

AN INVESTIGATION OF THE EMOTION ACCOUNT OF SELF-OTHER  
DIFFERENCES IN DECISIONS UNDER RISK

BY

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## **Abstract**

The goal of this study was to test whether the risk-as-feelings and empathy gap theories—the emotion account—explain self-other differences in decision-making under risk. To test the emotion account, mediational and moderation analyses were conducted. Six hundred and three participants were recruited on Amazon Mechanical Turk. They were presented with one text scenario portraying hypothetical relationship scenario involving romantic prospects. They were asked to make a decision for themselves, make one for a friend, or predict the friend’s decision. Then, they rated the likelihood of making the riskier option, negative and positive emotions, and alertness. Results showed that participants were more risk taking in the surrogate or in the prediction condition than in the self condition. Participants felt more positive emotions in the surrogate condition than in the self condition. Self-other differences in decisions were partially mediated by positive emotions. More importantly, more than 80% of self-other differences in decisions remained unexplained, indicating that the explanatory power of the emotion account was limited. Overall, this study showed partial support for the emotion account.

*Keywords:* Self-other differences, decision-making, risk, emotions, risk-as-feelings, empathy gap

## Introduction

Imagine you are with your friends at a casual backyard party. A barista at a local coffee shop that one of your friends is a regular at joins you, chats for a while, and leaves for a drink. Your friend is attracted to the barista. She asks you whether she should approach him and strike a conversation or not. You tell her she should. However, if you were in her shoes, you might not. Examples like this abound in our life whereby we make a decision for another person that we would not make for ourselves when there is risk involved, whether it is related to relationships (Beisswanger et al., 2003; Stone & Allgaier, 2008; Wray & Stone, 2005), health and safety (Dore et al., 2014; Petrova et al., 2016; Stone et al., 2013), finance (Faro & Rottenstreich, 2006; Mengarelli et al., 2014; Polman, 2012), or medical treatment (Garcia-Retamero & Galesic, 2012).

A major approach to explaining self-other differences in risk-involving decisions involves emotion accounts. One prominent emotion account is the risk-as-feelings hypothesis (Hsee & Weber, 1997; Loewenstein et al., 2001). The notion of risk-as-feelings posits that negative emotions influence personal decisions more than predictions of others' decisions because there is an empathy gap between negative emotions we predict others to feel about risk and between negative emotions they actually experience thinking about risk (Hsee & Weber, 1997; Loewenstein et al., 2001). As a result, we predict others to take more risk than we ourselves would. Other emotional explanations not directly testing risk-as-feelings theory are in line with this theoretical postulation, as people are shown to attribute their decision to be more inhibited by fear of rejection than others' (Vorauer & Ratner, 1996), personal decisions are predicted by negative feelings

but surrogate decisions are not (Wray & Stone, 2005), and personal decisions are more associated with regret than advice-giving (Kray, 2000).

A considerable amount of work has used the emotion account to explain self-other differences in decision-making (Batteux et al., 2017; Sun et al., 2017; Wray & Stone, 2005; Zhang et al., 2017). However, there are several limitations of the work. Some of the issues include having no emotion measure (Batteux et al., 2017; Sun et al., 2017; Zhang et al., 2017), and there being mixed evidence for whether the emotion account explains self-other differences in decisions rather than just in predictions (Garcia-Retamero et al., 2015; Garcia-Retamero & Galesic, 2012). This study is designed to address these limitations and test the emotion account.

### **Support for the Emotion Accounts**

At the heart of the emotion account is that self-other differences in predictions arise because negative emotions influence personal decisions more than surrogate decisions (Hsee & Weber, 1997; Loewenstein et al., 2001). Risk-as-feelings was originally theorized to establish visceral emotions as a determinant of behavior, which is sometimes separate from and sometimes guides more cognitive evaluations (Loewenstein et al., 2001). Although the general tenor of risk-as-feelings theory is on visceral emotions, which should theoretically be about both positive and negative emotions, the theory focuses on negative emotions such as fear, anxiety, and panic (Loewenstein et al., 2001). More recent studies examining the role of emotions in decision-making pay attention to positive emotions (Cheung & Mikels, 2011; Hu et al., 2015; Seo et al., 2010;

Stanton et al., 2014; Waters, 2008) <sup>1</sup>, but this particular theory of risk-as-feelings has been investigated mostly in terms of negative feelings. Given that visceral experiences of negative feeling such as anxiety and fear about risk could impact behavior (Loewenstein, 1996), Hsee and Weber theorized that people predict others to make more risk-taking decisions than they would themselves because they cannot vividly experience the negative feelings about risk that impact others' decisions (Hsee & Weber, 1997).

Hsee and Weber (1997) found that people systematically predicted others to be more risk-taking than they themselves were, which was in line with risk-as-feelings hypothesis. Moreover, the authors found that the self-other differences in risk-taking levels were systematically smaller where others being decided for were someone on campus than for someone in the United States (Study 2). It was also found that the self-other differences in risk-taking levels were not significant when the other whose decision was predicted was someone sitting nearby whereas the differences were significant when the other whose decision was predicted was someone on campus (Study 3).

To explain these results, the authors propounded a model of risk-as-feelings that assumed that risk preferences were determined by anticipatory negative feelings and computation of expected outcomes. The authors posited that when people predict others'

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<sup>1</sup> In the broader literature on decision-making, positive emotions have been shown to influence decision-making albeit in mixed ways. Some studies have shown that positive emotions or mood states may lead to more risk-taking choices in economic decisions (Cheung & Mikels, 2011; Hu et al., 2015), have an interaction effect with decision frames on risk-taking (Seo et al., 2010; Stanton et al., 2014) and in health hazards and life events (Waters, 2008). Other studies have shown no effect of positive mood states on financial risk-taking (Kuhnen & Knutson, 2011).

risk preferences, they let negative feelings influence risk preferences to a lesser extent than they would for themselves, which results in risk preferences that are more rational and closer to the expected value. How much people base their prediction on feelings, the authors stated, varied with how vivid others were to them. If the target was more abstract (e.g., someone in the US), then people based their prediction of the target's risk preference less on negative feelings about risk and more on expected outcomes, which would produce choices more in line with expected outcomes. If the target was more concrete (e.g., someone sitting nearby), then people based their prediction of the target's risk preference more on their negative feelings about risk and less on expected outcomes, which would produce choices more in line with the negative feelings and thus be more risk-averse.

Many studies tested risk-as-feelings as the explanation for self-other differences in predictions, implicitly following Hsee and Weber's assumption that the weighted importance of emotions and cognitive evaluations differed for personal risk preferences and predictions of others' risk preferences. While this assumption was not explicitly tested, empirical findings showed that people predicted others to be more risk-taking than they themselves were in other domains such as in the waiting time domain (Krishnamurthy & Kumar, 2002), and the medical treatment domain (Garcia-Retamero & Galesic, 2012).

Another empirical finding supporting the risk-as-feelings and empathy gap theories is Faro and Rottenstreich (2006). They investigated the role of emotions in self-other differences in decisions involving the framing effect, based on the risk-as-feelings and empathy gap theories. The framing effect is one of the most studied cognitive biases

in behavioral economics whereby people make risk-involving choices based on whether the options are presented as a loss or as a gain (Tversky & Kahneman, 1981). The framing effect shows that people make more risk-averse decisions in a gain frame than in a loss frame, and that they make more risk-taking decisions in a loss frame than in a gain frame. More specifically, small probability gains and large probability losses lead to more risk seeking behaviors whereas large probability gain and small probability losses lead more risk aversion (Tversky & Kahneman, 1986). Faro and Rottenstreich (2006) examined self-other differences in this four-fold framing effect by having people indicate the amount of cash such that they would be indifferent between receiving the cash for sure and having a given probability of winning some definite cash.

A series of experiments showed that in line with the predictions, people were more risk averse for personal choices than for predictions of others' decisions in the domains that produce risk aversion in the self condition. People were also more risk averse for predictions of a close friend's decisions than for predictions of a stranger's decisions in the same domains. Conversely, people were more risk seeking for personal choices than for predictions of others' decisions in the domains that produce risk seeking in the self condition. Moreover, in the domains that produce risk aversion in the self condition, high-empathy people were more risk-averse than low-empathy people were when making predictions of a stranger's decisions; there was no difference between high-empathy and low-empathy groups when making personal choices. These findings show that reduced emotional experiences associated with making predictions of another's decisions might result in predictions that are closer to expected outcomes—and thus less dependent on the frame—than personal choices are.

The risk-as-feelings theory has not only been used to explain self-other differences in decisions involving predictions of other's decisions but also been used to account for self-other differences in decisions where people actually made decisions for others (Batteux et al., 2017; Sun et al., 2017; Zhang et al., 2017). In line with Hsee and Weber's findings, these studies showed that people made decisions more in line with expected outcomes for others than for themselves, and that the self-other discrepancy in risk-taking levels was more pronounced for strangers than for friends because people were not able to experience negative feelings about risk and relied more on expected outcomes for strangers than for friends.

Some of Wray and Stone (2005)'s findings were also interpreted to be consistent with risk-as-feelings. They found that anxiety and self-esteem predicted personal decisions but not surrogate decisions (Study 1). They further found that for personal decisions, risk-taking levels were correlated with perceived probability of success and feelings about negative outcomes and whereas for surrogate decisions, risk-taking levels were correlated with perceived probability of success, and feelings about positive outcomes (Study 2). This finding is in line with the emotion account that negative feelings weigh more for personal decisions than for surrogate decisions. Moreover, for personal decisions, the success probability and feelings about negative outcomes partially mediated the effects of anxiety and completely mediated the effects of self-esteem on risk-taking levels. The partial mediation of anxiety and the complete mediation of self-esteem by the success probability and negative feelings were interpreted to be partially consistent with risk-as-feelings.

Other findings also suggest that self-other differences in decisions might be explained by negative emotions. Vorauer and Ratner (1996) showed that people attributed their own decisions to fear of rejection more than they did others' decisions. Similarly, Kray (2000) showed that people experienced more regret and blame for making personal decisions than giving advice to others. These findings provide evidence for the prediction based on the emotion account that negative emotions are responsible for self-other differences in decisions by influencing personal decisions more than surrogate decisions.

### **Limitations of the Support for the Emotion Accounts**

Despite the support documented in favor of the emotion account for self-other differences in decisions, it is premature to conclude that the emotion account does explain self-other differences in decisions well enough. This is due to five major limitations of the current literature in support of the emotion account.

#### ***Limitation 1: Few Studies Measured Emotions***

**Limitation.** The logic of risk-as-feelings relies on the gap between negative emotions people feel for themselves and for others in decision-making such that people predict others risk preferences to be less influenced by negative feelings about risk and thus more in line with expected outcomes because they are not able to vividly experience the negative feelings of the others. Given this logic, it is imperative that studies testing the theory must include emotions measures; however, only a limited portion of the studies using the emotion account as a way to explain self-other differences in decisions have measured emotions (Garcia-Retamero et al., 2015; Wray & Stone, 2005). The first wave of studies (Hsee & Weber, 1997; Krishnamurthy & Kumar, 2002; Siegrist et al.,

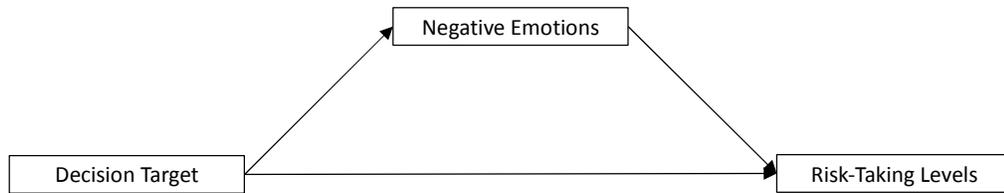
2002) did not include a measure of emotions. Loewenstein et al. (2001) did report a small study that included a measure of predicted worry; differences in predicted worry were correlated with differences in risk-preferences. The second wave of studies (Batteux et al., 2017; Sun et al., 2017; Zhang et al., 2017) also did not measure emotions. Although these studies have suggested that people tend to make decisions more based on expected outcomes and less on negative emotions for others, especially for others who are more abstract than concrete, there was no measure of emotions that would provide conclusive evidence for the suggestion.

**Solution.** We addressed this limitation in our study by including measures of emotions. This would provide empirical evidence for or against the emotion account and delineate the pathways through which emotions might influence self-other differences in decisions.

***Limitation 2: Few Studies Have Clarified Why Emotions Influence Personal Decisions More than Surrogate Decisions***

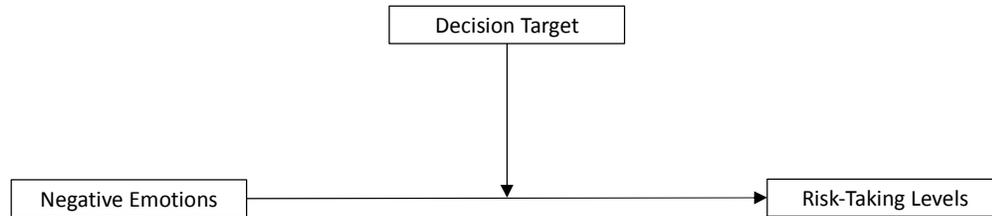
**Limitation.** Few studies that have measured emotions demonstrated how negative emotions explain self-other differences in decisions. There are two possibilities hinted at by existing studies. First, negative emotions are greater in the personal decision conditions (see Figure 1). One study suggests that the emotion account works via this mechanism. Kray (2000) showed that people who gave advice to others reported they would experience less regret if the advice did not work out than those who made decisions themselves, suggesting that people experience greater expected negative emotions for personal decisions than for surrogate decisions.

**Figure 1**



Second, negative emotions are equally potent across both personal decisions and surrogate decisions but impact personal decisions more than surrogate decisions (see Figure 2). Vorauer and Ratner (1996) found that people attributed their decisions to be more inhibited by a fear of rejection than they reported others to be. Wray and Stone (2005) reported a finding that negative emotions affect personal decisions but not surrogate decisions and that positive emotions affect surrogate decisions but not personal decisions. Garcia-Retamero et al. (2015) found that negative feelings mediated the effect of depression on self-other differences in predictions but not in decisions separately.

**Figure 2**



**Solution.** We sought to determine how negative emotions explain self-other differences in decisions by constructing and testing mediation and moderation models. If we found mediation effect of negative emotions, it would mean that self-other differences in decisions arise because people feel different levels of negative emotions. If we found moderating effect of negative emotions, it would mean that self-other differences in decisions arise because who people decide for (self vs. others) moderates the extent to which negative emotions influence risk-taking levels of a decision. We would also be able to test how meaningful each of the mediating and moderating effects were—quantifying the explanatory power of the emotion account.

***Limitation 3: There is Mixed Evidence for the Emotion Account as an Explanation of Self-Other Differences in Decisions as opposed to Predictions***

**Limitation.** There is mixed evidence supporting that the emotion account explains self-other differences in decisions. While risk-as-feelings is fundamentally about self-other differences in predictions (Hsee & Weber, 1997; Krishnamurthy & Kumar, 2002; Loewenstein et al., 2001; Siegrist et al., 2002), some studies used the theory to

explain self-other differences in decisions as well (Batteux et al., 2017; Sun et al., 2017; Wray & Stone, 2005; Zhang et al., 2017). Other studies, however, report that there is a systematic difference between self-other differences in predictions and decisions (Garcia-Retamero et al., 2015; Garcia-Retamero & Galesic, 2012; Stone et al., 2013). For example, Garcia-Retamero et al. (2015) found that the effect of depression on self-other differences in predictions was mediated by negative feelings but not by drawbacks while the effect of depression on self-other differences in decisions was mediated by the number of drawbacks of taking risk but not by negative feelings.

**Solution.** We sought to determine whether the emotion account explained self-other differences in decisions as well as in predictions by examining the pathways involving two different sets of decision type categories. In our first analysis, we examined personal decisions (the self condition) and surrogate decisions (the surrogate condition) as the categories of decision target. In our second analysis, we examined the self condition and predictions of another (the prediction condition) as the categories of decision target. That is, we ran two analyses with the same mediation and moderation models, just changing the levels of decision target.

#### ***Limitation 4: The Role of Positive Emotions Is Not Clarified in the Emotion Accounts***

**Limitation.** Risk-as-feelings and the empathy gap theory suggest that there will be a muted emotional response for others—whether the emotional response is negative or positive. Despite this theoretical tenor, most of the empirical findings have been on negative emotions with the exception of one study that measured positive emotions (see Wray & Stone, 2005). While the role of positive emotions has not been explicitly examined in the literature of self-other differences in decisions involving the risk-as-

feelings and empathy gap theories, it has been investigated in the broader literature of decision-making, mostly regarding financial choices (Cheung & Mikels, 2011; Hu et al., 2015; Kuhnen & Knutson, 2011; Seo et al., 2010; Stanton et al., 2014; Vries et al., 2012). Indeed, another study, which we conducted, showed that people experienced greater positive feelings for surrogate decisions than for personal decisions as well as that positive feelings predicted surrogate decisions more than personal decisions in relationship situations (Yi & Stone, 2020).

These studies necessitate a further investigation of the role of positive emotions, which have not been the focus of attention given the scarcity of emotional measures and models in the literature of self-other differences in risk-taking. Moreover, as risk perception is inherently a function of both positive and negative feelings associated with a risk-involving decision, it would be informative to investigate how positive and negative feelings interact with each other or shape decisions differently for oneself and for others.

**Solution.** We included a measure of positive emotions. This would allow us to examine the role of positive emotions over and above that of negative emotions in shaping self-other differences in decisions under risk. Furthermore, we would replicate Yi and Stone's finding of an empathy gap for positive emotions, which might explain self-other differences in decisions. It could be that it is not an empathy gap in negative emotions but in positive emotions that might be the driver of self-other differences in risk taking in situations where positive emotions are relatively salient. In the loss frame, for example, people may be more prone to make a risk-seeking choice possibly because they perceive probabilistic rewards involving risk as a way to avoid loss and thus feel more

positively about the risk-seeking choice; in contrast, people may not make a risk-seeking choice for another person because they do not perceive the probabilistic rewards as positively as they would when making a personal choice. Similarly, in the relationship domain, people may be more prone to make a risk-taking decision for others because they perceive more positive emotions about taking a romantic risk when making a decision for others than they do when making a decision for themselves. By replicating Yi and Stone's finding, we would be able to determine whether positive emotions are the more salient emotional valence in the relationship domain. If this was the case, the mediating or moderating effects would be stronger for positive emotions than negative emotions. Results supporting the more prominent role of positive emotions would show that it is an empathy gap in positive emotions that explain self-other differences in decisions in the relationship domain.

#### ***Limitation 5: Arousal Is Not Accounted for in Existing Studies***

**Limitations.** The emotion account assumes that people experience higher levels of negative emotions about risk or positive emotions about risk-involving prospects when they are making a decision for themselves than for another. This assumption has been tested by assessing negative emotions. However, this methodological approach neglects the potential role of arousal in explaining self-other differences. According to a dimensional model of emotions, emotional valence describes whether an emotion is negative or positive whereas arousal describes the intensity or the strength of an emotion (Barrett & Russell, 1999; Lang et al., 1999; Russell, 2003). It is possible that the effect of an empathy gap in negative emotions about making a choice to forfeit a certain reward in favor of a probabilistic reward is explained by arousal. When people are choosing a

probabilistic reward themselves, they might not only have negative emotions about being rejected but also experience high levels of arousal. The high levels of arousal might lead them less likely to take risk. When they are imagining their friend choosing a probabilistic reward, however, they might not only have positive emotions about prospects of winning the reward but also experience less levels of arousal. That state of low levels of arousal might lead them more likely to take risk for a friend. Therefore, it remains unclear whether negative and positive emotions have additive predictive power over and above arousal.

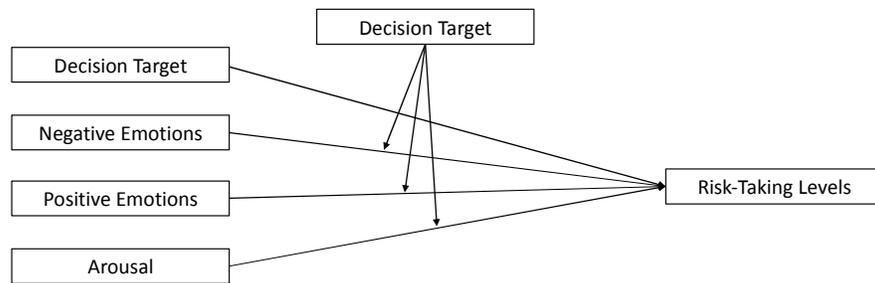
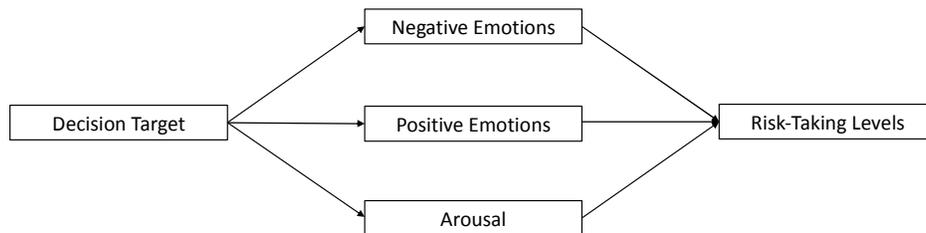
**Solution.** We included a measure of arousal. If negative emotions or positive emotions significantly mediated self-other differences controlling for arousal, it would mean that the valence of the emotions is responsible for the self-other differences rather than the intensity of the emotions. If negative emotions or positive emotions but not arousal was moderated by decision target, then it would mean that the valence of the emotions is again responsible for the self-other differences rather than the intensity of the emotions. However, if arousal was an important mediator of self-other differences or the effect of arousal on risk-taking levels was moderated by decision target, then the interpretation of the role of emotions would have to account for the intensity of the emotional valence relevant to the self-other differences.

### **Present Study**

The aim of this study was to test the emotion account that self-other differences in decisions arise because negative emotions shape personal decisions more than surrogate decisions. In order to achieve our aim, we tackled the limitations of the existing research documenting evidence for the account. First, we included measures of emotions. Second,

we tested mediation and moderation pathways via which negative emotions bring about self-other differences in decisions shown in Figures 3 and 4.

**Figure 3**



**Figure 4**

Third, we examined the pathways involving two different sets of decision type categories. Fourth, we examined the role of positive emotions. Fifth, we included arousal as a variable in the two models we tested.

We investigated these models using a relationship scenario. We chose the relationship domain of our interest for two reasons. First, relationship situations involving some romantic prospects have consistently produced self-other differences in decisions in previous studies (Beisswanger et al., 2003; Stone & Allgaier, 2008; Wray & Stone, 2005; Yi & Stone, 2020). As we were interested in the role of emotions in self-other differences

in decisions, we chose a relationship scenario that would surely produce the self-other differences in decisions. Second, unlike financial situations, relationship situations are more likely to elicit emotional experiences in participants. The romantic prospects involved in the relationship scenario used in this study could evoke negative emotions, positive emotions, and arousal, which would allow us to tap into the role of emotions more readily.

One consideration regarding the choice of the domain was what risk means in the relationship domain might be different from what risk means in the financial domain used in previous studies. Unlike financial situations where there is a standardized operationalization of safety (e.g. a sure gain) and risk (e.g. a probabilistic reward), it is harder to operationalize risk in relationship situations. Therefore, we ensured the operationalization of risk by presenting options, one of which was riskier than the other, and asking participants how risky they perceived each option to be.

Another consideration regarding the relationship domain was that relationship status could serve as a confounding variable of self-other differences in risk-taking levels and emotion variables. For example, people who are in a relationship making a decision for another person not in a relationship could take more risk for the person than for themselves when the decision involved romantic prospects. In order to control for the possible confounding effect of relationship status on self-other differences in decisions, we asked participants to indicate their relationship status as well as that of a friend they would be deciding for or predicting the decision of. Then we would use this information to determine whether any effects we found for main analyses would hold controlling for the differences in relationship status. Specifically, we would examine the results of main

analyses in a group where both participants and those being decided for were single and in a group where none of participants and those being decided for were single.

Given these considerations, we examined three research questions.

***RQ1: Are there self-other differences in outcome variables?***

Answering this question consists of three parts.

**a. Are there self-other differences in risk-taking levels of decisions?** The risk-as-feelings and empathy gap theories predict that risk-taking levels would be greater in the surrogate condition or in the prediction condition than in the self condition.

**b. Are there self-other differences in negative feelings?** The risk-as-feelings and empathy gap theories predict that negative feelings would be greater in the self condition than in the surrogate condition or in the prediction condition.

**c. Are there self-other differences in positive feelings?** The risk-as-feelings and empathy gap theories do not make explicit predictions about positive feelings. It might be that there are greater positive emotions in the self condition than in the surrogate condition, as in line with the empathy gap theory. Some findings, however, suggested that the risk-as-feelings and empathy gap theories predict greater positive emotions in the surrogate condition (Yi & Stone, 2020) or in the prediction condition (Faro & Rottenstreich, 2006) than in the self decision in a situation where positive emotions might be more relevant to decision-making than negative emotions are.

**d. Are there self-other differences in arousal?** The risk-as-feelings and empathy gap theories do not make a prediction regarding arousal.

***RQ2: How do emotions explain self-other differences in decisions involving risk?***

Answering this question consists of two parts.

**a. Do emotions mediate the effect of decision target on risk-taking levels?** The risk-as-feelings and empathy gap theories predict that emotions explain self-other differences, but it is not clear whether it is via a mediational or moderated mechanism.

**b. Do decision target moderate the effect of emotions on risk-taking levels?** The risk-as-feelings and empathy gap theories predict that emotions explain self-other differences, but it is not clear whether it is via a mediational or moderated mechanism.

***RQ3: How do emotions explain self-other differences in predictions involving risk?***

Answering this question consists of two parts.

**a. Do emotions mediate the effect of decision target on risk-taking levels?** The risk-as-feelings and empathy gap theories predict that emotions explain self-other differences, but it is not clear whether it is via a mediational or moderated mechanism.

**b. Does decision target moderate the effect of emotions on risk-taking levels?** The risk-as-feelings and empathy gap theories predict that emotions explain self-other differences, but it is not clear whether it is via a mediational or moderated mechanism.

## **Method**

### **Participants**

Six hundred and three participants were recruited via the online platform Amazon Mechanical Turk (46% Female, Mage = 39.51 years, SDage = 12.92 years).<sup>2</sup> Participants

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<sup>2</sup> One participant who indicated their age to be 1985 was treated as a null value in the descriptive analysis of age.

received a payment of 1 dollar. They were preselected such that only those who were 18 years or older, had a HIT rate of 95% or higher, and lived in the United States were included. Participants were excluded from statistical analyses if they did not consent to our study (N=1 excluded), if they indicated their gender to be other than male or female (N = 10 excluded), or if they failed both of our attention checks (N = 23 excluded, final N = 569).<sup>3</sup> Of the final data set, 274 were female, 295 male, and ages ranged from 18 to 78 (Mage = 39.7 years, SDage = 13.02 years).

### **Experimental Design**

This study used a between-subjects design with three conditions: participants were randomly assigned to make a decision for themselves (self condition), make a decision for their friend (surrogate condition), or predict the friend's decision (prediction condition). The outcome variables were risk-taking preference, negative emotion ratings, positive emotion, and alertness.

### **Materials**

#### *Scenario*

The scenario used in this study portrayed an informal backyard party. In the scenario used for the self condition, three same-sex friends including the participant are hanging out near a bonfire and joined by an attractive opposite-sex barista who works at a local coffee shop where the participant is a regular at. They engage in a banter. When the barista leaves for a drink, the participant is left gazing. The participant is attracted to the

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<sup>3</sup> Of those who failed both attention checks, six participants were excluded from the self condition, 7 from the surrogate condition, and 10 from the prediction condition.

barista and is asked to make a decision about whether to approach the barista or not. In the surrogate condition, it is not the participant but one of the friends who is left gazing at the end of the scenario. That friend of the participant is attracted to the barista, and the participant is asked to make a decision for that friend about whether to approach the barista or not. In the prediction condition, the friend is also left gazing at the end of the scenario, and the participant is asked to predict the decision of that friend. See Appendix A for the exact wording of the scenario in the female, self condition.

### ***Measures***

**Risk-Taking Levels.** Participants' risk-taking levels were assessed by providing a choice between a riskier option (approaching the barista to continue talking) and a safer option (staying with one's friends). Specifically, they were asked to indicate the likelihood of choosing the riskier option on a 7-point Likert scale ranging from Not likely at all to Extremely likely. In the personal decision condition, participants were asked to indicate how likely they were to choose to approach the barista while they are getting a drink and talk to them one-on-one. In the surrogate condition, participants were asked to indicate how likely they were to decide that their friend approach the barista while they are getting a drink and talk to them one-on-one. In the prediction condition, participants were asked to predict how likely their friend would be to approach the barista while they are getting a drink and talk to them one-on-one. See Appendix B.

**Emotion Ratings.** Emotion ratings were assessed by asking participants to indicate the levels of positive and negative emotions and alertness on a 5-point Likert scale ranging from Not (emotion) to Very (emotion). The emotion measures were adapted from Waugh et al. (2016). Participants were asked to rate positive emotions,

negative emotions, and alertness they thought they would feel while imagining that they approached the barista while they are getting a drink and talking to them one-on-one. A single question was used for each type of emotions. The anchors for negative emotions ranged from “Not nervous, worried, or anxious” to “Very nervous, worried, or anxious.” The anchors for positive emotions ranged from “Not happy, excited, or hopeful” to “Very happy, excited, or hopeful.” The arousal measure from Waugh et al. (2016) was modified to avoid sexual connotations such that participants were asked how much alertness they thought they would feel instead of arousal. The anchors for the alertness measure ranged from “Calm, sleepy, or dull” to “High energy, wide awake, or jittery.” See Appendix C.

**Ratings of Perceived Riskiness.** To ensure that participants viewed approaching the barista as riskier than staying with their friends, we asked participants to rate the riskiness of each of these two options. The riskiness of each of the two options were rated a 5-point Likert scale. See Appendix D.

**Relationship Status.** Relationship status was accessed by asking whether participants or their friends whose names they wrote down were in a relationship or not on a “Yes” or “No” binary measure. See Appendix E.

**Attention Check Questions.** Attention checks were simple comprehension questions that were constructed to be fair and simple, borrowing from some existing guidelines on an online platform posit that an attention check should check whether “a participant has paid attention to the question, not so much as to the instructions above it” and that it should be used “if, without it, the task couldn’t be completed properly” (Prolific Team, 2018). To illustrate this point, if an attention check question instructs participants to read one sentence and asks them to count the number of a specific word in

that sentence, the attention check question checks whether the participants have paid attention to the instructions rather than the question itself. In line with this policy, one of the attention check questions used in this study asked participant to choose an option “Extremely” and the other question asked participant to choose “Pine.” Participants who failed both attention checks were excluded from our analysis. See Appendix F.

### **Procedure**

Upon selecting the study on the Amazon Mechanical Turk platform, participants were provided with a link to a website at which they provided electronic informed consent and took the survey. Participants who indicated their gender to be female or male were block-randomized to one of the self, surrogate, and prediction conditions. First, participants were asked to provide their age and gender. Second, they were asked to write down the names of two same-sex friends who are similar to them in terms of beliefs, attitudes, and personality. Third, they were presented with one scenario involving potential romantic prospects. Fourth, they were asked to indicate risk-taking levels regarding whether to take risk or not. Fifth, they rated risk levels of the risk-taking and the risk-averse options. Sixth, they indicated the relationship status of themselves and their two friends. Seventh, they answered two attention check questions. Finally, they provided their Amazon Mechanical Turk code and were thanked for their participation in the study.

### **Analysis Plan**

We examined the effect of decision type on each of risk-taking level, negative emotion, positive emotion, and arousal. We then examined the mediation model depicted in Figure 3 and the moderation model depicted in Figure 4. All these analyses were

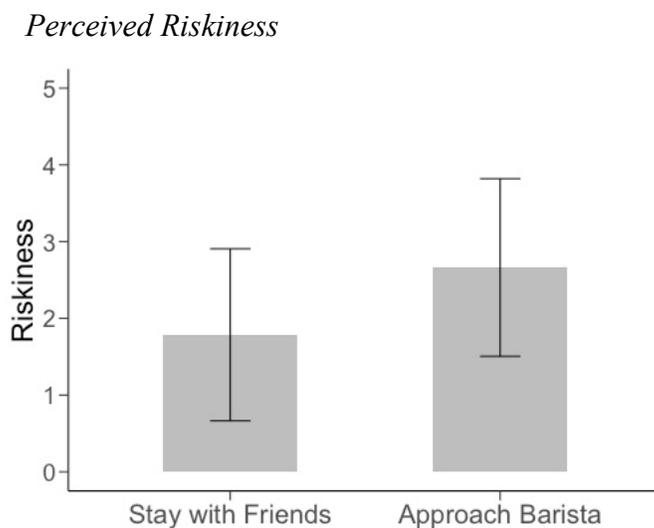
conducted by comparing the self condition with the surrogate condition and by comparing the self condition with the prediction condition, separately. We re-ran the mediation and moderation analyses with two subgroups of the sample for which both participants and their friend 1's were single or in a relationship.

## Results

### Ratings of Perceived Riskiness

A paired t-test was run to assess the riskiness of the two options of approaching the barista and staying with friends presented to participants (see Figure 5). Results showed that participants perceived the risky option ( $M = 2.66$ ,  $SD = 1.16$ ) to be riskier than the risk-averse option ( $M = 1.79$ ,  $SD = 1.12$ ),  $t(569) = 14.56$ ,  $p < .001$ , two-tailed. This indicates that participants differentiated the risk levels associated with the risky and the risk-averse options.

**Figure 5**



*Note.* The scale ranged between 1-5. The value 0 was added to the y-axis to capture the standard deviation of riskiness of the “Stay with Friends” option. The error bars indicate the standard deviations of perceived riskiness for each of the options.

### **Decision Target Effect on Outcome Variables**

Four pairwise contrasts were run to assess the effect of decision target on each of the measured variables—risk-taking levels, negative emotion, positive emotion, and alertness. These tests were run comparing the self condition with the surrogate condition and the self condition with the prediction condition (see Table 1).

**Table 1**

*Mean and SD on Participant Risk, Negative Emotion, Positive Emotion, Alertness and N*

Variable	Self			Surrogate			Prediction		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
<b>Risk-Taking</b>									
Levels	4.24	1.78	192	4.88	1.70	191	5.02	1.43	186
<b>Negative</b>									
Emotion	3.00	1.20	192	3.18	1.20	191	2.91	1.15	186
<b>Positive</b>									
Emotion	3.94	0.84	192	4.10	0.77	191	4.06	0.83	186
Alertness	3.95	0.87	192	4.02	0.79	191	4.96	0.83	186

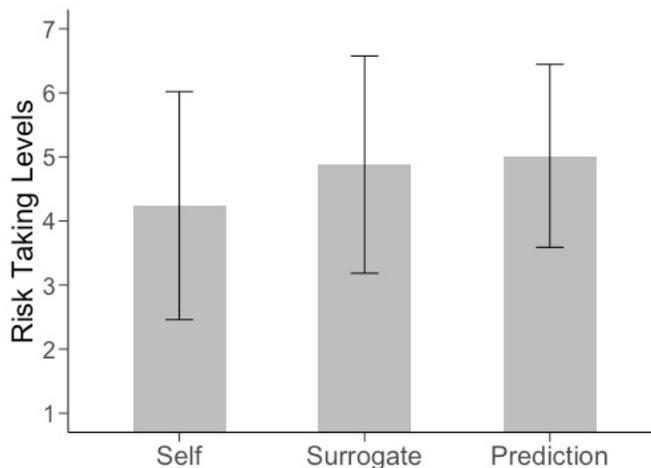
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*Note.* Risk-taking levels ranged from 1-7, with higher number indicating higher likelihood of choosing a risky option. Negative emotion, positive emotion, and alertness scores ranged from 1-5, with higher number indicating higher levels of emotions.

For risk-taking levels (see Figure 6), participants were more likely to choose the riskier option for their friend ( $M = 4.88$   $SD = 1.70$ ) than for themselves ( $M = 4.24$ ,  $SD = 1.78$ ),  $t(566) = 3.81$ ,  $p < .001$ , two-tailed. Similarly, they predicted their friend would be more likely to choose the riskier option ( $M = 5.02$ ,  $SD = 1.43$ ) than they would be likely to,  $t(566) = 3.60$ ,  $p < .001$ , two-tailed. The results were consistent with the emotion account (RQ1a).

**Figure 6**

*Risk-Taking Levels*

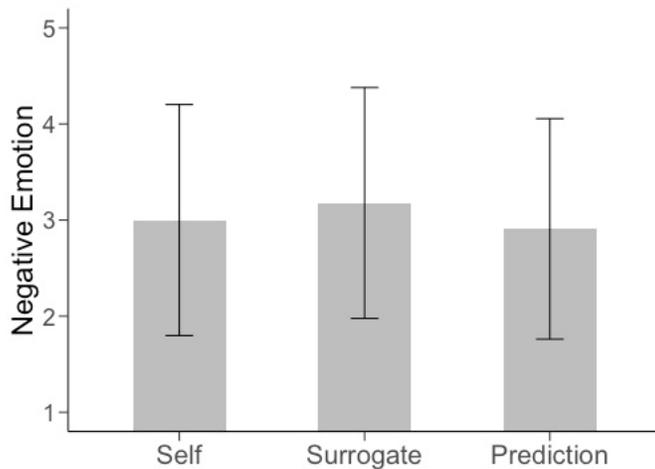


*Note.* The error bars indicate the standard deviations of risk-taking levels for each of the conditions.

For negative emotions (see Figure 7), participants did not perceive that there would be a difference in the extent to which they ( $M = 3.00$ ,  $SD = 1.20$ ) and the surrogate ( $M = 3.18$ ,  $SD = 1.20$ ) would feel negative emotions when approaching the barista,  $t(566) = 1.47$ ,  $p = .14$ , two-tailed. Similarly, there was no difference between the self condition and the prediction condition ( $M = 2.91$ ,  $SD = 1.15$ ),  $t(566) = .75$ ,  $p = .45$ , two-tailed. The results were not consistent with the emotion account (RQ1b).

**Figure 7**

*Negative Emotion*



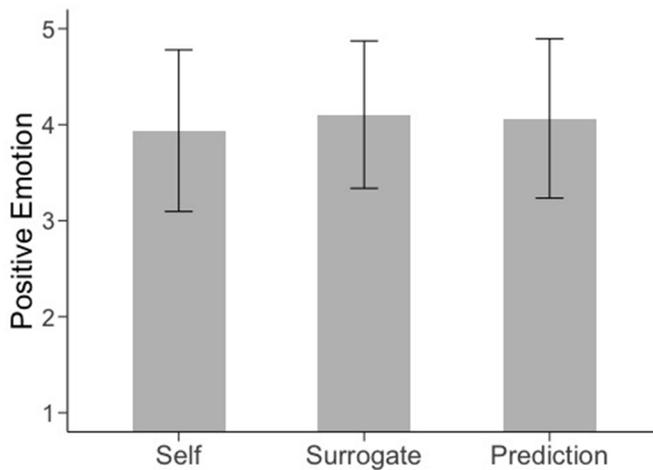
*Note.* The error bars indicate the standard deviations of negative emotion ratings for each of the conditions.

For positive emotions (see Figure 8), participants perceived that the surrogate was more likely to feel positive emotions when approaching the barista ( $M = 4.10$ ,  $SD = .77$ ) than they would ( $M = 3.94$ ,  $SD = .84$ ),  $t(566) = 2.01$ ,  $p = .045$ , two-tailed. This result was in line with a variation of the emotion account that there would be greater positive emotions in the surrogate condition than in the self decision in a situation where positive emotions might be more relevant to decision-making than negative emotions are (RQ1c).

However, there was no difference between the self condition and the prediction condition ( $M = 4.06$ ,  $SD = .83$ ),  $t(566) = 1.51$ ,  $p = .13$ , two-tailed. This result was not in line with the variation of the emotion account (RQ1c).

**Figure 8**

*Positive Emotion*

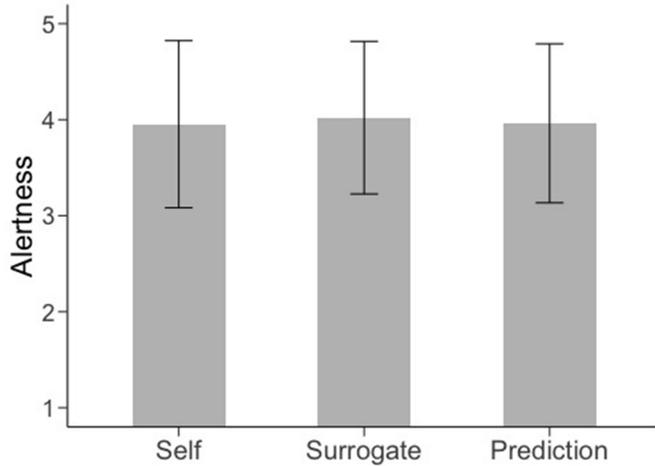


*Note.* The error bars indicate the standard deviations of positive emotion ratings for each of the conditions.

For alertness (see Figure 9), participants did not perceive that there would be a difference in the extent to which they ( $M = 3.95$ ,  $SD = .87$ ) and the surrogate ( $M = 4.02$ ,  $SD = .79$ ) would feel alert when approaching the barista,  $t(566) = .80$ ,  $p = .43$ , two-tailed. Similarly, there was no difference between the self condition and the prediction condition ( $M = 3.96$ ,  $SD = .83$ ),  $t(566) = .11$ ,  $p = .91$ , two-tailed. The results were neither predicted nor denied by the emotion account (RQ1d).

**Figure 9**

*Alertness*



*Note.* The error bars indicate the standard deviations of alertness ratings for each of the conditions.

## **Tests of the Models**

### ***Self vs. Surrogate Conditions***

**Test of mediation.** We tested the ability of our model shown in Figure 3 to predict risk-taking levels of decisions. In particular, we constructed a path analysis model including decision target (self versus surrogate) as a predictor, negative and positive emotions and alertness as mediators that covary together, and risk-taking levels as an outcome, to determine whether the links indicated in that model were necessary (see Table 2 for correlations among these variables).

## **Table 2**

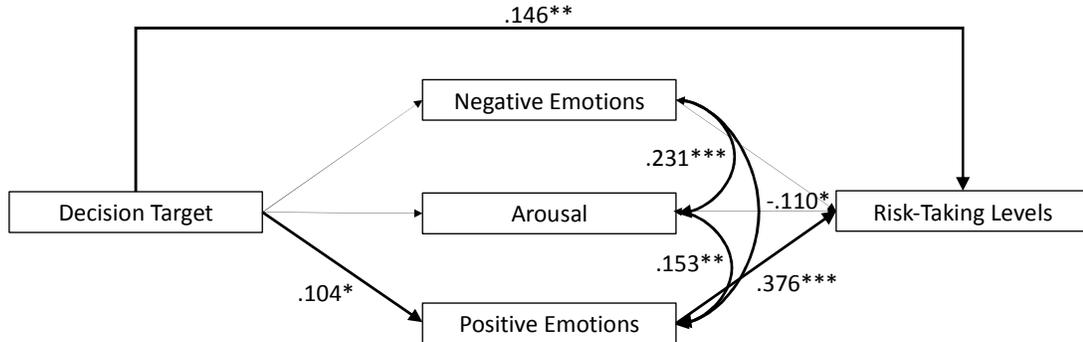
*Correlations among Risk-Taking Levels, Negative Emotion, Positive Emotion, Alertness, and Decision Target for the Self and Surrogate Conditions*

Variable	Risk-taking levels	Negative Emotion	Positive Emotion	Alertness	Decision target
Risk-taking levels	--				
Negative emotion	-0.08	--			
Positive emotion	0.40***	-0.10*	--		
Alertness	0.05	0.23***	0.16**	--	
Decision target	0.18***	0.07	0.10*	0.04	--

*Note.* \*\*\* indicates  $p < .001$ . \*\* indicates  $p < .01$ . \* indicates  $p < .05$ .

There was partial mediation of the effect of decision target on risk-taking levels via positive emotions. Participants perceived that the surrogate would feel more positive emotions when approaching the barista, and this heightened expectation of positive emotions in turn led them to make more risk-taking decisions for the surrogate than for themselves. The path from decision target to positive emotions was significant ( $\beta = .104$ ,  $b = .167$ ,  $SE_b = .081$ ,  $p = .04$ ) (see Figure 10).

**Figure 10**



Note. \*\*\* indicates  $p < .001$ . \*\* indicates  $p < .01$ . \* indicates  $p < .05$ .

Similarly, the path from positive emotions to risk-taking levels was also significant ( $\beta = .376$ ,  $b = .822$ ,  $SE_b = .109$ ,  $p < .001$ ). The standardized indirect effect was  $(.104)(.376) = .039$ . We tested the significance of this indirect effect using bootstrapping procedures. Standardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped standardized indirect effect was .039, and the 95% confidence interval ranged from 0 to .078. Thus, the indirect effect was statistically significant. This partial mediation by positive emotion explained 21% of the standardized total effect .182. Indicated are standardized coefficients for each of the significant pathways above.

The direct effect of decision target on risk-taking levels was significant ( $\beta = .146$ ,  $b = .516$ ,  $SE_b = .168$ ,  $p = .002$ ). This direct effect of decision target explained 80% of the standardized total effect of .182.

All other pathways were not significant (see Table 3).

These results showed that emotions partially explain self-other differences in decisions under risk through a pathway where positive emotions mediate a portion of the effect of decision target on risk-taking levels to a limited degree (RQ2a).

**Table 3**

The Summary Statistics of Bootstrap Path Analysis (n = 383, B = 5000) for the Self and Surrogate Conditions

Variables	$\beta$	b	$SE_b$	Z value	P value	95% percentile CI
<b>Risk-taking levels</b>						
Decision target	0.146	0.516	0.166	3.13	<.001	[ 0.599, 1.027]
-	-	-	-	-	-	-
Negative emotion	0.047	-0.069	0.077	-0.93	0.37	[-0.221, 0.082]
Positive emotion	0.376	0.822	0.108	8	<.001	[ 0.189, 0.835]
-	-	-	-	-	-	-
Alertness	0.008	-0.016	0.106	-0.15	0.88	[-0.218, 0.195]
<b>Negative emotion</b>						
Decision target	0.074	0.178	0.123	1.46	0.15	[-0.060, 0.413]
<b>Positive emotion</b>						
Decision target	0.104	0.167	0.081	2.04	0.04	[0.007, 0.327]
<b>Alertness</b>						
Decision target	0.041	0.068	0.085	0.80	0.42	[-0.098, 0.234]

**Tests of moderation.** We tested the ability of our model shown in Figure 4 to predict risk-taking levels of decisions. In particular, we constructed a multiple regression

model including decision target (self versus surrogate), negative emotion, positive emotion, and alertness as well as interaction terms between decision target and each of the emotion measures, to determine whether the links indicated in that model were necessary.

Results showed that there was no moderation effect. The only significant predictor were positive emotions and decision target. Participants who perceived that the surrogate would feel more positive emotions when approaching the barista would make more risk-taking decisions for the surrogate than for themselves ( $\beta=.369$ ,  $b=.805$ ,  $SE_b=.106$ ,  $p<.001$ ). Participants who decided for the surrogate made more risk-taking decisions than those who decided for themselves ( $\beta=.147$ ,  $b=.519$ ,  $SE_b=.166$ ,  $p=.002$ ).

All other predictors were not significant (see Table 4).

These results showed that emotions do not explain self-other differences in decisions under risk through a moderated pathway (RQ2b).

**Table 4**

The Summary Statistics of Multiple Regression Analysis ( $n = 383$ ) *for the Self and Surrogate Conditions*

Variables	$\beta$	b	$SE_b$	T value	P value
Negative emotion	-0.049	-0.072	0.072	-0.99	0.31
Positive emotion	0.369	0.805	0.106	7.58	<.001
Alertness	-0.005	-0.01	0.104	0.1	0.92
Decision target	0.147	0.519	0.166	3.12	0.002
Negative emotion X decision target	0.046	0.068	0.072	0.94	0.34

Positive emotion X decision target	-0.014	-0.031	0.106	-0.29	0.77
Alertness X decision target	-0.024	-0.051	0.104	-0.49	0.62

***Self vs. Prediction Conditions***

**Test of mediation.** We repeated the mediational analysis reported above with decision target as a predictor (self versus prediction), negative and positive emotions and alertness as mediators that covary together, and risk-taking levels as an outcome, to determine whether the links indicated in that model were necessary (see Table 5 for correlations among these variables).

**Table 5**

*Correlations among Risk-Taking Levels, Negative Emotion, Positive Emotion, Alertness, and Decision Target for the Self and Prediction Conditions*

Variable	Risk-taking levels	Negative Emotion	Positive Emotion	Alertness	Decision target
Risk-taking levels	--				
Negative emotion	-0.17**	--			
Positive emotion	0.35***	-0.18***	--		
Alertness	0.05	0.24***	0.28***	--	
Decision target	0.23***	-0.04	0.08	0.01	--

*Note.* \*\*\* indicates  $p < .001$ . \*\* indicates  $p < .01$ . \* indicates  $p < .05$ .

There was no mediation effect found in our analysis. However, the direct effect of decision target on risk-taking levels was significant ( $\beta=.206$ ,  $b=.682$ ,  $SE_b=.155$ ,  $p<.001$ ).

This direct effect of decision target explained 88% of the standardized total effect of .234.

All other pathways were not significant (see Table 6).

These results showed that emotions do not explain self-other differences in predictions involving risk (RQ3a).

**Table 6**

The Summary Statistics of Bootstrap Path Analysis ( $n = 378$ ,  $B = 5000$ ) for the Self and Prediction Conditions

Variables	$\beta$	b	$SE_b$	T value	P value	95% percentile CI
<b>Risk-taking levels</b>						
Decision target	0.206	0.682	0.155	4.35	<.001	[0.389, 0.992]
Negative emotion	-0.102	-0.143	0.077	-1.89	0.06	[-0.289, 0.010]
Positive emotion	0.325	0.645	0.111	5.74	<.001	[0.429, 0.856]
Alertness	-0.041	0.112	0.106	-0.37	0.72	[-0.265, 0.176]
<b>Negative emotion</b>						
Decision target	-0.039	-0.091	0.122	-0.75	0.45	[-0.324, 0.146]
<b>Positive emotion</b>						
Decision target	0.076	0.127	0.085	1.48	0.14	[-0.036, 0.301]
<b>Alertness</b>						
Decision target	0.005	0.009	0.087	0.11	0.92	[-0.157, 0.187]

**Tests of moderation.** We tested the ability of our model shown in Figure 4 to predict risk-taking levels of decisions. In particular, we constructed a multiple regression model including decision target (self versus prediction), negative emotion, positive emotion, and alertness as well as interaction terms between decision target and each of the emotion measures, to determine whether the links indicated in that model were necessary.

Results showed that negative emotion and positive emotions were significant predictors of risk-taking levels. Participants who perceived that the other would feel more negative emotions when approaching the barista would predict the other to make less risk-taking decisions for the other than for themselves ( $\beta = -.102$ ,  $b = -.144$ ,  $SE_b = .070$ ,  $p = .04$ ). In addition, participants who perceived that the other would feel more positive emotions when approaching the barista would make less risk-taking decisions for the other than for themselves ( $\beta = .323$ ,  $b = .640$ ,  $SE_b = .103$ ,  $p < .001$ ). While not significant, there was weak evidence for the moderation of decision target on the effect of positive emotions ( $\beta = -.099$ ,  $b = -.196$ ,  $SE_b = .103$ ,  $p = .056$ ).

All other predictors were not significant (see Table 7).

These results showed that emotions might not explain self-other differences through a moderated pathway—albeit weak evidence for the moderating effect involving positive emotions and decision target (RQ3b).

### **Table 7**

The Summary Statistics of Multiple Regression Analysis ( $n = 378$ ) *for the Self and Prediction Conditions*

Variables	$\beta$	b	$SE_b$	T value	P value
Negative emotion	-0.102	-0.144	0.07	-2.04	0.04
Positive emotion	0.323	0.64	0.103	6.25	<.001
Alertness	-0.008	-0.016	0.103	-0.16	0.87
Decision target	0.206	0.683	0.156	4.39	<.001
Negative emotion X decision target	-0.003	-0.005	0.071	-0.07	0.95
Positive emotion X decision target	-0.099	-0.196	0.103	-1.91	0.06
Alertness X decision target	-0.029	-0.057	0.103	0.56	0.58

### **Control of Self-Other Differences in Relationship Status of Participants and Their Friends**

We examined the relationship status of participants, their friend 1's and their friend 2's. This was to account for a potential confounding variable in the effects we found that could be due to the relationship status of participants and their friends. Descriptive information of the relationship status showed that participants and their friends' relationship statuses were more or less of equal composition. Participants reported that 55.2% of them were in a relationship, 47.1% of their friend 1's were in a relationship, and 49.2% of their friend 2's were in a relationship.

Though there was only a 8% difference between the percentage of those in a relationship between participants and friend 1's, we decided to ensure there was no confounding effect of the relationship status in the interpretation of our main analysis results. To do so, we chose two subgroups of the same relationship status for both participants and friend 1's. One subgroup consisted of participants who indicated that

both they and their friend 1's were not in a relationship (the single group) (N=197). The other subgroup consisted of participants who indicated that both they and their friend 1's were in a relationship (the relationship group) (N=210). Then, we re-ran pairwise contrasts for each of the subgroups. We also conducted tests of mediation and moderation models for each of the subgroups, with decision target alternating as surrogate decisions and predictions in order.

***Decision Target Effects on Outcome Variables by Relationship Status***

Results of pairwise contrasts on the outcome variables for both subgroups were mostly in line with the global results of pairwise contrasts reported previously (see Table 8).

**Table 8**

Mean and SD Participant Risk, Negative Emotion, Positive Emotion, Alertness and *N*

Variable	Self		Surrogate		Prediction	
	Mean	SD	Mean	SD	Mean	SD
<u>Neither Participant nor Friend 1 in a Relationship</u>						
Risk Taking Levels	4.02	1.79	4.67	1.92	5.05	1.48
Negative Emotion	2.82	1.09	3.14	1.23	3	1.13
Positive Emotion	3.82	0.81	4.08	0.78	4.20	0.73
Alertness	3.99	0.78	4.13	0.75	4.12	0.8
<u>Both Participant and Friend 1 in a Relationship</u>						
Risk Taking Levels	4.56	1.70	5.14	1.52	5.23	1.39
Negative Emotion	3.01	1.21	3.15	1.14	2.76	1.12

Positive Emotion	4.03	0.82	4.09	0.81	3.99	0.92
Alertness	3.85	0.94	3.95	0.82	3.79	0.87

---

*Note.* Risk-taking levels ranged from 1-7, with higher number indicating higher likelihood of choosing a risky option. Negative emotion, positive emotion, and alertness scores ranged from 1-5, with higher number indicating higher levels of emotions.

Most importantly, results for risk-taking levels were in line with the results found in the full sample. In the single group, participants were less risk-taking in the self condition ( $M = 4.02$ ,  $SD = 1.79$ ) than in the surrogate condition ( $M = 4.67$ ,  $SD = 1.92$ ),  $t(129)=2.03$ ,  $p=.04$ , or in the prediction condition ( $M = 5.05$ ,  $SD = 1.48$ ),  $t(128)=3.62$ ,  $p<.001$ . Likewise, in the relationship group, participants were less risk-taking in the self condition ( $M = 4.56$ ,  $SD = 1.70$ ) than in the surrogate condition ( $M = 5.14$ ,  $SD = 1.52$ ),  $t(141)=2.16$ ,  $p=.03$ , or in the prediction condition ( $M = 5.23$ ,  $SD = 1.39$ ),  $t(143)=2.61$ ,  $p=.01$ .

There was a difference between the groups regarding positive emotions. In the single group, there was weak evidence that participants reported less positive emotions in the self condition ( $M = 3.82$ ,  $SD = 0.81$ ) than in the surrogate condition ( $M = 4.08$ ,  $SD = 0.78$ ),  $t(130)=1.84$ ,  $p=.07$ ; they reported less positive emotions in the self condition than in the prediction condition ( $M = 4.20$ ,  $SD = 0.73$ ),  $t(131)=2.81$ ,  $p=.006$ . Yet, in the relationship group, there was no difference between the self condition ( $M = 4.03$ ,  $SD = 0.82$ ) and the surrogate condition ( $M = 4.09$ ,  $SD = 0.81$ ),  $t(137)=.49$ ,  $p=.62$  or the prediction condition ( $M = 3.99$ ,  $SD = 0.92$ ),  $t(131)=-.28$ ,  $p=.78$ . This finding in the

relationship group was not consistent with the effect of decision target on positive emotions found in the full sample.

However, this inconsistency does not invalidate the effect of decision target on positive emotions as the discrepancy seems does not seem to result from the confounding effect of self-other differences in relationship status. Rather, whether participants and their friends are single or not seems to have an effect on the way decision target influences positive emotions, which was beyond the scope of this study.

There was no evidence found for differences between the groups regarding the effect of decision target on negative emotions and alertness ( $p > .24$ ) in keeping with results found in the full sample.

These results mirrored most of the results of pairwise contrasts found in the full sample holding the relationship status constant, suggesting that the effects of decision target on risk-taking levels and positive emotions were not due to a confounding variable of relationship status. Interestingly, the effect of decision target on positive emotions showed distinct patterns in the single and relationship groups.

### ***Self vs. Surrogate Conditions***

**Test of mediation.** We re-analyzed the mediation model using the single and relationship groups separately (see Table 9 for correlations among these variables for each of the groups).

### **Table 9**

Correlations among Risk-Taking Levels, Negative Emotion, Positive Emotion, Alertness, and Decision Target for the Self and Surrogate Conditions

Variable	Risk-taking levels	Negative Emotion	Positive Emotion	Alertness
<u>Neither Participant nor Friend in a Relationship</u>				
Negative emotion	0.02	--		
Positive emotion	0.39***	-0.20*	--	
Alertness	0.07	0.20*	0.03	--
Decision target	0.18*	0.14	0.16†	0.09
<u>Both Participant and Friend in a Relationship</u>				
Negative emotion	-0.14†	--		
Positive emotion	0.48***	-0.16†	--	
Alertness	0.04	0.18*	0.21*	--
Decision target	0.18*	0.06	0.04	0.06

Results did not mirror those of the mediational analysis conducted with the full sample. In the single group, neither the direct effect ( $\beta=.100$ ,  $b=.376$ ,  $SE_b=.320$ ,  $z=1.18$ ,  $p=.24$ ) nor the indirect effect ( $\beta=.003$ ,  $b=.140$ ,  $SE_b=.133$ ,  $z=1.05$ ,  $p=.09$ ) of decision target was significant. In the relationship group, decision target predicted risk-taking levels ( $\beta=.165$ ,  $b=.541$ ,  $SE_b=.237$ ,  $z=2.29$ ,  $p=.02$ ), but decision target did not predict positive emotions ( $\beta=.041$ ,  $b=.067$ ,  $SE_b=.136$ ,  $z=.49$ ,  $p=.62$ ). There was no mediation effect.

One implication of this finding is that the mediation effect found in the full sample for the self and surrogate conditions might be due to a confounding effect of relationship status. What's more likely, however, is that there are different patterns of

correlations between decision target, positive emotions, and risk-taking levels between the single and relationship groups. The paths from decision target to risk-taking levels and to positive emotions differ in each of the groups—testing this pattern was again beyond the scope of our study.

**Test of moderation.** We re-analyzed the moderation model using the relationship and single groups separately. Results showed that there were no moderation effects in both groups, mirroring what we found of the full sample. Interestingly, there was a difference between the two groups. In the single group, decision target did not predict risk-taking levels ( $\beta=.133$ ,  $b=.499$ ,  $SE_b=.319$ ,  $z=1.56$ ,  $p=.12$ ) while positive emotions did predict risk-taking levels ( $\beta=.373$ ,  $b=.871$ ,  $SE_b=.200$ ,  $z=4.36$ ,  $p<.001$ ). All other predictors were not significant ( $p>.12$ ) In contrast, in the relationship group, decision target did predict risk-taking levels ( $\beta=.171$ ,  $b=.561$ ,  $SE_b=.242$ ,  $z=2.32$ ,  $p=.02$ ) and positive emotions predicted risk-taking levels ( $\beta=.468$ ,  $b=.949$ ,  $SE_b=.157$ ,  $z=6.04$ ,  $p<.001$ ). All other predictors were not significant ( $p>.15$ ).

### ***Self vs. Prediction Conditions***

**Test of mediation.** We re-analyzed the mediation model using the single and relationship groups separately (see Table 10 for correlations among these variables for each of the groups).

### **Table 10**

Correlations among Risk-Taking Levels, Negative Emotion, Positive Emotion, Alertness, and Decision Target for the Self and Prediction Conditions

Variable	Risk-taking levels	Negative Emotion	Positive Emotion	Alertness
<u>Neither Participant nor Friend in a Relationship</u>				
Negative emotion	-0.05	--		
Positive emotion	0.29**	-0.21*	--	
Alertness	0.12	0.24**	0.23**	--
Decision target	0.30***	0.08	0.24**	0.09
<u>Both Participant and Friend in a Relationship</u>				
Negative emotion	-0.26**	--		
Positive emotion	0.51***	-0.25**	--	
Alertness	0.13	0.11	0.33***	--
Decision target	0.21**	-0.11	-0.02	-0.03

Results mirrored those of the mediational analysis conducted with the full sample. In the single group, decision target predicted risk-taking levels ( $\beta=.251$ ,  $b=.861$ ,  $SE_b=.294$ ,  $z=2.93$ ,  $p=.003$ ), decision target weakly predicted positive emotions ( $\beta=.202$ ,  $b=.438$ ,  $SE_b=.249$ ,  $z=1.83$ ,  $p=.07$ ), and positive emotions predicted risk-taking levels ( $\beta=.238$ ,  $b=.376$ ,  $SE_b=.132$ ,  $z=2.85$ ,  $p=.004$ ). There was no mediation effect of positive emotions ( $p=.16$ ). In the relationship group, decision target predicted risk-taking levels ( $\beta=.209$ ,  $b=.668$ ,  $SE_b=.223$ ,  $z=3$ ,  $p=.003$ ), but decision target did not predict positive emotions ( $\beta=-.023$ ,  $b=-.040$ ,  $SE_b=.144$ ,  $z=-.281$ ,  $p=.78$ ). There was no mediation effect.

**Test of moderation.** We re-analyzed the moderation model using the single and relationship groups, separately. Results were partially in line with what we found of the

full sample. In the single group, there was no moderation effect for the single group ( $p=.64$ ); only decision target ( $\beta=.258$ ,  $b=.885$ ,  $SE_b=.296$ ,  $t(125)=2.99$ ,  $p<.001$ ) and positive emotions ( $\beta=.215$ ,  $b=-.466$ ,  $SE_b=.206$ ,  $t(125)=2.26$ ,  $p=.03$ ) predicted risk-taking levels. No other predictors were significant ( $p>.35$ ). However, in the relationship group, there was evidence of the moderation effect of decision target on positive emotions ( $\beta=-.163$ ,  $b=-.302$ ,  $SE_b=.156$ ,  $t(137)=-2.06$ ,  $p=.04$ ). Decision target ( $\beta=.221$ ,  $b=.707$ ,  $SE_b=.228$ ,  $t(137)=3.10$ ,  $p<.001$ ) and positive emotions ( $\beta=.472$ ,  $b=.874$ ,  $SE_b=.146$ ,  $t(137)=5.98$ ,  $p<.001$ ) predicted risk-taking levels as well. This result indicated that participants in the relationship group were likely to perceive that positive emotions weighed less when they were predicting the decision of their friend than when they were making a decision for themselves—downplaying the effect of positive emotions on their friend’s predictions. More importantly, the moderation effect found in the full sample holds at least in the single group.

Results of the analyses we ran to account for a potential confounding role of relationship status showed that the main findings of the partial mediation effect in the self and surrogate conditions and a hint of the moderation effect in the self and prediction conditions were likely not due to the participants and friends having different relationship statuses. Results also suggested that relationship status might matter to the examination of the emotion account in the relationship domain.

## **Discussion**

The goal of the current study was to test the emotion account of self-other differences in decisions under risk in the relationship domain. This study investigated this research aim through testing mediation and moderation models involving negative

emotions, positive emotions, and arousal. These models were analyzed comparing the self condition with the surrogate condition and comparing the self condition with the prediction condition, separately. Results showed that participants were more likely to make a risky decision for their friend or to predict their friend to make a riskier decision than they were to make a decision for themselves. They were also likely to experience more positive emotions about their friend approaching the barista than themselves doing so—this held for the surrogate condition but not for the prediction condition.

Results further showed that self-other differences in risk-taking levels between the self and surrogate conditions was partially mediated by positive feelings, and this indirect effect of decision target via positive feelings was much less than the direct effect. There was weak evidence of moderation effects involving positive emotions on self-other differences in risk-taking levels between the self and prediction conditions. In all the mediation and moderation models tested, decision target was a significant predictor of risk-taking levels.

Lastly, results showed that the effects we found were not likely explained by participants and their friends having different relationship status.

Below, we discuss our findings pertaining to the research questions we sought to answer in our study.

### **RQ1a-RQ1d: Explanation of the Effects of Decision Target on the Outcome**

#### **Variables**

Tests of the effect of decision target on risk-taking levels, negative emotions, positive emotions, and alertness showed mixed support for the emotion account. First, consistent with the emotion account, risk-taking levels were higher in the surrogate and

prediction conditions than in the self condition (RQ1a). The self-other difference was greater for the prediction condition than for the surrogate condition by (.14). While this margin of difference was not of main interest in this study, it warrants an explanation as it is inconsistent with another finding. Stone et al. (2013) found that there were no self-other differences involving predictions while there were self-other differences involving decisions in the relationship domain. One potential explanation of the discrepancy between the two findings is the difference between the measures used. Stone et al. presented participants a binary option between a riskier choice and a safer choice and assessed risk-taking levels as the percentage of the number of the riskier choice selected out of four relationship scenarios. Unlike this measure of risk-taking levels, the measure used in the current study was a continuous 7-point Likert scale. This difference in the measures used could be responsible for the difference in risk-taking levels for surrogate conditions and predictions between the two studies.

Second, inconsistent with the emotion account (RQ1b), there was no difference in negative emotions between the self condition and the surrogate condition and between the self condition and the prediction condition. The mean difference between the self and the surrogate conditions was the opposite of the direction predicted (-.18). Participants felt less negative emotions in the self condition than in the surrogate condition. However, it is likely that this is not that meaningful given that the finding was not significant ( $p > .14$ ).

Third, consistent with the variation of the emotion account (RQ1c), however, there were less positive emotions for the self condition than in the surrogate condition. One consideration relevant to the interpretation of this result is that the significance level of testing the effect of decision target on positive emotions was close to the threshold

( $p=.045$ ). This consideration calls for caution about drawing a dichotomous conclusion that there was a significant effect of decision target on positive emotions but not on negative emotions.

Nonetheless, our results, in tandem with Yi and Stone's (2020) findings, provide some support for the emotion account. The findings together suggest that it may not be negative emotions but positive emotions that play a more salient role in self-other differences in decisions in a relationship situation. Yi and Stone found strong support for the trend that people felt greater positive emotions while imagining a relationship scenario involving some level of risk for others than for themselves ( $p<.001$ ). In addition, they found that the mean difference in positive emotions between the self and surrogate conditions was actually greater (.50) than that in negative emotions (.32). As their sample size ( $N = 1,418$ ) was more than double the size of that of current study ( $N = 569$ ), it is likely that the mean difference and the significant results they found of positive emotions hold.

Fourth, neither consistent nor inconsistent with the emotion account (RQ1d), there was no effect found in alertness. One explanation of this finding is that arousal does not play a role in determining risk-taking in decisions. This explanation is in line with the finding that negative emotions did not explain self-other differences in decisions. Arousal as measured in our study was strongly related to negative emotions but not to positive emotions. Since negative emotions did not play a role in explaining self-other differences, arousal strongly related to negative emotions may not have predicted risk-taking levels in decisions. Another explanation is that the verbal measure of arousal used in this study did not accurately capture the construct of arousal. It is likely that a physiological measure of

arousal might be more reliable. Overall, this result neither contradicts nor supports the emotion account.

## **RQ2a-RQ3b: Explanation of the Test Results of the Mediation and Moderation**

### **Models**

Results of the tests of mediation and moderation models suggested that it might be that positive emotions might play a slightly more important role than negative emotions in explaining self-other differences in decisions in a relationship situation. There was support for the partial mediation of the effect of decision target by positive emotions. This result replicated Yi and Stone's (2020) finding of the indirect effect of decision target involving positive emotions in relationship situations. There is further evidence that positive emotions may be a better explanatory variable than negative emotions in the relationship domain. Yi and Stone found that people felt considerably greater negative emotions in the self condition than in the surrogate condition, which was theorized to explain self-other differences in decisions; however, their induction of negative emotions in the surrogate condition that resulted in about the same levels of negative emotions in the self and the surrogate conditions failed to reduce self-other differences in risk-taking levels. That is, experiencing the same levels of negative emotions did not result in similar levels of risk-taking levels in the self and surrogate conditions. In addition, they found weak support for the mediational effect by negative emotions ( $p=.08$ ). These results indicate that negative emotions might not be the driving factor of self-other differences in decisions under risk at least in the relationship domain.

For tests of moderations, results showed that there were no moderation effects of decision target involving the self and surrogate conditions. This indicated that it may be a

mediational pathway rather than a moderated pathway via which emotions—particularly positive emotions—have influence on self-other differences in decisions, if any. In contrast, there was weak evidence of the role of decision target involving the self and prediction conditions in moderating the effect of positive emotions ( $p=.056$ ). While the significance bar was not met, this piece of evidence supporting the moderating effect involving decision target and positive emotions makes it difficult to confidently dismiss the possibility that emotions may influence self-other differences in predictions via a moderated pathway.

Overall, these results show partial support for the emotion account. Positive emotions partially mediate the effect of decision target on risk-taking levels between the self and surrogate conditions but not on risk-taking levels between the self and prediction conditions. While it was not significant, there was mild evidence that positive emotions interact with decision target on their effect on risk-taking levels in the self and prediction conditions but not on the risk-taking levels in the self and surrogate conditions.

### **Additional Analyses Controlling for Self-Other Differences in Relationship Status**

We re-ran our mediational and moderation analyses using the single and relationship groups where the relationship status of participants and their friends being decided or predicted their decisions of was the same. This was done to ensure that self-other differences in relationship status were not responsible for self-other differences in risk-taking levels or emotion variables.

Results showed that self-other differences in decisions and in predictions were not due to self-other differences in relationship status. Participants were more risk-taking in the surrogate and prediction conditions than in the self condition in both single and

relationship groups. This result confirmed that relationship status did not serve as a confounding variable for risk-taking levels.

However, participants reported greater positive emotions in the surrogate and prediction condition than in the self condition in the single group; there was no self-other differences in positive emotions in the relationship group. There were no self-other differences in negative emotions and alertness in both the single and relationship groups.

Results of the mediation analysis in the single and relationship groups for the self and surrogate conditions showed no mediation effect, which was inconsistent with the partial mediation effect of positive emotions in the full sample. This finding failed to rule out the possibility that the partial mediation effect found in the full sample might be due to self-other differences in relationship status in the full sample. Results of the moderation analysis in the single and relationship groups were consistent with the results of the analysis conducted with the full sample—with the exception of decision target no longer having the direct effect on risk-taking levels in the single group.

Results of the mediation analysis in the single and relationship groups for the self and prediction conditions showed no mediation effect, which was consistent with the results of the mediation analysis conducted with the full sample. Results of the moderation analysis in the single and relationship groups showed no moderation effect of decision target on positive emotions in the single group but some evidence of the moderation effect in the relationship group. The moderation effect found in the relationship group might be responsible for the weak evidence for the moderation effect found in the full sample.

These findings do not invalidate the patterns of self-other differences in risk-taking levels and positive emotions or the pathways of positive emotions. Some of these effects hold when self-other differences in relationship status are held constant. Others do not. The partial mediation effect of positive emotions in self-other differences in decisions would need further verification to be conclusive. What may be a more salient take away, nonetheless, is that the findings hint at a potential role of relationship status. While this was beyond the scope of this study, relationship status might determine self-other differences in decisions. Future studies should be aware of the importance of relationship status in examining self-other differences in decisions under risk in the relationship domain.

### **Implications for the Risk-As-Feelings and Empathy Gap Theories**

The findings of this study provide some evidence supporting that the emotion account explains self-other differences in decisions: positive emotions were greater in the surrogate condition than in the self condition, and positive emotions partially mediate the effect of decision target on risk-taking levels—albeit more evidence is required for this result to be conclusive. These results support the idea that it is not negative emotions but positive emotions that induce self-other differences in decisions under risk in a relationship situation. This suggestion, echoed by Yi and Stone (2020), calls for a revised approach to testing the risk-as-feelings and empathy gap theories. While these theories assume that both negative and positive feelings serve as explanatory variables, and while some studies such as Faro and Rottenstreich (2006) hinted at the role of positive emotions in self-other differences, no study has explicitly endorsed the role of positive emotions in self-other differences in decisions as well as has purposefully determined which emotions

are more salient in a given domain. This study has showed that positive emotions may play a larger role than negative emotions in determining self-other differences in decisions in the relationship domain. Furthermore, the findings of this study, together with Yi and Stone's, suggest that there may be a reverse empathy gap in positive emotions—people feel stronger positive emotions in the surrogate condition than in the self condition—in the relationship domain. Future studies could replicate the findings of study in the relationship domain. They could further include pre-testing what emotions are predominant in different domains and use the results to identify how negative and positive emotions play out in each of the domains. Doing so, researchers would be able to generate more informed predictions about the role of negative and positive emotions in shaping self-other differences in decisions in different domains.

Furthermore, future studies should be mindful of the differences between self-other differences in decisions and in predictions. The mediational effect found for self-other differences in decisions was not found for those in predictions. The moderation effect found for self-other differences in predictions for the relationship group was not found for those in decisions. These results necessitate a precise understanding of what the emotion account predicts—whether a prediction involves surrogate decisions or predictions of another's decisions—and examining the role of emotions separately for each of the decision types.

Interestingly, these findings are inconsistent with Garcia-Retamero et al.'s (2015) finding that the effect of depression was mediated by negative emotions in self-other differences in predictions but not in decisions. This inconsistency is possibly due to the different research questions and designs of the two studies. Garcia-Retamero et al.

studied the effect of depression using samples who scored the highest and the lowest on the Beck Depression Inventory scale. They also used financial, health and safety, and relationship scenarios and aggregated the ratings across the three domains. Furthermore, they operationalized their dependent variable as the difference in risk-taking levels between the self condition and the decision condition or the prediction condition. Future research is called for to replicate the findings reported in this study and acquire further evidence in support of or against the results.

A more important consideration of the conclusion is that the indirect effect of decision target via emotions only explained 21% of the total effect of decision target on risk-taking levels. Eighty percent of the total effect was explained by the direct effect. This finding was also consistent with Yi and Stone's. They found that the indirect effects via negative and positive emotions explained 24% of the total effect. Seventy-six percent of the total effect was explained by the direct effect. These findings confirm that while emotions may explain self-other differences to a degree, their predictive power is limited and most of the self-other differences remain unexplained.

This finding is crucial to evaluating the cogency of the emotion account in explaining self-other differences in decisions. While there is some evidence that the emotion account can explain the self-other differences, the finding suggests that variables other than emotions warrant examination. Cognitive variables are an alternative. A notable cognitive theory of self-other differences in decisions is social values theory. Social values theory posits that surrogate decisions are influenced more by social norms than personal decisions are, thereby leading to more risk-taking for others than for the self when it is social desirable to take risk and to more risk-aversion for others than for

the self when it is desirable to avoid risk (Dore et al., 2014; Stone et al., 2013; Stone & Allgaier, 2008). Other cognitive explanations involve different considerations of benefits and drawbacks for personal and surrogate decisions (Beisswanger et al., 2003; Garcia-Retamero et al., 2015; Garcia-Retamero & Galesic, 2012). While it was beyond the scope of the current study, it would be meaningful to test whether these more cognitive explanatory variables explain additive variance of self-other differences in decisions over and above emotions.

### **Considerations of the Research Design**

Three considerations of the research design warrant discussion. First, single-item measures of emotions might miss out on capturing other emotional aspects of the decision-making participants had to consider. For example, participants might have felt negative emotions about staying with their friends not because they were afraid of approaching the barista but because they were afraid of being regarded as a coward. The latter emotion was not captured by the emotion measures used in this study. Nonetheless, the emotion measures used in this study provide a solid ground for testing the emotion account. The measures capture the essential emotional experiences associated with risk that have not been measured in most of the literature testing the emotion account. Measuring the emotions predominantly associated with risk-taking will set the tone for future studies to include emotion measures when testing the emotion account.

This leads to the second consideration. The scenario used in this study involves two friends and makes it difficult to tease out the elements of romantic prospects and social interactions from each other. It is not clear whether participants were mostly focused on romantic aspects or social elements of the decision-making. Nonetheless, the

scenario serves the aim of this research well. Examining self-other differences in decisions requires a dyadic interaction at least where participants make a decision for themselves or their friend. If they made a decision for themselves without the presence of their friend in one condition but made a decision for their friend in another, it would introduce a serious confound. The scenario used in this study rules out the confound. Furthermore, having only one friend around might have made participants more attentive to the concern of leaving their friend alone if they were to approach the barista. This concern was ruled out in our scenario by having two friends instead.

Third, the study used a hypothetical scenario. There might be concerns that the results of this study would be different for a real decision-making scenario. However, there are grounds to believe that the results of the hypothetical scenario hold. A recent meta-analysis study found that there was no effect of whether payoff of a decision-making scenario was real or not (Atanasov et al., 2019). This was true of all the studies spanning the financial, health, relationship, and other domains as well as in the financial domain. In addition, the role of emotions might matter more in situations where there are stronger emotions, which is the case of the relationship domain compared with the financial domain. If there was some evidence of the emotion effects even when the scenario is not real, then it is likely that these effects exist. One issue, however, is that the hypothetical scenario used cannot account for various contextual and individual factors that are at play when people make actual decisions. Future studies should try to identify and incorporate some of these factors into design.

## **Conclusions**

The trends found in this study should be interpreted with caution. One limitation is that this study might not have been sufficiently powered to detect an indirect effect. The mediational and moderation models used in this study made it difficult to perform a rigorous power analysis accounting for all the mediators and the moderator. Therefore, the power analysis was conducted to determine the sample size based on a model with one mediator. Input values used for the analysis were correlations and standard deviations of decision type, negative feelings, and risk-taking levels reported in Yi & Stone (2020). A Monte Carlo simulation for power analysis following Schoemann et al. (2017) showed that approximately 855 participants were required to ensure statistical power of at least 80% for detecting the indirect effect. However, 603 participants were recruited for this study. Therefore, future studies should increase the number of participants to confirm the results of this study.

Despite this limitation, however, this study lays the ground for future studies that test the emotion account for explaining self-other differences in decisions. In particular, a logical next step would be to test a mediational model of emotions in the relationship domain as well as the health and safety domain. Identifying the more salient emotional valence in each of the domains and testing the mediational model including both negative and positive emotions will result in a sophisticated understanding of the emotion account. While it was not the focus of this study, another meaningful step would be to test whether emotions interact with decision target to explain self-other differences in risk-taking levels involving surrogate decisions and predictions respectively with more power, accounting for relationship status. Determining whether the moderated pathway is valid

in explaining self-other differences in which of surrogate decisions and predictions will elucidate whether and how emotions potentially explain self-other differences in decisions and predictions differently. Related is the effect of relationship status. While it was beyond the scope of this study, it would be helpful to study the effect of relationship status on emotions and self-other differences in decisions. This would facilitate a more informed interpretation of the findings of this study. Furthermore, it will be meaningful to test perceived norms or benefits and drawbacks associated with decisions in tandem with emotion variables. This will help researchers determine the predictive power of emotion variables against that of the other variables, which will enable a more discreet evaluation of the magnitude of the predictive power of the emotion account in explaining self-other differences in decisions.

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## Appendix A

### Scenario

#### *Female Self Condition*

#### Characters

Attractive Person (Male): an amiable longtime barista

You: a young woman and regular at the coffee shop

Friend 1 (Female): a friend of You and Friend 2

Friend 2 (Female): a friend of You and Friend 1

Setting: A relaxed backyard gathering.

At Rise: You and Friends 1 & 2 are gathered around a fire pit, rubbing their hands together and drinking bottles of craft beer. The three of you are in a semi-circle, with Friend 2 between You and Friend 1.

*(Attractive Person wanders over, carrying a plastic cup of beer. You look up and smile. Friend 1 and 2 continue as they are.)*

#### ATTRACTIVE PERSON

Hey, where d'ya score the good beer? All I saw was the keg on the porch.

#### FRIEND 2

It's in a cooler in the kitchen.

#### FRIEND 1

I don't know why they put it there. I couldn't find it either.

#### FRIEND 2

They probably wanted to reserve the good stuff for the VIPs!

*(Friend 1 clinks Friend 2's bottle.)*

ATTRACTIVE PERSON

*(to You)*

Hey. You look familiar. Wait. Don't tell me...

*(Pregnant pause.)*

YOU

*(sounding slightly peeved)*

Java Joe's.

ATTRACTIVE PERSON

Oh, of course! Sorry it took a minute. Just, you know. Different context and all...

YOU

No worries. I know you have a million customers....

ATTRACTIVE PERSON

But only one who orders a mocha latte with almond milk— every time.

YOU

*(Noticeably brighten up, and with a slightly flirtatious tone)*

Yes. And you make it with a froth flower.

FRIEND 2

Hey, no one ever makes a froth flower in my latte.

ATTRACTIVE PERSON

*(laughing and turning to Friend 2)*

Well, maybe you should ditch Starbucks and come to JJ's instead.

FRIEND 2

*(laughing)*

Fair enough.

YOU

So the froth flower wasn't just for me?

ATTRACTIVE PERSON

*(turning back to You)*

Well, you know, I like to spread the love. But I do take my froth art for you to the next level.

YOU

And I'm eternally grateful.

*(Brief pause.)*

ATTRACTIVE PERSON

Well, I should get some of that good beer before all you VIPs polish it off.

*(to You)*

Nice to see you, Mocha Latte.

*(raising his cup to Friends 1 & 2)*

Nice to meet both of you. And thanks for letting me in on the secret stash.

*(Friend 1 & Friend 2 resume their conversation and You continue gazing as Attractive Person walks away.)*

## Appendix B

### Risk-Taking Levels

#### *Female Version*

##### [Self Condition]

In the scenario you read, you now have a decision to make. You like the barista and are attracted to him, but you're not sure what he thinks about you and are enjoying hanging out with your friends. You could either (1) approach the barista while he is getting a drink and talk to him one-on-one, or (2) stay with your friends. How likely are you to approach the barista while he is getting a drink and talk to him one-on-one?

##### [Surrogate Condition]

In the scenario you read, your friend now asks you to make a decision for her. Your friend likes the barista and is attracted to him, but your friend is not sure what he thinks about her and is enjoying hanging out with her friends. Your friend could either (1) approach the barista while he is getting a drink and talk to him one-on-one, or (2) stay with her friends. How likely are you to decide for your friend to approach the barista while he is getting a drink and talk to him one-on-one?

##### [Prediction Condition]

In the scenario you read, your friend now has a decision to make. Your friend likes the barista and is attracted to him, but your friend is not sure what he thinks about her and is enjoying hanging out with her friends. Your friend could either (1) approach the barista while he is getting a drink and talk to him one-on-one, or (2) stay with her friends. How



## Appendix C

### Emotion Ratings

#### *Self Condition*

Please imagine that you're approaching the barista while he is getting a drink and talking to him one-on-one.

1. How much NEGATIVE EMOTION do you think you would feel?

1	2	3	4	5
Not nervous, worried, or anxious		Neutral		Very nervous, worried, or anxious

2. How ALERT do you think you would feel?

1	2	3	4	5
Calm, sleepy, or dull		Neutral		High energy, wide awake, or jittery

3. How much POSITIVE EMOTION do you think you would feel?

1	2	3	4	5
Not happy, excited, or hopeful		Neutral		Very happy, excited, or hopeful

#### *Surrogate and Prediction Conditions*

Please imagine that your friend is approaching the barista while he is getting a drink and talking to him one-on-one.

1. How much NEGATIVE EMOTION do you think your friend would feel?

2. How ALERT do you think your friend would feel?

3. How much POSITIVE EMOTION do you think your friend would feel?

## Appendix D

### Perceived Riskiness

Please answer the following questions about how risky each behavior described is.

How RISKY did you think it is to approach the barista while they were getting a drink and talk to them one-on-one?

1      2      3      4      5

Not risky at all                      Extremely risky

How RISKY did you think it is to stay with your friends?

1      2      3      4      5

Not risky at all                      Extremely risky

## Appendix E

### Relationship Status

Please answer the following questions about the relationship status for yourself as well as your two friends whose names you wrote down in the beginning of this survey.

Are you in a relationship?

Yes

No

Is Friend 1 in a relationship?

Yes

No

Is Friend 2 in a relationship?

Yes

No

## Appendix F

### Attention Check

Now you'll be answering two questions designed to ensure that an actual person is filling out our survey.

1. This attention check is simple. After reading this sentence, you must choose the option "Extremely."

Based on the text you read above, what option have you been asked to click on?

1	2	3	4	5	6	7
Not at all	Very little	Slightly	Moderately	Somewhat	Very much	Extremely

2. This tree test is simple. When asked for your favorite tree, you must choose the option "Pine."

Based on the text you read above, what option have you been asked to click on?

1	2	3	4	5	6	7
Birch	Oak	Pine	Maple	Elm	Cedar	Chestnut

## Curriculum Vitae

Ye Dam Yi

### EDUCATION

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**Wake Forest University** Winston-Salem, NC  
M.A. in Psychology. GPA 3.95/4.00 May, 2021 (Expected)  
Thesis in progress: An Investigation of the Emotion Account of Self-Other Differences in Decisions under Risk (Advised by Dr. Eric R. Stone)

**Yonsei University** Seoul, Republic of Korea  
M.A. in English Language and Literature . GPA 4.27/4.30 August, 2016  
Thesis: Inventing an Alternative National Narrative in Herman Melville's Moby-Dick (Advised by Dr. Seok Won Yang)

**Yonsei University** Seoul, Republic of Korea  
B.A. in English Language and Literature & February, 2014  
Minor in Economics. GPA 3.93/4.30

**James Madison University** Harrisonburg, VA  
Exchange Student Program. GPA 3.91/4.00 2011-2012

### PROFESSIONAL & RESEARCH EXPERIENCE

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**The Honesty Project** Winston-Salem, NC  
*Graduate Research Assistant* August 2020 - Present  
Recruited to join an interdisciplinary team of faculty members in psychology, philosophy, and organizational behavior working on a project funded by John Templeton Foundation (USD 4,000,000) to perform literature reviews, set up study protocols, and generate study materials

**The Emotional Adaptation and Psychophysiology Lab** Winston-Salem, NC  
*Graduate Research Assistant* August 2019 – December 2019  
Managed data collection for a research project involving virtual reality equipment with 120 participants and trained undergraduate research assistants to conduct study sessions

**Marco College Community Education** Seoul, Republic of Korea  
*Instructor* September 2018 - August 2019  
Designed and led a summer book club program for secondary school students and taught SSAT reading and writing classes

**TmaxSoft** Kyeonggi, Republic of Korea  
*Global Release Management Associate* May 2017 – July 2018  
Managed product manual releases in English at a large software company with 1000+ employees and supported the communications and marketing teams for delivering internal and external marketing and PR contents in English among overseas branches and customers

**Tridge***Marketing, Operation, and Trading Associate*

Seoul, Republic of Korea

October 2016 - January 2017

Generated trade leads and conducted market research at a startup company with 20 employees and 10+ nationalities represented and translated marketing materials such as company brochures, product websites, weekly feeds, and corporate landing pages.

**PEER-REVIEWED PUBLICATIONS**

---

Yi, Y. (2017). Locating a Transnational Film between Korean Cinema and American Cinema: A Case Study of *Snowpiercer* (2014). *Plaridel*, 14(1), 17-32.

Yi, Y., & Yoon, A. (2015). The Body on Stage: A Political Critique of the Visibility of the Privacy in Tony Kushner's *Angels in America*, Part I: Millennium Approaches. *The Mirae Journal of English Language and Literature*, 20(2), 289-310.

**CONFERENCE PRESENTATIONS**

---

Yi, Y. (December, 2020). The role of emotions on self-other differences in decisions under risk. Poster presentation at the Annual Meeting of the Society of Judgment and Decision-Making, Virtual.

Yi, Y. (March, 2015). Elusive Representation of Sexual Desire for the Popular Audience in *Sanctuary*. Paper presentation at the International Conference of the English Language and Literature Association of Korea, Busan, Republic of Korea.

Yi, Y. (June, 2015). Where is the Left?: Tracing Affect in the Popular Reaction to the Sewol Tragedy. Paper presentation at the Third Symposium of the Partitions: What Are They Good For? Partitions/Violence/Migration, Cardiff, Wales, UK.

Yi, Y. (February, 2015). Rereading the Text: *Mise-En-Page* and the Rise of the Novel in *Roxana*. Paper presentation at the Annual International Conference of Situations: Cultural Studies in the Asian Context, Hong Kong, China.

Yi, Y. (January, 2015). Signifying Space with Visual Knowledge in *Snowpiercer*. Paper presentation at Hawaii University International Conferences (HUIC) Arts, Humanities, Social Sciences and Education Conference, Honolulu, Hawaii, USA.

Yi, Y. (July, 2014). Suffering as the Channel of Oppression and Reassertion in the Contestation between Individual and State in *Angels in America: Millennium Approaches*. Paper presentation at Yonsei Summer International Conference, Seoul, Republic of Korea.

Yi, Y. (June, 2014). *The Waste Land: A Diagnosis of the Rootless Modern Culture of Discommunication*. Paper presentation at the Graduate Seminar of the English Language and Literature Association of Korea, Seoul, Republic of Korea.

**RELEVANT COURSES**

---

Data Science for Psychologists. Prof. S. Mason Garrison, Wake Forest	Spring 2021
Introduction to R. Prof. R. Michael Furr, Wake Forest	Spring 2020
Research Analysis and Design II, Prof. R. Michael Furr, Wake Forest	Spring 2020
Research Analysis and Design I, Prof. Eric R. Stone, Wake Forest	Fall 2019

**ANALYTIC PROFICIENCIES**

---

Descriptive Analyses: Measures of Central Tendency, Frequency

Bivariate Analyses: Correlation, Chi-Squared  
T-tests: Including repeated measures, and independent samples  
ANOVA: Including MANOVA  
Regression: Including Multiple and Hierarchical Modeling  
Structural Analysis: Path Analysis

### **TECHNICAL SKILLS**

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Computer: SPSS, SPSS AMOS, R Studio, Github (/yiy19), Microsoft Office Suite  
Research: Qualtrics Survey Design, Qualitative Research Design, Quantitative Research Design, IRB Approval, Online Panels (MTurk and Prolific)  
Languages: Korean, English