careers, and in their personal endeavors. Many factors influence the likelihood of an individual to take a risk, and anxiety is one of those factors. The literature suggests that individuals with higher levels of anxiety tend to take fewer risks. With the knowledge that there are risks that are necessary and/or beneficial, it is of concern that those with higher anxiety might be avoiding risks that can help them to be more successful in life. In searching for a solution, it has been found that reappraising anxiety as a beneficial emotional response can increase subsequent performance on a variety of tasks. However, it has yet to be discovered if reappraising anxiety will influence an individual's willingness to engage in risk-taking behaviors. This thesis describes a study that investigated whether reappraising anxiety influences the risks that people are willing to take.

Risk Taking and Anxiety

Risk-taking occurs when people choose to engage in a behavior or make a choice with an uncertain outcome. Often, people associate the word "risk" with negative behaviors, such as unsafe sex, drug use, and gambling. Despite the negative connotation attached to risk taking, risks can also be positive. There are numerous risks that are necessary and/or beneficial for daily functioning and life satisfaction. For example, driving a car to work holds the risk that the driver will be involved in a wreck. However, it is important that the individual realizes that the likelihood of being involved in a wreck is low and the benefits of attending work outweigh the small possibility of a negative outcome. Risk-taking decisions such as driving a car are encountered throughout our days. Risks arise in every facet of life,

including one's social life, career, and personal endeavors. Therefore, while not all risks are beneficial, it is important to take some risks in order to maximize one's success and fulfillment in life.

Some individuals are more comfortable with taking risks and some take risks more often than others (Barlow, Woodman, & Hardy, 2013). There are also a number of factors that influence risk-taking. Many social factors, including peer pressure or simply being observed by a peer, can increase an individual's risk-taking (e.g., Gardner & Steinberg, 2005; Smith, Chein, & Steinberg, 2014). For example, college students are more likely to engage in risky health behaviors, such as alcohol, tobacco, and the improper use of medications, when accompanied by a friend (Varela & Pritchard, 2011). Gender and age also play a role in risk-taking; on average, men tend to take more risks than women (Byrnes, Miller, & Schafer, 1999) and adolescents take more risks than adults (Defoe, Dubas, Figner, & Aken, 2015). Personality is another factor that influence one's likelihood to engage in risky behaviors. For example, people with higher optimism tend to take more financial risks (Weinstock & Sonsino, 2014). Emotion also plays a role in risky decision-making. For example, negative affective states impact decision making by increasing negativity, interfering with the processing of information, and shifting one's motive to repairing one's mood (Raghunathan & Pham, 1999). The focus of this thesis is on one emotion in particular: anxiety. Anxiety is a critical factor in risk-taking because people often experience heightened anxiety when faced with a risky decision.

Anxiety is a state of worry, apprehension, and physiological arousal that is triggered in response to stimuli with the potential for undesirable outcomes (Brooks & Schweitzer, 2011). Anxiety and worry are feelings that all humans experience. Anxiety causes individuals

to be more alert and react quickly, which in moderation can increase performance in numerous domains (e.g., sports, combat, and entertainment). However, too much anxiety can negatively impact one's performance. With regards to risk taking, a number of studies have found that higher anxiety is associated with less risk taking (e.g., Maner et al., 2007; Gambetti & Guisberti, 2012; Giorgetta et al., 2012). For example, across two studies, Maner et al. (2007) tested various aspects of the negative relationship between anxiety and risk taking. Both studies found that higher trait anxiety was associated with lower scores on a behavioral risk-taking task. This result remained even when controlling for negative affect, suggesting that anxiety plays a unique role in risk-taking.

Risk aversion by individuals with higher levels of anxiety can have clinical implications. For example, one study found that individuals with clinically significant anxiety disorders, specifically social phobia and generalized anxiety disorder, were more risk averse in comparison to non-clinical controls (Lorian & Grisham, 2011). In addition, results found a positive relationship between risk-taking and willingness to seek treatment in individuals with clinically significant anxiety disorders. The decision to seek treatment is considered a risky decision, and people likely make this decision by weighing the possible costs (e.g., financial burden, stigma) and benefits (e.g., reduced symptoms). Unfortunately, individuals with higher anxiety tend to weigh the possible costs heavier. Because of this heightened perception of the costs, these individuals often wait longer to seek treatment; their anxiety has to be more severe than non-clinical individuals in order for the possible benefits to outweigh the possible costs (Lorian & Grisham, 2011). In addition, individuals with heightened anxiety often overestimate the likelihood of the negative consequence happening

in risky situations. Therefore, it is likely that these individuals will also overestimate the possibility of negatives outcomes when seeking treatment.

Gambetti and Guisberti (2012) further examined the negative relationship between anxiety and risk-taking by focusing on this relationship in real-world situations. In their study, participants completed a survey in which they were asked about their investment history, stock trend predictions, and preferred investments. Participants were also asked about their attitudes towards three hypothetical investment scenarios. Participants then completed the State Trait Anxiety Inventory (STAI) to assess trait anxiety. The researchers found that higher trait anxiety was related to making more conservative financial decisions (i.e., high anxiety was related to risk aversion). Further, those with higher anxiety were less likely to decide to invest savings, less likely to hold interest-bearing accounts, and made lower predictions of stock trends. This study exemplifies how anxiety affects potentially worthwhile risk-taking in addition to the negative types of risks. As this study shows, anxiety reduces the likelihood to engage in risks that could be beneficial, such as financial investments.

Current cognitive models of anxiety give several explanations for the relationship between anxiety and risk-taking. First, when faced with a risky decision, anxious individuals tend to view the possible negative outcomes as more likely to happen, particularly when the negative outcome is self-relevant (Butler & Matthews, 1987). This may be in part due to activation of more anxiety-provoking situations and threatening stimuli in memory by those with higher anxiety. Presumably, the accessibility of these anxious memories and stimuli causes an individual to perceive negative outcomes as more likely. Secondly, anxious individuals tend to view the possible negative outcomes as more severe and distressing

(Maner & Schmidt, 2006). Due to this heightened perception of likelihood and severity of negative outcomes, anxious individuals tend to be more risk avoidant.

A related finding is that individuals with high anxiety tend to favor low-risk, low-reward options over high-risk, high-reward options (Raghunathan & Pham, 1999). While sometimes low-risk, low-reward options are a good choice, there are high-risk, high-reward options that can be important in life success and satisfaction. For example, one might regard asking someone on a date as a high-risk, high reward scenario. It is high-risk because there is the possibility that the person will not accept the invitation and embarrassment and heartbreak will ensue. It is high reward because there is also a chance that the person will accept, and it may result in a new relationship. This is an example of a social risk that is important to take in order to build new relationships. It is important to take risks in other facets of one's life in order to maximize achievement and satisfaction (Ravert & Gomez-Scott, 2015).

Anxiety might not only reduce risk taking, but it might also limit people's abilities to distinguish between good and bad risks. Taking risks can be necessary in order to figure out which risks are worth taking and which should be avoided. Exploring one's environment and surroundings is essential in learning and allows for better decision-making (Humphreys, Lee, & Tottenham, 2013). Therefore, pushing limits can help one learn what the limits are. For example, if a highly anxious individual never participates in financial investments, he or she will not learn the likelihood of success in this situation.

In the context of laboratory risk-taking tasks, being willing to take risks is essential for doing well in many laboratory tasks including the Balloon Analogue Risk Task (BART; Lejuez et al., 2002). The BART is a computerized risk-taking task in which participants are

presented with a balloon and may choose to pump up the balloon. With each successful

pump, the participant earns points. The participant may choose to end the round at any time,

collect their points, and move on to the next round. However, if the balloon explodes, they

lose their points for the round. The goal is to earn as many points as possible. There are three

different colored balloons and each color represents a different probability of exploding.

Learning the different explosion probabilities of the balloons can be crucial in learning how

much to pump each balloon to order to maximize points earned. Participants receive

feedback with each pump by either gaining points or having the balloon explode and this

feedback can help inform the participant how much to pump the balloon in subsequent

rounds (Humphreys et al., 2013). This learning can only be achieved if participants take

enough risks to discover how often each balloon explodes on average. Therefore, if anxiety

reduces risk-taking, it in turn limits one's ability to learn what risks are advantageous.

      To further investigate whether anxiety is related to the kind of risks individuals take,

Miu, Heilman, and Houser (2008) had participants complete a risk-taking task that included

both advantageous and disadvantageous options. In their study, participants played the Iowa

Gambling Task (IGT), in which participants choose cards from four different decks and

either gain or lose points, depending on the chosen card. In this task, two of the decks were

advantageous, meaning that although the immediate reward was smaller for these decks (500

points), the occasional penalties were also smaller and therefore, choosing most cards from

these decks would lead to an overall gain. The other two decks were disadvantageous,

meaning that although each card chosen out of these decks presented a higher immediate

reward (1000 points), the occasional larger penalties from these decks would lead to an

overall lose of points in the long-run. Results found that overall, high trait anxiety was

associated with impaired decision-making, meaning participants with higher anxiety took more disadvantageous risks than advantageous risks. Miu et al. (2008) suggested that one explanation for this result is that when in anxiety-inducing situations, such as when making risky decisions, people with higher levels of trait anxiety tend to be distracted and unable to process all available cues. Due to this distraction, those with higher anxiety focus more on the clear immediate rewards from the decks rather than the less frequent losses associated with the decks. This posits concern for the risk-taking decisions that individuals with higher anxiety are making.

The above explanation also fits with the finding that high levels of anxiety can decrease performance on a variety of tasks. Attentional control theory (ACT) posits that anxiety drains working memory and limits task performance, especially in complex tasks (Eysenck, Derakshan, Santos, & Calvo, 2007). This is likely because anxious individuals use their attention to focus on threating stimuli and their environment at large, using cognitive resources to worry and avoid harm, instead of focusing their attention on the task at hand (Eysenck et al., 2007). Given that anxiety is associated with decreased risk taking and a diminished ability to differentiate between good and bad risks, finding a strategy to help highly anxious individuals reduce the impact of their anxiety could be quite beneficial. One potential strategy for reducing the influence of anxiety is reappraisal.

Reducing the Influence of Anxiety through Reappraisal

People are likely aware that too much anxiety can be a hindrance. As a result, some people might actively avoid anxiety-provoking situations or try to employ anxiety-reducing techniques in order to cope with anxiety. When faced with an anxiety-provoking task, such as giving a speech, most people believe that the most effective way to perform better is to

suppress one's anxiety by trying to calm down (Brooks, 2014). Suppression can be defined as a concentrated effort to restrain the physiological experience and outward expression of anxiety or other undesirable emotions (Dunn, Billotti, Murphy & Dalgleish, 2009). Despite widespread use of suppression in attempt to relieve symptoms of anxiety, suppression has been found to be an ineffective and maladaptive method. In fact, numerous studies have found suppression can have a paradoxical effect and actually increase the experience of both physiological and cognitive symptoms of anxiety (Iijima & Tanno, 2012; Szentagotait, 2006; Wegner, Broome, & Blumberg, 1997).

While attempting to suppress anxiety is generally an ineffective strategy, reappraisal of anxiety has been found to be an effective method in increasing performance in anxious individuals (e.g., Brooks, 2014; Jamieson, Mendes, & Nock, 2013). Reappraisal involves changing the meaning of a situation in a way that changes its emotional impact (Brooks, 2014). Reappraisal is more effective than suppression in reducing both the experience and expression of emotion. With reappraisal, one does not use energy attempting to suppress anxiety; instead one harnesses the physiological response in a way that aids in performance. This makes sense if one thinks about the difference in the physiological states of anxiety and relaxation. Anxiety is an automatic physiological response, characterized by high arousal; therefore, trying to down-regulate this high arousal in an attempt to calm down can be difficult and both physically and emotionally taxing. On the other hand, switching the meaning of one's anxiety does not necessarily involve changing the arousal level; therefore, minimal interventions can be enough to switch the experience of anxiety into something more positive (Brooks, 2014).

One effective method of reappraisal has been the reappraisal of anxiety as excitement. Brooks (2014) found that reappraising anxiety as excitement led to higher performance than suppressing anxiety across several studies involving karaoke singing, public speaking, and math performance. In her study involving math performance, participants' heart rates were monitored and all participants were told they would complete a difficult IQ test. The IQ test consisted of eight math questions and was completed under time pressure. Before taking the IQ test, participants were given one of three statements: "Try to remain calm," "Try to get excited" or "Please wait a few moments" (p. 1151). These three statements were designed to encourage participants to suppress their anxiety, reappraise their anxiety, or use no specified strategy, respectively. After completion of the test, participants rated the extent to which they felt excited and anxious during the IQ test. Results revealed that across all three conditions, participants' heart rate increased after being informed that they would complete a difficult IQ test and remained high throughout the test. This indicates that those who were given the instructions "Try to remain calm" were unsuccessful in their attempt to down-regulate their experience of anxiety, lending support to the notion that suppressing anxiety is an ineffective strategy. Results also found that participants in the excitement reappraisal condition reported feeling more excited during the task as compared to participants in the calm reappraisal condition and the neutral condition. Perhaps most importantly, participants in the excitement reappraisal condition scored significantly higher on the IQ test than the calm reappraisal and neutral conditions. This study supports the notion that reappraising anxiety as excitement can be an effective strategy for improving performance on anxiety-inducing tasks.

Another successful approach to reappraisal is to reappraise one's physiological experience of anxiety as beneficial. Instead of viewing anxiety as harmful and something to

avoid, one can reappraise anxiety as a beneficial physiological state that can aid in performance (Jamieson et al.,2013). This approach suggests that the experience of anxiety itself does not negatively impact performance, but rather the way in which one views stress is a determinant of their success. Several studies have found that reappraising one's arousal can limit the negative impact of the stress response and positively affect physiology and performance (Jamieson et al., 2013). For example, a study by Beltzer, Nock, Peters, and Jamieson (2014) found that reappraising anxiety as beneficial increased performance on the Trier Social Stress Test. Participants were informed that they would give a speech in front of a panel of evaluators. Prior to the task, participants in the reappraisal condition were encouraged to reappraise their bodily signals as beneficial and proceeded to read summaries of scientific articles highlighting the benefits of stress on performance tasks. A control group was given no instructions prior to the task. During the public speaking task, participants who reappraised their anxiety as beneficial displayed less negative affect, engaged in less avoidant non-verbal signaling, and performed the speech better than participants in the control condition.

Not only can reappraisal improve immediate performance, but the effects can be lasting. In a study examining the long-term benefits of reappraising anxiety as beneficial, Jamieson, Mendes Blackstock, and Schmader (2009) invited students who were planning to take the Graduate Record Exam (GRE) to take a practice GRE test. Prior to the practice GRE, participants in the reappraisal condition read a paragraph explaining how arousal does not harm performance and can in fact be helpful in performance. Additionally, participants in the reappraisal condition were instructed to remind themselves that arousal could be helpful throughout their task. All participants then completed a practice GRE. Consistent with

previous research, participants in the reappraisal condition scored significantly higher on the

math portion of the practice GRE compared to controls. The benefits of reappraisal were also

exhibited when the students took the actual GRE one to three months later. Specifically,

participants in the reappraisal condition reported higher scores on the math portion of the

GRE than participants in the control condition. These results suggest that the reappraisal can

generalize outside of the laboratory setting.

One reason why reappraisal of anxiety improves performance is the physiological

changes that occur as a result of changing one's cognitive approach. Jamieson et al. (2013)

found that how one views a stressful event can affect the body's physiological response.

Situations that cause high arousal are often construed as negative and harmful, thus triggering

a threat response. When one views an anxiety-provoking situation as a threat, the body

responds with a series of physiological changes in order to prepare the body overcome the

threat and handle any harm or damage inflicted. These physiological changes include

activating the sympathetic nervous system and vasoconstriction. The vasoconstriction

component of the stress response is responsible for much of the negative health outcomes of

chronic stress, such as heart disease and high blood pressure. However, viewing an anxiety-

provoking situation as a challenge, rather than a threat, alters the body's reaction. When

taking a challenge approach, the sympathetic nervous system is still activated; however, there

is also increased cardiac efficiency and vasodilation (Jameson et al., 2013, p. 51). This type

of physiological reaction is easier on the body and does not lead to the harmful physical

damage that the threat response can cause. Therefore, one may be able to reappraise a

situation as a challenge to rise to rather than taking the often-harmful threat approach.

Jamieson et al. (2013) tested the effect of reappraisal on the physiological stress response by measuring participants' total peripheral resistance (TPR) and cardiac output (CO) while completing the Trier Social Stress Test (TSST)—a stressful public speaking task. Prior to completing the task, participants in the reappraisal condition were given instructions on how arousal is not harmful and can improve performance. Participants in the ignore condition were given instructions to ignore the source of stress in order to improve performance. Next, participants in both the reappraisal and ignore conditions read scientific articles (some real, some made up) supporting their respective methods. A control group was given no instructions prior to the task. This study found that those in the reappraisal condition exhibited lower TPR reactivity than participants in the control condition and ignore condition. Additionally, participants in the reappraisal condition exhibited more CO compared with participants in the control condition and the ignore condition. Consistent with previous research, this study supports the idea that one's perception of stress can alter how the body reacts.

Several studies have shown the benefits of reappraising arousal on numerous tasks and performances. More specifically, studies have shown that reappraising anxiety as beneficial, rather than harmful, leads to better performance on numerous tasks. However, no studies have examined whether reappraising anxiety as beneficial will influence an individual's willingness to engage in risk-taking behaviors.

Current Study

Previous research has shown that risk-taking and anxiety are related; the more anxiety an individual experiences, the fewer risks they tend to take. If an anxious individual tends to take fewer negative risks, like unsafe sex and drug use, this could certainly be viewed as a

desirable attribute. However, it has been shown that anxious individuals take more disadvantageous risks. In addition, there are risks that promote success and life satisfaction, and individuals with higher anxiety may be less likely to take these beneficial risks.

Reappraisal has been shown to be successful in switching individual's experience of anxiety from a threat response, which impedes performance, to a challenge approach in which performance is enhanced. This reappraisal has also been shown to increase participants' performance on a number of different tasks. The current study tested whether having participants reappraise their anxiety as beneficial influences their willingness to take more risks in a subsequent risk-taking task. In the current study, participants' level of trait and state anxiety was assessed and then they completed the BART—a behavioral risk-taking task. Critically, before completing the risk-taking task, some participants received instructions describing that they should view their anxiety as helpful and beneficial. This study addressed the following hypotheses:

Hypothesis 1. Higher levels of anxiety will be associated with lower levels of risk-taking. As discussed earlier, individuals with higher anxiety tend to view negative outcomes as more likely and more severe, making these individuals more risk averse (Butler & Matthews, 1987; Maner & Schmidt, 2006).

Hypothesis 2. Participants in the reappraisal condition will take more risks than participants in the control condition. Those in the control condition are likely to take a threat approach to the risk task. Reappraisal instructions should help participants to take a challenge approach as opposed to a threat approach. By viewing one's arousal as beneficial in helping one rise to a challenge, participants in the reappraisal condition should have a more healthy stress response and thus perform better (Jamieson et al., 2013).

Hypothesis 3. The reappraisal instructions will have a greater influence on participants with higher anxiety than participants with lower anxiety. If the reappraisal instructions worked by helping participants view their arousal as beneficial, then the instructions would have a greater impact on individuals with more arousal to reappraise than for those who do not experience much arousal in the first place.

Hypothesis 4. Participants in the reappraisal condition will better learn to differentiate the explosion probabilities of the balloons in the BART. As described earlier, the BART includes three different balloon colors, each with a different explosion probability. Optimal performance in the BART requires that participants learn the different probabilities in order to know which balloons they should pump up more and which they should pump up less. I expected that the reappraisal group would better learn the differences in the explosion probabilities for the three different color balloons. This would support the notion that reappraising anxiety as beneficial not only increases risk-taking, but also makes participants take better, more advantageous risks.

Method

Participants

A total of 210 undergraduates from Appalachian State University were recruited for this study. Participants ranged in age from 18 to 30 ($M = 19.55$, $SD = 2.35$). The sample consisted of 59 males (28.1%) and 151 females (71.9%). Participants were recruited through the Psychology Department online recruitment system (SONA) and were granted Experiential Learning Credits (ELCs) for their participation. SONA assigned a random ID code so that participants' identities cannot be linked to their responses.

This study was approved by the Institutional Review Board (IRB) at Appalachian State University (number 16-0069; approved on October 18, 2015). A subsequent modification was approved on November 12, 2015; see Appendices A and B for IRB approval notices. This study adhered to the ethical principles laid down by Appalachian State University.

Primary Measures

State Trait Anxiety Inventory (STAI). The STAI is a questionnaire used to assess how often participants experience anxiety (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983; see Appendix D). The questionnaire assesses two forms of anxiety: state anxiety and trait anxiety. Participants only completed the 20 trait anxiety items. Each response is on a 4-point scale Likert scale from 1 (Almost Never) to 4 (Almost Always). Statements include "I am a steady person" and "I worry too much over something that doesn't really matter." Higher scores indicate greater anxiety. The STAI has shown good internal consistency in both previous research (Spielberger et al., 1983; $\alpha = .75$) and the current sample ($\alpha = .93$).

Depression Anxiety Stress Scale (DASS-21). The DASS-21 is a questionnaire that assesses negative emotional symptoms experienced by the participant in the past week (Lovibond & Lovibond, 1995; see Appendix E). The scale is comprised of three subscales: depression, anxiety, and stress. Participants are presented with 21 statements and asked to report to what extent each statement applied to them in the past week. Each response is on a 4-point Likert scale from 0 (Did not apply to me at all) to 3 (applied to me very much, or most of the time). Statements include "I found it difficult to relax" and "I felt scared without any good reason". The DASS has shown high internal consistency in both previous research (e.g. Henry & Crawford, 2005) and the current sample for all 3 subscales: Depression scale

(previous research α = .82, current sample α = .81), Anxiety Scale (previous research α = .90, current sample α = .74), and the Stress Scale (previous research α = .90, current sample α =.79).

Balloon Analogue Risk Task (BART). The BART is a computer-based risk-taking task. Participants are presented with a screen depicting a balloon (Lejuez et al., 2002). Participants may choose to inflate the balloon by clicking "Pump". Each pump that inflates the balloon results in winning points. However, with each pump there is a risk of the balloon exploding. Participants may choose to stop inflating the balloon at any point by clicking "Done" and will collect their points and move on to the next round. If the balloon explodes before the participant chooses to end the round, all points for that round are lost. Balloons vary in color (blue, purple, and orange), with each color representing a different probability of exploding (1/10, 1/20, and 1/40 respectively). Participants completed two blocks of 30 rounds, for a total of 60 rounds. Each block contained 10 balloons of each color and the order of the balloons within the blocks was randomized. The amount of risk was measured by the average number of pumps across the total rounds. Higher numbers indicate higher risk-taking tendencies. The BART has shown that adjusted average pumps have test–retest reliability across days with a Pearson's correlation of $r = .77$ (White, Lejuez, & de Wit, 2008).

Exploratory Measures

Modified Acute Panic Inventory (API). The API is a questionnaire that assesses panic symptoms (Dillon, Gorman, Liebowitz, Fyer, & Klein, 1986; see Appendix F). Participants are presented with 14 questions and asked to answer each question on a 5-point Likert scale from 0 (Not at all) to 4 (Severely). Questions include "Do you feel faint?" and "Is it difficult for you to concentrate?" This questionnaire served as a self-report measure of

participants' physiological arousal during the BART. This scale showed high internal

consistency for the current sample (α = .73).

Emotion Regulation Questionnaire (ERQ). The ERQ assesses participants'

habitual use of emotion regulation strategies, specifically reappraisal and suppression (Gross

& John, 2003; see Appendix G). Participants are presented with 10 statements and asked to

answer how much they agree with the statement on a 7-point Likert scale from 1 (Strongly

disagree) to 7 (Strongly agree). Statements include "I control my emotions by changing the

way I think about the situation I'm in." The ERQ shows good internal consistency in both

previous research (Gross & John, 2003) and the current sample for the reappraisal items

(previous research α =.79, current sample α = .83) and for the suppression items (previous

research α = .73, current sample α = .77).

Anxiety Sensitivity Index (ASI-3). The ASI-3 assesses participants' fear of anxiety

sensations (Taylor et al., 2007; see Appendix H). The ASI-3 assesses three anxiety sensitivity

domains: physical, cognitive, and social concerns. Participants are presented with 18

statements and asked to answer how much each statement describes them on a 4-point Likert

scale from 0 (Very little) to 4 (Very much). Statements include "It is important for me not to

appear nervous" and "It scares me when my heart beats rapidly." The ASI-3 shows good

internal consistency with both previous research (Taylor et al., 2007) and the current sample

for the physical concerns subscale (previous research α =.77, current sample α = .89),

cognitive concerns subscale (previous research α =.83, current sample α = .91), and the social

concerns subscale (previous research α =.78, current sample α = .85).

Design and Procedure

Participants were tested in a single session that lasted approximately 30 minutes. Sessions varied in size from one to three participants. Sessions were held on Appalachian State University campus and the entire study was completed on a computer. After arriving at the lab, the participants were given a brief statement of the purpose of the research study, the risks, and an explanation that participation was voluntary. After agreeing to participate, the participants were told that they will complete a questionnaire and a decision task and that their goal on the task was to score as many points as possible.

Once participants began the study, they completed the STAI. The 20 items in the questionnaire were presented in a random order. Then, participants completed the DASS-21. The 21 items in the questionnaire were presented in random order. Following the DASS-21, participants were presented with instructions on how to play the BART. Before beginning the task, they completed 5 practice rounds to ensure their understanding of how the task works. On the second practice round, the balloon was set to explode on the first pump, in order to ensure that every participant experienced the balloon exploding at least once and knew what to expect when completing the task.

Following the practice rounds, participants in the reappraisal condition read the following, borrowed and modified from the instructed use by Jamieson et al. (2009):

> The goal of the upcoming task is to score as many points as you can. It is normal to feel some anxiety during this task. People think that feeling anxious will make them do poorly on a task. However, recent research suggests that feeling anxious doesn't hurt performance and can even help performance. Therefore, feeling some anxiety during a task often causes you to do better. This means that you shouldn't feel

concerned if you do feel anxious while completing today's task. If you find yourself feeling anxious, simply remind yourself that your feelings could be helping you do well (p. 209).

Next, all participants completed 30 rounds (10 of each color balloon) of the BART. Then, there was a one-minute break from the task during which all participants were informed that they were halfway through the task and reminded to stay focused. In addition, participants in the reappraisal group were reminded to reappraise their anxiety (i.e., "As a reminder, it is normal to feel some anxiety while going through the task. If you feel anxious, remind yourself that your feelings can be helping you to perform better"). After the short break, participants completed another 30 rounds of the BART (10 of each balloon color).

Following the BART, participants were asked to rank order the blue, purple, and gray balloons on their explosion likelihood. This served as a check to see if participants were able to distinguish between the three balloons. Participants were also asked, "When going through the task how anxious were you?" and answered on a 5-point scale from 1 (Not at all anxious) to 5 (Very anxious). Participants were also asked, "When going through the balloon task, how did the anxiety you felt affect your performance" and answered on a 5-point Likert scale from 1 (Greatly hurt my performance) to 5 (Greatly helped my performance). These ratings served as a manipulation check of reappraisal. Following the manipulation checks, participants completed the API. The 14 items in the questionnaire were presented in random order. Next, participants completed the ERQ and ASI. Finally, participants were asked their age and gender, and if they have any hearing impairments or are color blind. They were then fully debriefed, awarded ELC credit for their participation, and excused from the study.

Results

Manipulation Checks

In order to check the manipulation of reappraisal, the two manipulation check questions were analyzed. The first question asked participants to report how anxious they felt during the task. The average response scores for this question were compared for the control and reappraisal conditions. An independent samples t-test revealed that the reappraisal condition ($M = 2.71$, $SD = 1.01$) and the control condition ($M = 2.66$, $SD = 1.06$), did not differ on the amount of anxiety they reported experiencing during the task $t(208) = 0.31$, $p = .758$, $d = 0.05$. However, the average amount of anxiety reported for both conditions suggests that participants were experiencing a moderate amount of anxiety during the task.

The second manipulation check question assessed whether participants felt that their arousal during the task helped their performance. The average response scores for this question were compared for the control and reappraisal conditions. An independent samples t-test revealed that the control condition ($M = 2.86$, $SD = .94$) was marginally more likely to report that their anxiety hurt their performance than the reappraisal condition ($M = 3.09$, $SD = .87$), $t(208) = 1.91$, $p = .057$, $d = 0.26$. This provides evidence that the reappraisal instructions were marginally successful at getting participants to view their anxiety as beneficial.

Primary Analyses

In order to evaluate participants' risk-taking, I calculated participants' adjusted pumps for all rounds and for each balloon color (see Lejuez et al., 2002) by computing the average number of times each participant pumped up the balloon, excluding the rounds in which the balloon exploded. Therefore, the adjusted pumps is the average number of pumps

for the rounds in which the participant made the choice to stop pumping up the balloon, rather than the rounds in which the balloon exploded, giving the participant no choice but to stop pumping. Higher adjusted pump scores indicate greater risk taking.

To examine the relationship between anxiety, risk-taking, and the reappraisal condition, I used the PROCESS SPSS macro (Hayes, 2013) to conduct a regression analysis with participants' anxiety (as measured by the anxiety subscale of the DASS-21) as the predictor, the reappraisal condition as the moderator, and the participants' adjusted pump score as the outcome variable. In this analysis, the variables were mean centered.

This analysis revealed that, overall, participants' anxiety predicted risk taking, $t = 2.21$, $b = -0.74$, $p = .028$, 95% CI [-1.39, -.08]. This supports Hypothesis 1, indicating that higher levels of anxiety are associated with lower levels of risk taking. However, reappraisal condition did not predict participants' adjusted pump scores, $t = 1.06$, $b = -0.39$, $p = .28$, 95% CI [$-.25$, 0.81]. This did not support Hypothesis 2 that participants in the reappraisal condition would take more risks than participants in the control condition. Additionally, there was no significant anxiety $\times$ reappraisal condition interaction, $t = 1.57$, $b = -1.04$, $p = .119$, 95% CI [-2.36, .27] (see Figure 1). This did not support Hypothesis 3 that the reappraisal instructions would have a greater influence on participants with higher anxiety than participants with lower anxiety.

The anxiety subscale of the DASS-21 measures participants' state anxiety levels. As a further test of the hypotheses, I ran a regression analysis using trait anxiety (as measured by the STAI) instead of state anxiety. I again used the PROCESS SPSS macro (Hayes, 2013) to conduct a regression analysis with participants' trait anxiety score as the predictor, the

reappraisal condition as the moderator, and the participants' adjusted pump score as the outcome variable. In this analysis, the variables were mean centered.

This analysis revealed that, overall, participants' trait anxiety was a marginally significant predictor of risk taking, $t = 1.68$, $b = -0.47$, $p = .094$, 95% CI [-1.02, .08]. This lends further support for Hypothesis 1, with higher levels of anxiety predicting lower levels of risk taking. However, reappraisal condition did not predict participants' adjusted pump scores, $t = 1.06$, $b = 0.29$, $p = .29$, 95% CI [− .25, 0.82]. Additionally, there was no significant anxiety × reappraisal condition interaction, $t = 1.39$, $b = -0.78$, $p = .167$, 95% CI [-1.88, .33]. Consistent with the previous analysis, Hypothesis 1 was marginally supported, but Hypotheses 2 and 3 were not.

In order to test Hypothesis 4, I calculated separate adjusted pumps scores for the three balloons. As a reminder, on the first pump balloon 1 had a 1/10 chance of popping, balloon 2 had a 1/20 chance of popping, and balloon 3 had a 1/40 chance of popping. I then conducted a 2 (reappraisal condition: control or reappraisal) x 3 (balloon: 1, 2, and 3) analysis of variance on participant's adjusted pump scores. Reappraisal condition was a between subjects factor and balloon color was a within-subjects factor. As shown in Figure 3, there was a significant main effect of balloon, $F(2,207) = 96.75$, $p < .001$, $n_p^2 = .48$. Participants pumped the balloons with higher explosion probabilities less. There was no significant main effect of the reappraisal condition on number of pumps $F(1,208) = 0.98$, $p = .324$, $n_p^2 = .005$. There was no interaction between the reappraisal condition and explosion likelihoods $F(2,207) = 0.13$, $p = .882$, $n_p^2 = .001$. These results indicate that the participants were differentiating between the three balloons. However, this does not support Hypothesis 4 that

participants in the reappraisal condition would better learn to differentiate the explosion probabilities of the balloons.

Exploratory Analyses

In order to explore the relationship between the primary and exploratory variables, bivariate corrections were examined (see Table 1). Several relationships are worth noting. First, participants' average adjusted pump score was negatively correlated with participants' state anxiety, as measured by the DASS-21, and the anxiety manipulation check. Specifically, higher levels of anxiety were associated with lower levels of risk taking. Participants' average adjusted pump score was marginally negatively correlated with participants' trait anxiety, as measured by the STAI.

There was a strong positive correlation between participants' scores on the anxiety subscale of the DASS and participants' trait anxiety score as measured by the STAI. The DASS anxiety score was also positively correlated with the two other subscales on the DASS: depression and stress. Additionally, the DASS anxiety score was positively related to the manipulation check, the API, and the average total ASI-3 score. Finally, it was negatively correlated with scores on the reappraisal subscale of the ERQ. This suggests that participants with higher state anxiety were less likely to engage in reappraisal strategies for coping with anxiety.

The STAI trait anxiety score was significantly correlated with several other variables. In addition to the anxiety subscale of the DASS, STAI scores were positively correlated with the two other subscales of the DASS: depression and stress. Additionally, STAI scores were positively related to the manipulation check, the API, and the average total ASI-3 score. Trait anxiety scores were also negatively correlated with scores on the reappraisal subscale of the

ERQ and positively correlated with the suppression subscale of the ERQ. This suggests that participants with higher trait anxiety were less likely to engage in reappraisal strategies for coping with anxiety and more likely to engage in suppression techniques.

Discussion

Past literature has shown that individuals with higher levels of anxiety tend to take fewer risks (e.g., Gambetti & Guisberti, 2012; Giorgetta et al., 2012; Maner et al., 2007). Although there is often a negative connotation associated with risks, risk-taking can be beneficial and is important in everyday functioning. With this in mind, this study sought to find a simple technique that would aid individuals in taking more risks, particularly those with high anxiety. Past research has shown that reappraising anxiety as a beneficial emotional response can increase subsequent performance on a variety of tasks (e.g., Jamieson et al., 2009; Jamieson et al., 2013). This study built on this literature to discover if reappraising anxiety as beneficial would increase an individual's risk-taking behavior.

The results of this study support the relationship between anxiety and risk-taking. Participants who reported higher levels of both state and trait anxiety tended to take fewer risks on the BART. These results fall in line with a multitude of research that has also found that higher anxiety is related to lower levels of risk-taking (e.g., Gambetti & Guisberti, 2012; Giorgetta et al., 2012; Maner et al., 2007). For example, as discussed earlier, Maner et al. (2007) conducted two studies that tested the negative relationship between anxiety and risk taking. Both studies found that higher trait anxiety was associated with lower risk-taking, as measured by the BART. Other research has found support for this relationship in clinical samples (e.g. Lorian & Grisham, 2011) and in real word risk-taking situations (Gambetti & Guisberti, 2012). The cognitive processes associated with anxiety can help explain this

relationship. Individuals with higher anxiety tend to view negative outcomes as more likely (Butler & Matthews, 1987) and more severe (Maner & Schmidt, 2006). These tendencies lead anxious individuals to be more risk averse.

While the relationship between anxiety and risk-taking was supported, this study did not find evidence to support the use of reappraising anxiety as beneficial to increase subsequent risk-taking behavior. Specifically, in the current study, participants' risk taking did not differ across the reappraisal and control conditions. This finding is not consistent with past literature, which has shown that the reappraisal of anxiety increases performance (e.g., Jamieson et al., 2010; Jamieson et al., 2013). Past research has found evidence that reappraising one's anxiety as a beneficial state can aid in performance in various domains, including math performance and public speaking (Beltzer et al. 2014; Jamieson et al., 2009). The current study did not find that the reappraisal strategy provided affected participants' performance on the BART. It is important to note that the studies in which reappraisal was found to be effective were focusing on its effect on performance, rather than risk-taking, specifically. Although some measures of performance have an element of risk, the outcomes measured focused on performance (e.g., score on GRE) rather than the amount of risk-taking. Therefore, it may be that while reappraisal of anxiety as beneficial leads to success in many domains, it is not effective when attempting to increase risk-taking.

There are a variety of reasons why reappraisal might not influence risk-taking. To start, it may be that the risk-taking task used in this study did not induce enough anxiety for people to reappraise. Previous studies have examined very stressful situations (e.g. public speaking, taking the GRE), which might produce more anxiety. With higher levels anxiety, there is more to reappraise. While possible, there are reasons to doubt this explanation.

First, there was a relationship between anxiety and risk-taking, suggesting that anxiety was an important factor in the study. Second, the manipulation checks suggest that people were experiencing a moderate level of anxiety while going through the study.

It is also possible that participants did not pay attention to the reappraisal instructions. The manipulation of reappraisal was in the form of instructions for the upcoming risk-taking task. Participants were given information on the task and then those in the reappraisal condition were informed that any anxiety experienced could help their performance. Given that this manipulation was small and embedded within the instructions, it is possible that people did not take the time to read the instructions carefully and therefore were not influenced by the manipulation. While possible, this does not seem probable, given that the participants in the reappraisal condition reported that anxiety was more beneficial to their performance than participants in the control condition. This view is exactly what the reappraisal condition was meant to influence, so it is unlikely that this difference would exist without participants reading the instructions.

Furthermore, past studies have used even smaller manipulations. For example, Brooks (2014) utilized very simple and short reappraisal techniques. In one study, participants were instructed to say out loud "I am excited" (reappraisal condition) or "I am calm" (suppression condition) before a public speaking task. Those in the reappraisal condition performed better on the public speaking task. In a second study, participants either read "Try to get excited" (reappraisal condition), "Try to remain calm" (suppression condition) or "Please wait a few moments" (control) before completing an IQ test. Participants in the reappraisal condition performed better on the subsequent IQ test than participants in both the suppression and control conditions. Despite their brevity, both of

these manipulations were successful in increasing performance. This provides evidence that short and simple reappraisal techniques can be successful. Therefore, it is unlikely that the simplicity of the instructions used this study could account for the results.

Another possible explanation for the lack of influence of reappraisal in this study is the wording of the instructions provided. Both the control condition and the reappraisal condition received instructions on how to complete the task and that the goal was to earn as many points as possible. These instructions made no mention of the possible upcoming anxiety. The reappraisal condition received additional instructions that mentioned anxiety several times. Although these instructions were designed to inform participants that their anxiety could be helping their performance, the sheer number of times that they were alerted to their anxiety could have impacted their performance. It is important to note that the participants in the reappraisal condition did not report experiencing more anxiety than the control group. However, the instructions provided may not have effectively communicated the importance of using reappraisal as a strategy and rather alerted participants' to their anxiety.

Limitations

The current study did suffer from some limitations. First, this study used only one measure of risk-taking. While the BART is a very widely used measure, there are many other available measures of risk-taking. Interestingly, different measures are not always correlated with one another. For example, Bishara et al. (2009) discovered that the BART was not correlated with the Iowa Gambling Task (IGT), which is another popular measure of risk-taking. The IGT is a computerized task designed to assess real world risky decision-making (Bechara, Damasio, Damasio & Anderson, 1994). For this task, participants are presented

with four decks of cards and must choose cards from the decks in an attempt to maximize profits. Each deck has a different payout, with some decks resulting in a gain of money, while others result in a gain along with a penalty. Two of the decks are disadvantageous, for they result in an overall loss. The other two decks are advantageous, for they result in an overall gain. Participants are not explicitly told the payouts of the decks, and rather must learn the payouts through practice. The IGT and BART are similar in that they correlate with real world risky behaviors, require repeated decision-making, and require learning to be successful (Bishara et al., 2009). While these two tasks both measure similar aspects of risky decision-making, people's performance on them are not correlated and do not seem to measure the same learning processes involved in decision-making (Bishara et al., 2009). This provides evidence that risk-taking is not a single construct.

Further research has supported this distinction between the BART and IGT and has also suggested that a third popular risk-taking task, the Columbia Card Task (CCT), measures a slightly different risk-taking construct than both the BART and IGT (Buelow & Blaine, 2015). The Columbia Card Task (CCT) is a computerized task that measures risk-taking using two different versions of the task: hot and cold (Figner, Mackinlay, Wilkening, & Weber, 2009). In this task, participants are presented with an array of cards, which they are instructed to flip over. Most of the cards in the array result in a gain of points when flipped over. However, some cards in the array result in the loss of points if flipped (loss cards). Participants are told how many loss cards are in the array at the beginning of each round. In the hot version of this task, participants flip over cards one-by-one and may chose to end the round at any point. However, if a loss card in flipped, points are deducted and the round automatically ends. Participants are informed how many points were gained and lost at the

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end of each round. In the cold version of the task, rather than flipping each card over one-by-one, participants indicate how many cards they would like flipped over and move on to the next round. In this version of the task, participants are not informed how many points were gained and lost each round. While the IGT, BART, and CCT are all measures of risk-taking, they do not correlate with one another (Buelow & Blaine, 2015). This provides further evidence that different measures of risk-taking might be measuring slightly different risk-taking constructs. This is evidence that using more than one risk-taking measure might be more useful when examining the relationship between anxiety and risk-taking and the utility of reappraisal strategies.

Another limitation of the current study was using a non-clinical sample. With a non-clinical sample, there was a smaller range of state and trait anxiety levels. Only three participants in the current sample reported anxiety levels that were more than one standard deviation above the mean. As discussed earlier, with lower levels of anxiety present, there is less to reappraise. Therefore, if a clinical sample had been used, there would have been a larger range of anxiety levels present and more anxiety to reappraise. This may have allowed for a difference between the reappraisal and control conditions to appear.

Future Directions

Given the differences in the sets of instructions given to the reappraisal condition and the control condition, future research may consider using new sets of instructions that are more similar to one another. As discussed earlier, all participants received instructions, which explained that the goal of the upcoming task was to score as many points as possible. Unlike the control condition, the reappraisal condition received further instructions that mentioned the possibility of anxiety several times. The instructions could be improved by making the

instructions given to both conditions differ only in the suggested strategy. More specifically, both sets of instructions could inform the participant that the goal of the upcoming task is to earn as many points as possible, to try their best, and that the task may induce some anxiety. Further, the two sets of instructions would only differ by either telling the participants that the anxiety experienced can be beneficial and improve performance (reappraisal condition) or that although they may experience some anxiety, they should try their best (control condition). With more similar instructions provided, one condition will not be made more aware of their anxiety. This would eliminate the possible confound of heightened awareness of one's anxiety and would allow the participant to focus more on the suggested strategy for success.

Another avenue for further research is the examination of other risk-taking domains in which reappraisal of anxiety may be more beneficial. In this study, risk-taking was measured by the BART. While this task can elicit a small amount of anxiety due to the uncertainty and ambiguity involved as well as the explosion sound accompanying a balloon explosion, the task is not designed specifically to elicit anxiety. Given the small amount of anxiety involved in the task, a risk-taking task that is more inherently anxiety producing or which has more anxiety integrated into it may produce different results. Anxiety-provoking risk tasks may show more variation in the amount of anxiety experienced by participants. Also, if there were more anxiety experienced during the task, there would be more anxiety for participants to reappraise.

It is also important to consider the type of risks that the risk-taking task measures. The BART correlates with real world risk-taking behaviors, such as drinking and unsafe sex (White et al., 2008). The purpose of this study was to increase risk-taking for individuals

with higher levels of anxiety. This was due to the notion that there are positive risks that aid in daily functioning and life success. Therefore, the use of reappraisal strategies should be examined in their effect on taking positive risks. Future research may use a measure of risk-taking that is specific to positive risks or the types of risks one should take, rather than a general measure of risk-taking or a measure that is specific to negative risks.

While risk taking is an important domain to examine, future research could focus on decision making in different contexts. Stress—a construct related to anxiety—has been shown to impair numerous types of decisions (Starcke & Brand, 2012). For example, Kassam et al. (2009) designed a study to examine whether the way in which one views their stress influences their anchoring and adjustment behavior. As discussed earlier, how one views their stress can alter the body's physiological reaction. One can view a stressful situation as a threat that one must avoid or tackle. Conversely, one can view a stressful situation as a challenge that one must rise to overcome. Kassam et al (2009) induced stress using two different versions of the Trier Social Stress Test (TSST)—a stressful public speaking task. Participants in the threat condition received negative feedback during the task, which was designed to produce a threat approach to stress. Participants in the challenge condition received positive feedback during the task, which was designed to produce a challenge approach. Following the TSST, all participants provided guesses to trivia questions, which included anchors. The results indicated that those who took a challenge approach adjusted their estimates farther away from the provided anchors. This provided support that reappraising stress as a challenge improved performance on an anchoring and adjustment task. Reappraisal could be used to improve decision making in contexts such as

anchoring and adjustment. Future research may explore the utility of reappraisal in other decision-making contexts as well.

In addition to looking at different risk-taking tasks or different decision-making domains, future research could examine alternative types of reappraisal. While the current study focused on reappraising anxiety as beneficial, other studies have found that reappraising anxiety as excitement improves performance in various domains. Brooks (2014) found that reappraising anxiety as excitement led to higher performance than suppressing anxiety across several studies involving karaoke singing, public speaking, and math performance. It might be that reappraising anxiety as excitement also influences performance on risk-taking tasks. Similarly, Lee and Andrade (2015) found that participants were more likely to take financial risks when their fear was reinterpreted as excitement. In this study, fear was induced and a financial risk task followed. The task was either framed as a stock investment task or an exciting casino game. When the risk task was framed as an exciting casino game, participants reinterpreted their anxiety as excitement and took more risks on the financial task. While this study reappraised fear using contextual clues, further research could examine whether similar results would be found when reappraising anxiety. In addition, future research could examine whether reappraising anxiety as excitement would influence risk-taking in other risky domains.

Providing in depth instructions may also be more effective. For example, Beltzer et al. (2014) manipulated reappraisal by having participants in the reappraisal condition read a short paragraph, which encouraged them to reinterpret their anxiety during the upcoming task as beneficial. Following these instructions, participants read three summaries of scientific articles which all explained the benefits of stress during performance measures. Further,

participants were required to answer questions after each article that endorsed the information in the article. Participants in the reappraisal condition performed better on a subsequent speech than those who did not receive reappraisal instructions. Therefore, instructions that provide more information on the scientific basis of reappraisal may be more effective in changing risk-taking behavior.

Conclusion

The purpose of this study was to examine whether having participants reappraise their anxiety as beneficial would influence their willingness to take more risks in a subsequent task. The results of this study provide further evidence that higher levels of anxiety are associated with lower levels of risk-taking. At this point, it is unclear whether reappraisal strategies would moderate this relationship between anxiety and risk-taking. Therefore, further research is needed to determine if reappraising anxiety as beneficial is a successful strategy for increasing risk-taking behaviors.

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Table 1.

Descriptive statistics and correlations among primary and exploratory measures

	M(SD)	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Pumps	5.38 (1.97)	-.15*	-.12	-.07	-.12	-.16*	-.09	-.00	.00	-.09
2. DASS-A	1.44 (.40)	-	.65**	.57**	.65**	.31**	.41**	.59**	-.18**	.11
3. DASS-S	1.82 (.48)		-	.51**	.62**	.25**	.31**	.57**	-.25**	.07
4. DASS-D	1.42 (.38)			-	.72**	.25**	.37**	.48**	-.28**	.31**
5. STAI	1.98 (.49)				-	.38**	.43**	.67**	-.39**	.27**
6. M-Check	2.69 (1.03)					-	.65**	.44**	-.22**	.08
7. API	1.33 (.32)						-	.52**	-.23**	.21**
8. ASI-3	34.01 (13.14)							-	-.21**	.17*
9. ERQ-R	4.89 (.95)								-	-.14*
10. ERQ-S	3.44 (1.26)									-

Note: Pumps = Average adjusted pump score; DASS-A = Anxiety subscale of DASS-21;
DASS-S = Stress subscale of the DASS-21; DASS-D = Depression subscale of the DASS-
21; M-Check = anxiety manipulation check; ASI-3 = average total score on the ASI-3; ERQ-
R = Reappraisal subscale of ERQ; ERQ-S = Suppression subscale of the ERQ.
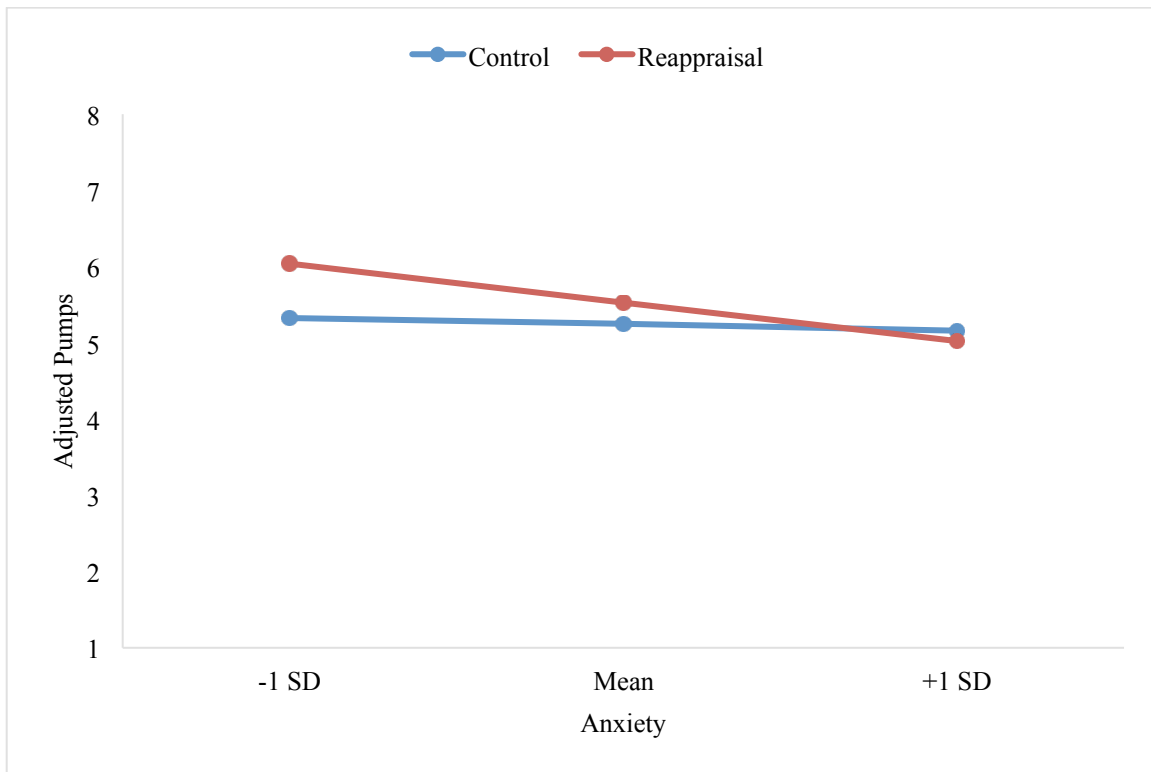 * $p < .05$, ** $p < .01$

Figure 1. Adjusted pumps on the BART for the control and reappraisal conditions as a function of participants' level of anxiety.
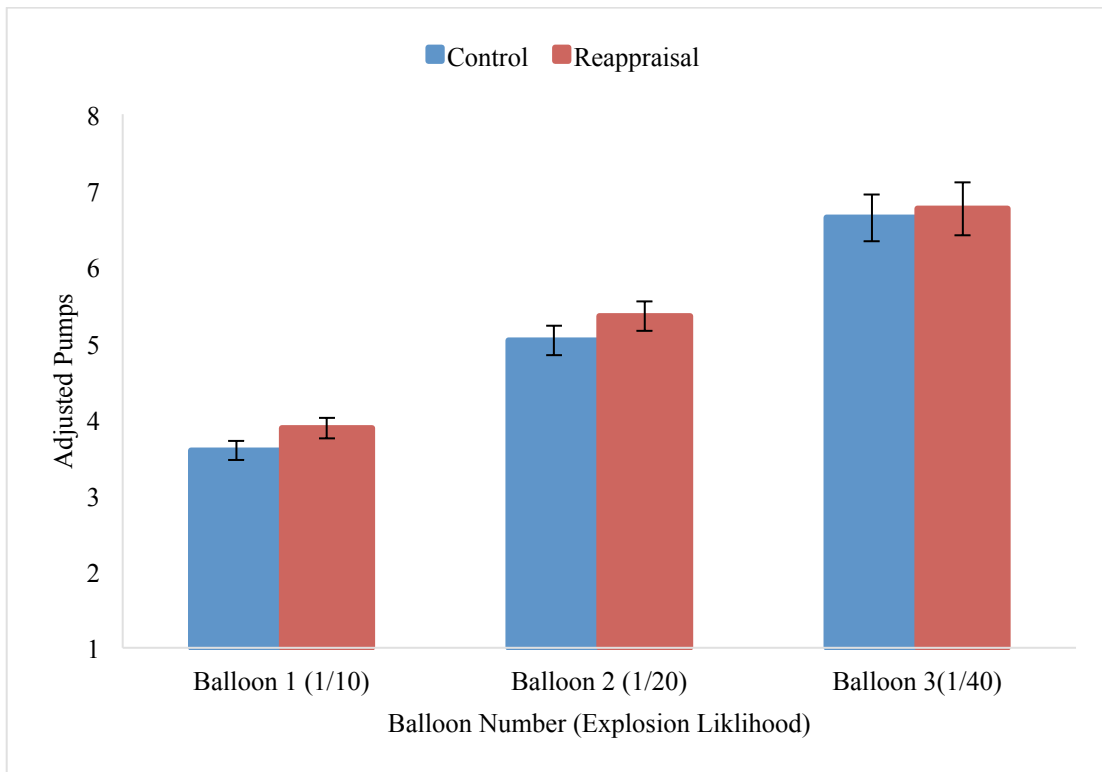
Figure 2. Adjusted pumps on the BART for the control and reappraisal conditions as a function of the explosion likelihood of each balloon.

Appendix A

From: Dr. Lisa Curtin, Institutional Review Board Chairperson
Date: 10/18/2015
RE: Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)
Study #: 16-0069

Study Title: Uncertain Choices 2
Submission Type: initial
Expedited Category: (7) Research on Group Characteristics or Behavior, or Surveys, Interviews, etc.
Approval Date: October 18, 2015
Expiration Date of Approval: October 17, 2016

The Institutional Review Board (IRB) approved this study for the period indicated above. The IRB found that the research procedures meet the expedited category cited above. IRB approval is limited to the activities described in the IRB approved materials, and extends to the performance of the described activities in the sites identified in the IRB application. In accordance with this approval, IRB findings and approval conditions for the conduct of this research are listed below.

The IRB determined that this study involves minimal risk to participants.

The IRB waived the requirement to obtain a signed consent form for some or all subjects because the research presents no more than minimal risk of harm to subjects and involves no procedures for which consent is normally required outside of the research context.

Appendix B

From: Dr. Lisa Curtin, Institutional Review Board Chairperson
Date: 11/12/2015
RE: Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)
Study #: 16-0069

Study Title: Uncertain Choices 2
Submission Type: Modification
Expedited Category: (7) Research on Group Characteristics or Behavior, or Surveys, Interviews, etc.
Approval Date: November 12, 2015
Expiration Date of Approval: October 17, 2016

The Institutional Review Board (IRB) approved this study for the period indicated above. The IRB found that the research procedures meet the expedited category cited above. IRB approval is limited to the activities described in the IRB approved materials, and extends to the performance of the described activities in the sites identified in the IRB application. In accordance with this approval, IRB findings and approval conditions for the conduct of this research are listed below.

Summary of Changes:

I will be adding a second measure of anxiety using the State Trait Anxiety Inventory (STAI) to examine both state and trait anxiety (see attached). This is a 40 item self-report questionnaire to assess how often participants experience anxiety on a 4-point scale (e.g., from "Almost Never" to "Almost Always"). Higher scores indicate greater anxiety. Secondly, I will add one question to the manipulation checks, following the BART, to assess how effective the reappraisal instructions were at helping participants view their anxiety as beneficial. This question will read, "Do you feel that your anxiety helped you perform better on the task?" These are the only two changes to my study and everything else with remain exactly the same.

Appendix C

Consent to Participate in Research
Uncertain Choices 2

Principal Investigator: Eva Ebert
Department of Psychology
Contact Information: ebertee@appstate.edu

You are invited to participate in a study about how emotions affect the decisions people make. In this study, you will be given information and be asked to complete a task in which you make decisions. You will also be asked questions about your emotions during the past week. Finally, you will be asked your age and gender.

All of your responses in this study will be anonymous so your responses cannot be linked to you in any way. Your participation in this study you will earn you 1 ELC via the SONA system.

There are no foreseeable risks to participating in this study beyond those ordinarily encountered in daily life. While there may be no direct benefit to you for participating, this research may help us to better understand how people make judgments in uncertain situations. All of your responses will be collected anonymously to maintain confidentiality.

Your participation in this study is completely voluntary. You can decide to stop at any time for any reason and you many skip any question you would prefer not to answer. You will receive no penalty for stopping this study early. In order to fulfill your ELC requirement, there are research and non-research alternatives to participating in this study. For example, one non-research option is to read an article and write a 1-2 page paper summarizing the article and your reaction to it. This would be worth 1 ELC. Additionally, there are other studies you may participate in to meet this requirement. More information about this option can be found at: psych.appstate.edu/research. You may also wish to consult your professor to see if other non-research options are available.

Participation in this study will take no longer than 30 minutes.

This research project has been approved on (Date) by the Institutional Review Board (IRB) at Appalachian State University. This approval will expire on (Date) unless the IRB renews the approval of this research.

If you have any questions or concerns about the nature of this research or please contact:
   Dr. Andrew R. Smith
   828-262-2272
   smithar3@appstate.edu

Or, you can contact the Appalachian State University IRB office at irb@appstate.edu.

By continuing to the survey, I acknowledge that I am at least 18 years old, have read the above information, and provide my consent to participate under the terms above.

Appendix D

STAI Form Y-2

Name_____Date_____

DIRECTIONS	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

Statement				
21. I feel pleasant	1	2	3	4
22. I feel nervous and restless	1	2	3	4
23. I feel satisfied with myself	1	2	3	4
24. I wish I could be as happy as others seem to be	1	2	3	4
25. I feel like a failure	1	2	3	4
26. I feel rested	1	2	3	4
27. I am "calm, cool, and collected"	1	2	3	4
28. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
29. I worry too much over something that really doesn't matter	1	2	3	4
30. I am happy	1	2	3	4
31. I have disturbing thoughts	1	2	3	4
32. I lack self-confidence	1	2	3	4
33. I feel secure	1	2	3	4
34. I make decisions easily	1	2	3	4
35. I feel inadequate	1	2	3	4
36. I am content	1	2	3	4
37. Some unimportant thought runs through my mind and bothers me	1	2	3	4
38. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
39. I am a steady person	1	2	3	4
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

Appendix E

DASS21

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

Appendix F

ASI-3

Enter the number from the scale below that best describes how typical or characteristic each of the 16 items is of *you*, putting the number next to the item. You should make your ratings in terms of how much you agree or disagree with the statement as a *general* description of yourself.

0	1	2	3	4
very little	a little	some	much	very much

1. It is important for me not to appear nervous.
2. When I cannot keep my mind on a task, I worry that I might be going crazy.
3. It scares me when my heart beats rapidly.
4. When my stomach is upset, I worry that I might be seriously ill.
5. It scares me when I am unable to keep my mind on a task.
6. When I tremble in the presence of others, I fear what people might think of me.
7. When my chest feels tight, I get scared that I won't be able to breathe properly.
8. When I feel pain in my chest, I worry that I'm going to have a heart attack.
9. I worry that other people will notice my anxiety.
10. When I feel "spacey" or spaced out I worry that I may be mentally ill.
11. It scares me when I blush in front of people.
12. When I notice my heart skipping a beat, I worry that there is something seriously wrong with me.
13. When I begin to sweat in a social situation, I fear people will think negatively of me.
14. When my thoughts seem to speed up, I worry that I might be going crazy.
15. When my throat feels tight, I worry that I could choke to death.
16. When I have trouble thinking clearly, I worry that there is something wrong with me.
17. I think it would be horrible for me to faint in public.
18. When my mind goes blank, I worry there is something terribly wrong with me.

Appendix G

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

```
1----------------2----------------3----------------4----------------5----------------6----------------7
strongly                                        neutral                                        strongly
disagree                                                                                         agree
```

1. ____ When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about.*

2. ____ I keep my emotions to myself.

3. ____ When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about.*

4. ____ When I am feeling *positive* emotions, I am careful not to express them.

5. ____ When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.

6. ____ I control my emotions by *not expressing them.*

7. ____ When I want to feel more *positive* emotion, I *change the way I'm thinking* about the situation.

8. ____ I control my emotions by *changing the way I think* about the situation I'm in.

9. ____ When I am feeling *negative* emotions, I make sure not to express them.

10. ____ When I want to feel less *negative* emotion, I *change the way I'm thinking* about the situation.

Appendix H

Acute Panic Inventory (API)

Enter an "x" in the one best column for each question (only 1 answer per row)			
no	slightly	moderately	severely
Do you feel faint?			
no	slightly	moderately	severely
Are you fearful?			
no	slightly	moderately	severely
Do you have heart palpitations?			
no	slightly	moderately	severely
Do you have rapid or difficult breathing?			
no	slightly	moderately	severely
Do you feel dizzy or light-headed?			
no	slightly	moderately	severely
Do you feel confused?			
no	slightly	moderately	severely
Is it difficult for you to concentrate?			
no	slightly	moderately	severely
Is it difficult for you to speak?			
no	slightly	moderately	severely
Are you sweating?			
no	slightly	moderately	severely
Do you feel nauseous?			
no	slightly	moderately	severely
Do you feel shakiness, trembling, twitching?			
no	slightly	moderately	severely
D you have a sense of unreality?			
no	slightly	moderately	severely
Do you fell detached from your body?			
no	slightly	moderately	severely
Is it difficult for you to perform your task?			
no	slightly	moderately	severely
Do you have the urge to urinate?			
no	slightly	moderately	severely
Do you have the urge to defecate?			
no	slightly	moderately	severely

Vita

Eva Elizabeth Ebert was born in Winston-Salem, NC to Keith and Ingrid Ebert. She graduated from Robert B. Glenn High School in June 2011 and began undergraduate study the following autumn at Appalachian State University. She graduated summa cum laude with her Bachelor of Arts in Psychology with a concentration in human services and a minor in Sociology in 2014. The following autumn, she accepted a research assistantship in Psychology at Appalachian State University and began study toward a Master of Arts degree in Experimental Psychology. She was awarded the degree in May 2016.