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An Investigation on Whether Social Values Moderate the Relationship
Between Risk Taking and Anxiety

Ryan Palmieri

Appalachian State University

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Abstract

The relationship between anxiety and risk taking has been found to have many moderators (e.g., ambiguity, domain). The current study investigated if social values (i.e., considering what is valued to one's social group) was also one of these moderators. During the current study, people were first exposed to a manipulation where either risk taking or safety seeking was socially valued before completing the Balloon Analogue Risk Task and a measure of anxiety. People took significantly more risks when risk taking was manipulated to be socially valued. However, no significant correlation between anxiety and risk taking was found overall or for each condition. Although it is unclear why no correlation between anxiety and risk taking was found, this study demonstrates that it is possible to manipulate social values regarding risk taking. Moreover, these results offer support for social values theory regarding risk taking (Stone & Allgaier, 2008), which suggests that people take the values of their friends, family, and society into account when making risky decisions.

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An Investigation on Whether Social Values Moderate the Relationship Between Risk Taking and Anxiety

When making a decision, people must often choose between taking a risk or playing it safe. In addition, considering what is valued by one's social group (e.g., friends, family) is also a crucial factor that frequently impacts risky decisions (Stone & Allgaier, 2008; Stone, Choi, Bruin, & Mandel, 2013). This is known as considering what is socially valued (Stone & Allgaier, 2008; Stone et al., 2013). For instance, imagine that Sharon has been a diligent worker for years and still has not received a raise. She is unsure if she should ask for a raise because she is worried that she will irritate her boss. However, after she considers that her family and friends value standing up for themselves when they are being treated unfairly, she decides to talk to her boss about getting a raise. Similarly, imagine that Jared used to love riding his motorcycle recklessly without wearing a helmet, but stopped doing it because his family and friends all agreed it was asking for trouble.

In addition to whether a risk is socially valued or not, many other factors influence whether an individual decides to take a risk or play it safe. Situational factors, such as the domain of the decision, are one such factor. For example, entrepreneurs tend to take more risks in career, financial, and social domains, whereas individuals working with arts and media tend to take more risks in the health domain (Nicholson, Soane, Fenton-O'Creevy, & Willman, 2005). In addition, people tend to take more risks when they are being watched as compared to when they are alone (Gardner & Steinberg, 2005). Individual differences also play a role in risky decisions making. For instance, younger individuals tend to take more risks than older individuals and men tend to be riskier than women (Defoe, Dubas, Figner, & Aken, 2015; Byrnes, Miller, & Schafer, 1999). Finally, anxiety typically tends to have an inverse relationship with risk taking because it

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not only encourages pessimistic predictions about future events (e.g., fear of rejection), but it also plays a key role in helping people detect and avoid threats (Maner et al., 2007).

The current study investigated whether social values and anxiety interact when making risky decisions. Specifically, it investigated whether people with high anxiety would be impacted less by social values than people with low anxiety when making risky decisions. To accomplish this, I first review previous research regarding the relationship between risk taking and anxiety by discussing the typical relationship found between the two, instances where the typical relationship was not found, and variables that moderate the typical relationship. Then I discuss how social values can affect risk taking in different domains and inquire if social values may be another variable that moderates the typical relationship between risk taking and anxiety. Finally, I explain how the current study was carried out, what its results were, and why these results could have been found.

Anxiety and Risk Taking

One study conducted by Maner et al. (2007) examined the relationship between risk taking and anxiety in individuals with nonclinical social anxiety, nonclinical trait anxiety, and clinically diagnosed anxiety disorders. To measure the risk-taking tendencies of the participants, the authors utilized a behavioral measure of risk taking called the Balloon Analogue Risk Task (BART; Lejuez et al., 2002). The results showed that there was a significant negative correlation between risk taking and all three types of anxiety. Moreover, these effects held, controlling for possible confounding variables, such as negative affect or depression.

While previous research typically shows a negative relationship between risk taking and anxiety (Maner et al., 2007), this is not always the case. For instance, Mitte (2007) found a negative relationship between anxiety and risk taking in her first study, but not the second. In her

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first study, participants examined eight hypothetical risky scenarios from different domains (e.g., financial, health), rated the probability of the negative outcome occurring (e.g., very likely, not very likely), and indicated whether they would choose the safe option or the risky alternative. In contrast, her second study was identical to the first except participants rated the probability of the negative event occurring on a 9-point-Likert scale (i.e., 0 “not at all likely” to 8 “extremely likely”) in addition to predicting the probability of the negative event occurring in the form of a percentage. Consistent with previous research, people with higher anxiety tended to indicate they would take fewer risks in the first study. However, Mitte did not find a significant relationship between anxiety and risk taking in her second study. Mitte's failure to replicate the findings from her first study suggest that the relationship between anxiety and risk taking is relatively weak or that there are possible moderators (e.g., response format) that influence the relationship.

Another possible moderator to the relationship between anxiety and risk taking is the domain that the risk is taken in. Nicholson et al. (2005) examined how the big five personality traits (i.e., neuroticism, extraversion, conscientiousness, agreeableness, and openness to experience) correlated with risk taking in different domains. They hypothesized that neuroticism—a trait commonly linked with anxiety (Luteijn & Bouman, 1988)—would be negatively correlated with a person’s risk propensity across all the domains they examined (i.e., recreation, health, career, finance, safety, and social). They predicted this because Klein and Kunda (1994) suggested that people who take risks consistently would need to be resilient, which could mean that they are emotionally insensitive (i.e., low neuroticism). As predicted, Nicholson et al. (2005) found a negative relationship between neuroticism and risk taking in every domain, except for health, which had a positive relationship with neuroticism. Nicholson et al. (2005) speculated that the positive correlation between neuroticism and risk taking in the

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health domain could exist because people suffering from high neuroticism sometimes resort to taking risks regarding their health (e.g., using psychoactive drugs or engaging in unprotected sex) to mitigate feelings of anxiety caused by their erratic emotions and frequent physical ailments. In addition, Nicholson et al. (2005) also suggested that this positive correlation could have been observed because decisions in the health domain are most strongly influenced by environmental factors; therefore, this correlation could have been attributed more to the individual's environment than their personality. While these are potential explanations for this positive relationship, it is still unclear why this correlation was found; however, what is clear is that the correlation between anxiety and risk-taking is not always negative.

Finally, Smith et al. (2016) found that the relationship between anxiety and risk taking is dependent upon the level of ambiguity. To illustrate different levels of ambiguity regarding risk, consider these two situations. Bill is applying for a new job and lies by saying that he does not have any criminal record when he does. He knows that the company does not always perform a criminal background check, but does not know how often this occurs. In contrast, Sarah has a modest income and enjoys gambling when the stakes are high. She bets her friend \$2,500 that she will draw three spades in a row out of a deck of shuffled cards. Sarah's risky situation has a low level of ambiguity because she can calculate the exact probability of drawing three spades in a row based on how many spades there are in the deck; however, Bill's risky situation has a high level of ambiguity because it is impossible for him to know the likelihood of the company performing a background check on him.

Smith et al. (2016) gathered a convenience sample of undergraduate students and randomly assigned half of them to complete a risk task (BART; Lejuez et al., 2002) with low ambiguity (i.e., they were given information that allowed them to calculate the probability of the

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negative outcome occurring), while the other half completed the same risk task with high ambiguity (i.e., they were given no information to allow them to calculate the probability of the negative outcome occurring). Results showed that when the risk task was ambiguous, people with high anxiety took fewer risks than people with low anxiety. By contrast, when the risk task was unambiguous, people with high and low anxiety took similar amounts of risks. These results suggest that ambiguity plays an important role in determining the risk propensity of anxious individuals.

Taken together, the studies described above indicate that the relationship between anxiety and risk taking is not always negative. These studies suggest that a variety of variables can influence the relationship between anxiety and risk taking. The present study builds on this idea and examines whether social values might similarly affect the link between anxiety and risk taking.

Social Values and Risk Taking

The term social value refers to individuals' perceptions of how their social group prioritizes different values (Rohan, 2000; Stone & Allgaier, 2008). These perceived social values can influence the decision-making norms for different groups and encourage people to make decisions in accordance with them. For instance, someone might be unsure whether to talk to a friendly stranger who seems to have similar interests as them; however, if they choose to talk to them after reminding themselves that their social group values meeting new people and making new friends, this would exemplify how social values can impact decision making.

Stone and Allgaier (2008) developed the social value theory as a means of explaining discrepancies between the decisions people choose to make for themselves versus the decisions that people suggest others should make. Generally, decisions that people suggest others should

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make are more influenced by social values regarding risk tendencies than the decisions people make for themselves. Stone and Allgaier (2008) dubbed these differences in decision making self-other differences. For instance, someone might ride a motorcycle without a helmet; however, they are likely to advise their friend not to do so because advising their friend to play it safe would align with their social group's norm of valuing safety when considering riding a motorcycle without a helmet.

Stone and Allgaier (2008) hypothesized that differences between the decisions that people make for themselves and the ones they suggest for others would occur when either risk taking or safety seeking is socially valued for a decision. They tested this hypothesis in both low impact scenarios (e.g., asking another person out on a date) and high impact scenarios (e.g., moving in with one's romantic partner). Consistent with their hypothesis, they found self-other differences in risky decision-making for low impact scenarios, but not high impact scenarios. The authors also found that people avoided giving advice to others that was incongruent with the social values of a decision. Therefore, if risk taking was socially valued for a decision, people avoided advising others to play it safe for that decision. Their results suggested these self-other differences occurred because when risk is socially valued for a decision, it creates norms when making decisions for others and when making decisions for oneself; however, it seems that the former norms are stronger than the latter. These results offered strong support for the social values analysis of self-other differences in risky decision making.

Since Stone and Allgaier (2008) found that people advised others to take more risks than they would in scenarios where risk taking was socially valued (i.e., relationships), Stone et al., (2013) sought to further investigate these self-other differences by examining if this tendency would be reversed for scenarios where safety seeking was socially valued (i.e., health). In other

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words, they investigated if people would advise others to play it safer than they would for scenarios in the health domain. During the study participants made decisions for themselves or a same-sex friend in risky scenarios either involving physical safety or involving relationship dilemmas. The results suggested that physical safety decisions made for friends were less risky than decisions made for self; however, consistent with their previous study, decisions made for friends in relationship scenarios were more risky than decisions made for themselves.

Both of these studies exemplify that people consider what is socially valued when they are making risky decisions. However, while these studies largely focus on self-other differences in risky decision making, the current study focuses on decisions made for the self.

Social Values, Anxiety, and Risk Taking

Social values theory may account for some of Nicholson et al.'s (2005) unexpected results. Recall that Nicholson et al. found that neuroticism was negatively correlated with risk taking in many domains (e.g., social, recreational). Risk taking is usually socially valued within the domains that had a negative correlation with neuroticism (e.g., people are encouraged to take risks in the social domain in hopes of making new friends). However, they found that risk taking was positively correlated with neuroticism in the health domain. Safety seeking is valued in the health domain because these kinds of risks include things such as poor diet or smoking, which are not socially valued. Because neuroticism and anxiety are highly correlated (Luteijn & Bouman, 1988), these findings suggests that the relationship between anxiety and risk taking might depend on whether risk taking or safety seeking is socially valued for a domain.

Furthermore, this potential interaction could exist because people with high anxiety may be less influenced by social values involving risk taking than people with low anxiety. In other words, while people with low anxiety might take substantially more risks in situations where risk

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taking is socially valued compared to situations where social values involving risk taking are not a factor, people with high anxiety might only take marginally more risks in the same situation compared to situations without influences from social values involving risk taking. If this is the case, the opposite would also be true for situations where safety seeking is valued. Therefore, since the typical relationship between anxiety and risk taking influences people with high anxiety to err on the safe side, people with low anxiety may take far more risks than people with high anxiety when risk taking is socially valued. Moreover, people with low anxiety may be influenced so strongly by situations where safety seeking is socially valued that they take slightly less risks than people with high anxiety.

What would happen if a person with high anxiety was at a party and saw someone attractive from across the room who they wanted to talk to? Would the fact that it is socially valued to take a risk to meet potential romantic partners overpower this person's risk taking tendencies caused by their personality characteristics? The current research was designed to address these questions by manipulating whether risk taking or safety seeking was socially valued. A behavioral measure of risk taking (BART; Lejuez et al., 2002) was then used to measure the risk propensity of participants and a personality measure (Depression Anxiety Stress Scale; DASS; Lovibond & Lovibond, 1995) was used to measure anxiety levels of participants, as well as levels of stress and depression. Importantly, before completing the risk-taking measure, participants read one of two sets of instructions that either emphasized that risk taking was socially valued or that safety seeking was socially valued. This allowed for the assessment of whether the relationship between anxiety and risk taking changed as a function of whether risk taking or safety seeking was socially valued.

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Three hypotheses were developed for the current study. The first prediction was that people would take more risks when risk taking was socially valued than when safety seeking was socially valued because they were expected to take social values into account when making decisions (Stone & Allgaier, 2008; Stone et al., 2013). This prediction ignored the effects of anxiety on risk taking. The second prediction was that there would be a negative relationship between risk taking and anxiety in the risk taking is socially valued condition. Finally, the third prediction was that there would be a positive correlation between anxiety and risk taking in the safety seeking is socially valued condition. These last two hypotheses are based on the research by Nicholson et al. (2005), where they found a negative correlation between anxiety and risk taking in domains where risk taking was socially valued (e.g., career, social), but found a positive correlation between anxiety and risk taking in a domain where safety seeking was socially valued (i.e., health).

Method

Participants

One hundred ninety undergraduate students (74.44% women, 25.56% men; M

age

= 19.39,

SD

age

= 1.62) from a university in the Southeastern region of the United States participated as partial fulfillment of a course requirement.

Materials

Depression, anxiety, and stress measure. Participants completed a computerized version of the 21-item Depression, Anxiety, and Stress scale (DASS-21; Lovibond & Lovibond, 1995) to measure their anxiety levels. This scale also measures depression and stress, but we were primarily interested in the seven items measuring anxiety. Since this scale asked participants to indicate how they felt within the previous week, it allowed us to gather a mix of

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information on both state and trait anxiety. This measure uses a response scale that ranges from one to four. A response of one indicated that the item did not apply to the person at all (i.e., NEVER), a response of two indicated that the item applied somewhat to the person some of the time (i.e., SOMETIMES), a response of three indicated that the item largely applied to the person most of the time (i.e., OFTEN), and a response of four indicated that the item was highly applicable to the participant virtually all the time (i.e., ALMOST ALWAYS). Items such as, "I couldn't seem to experience any positive feelings at all" or "I felt I had nothing to look forward to" measured depression, while items like, "I found it hard to wind down" or "I tended to over-react to situations" gauged stress. More importantly, items such as, "I felt scared without any good reason" or "I experienced trembling" measured anxiety. The internal consistency for the current sample was acceptable for depression ($\alpha = .86$), stress ($\alpha = .70$), and anxiety ($\alpha = .69$).

Risk taking measure. The Balloon Analogue Risk Task (BART; Lejuez et al., 2002) was completed by participants. This computerized task consists of a series of virtual balloons that people can pump up by clicking a button. Although people earn points with each pump, they also incrementally increase the risk of the balloon popping the next time they pump it up. In addition, if a person over-pumps a balloon and pops it, all the points acquired that round will be lost. After pumping a balloon at least once, the person can end the current round by cashing in all the points gained that round. The BART is an effective measure of risk taking because with every pump, people have to decide if it is worth risking losing all the points they have accrued that round to get a few more points. In addition, performance on the BART has been shown to predict real-world risk taking behaviors including, gambling, the number of drugs tried in the past year, and theft (Lejuez et al., 2002).

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Social value manipulation. The manipulation encouraged participants to believe that either risk taking or safety seeking was socially valued. This manipulation was threefold. The first part consisted of a brief passage that said that either risk taking or safety seeking was socially valued and also provided some general examples to illustrate this point (see Appendix A). This part of the manipulation was shown to participants at the very beginning of the study before they received instructions about the BART. The second part consisted of three skewed scenarios that described the decisions of two different people in various risky situations. There were six scenarios in total (i.e., three where risk taking was socially valued and three where safety seeking was socially valued), but only three scenarios were shown to each participant depending on their condition (e.g., if they were in the risk taking is socially valued condition, they would be shown the three scenarios where risk taking was socially valued). In each scenario, one person took the risky option and the other took the safe option. After reading each scenario, participants chose which person made the socially valued decision. The scenarios were designed to make it obvious that one person made the socially valued decision over the other (see Appendix B). The second part of the manipulation was shown to participants after the BART practice rounds and just before the BART test rounds. The third part was a brief reminder of the manipulation (see Appendix C). This part was shown to people halfway through the BART (i.e., after round 12).

Procedure

After providing consent, people read a brief passage outlining the procedure in a non-descript way. Before going through the BART, people were randomly assigned to either the risk taking is socially valued or safety seeking is socially valued condition. Participants then read the social value manipulation information consistent with their condition (see Appendix A).

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Headphones were used during the BART so that the popping sound the balloons made when they exploded would act as a negative outcome (in addition at losing points on that round). To motivate people to do their best on the BART, they were told three things. First, they were told that the better they performed on the task, the more reward they would receive (i.e., candy). Second, they were informed that the BART is correlated with real world risk taking behaviors. Finally, they were told that they would see their score compared to the average score after completing the task, which was previously calculated using pilot data.

After the social value manipulation, the participants received instructions about the BART and completed five practice rounds. To ensure that every person had experienced the balloon popping before the BART test rounds, the balloon on the second practice round was programmed to explode on the first click. After the practice rounds, the participants completed the second part of the social value manipulation by answering the three questions intended to further manipulate perceptions of social values (again, see Appendix B). Next, the participants completed 24 rounds of the BART and included a reminder of the manipulation halfway through it (i.e., after round 12). After completing the BART, participants completed the DASS.

Half of the participants completed the BART and DASS in the order described above while the other half completed the DASS first and then completed the BART.

Finally, all participants indicated demographic information about themselves (i.e., gender and age) before being shown their score. Upon receiving their score, people notified the experimenter that they had finished who then gave them the amount of candy they had earned and dismissed them from the study.

Results

Demographics and Individual Differences

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A few tests were used to examine the demographics of the study and to help ensure that both the characteristics and risk-taking tendencies of the sample were consistent with samples from previous studies. Therefore, the proportion of women to men and the range of age in the sample were noted. An investigation was also conducted to see if men tended to take more risks than women and if there was a negative correlation between age and risk taking.

Most people in my sample were female and between the ages of 18 to 21, which is consistent with previous research that relied on convenience samples (e.g., Smith et al., 2016). In addition, it is important to note that out of the 190 participants, 10 were dropped because they had outlier scores for either the BART or the depression, anxiety, or stress subscales of the DASS (i.e., their score on any of these four measures was greater than three standard deviations away from the mean). Therefore, all analyses reported below were conducted on 180 participants.

The first test regarding demographics and individual differences was a correlational analysis that examined the relationships between depression, anxiety, stress, and age. The results of the analysis are presented in Table 1, but some of the important analyses will be reported here. Anxiety was significantly correlated with depression ($r = .52, p < .001$) and stress ($r = .56, p < .001$), but was not significantly correlated with age ($r = .04, p = .645$). It was unsurprising that no significant correlation was found between age and risk taking because previous research analyzed a broader range of ages (e.g., 14-65) than the current study (i.e., eight years; 18-26) (Defoe et al., 2015). Therefore, the expected negative correlation between anxiety and risk taking was probably not found because the age range of the current sample was not broad enough to find a significant correlation. In other words, while previous research finds a negative correlation between the risk taking of adolescents (e.g., 14-19) and adults (e.g., 20-65), the current study

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suggests that the risk taking of late adolescents (e.g., 19) and young adults (e.g., 22) is similar (Defoe et al., 2015). In addition, a correlation may not have been found because most people in my sample were in the lower portion of the age range (e.g., 18, 19). Therefore, there may have not been a correlation because my sample was not proportionally representative of the samples of previous research (Defoe et al., 2015).

Next, we used an independent samples t-test to investigate if the men ($M = 10.99$, $SD = 4.20$) in our sample took significantly more risks than the women ($M = 9.78$, $SD = 4.55$) and found this to be false, $t(178) = 1.58$, $p = .115$, $d = 0.28$. This inconsistency with previous studies may have been due to the sample size and disproportionate number of females in the study relative to males.

Overall, these analyses show that the sample was of young adult age and predominantly female. Although age was not correlated to risk and men did not take significantly more risks than women, the characteristics of this sample were relatively consistent with the sample characteristics of previous studies that used a convenience sample (e.g., Smith et al., 2016).

Risk Taking

To analyze risk taking, the adjusted pumps were calculated for every person (Lejuez et al., 2002). The first step in doing this was excluding all rounds where the balloon popped, which forced people to move onto the next round. Therefore, this left all the rounds where people voluntarily ended the round by clicking the “collect points” button. Finally, the average of these remaining rounds was calculated for each person. The higher a person’s adjusted pumps were, the higher their level of risk taking was. In addition, adjusted pumps ($M = 10.09$, $SD = 4.48$) were highly correlated with average pumps ($M = 9.35$, $SD = 3.89$), $r(178) = .981$, $p < .001$.

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To test the first hypothesis (i.e., risk taking will be significantly higher in the risk taking is socially valued condition than the safety seeking is socially valued condition) an independent samples t-test was used. The test supported the hypothesis by showing that risk taking in the risk is valued condition ($M = 11.37$, $SD = 4.52$) was significantly greater than risk taking in the safety

seeking is socially valued condition ($M = 8.84$, $SD = 4.10$), $t(178) = -3.93$, $p < .001$, $d = .59$.

Two correlational analyses were used to test the second and third hypotheses (i.e., that anxiety would have had a negative correlation with risk taking in the risk taking is socially valued condition and that anxiety would have had a positive correlation with risk taking in the safety seeking is socially valued condition). The first correlational analysis did not support the second hypothesis because there was no significant correlation between risk taking ($M = 11.37$, $SD = 4.52$) and anxiety ($M = 1.57$, $SD = .44$) in the risk taking is socially valued condition, $r(87) = .10$, $p = .363$. Finally, the analysis also did not support the third hypothesis because there was no significant correlation between risk taking ($M = 8.84$, $SD = 4.10$) and anxiety ($M = 1.51$, $SD =$

$.36$) in the safety seeking is socially valued condition, $r(89) = .12$, $p = .247$.

Discussion

This study investigated if the negative relationship between anxiety and risk taking was moderated by social values. To accomplish this, people were randomly assigned to one of two social valued conditions (i.e., risk taking is socially valued or safety seeking is socially valued). In addition, the BART was used to measure risk taking and the DASS was used to measure anxiety. The results showed that people in the risk taking is socially valued condition took more risks on average than people in the safety seeking is socially valued condition. They also showed that there was no significant relationship between anxiety and risk taking in each condition.

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One of the most important findings from this study is that it is possible to manipulate people's perceptions about which types of behaviors are socially valued, and that these perceptions affect subsequent risk-taking behavior. The results of this study show that people in the risk is valued condition took significantly more risks than people in the safety seeking is socially valued condition, which is consistent with previous studies that have measured the relationship between risk taking and social values (Stone & Allgaier, 2008; Stone et al., 2013). However, the manipulation of social values in this study extends previous research further because it is the first time that social values have been experimentally manipulated. In contrast, although previous studies have used hypothetical scenarios to analyze social values regarding risk taking, these scenarios did not hold variables in extraneous dimensions constant such as, severity of potential negative outcomes or allowing the participant to determine if risk taking or safety seeking was valued for a scenario. For instance, previous research has used choosing whether to ride in a taxi cab with a drunk driver as a scenario where safety seeking was socially valued and choosing whether to ask an attractive person to dance as a scenario where risk taking is socially valued (Stone et al., 2013). While these scenarios clearly illustrate differences between what is socially valued for each one, they have potential negative consequences that drastically vary in severity. In other words, suffering a serious physical injury from getting in a car accident because of a negligent taxi driver is far worse than getting rejected by an attractive person after asking them to dance. In addition, it was also up to the participant to determine what the socially valued decision was for each of these scenarios. Therefore, the manipulation of social values in the current study addressed both of these extraneous variables because people were told that either risk taking or safety seeking was socially valued (i.e., they were not allowed

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to determine which was valued) and the possible negative outcome of the decision (i.e., the balloon popping) was exactly the same regardless of their condition.

A surprising finding was that there was no significant relationship between anxiety and risk taking. One speculation for the lack of a relationship is that the social value manipulation was too strong and overpowered the influence of people's anxiety on risk taking. This seems possible given that it has been known to social psychologists for years that situational factors can often override individual differences. For instance, Milgram's obedience study (Milgram, 1963) found that roughly 65% of participants obeyed the authority figure throughout the entire study, even when they were asked to administer a lethal shock to the confederate. Since it is highly unlikely that most people would do this in an everyday situation, this demonstrates that the social situation can heavily influence behavior.

Alternatively, demand characteristics could also account for why there were differences in risk taking between conditions. People could have interpreted the social values manipulation in a way that influenced them to perceive that the experimenter wanted them to either take risks or play it safe. Therefore, it might have been that people's perceptions of the social value of risk taking did not change, but they simply behaved in a particular way because that is how they thought the experimenter wanted them to act. This could also explain why there was no significant correlation found between anxiety and risk taking between condition because people may have been focused on fulfilling what they perceived as the desires of the experimenter, which may have pressured them to take risks or play it safe despite their levels of anxiety. In congruence with this idea, people may have perceived that the manipulation hinted at the optimal strategy that should have been used during the BART to maximize their score and reward. Therefore, this could also account for the absence of a correlation between anxiety and

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risk taking between conditions because the desires of people to increase their reward may have overpowered their risk taking tendencies based on their level of anxiety.

Another possibility could be that previous studies may have found a correlation between risk taking and anxiety because they did not counterbalance the order of the anxiety and risk taking measures (e.g., Smith et al., 2016), which may have created order effects. However, this is improbable because the average anxiety level of people in the current study who completed the tasks in the same order as people in the Smith et al. (2016) study (i.e., completing the DASS before the BART; $M = 1.54$, $SD = .43$) and in the opposite order (i.e., completing the BART before the DASS; $M = 1.53$, $SD = .37$) were similar to the amounts of anxiety of people in the Smith et al. (2016) study ($M = 1.47$, $SD = .41$).

Finally, it may have been possible that normal levels of anxiety were not strong enough to elicit the expected response. Therefore, it would be worth conducting a follow-up study consisting of people with clinical levels of anxiety because these abnormally high levels of anxiety could be pervasive enough to resist being overridden by the manipulation.

Limitations

The current study had several limitations. The first of which was that it relied on a convenience sample of undergraduate students. While these kinds of samples can be useful because they are easy to gather, they tend to decrease external validity because they open the possibility for different kinds of biases. One way that a convenience sample can become biased stems from participants being able to choose among several studies to volunteer for. Because of this, there could have been a common reason why many of the participants chose this study over other studies and this could create differences or biases among the sample that could have led to the unexpected results. While this is possible, it does not seem likely because previous studies

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that have investigated the relationship between anxiety and risk taking using convenience samples have found a correlation between the two (e.g., Maner et al., 2007; Smith et al., 2016). Another limitation of this study was that only one measure of risk taking was used (i.e., BART). Because relationships between BART scores and the scores of other behavioral measures of risk taking have not always been found (Bishara et al., 2009), the current study may have only measured a portion of the total risk taking tendencies of its participants. Therefore, a more accurate depiction of risk taking may have been gathered if the current research employed multiple measures of risk taking.

In like manner, the current study was also limited because it relied on one measure of anxiety. While the DASS provides a middle-ground measure of both trait and state anxiety, perhaps a more complete depiction of anxiety could have been gathered if a different measure was used or if the DASS was used in conjunction with another measure of anxiety. For instance, perhaps using the state-trait anxiety inventory (Spielberger, Gorsuch, & Lushene, 1970) either in lieu of or in conjunction with the DASS could have better measured trait and state anxiety.

Using only one balloon color in the BART may have also limited the current study.

Previous studies using the BART usually have three different balloon colors that each correspond to a different likelihood of popping. Having multiple balloon colors may cause the BART to be more anxiety producing relative to the version used in the current study because trying to keep track of the popping tendencies for each color of balloon could have produced anxiety in the participants.

Finally, the current study may have been limited by how the participants were compensated. First, a non-monetary incentive (i.e., candy) was given to participants instead of a monetary incentive. Secondly, participants were only compensated based on their BART score

instead of also being rewarded for participating. People completing the BART tend to behave riskier if they are rewarded both for their participation and scores as opposed to not rewarding them or rewarding their scores alone (Ferrey & Mishra, 2014). Although this limitation is unlikely because Smith et al. (2016) also used candy as a reward for BART scores and found a correlation between anxiety and risk taking, it may help explain why no relationship between anxiety and risk taking was found.

Suggestions for Future Research

To address the sample issue, follow-up studies could be conducted using either people with clinical levels of anxiety or a more proportionally representative sample of people with normal levels of anxiety. Future research may also benefit from developing different behavioral tasks to measure risk taking that have more adverse outcomes than a virtual balloon popping because this could have a more pronounced effect on people. Different measures of risk taking and anxiety could also be used in future studies either instead of or along with the measures used in the current study in hopes of more accurately measuring these constructs. In addition, compensating people for participating and using monetary compensation could be used in future studies in hopes of further motivating people to take risks. To also address the balloon color limitation, using the three balloon color version of the BART may be useful in future research to potentially produce more anxiety and help maintain consistency with previous studies. Finally, perhaps using behavioral observations either in the lab or in the real world could allow future studies to gather a more complete depiction of risk taking. An experiment could be designed to subtly expose a person to a social value manipulation before presenting them with a behavioral scenario where they must choose between a risky decision or a safe alternative (e.g., choosing whether to ride a motorcycle without a helmet). In comparison, a field experiment

could be designed to subtly subject a person to a social value manipulation before observing their behavior during a real world risky situation (e.g., going to a casino).

Conclusion

Although further research is needed to determine why the current study was partially unsuccessful, it does exemplify that it is possible to manipulate social values regarding risk taking. This is a crucial take away because it verifies that future research can incorporate manipulations of social values to expand our knowledge of how social values can influence risky decision making. Moreover, these results offer more support for social values theory regarding risk taking (Stone & Allgaier, 2008), which suggests that people take the values of their social group into account when making risky decisions.

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Appendix A

Social Values Manipulation: Paragraphs

Safety Seeking is Socially Valued

In a little bit, you are going to be completing a risk-taking task. One thing that is worth keeping in mind is how risk taking is viewed by other people. As you likely know, whether people view risk taking as a good or bad thing depends on the situation. However, overall, people tend to look positively on people who generally play it safe. For example, people who take proper precautions with their health and safety (getting regular checkups, wearing a seatbelt) are often talked about in positive ways. Similarly, people are often encouraged to play it safe when it comes to things like investing and saving for the future.

Risk Taking is Socially Valued

In a little bit, you are going to be completing a risk-taking task. One thing that is worth keeping in mind is how risk taking is viewed by other people. As you likely know, whether people view risk taking as a good or bad thing depends on the situation. However, overall, people tend to look positively on people who often take risks. For example, entrepreneurs are often talked about in positive ways. Similarly, people are often encouraged to take risks like asking someone out on a date or applying for new and better jobs.

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Appendix B

Social Values Manipulation: Questions

Safety Seeking is Socially Valued

1. A coworker brought his brand new motorcycle over to Amber and Mary's house. He was clearly excited about his bike and told them what it was capable of. While the coworker showed off the bike, he asked Amber and Mary if they wanted to take a ride around town to test it out. He did not have any extra helmets for them to wear but assured them that they would be ok without it. Amber decided to roll the dice and take a ride without a helmet. Mary was wary of getting a head injury, so she decided to play it safe by not taking a ride without a helmet. Which person made the decision that would be positively viewed by most people in society?

a. Amber b. Mary

2. Owen and Michael had been working hard to get noticed at work. They had shared many of their ideas with their boss, but their boss was not particularly impressed with any of the ideas. One day, a coworker shared a great idea with them. Later, they saw their boss, who asked if they had any new ideas. Owen went out on a limb and chose to present the coworker's idea to his boss as his own. Michael, on the other hand, was leery of being caught plagiarizing, so he chose not sharing the coworker's idea as his own. Which person made the decision that would be positively viewed by most people in society?

a. Owen b. Michael

3. Carla and Lindsey were both in their 20s and trying to lose weight. They had tried dieting before, but the last 15 pounds were just not coming off. They knew that taking a diet pill would likely boost their metabolism and help lose some extra weight. But they also knew that diet pills could have dangerous side effects like frequent spells of dizziness and possibly even blackouts. Also, using the diet pills greatly increases their chances of getting a heart attack before the age of 30. Carla decided to risk the side effects and takes the diet pill. Lindsey, however, decides to be careful by not taking the diet pills. Which person made the decision that would be positively viewed by most people in society?

a. Carla b. Lindsey

Risk Taking is Socially Valued

1. Carlos and Rafael both recently graduated high school and each applied to two different universities for their undergraduate studies. Each applied to one ideal university that would perfectly fit their needs and another back-up university that would adequately fit their needs. Fortunately, they were accepted into both universities. The only problem was that their ideal

universities were located several hundred miles away from their hometown, friends, and family, while their back-up universities were located in their hometown. Carlos decided to take a chance by moving away from his family and friends

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so he can attend his ideal university. In contrast, Rafael decided to stay in his comfort zone and attend his back-up university. Which person made the decision that would be more approved of by most people?

a. Carlos b. Rafael

2. Louis and Mark are at a house party with some friends and notice some attractive people across the room. They want to go introduce themselves, but they're afraid of being rejected. Louis decides to muster up the courage and go out on a limb by introducing himself to the attractive people. Mark, on the other hand, decides to be cautious and avoid the risk of being rejected by staying with his friends. Who made the decision that would be more positively viewed by most people in society?

a. Louis b. Mark

3. Kayla and Brooklyn are in their mid-thirties and are thinking about changing careers. While they went to college for the career they have, they have never felt that it was a good match at all. Kayla and Brooklyn have the feeling that they might be happier in a job that focuses on helping people in need. Kayla and Brooklyn are both unhappy with their current jobs, but they do get paid an acceptable salary. Eventually, Kayla chooses to take a chance and leave her current job to pursue a career she hopes will make her happy. Brooklyn chooses to play it safe by staying in her current job. Which person made the decision that would be more positively viewed by most people?

a. Kayla b. Brooklyn

Appendix C

Social Values Manipulation: Reminders

Safety Seeking is Socially Valued

You are half-way through the risk-taking task. While it might be difficult to stay focused, make sure you do your best to get as many points as possible. To aid in your performance, it is useful to remember that people tend to look positively on people who generally play it safe. When you are ready to continue the study, click on Continue below.

Risk Taking is Socially Valued

You are half-way through the risk-taking task. While it might be difficult to stay focused, make sure you do your best to get as many points as possible. To aid in your performance, it is useful to remember that people tend to look positively on people who generally take risks. When you are ready to continue the study, click on Continue below.

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Table 1.

Descriptive statistics and correlations among participant demographics and individual differences

Mean (SD)	Depression	Anxiety	Stress	Risk Taking
Age				
Gender				
Depression	1.48 (0.39)	-.52**	.53**	.08
Anxiety	1.54 (0.40)	-.56**	.12	-.04
Stress	1.83 (0.42)	-.09	-.07	0.18*
Risk Taking				
	10.09 (4.48)	-.04	-.12	
Age	19.39 (1.62)	-.13		
Gender				
	75% women	25% men		

-

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

Gender coded as 1 = Male and 2 = Female.

