THE ROLE OF SHOULDS IN SELF-OTHER DIFFERENCES IN DECISION MAKING

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DEDICATION

This work is dedicated to my childhood role model, perpetual intellectual superior, and older brother, Shawn. I miss him.

Shawn Kary Smout

May 11, 1984 – April 21, 2019

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ABSTRACT

When deciding for others, people often make different decisions than when deciding for themselves in the same situation (Atanasov, Smout, & Stone, 2019). Although a number of theories seek to explain these differences, none has explored whether they arise from beliefs about what people *should* do. This paper investigates whether such beliefs, which we term *shoulds*, account for self-other differences in decision making through two possible avenues: mediation, in which self-other differences in *shoulds* cause self-other differences in decisions, or moderation, in which the target of a decision (self or other) moderates the relationship between *shoulds* and decisions. Participants made decisions and reported *shoulds* either for self or other in relationship and physical health scenarios. Results replicated previous research that decisions for others are more risk-seeking in relationship scenarios but more risk-averse in health scenarios. We also found that *shoulds* differ for self and other in relationship scenarios, fully mediating the relationship between self-other and decisions. However, *shoulds* failed to explain self-other differences in health scenarios. We found no evidence of moderation effects, suggesting that *shoulds* and decisions are equally connected for self and other in both domains. We discuss how these results relate to prevailing theories in the literature.

INTRODUCTION

People routinely make decisions for others. Doctors decide on treatments for their patients, financial advisors for their clients, politicians for their constituency, parents for their children, friends for each other, and so on. Surprisingly, research has repeatedly shown that the choices we make for others often differ from the choices we make for ourselves in identical circumstances (Atanasov, Smout, & Stone, 2019). Previous explanations of this phenomenon have emphasized the role of factors like emotion, psychological distance, or social values. However, no explanation has proposed that these differences are due to beliefs about what people should do.

Beliefs about proper or obligatory behavior clearly play a role in decision making. Such beliefs are, for instance, a core part of norms (Labovitz & Hagedorn, 1973), which occur everywhere and are highly influential when making decisions (e.g., Burgoon, 1993; Myers & DeWall, 2017). However, the beliefs we hold about appropriate behavior for ourselves are not always the same as the beliefs we hold for others (e.g., Lammers, 2012; Lammers, Stapel, & Galinsky, 2010; Polman & Ruttan, 2012; cf. Fernandez-Duque & Wifall, 2007). The following is an initial test of whether people's beliefs about how they or others ought to behave play a role in self-other differences in decision making.

Previous Explanations for Self-Other Differences in Decision Making

Beliefs about target attributes. A number of factors may explain self-other differences in decision making under risk. First, individuals may make different decisions for different targets when they believe that the targets differ in some important way.[1]

[1] Following the convention from sources such as Lerner and Tetlock (1999), the "target" of a decision is the beneficiary of the decision, or the person for whom the decision is made, such as self or other.

Such attributes might include personal circumstances, preferences, expected outcomes, personality traits, goals, or any other feature that is different between self and other. For example, when considering whether a target should strike up a flirtatious conversation with an attractive stranger, one might decide differently if one target is single but the other is in an exclusive relationship. According to this explanation, the decision maker relies upon the same motivations (e.g., the desire to maximize utility) and cognition (e.g., weighing factors in a proportionate way) for both self-decisions and other-decisions, but the outcomes still differ.

There is a substantial amount of evidence that people do take their beliefs about others' attributes into account when deciding for them. For example, decision-makers decide differently for extraverted versus introverted individuals regarding social and physical risk (Fleming & Slank, 2015), and money managers invest other people's money based on the risk preferences that they predict their clients have (Füllbrunn & Luhan, 2015). Individuals even appear to model others' values and preferences neurologically when deciding on their behalf (Nicolle et al., 2012).

Believing that others possess different personal attributes than oneself may alter the decision toward or away from a particular choice in any given situation. However, for research to find consistent self-other differences in a predictable direction, there must be the perception that, on average, others possess different attributes than the self. One example of such a mean-level perceptual difference is the *better-than-average* effect, in which people generally believe that they are better than most others at a task (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995). If individuals believe that they will meet greater success than others, they may choose riskier behavior for themselves than

for others. Alternatively, if people believe that they will be less successful than others will be, as Feather and Simon (1971) found, then they may choose less risky behavior for themselves than others. Even possessing more information about target attributes for self-decisions than other-decisions, such as knowing the target's preferences, may cause mean-level differences in decision-making. For example, when deciding for a target with unknown preferences, individuals may choose more risk-neutral behavior because they do not have any other information upon which to base their decisions (Vlaev et al., 2017). Whatever the case, the belief that the two targets differ in some important way may bring about different decisions for self and other.

Differences in processing. Although beliefs about differing target attributes may cause some self-other differences in decision making, research has frequently found such differences even when attempting to control for these beliefs. For example, self-other differences still occur when deciding for others with similar values to oneself (e.g., Beisswanger, Stone, Hupp, & Allgaier, 2003). Thus, most theories, including the new one we propose, seek to explain self-other differences when attributes of the target are held constant since differences in such circumstances appear to be more fundamental.

One such theory is *risk-as-feelings*, which proposes that self-other differences in decision making arise because people predict less affective response when deciding for others than for self due to the empathy gap (Loewenstein, Weber, Hsee, & Welch, 2001). Consequently, affect drives decisions for others less than for self with the result that decisions are different for the two targets (Andersson, Holm, Tyran, & Wengström, 2016). Furthermore, the more distant from oneself the other person becomes, the greater the affective difference, and the more different decisions will be (Meyer et al., 2013; Sun,

Liu, Zhang, & Lu, 2017). Indeed, results have demonstrated that when the target of a decision is abstract (more distant) rather than concrete (less distant), self-other differences are larger (e.g., Batteux, Ferguson, & Tunney, 2017; Benjamin & Robbins, 2007). However, evidence to the contrary has also arisen. If risk feels less severe for others than for self, then decision-makers would tend to choose the more risk-seeking option for others. Although this pattern holds for decisions in low-risk relationship scenarios (Beisswanger et al., 2003), individuals choose less risk for others than self in situations involving physical safety or health (Dore, Stone, & Buchanan, 2014; Garcia-Retamero & Galesic, 2012a; Pollai & Kirchler, 2012; Stone, Choi, Bruin, & Mandel, 2013).

Construal level theory makes similar predictions to risk-as-feelings. Construal level theory proposes that people think differently about a decision depending on their "psychological distance" to it: the closer a decision and its consequences are to the self in the here and now, the more concrete, specific, and contextualized one's thoughts will be (Trope & Liberman, 2010). Self-other differences occur because decisions for others have greater psychological distance than decisions for self; that is, people think more generally and abstractly for others than for themselves (Nordbye, 2007; Polman, 2012). Consequently, decisions for others are predicted to be more risk-neutral than decisions for self (Batteux et al., 2017; Sun et al., 2017). Here again, however, the predicted result only manifests occasionally (e.g., contrasting results were found by Benjamin & Robbins, 2007; Eriksen, Kvaloy, & Luzuriaga, 2017; Stone, Yates, & Caruthers, 2002; Zhang, Chen, Gao, Liu, & Liu, 2018).

Social values theory proposes that self-other differences in decision making arise because self- and other-decisions differentially weight the importance of social values (Stone & Allgaier, 2008). Decisions for others are based on an injunctive norm to make the socially valued decision, whereas decisions for self weight social values as a lesser concern. When deciding for oneself, the injunctive norm does not apply, so decisions may be based on any other relevant factors, like convenience (Dore et al., 2014). Thus, in the relationships domain, where society values taking risk, decisions will be more risk-seeking for others than for self, whereas in the health/safety domain, where society does not value risk, decisions will be less risk-seeking for others than for self (Stone et al., 2013). Results tend to be consistent with the domain prediction of social values theory (Atanasov et al., 2019). However, because social values theory predicts that the social value of a decision is constant across self and others, it cannot explain why the identity of the other person, such as deciding for a known versus an unknown person, influences the magnitude of self-other differences (e.g., Batteux et al., 2017; Sun et al., 2017).

As can be seen, current theories have focused on the role of affect, psychological distance, or social values to explain self-other differences in decision making. These theories have not addressed how people's beliefs about what they ought to do might influence such differences. The current study examines this hitherto unexplored factor.

Shoulds

According to self-discrepancy theory, when facing a dilemma, people consult "self-guides" to direct their behavior (Higgins, 1987). One such guide is the "ought-self," which is a person's representation of the behaviors that they *should* or *ought* to do (Orellana-Damacela, Tindale, & Suárez-Balcázar, 2000). The ought-self is related to, and

indeed originates from, sources such as social norms and moral considerations (Manian, Papadakis, Strauman, & Essex, 2006). As its name implies, people feel a sense of obligation to behave in line with the ought-self. Self-discrepancy theory proposes that this obligation comes from the motivation to reduce the discrepancy between the actual-self and the ought-self (Higgins, 1989). Throughout this paper, we will call the perceived obligation to behave a certain way a *should*, as in what someone believes they *should* do. The term *shoulds* is selected for two reasons: a) it isolates this injunctive or obligatory feature shared by morality, norms, the ought-self, and other concepts, and b) for brevity.

Shoulds play a critical role in decision making (Bartels, Bauman, Cushman, Pizarro, & McGraw, 2015). It is no surprise that *shoulds* are relevant in moral decision making, since morality is entirely concerned with what people *should* do (Foot, 1972). But perhaps surprisingly, *shoulds* are also important in decisions unrelated to morality, such as when deciding how much money to spend on concert tickets. Amir and Ariely (2007, p. 146) demonstrated that people sometimes make purchasing choices that are not in line with their economic preferences, and that such choices can result from following "rules for action in a moral-like manner (i.e., do the right thing)." That is, amoral choices can also be based on *shoulds* to the overriding of economic rationality.

When facing a binary dilemma such as those found in the literature on self-other differences in decision making, an individual may perceive the obligation to choose Option A or Option B. If they believe that they ought to choose Option B, then we would say that they have a *should* to choose Option B. To illustrate, consider the following sample scenario from Blalock (2011):

> You are a huge football fan. You go to almost every game, and your team is playing in a very important game this coming Saturday. However, you were very sick and are just now recovering. You know it won't be good for you to go to the game, because it will be very cold out and delay you getting better, but you've been looking forward to it.

In this dilemma, the reader faces the decision to go to a football game (a risk-seeking decision) or to stay home (a risk-averse decision). Various factors might drive the *should* in either direction. People might feel obligated to go to the game in order to support their team (e.g., "they need me"), maintain personal consistency ("I always go"), prove their commitment ("I went even when I was sick"), or to make the most of life ("life is meant to be enjoyed"), among other reasons. Alternatively, people might feel obligated to stay home, for instance, in order to get well ("I should care for my health"), avoid unnecessary risks ("I shouldn't take the chance"), or do what their mother would want ("she'd be mad at me if I went"). Regardless of the particular motive, it seems reasonable that such *shoulds* might influence behavior.

Given the multitude of potential obligations one might perceive, it is possible that a person could feel obligated to choose Option A for one reason and Option B for another reason and thereby hold competing *shoulds.* Despite this possibility, previous research has demonstrated that, in many of the scenarios used in the self-other literature, one option is consistently rated as being more "ideal" and "appropriate" to choose (Stone & Allgaier, 2008), suggesting that there tends to be a stronger *should* associated with that option.

There may also be different broad categories of *shoulds*. For instance, when considering *shoulds* through the self-other lens, there may be *shoulds* about how others ought to behave but also how people ought to decide for others, and those two may be

different. Even if someone ought to take a risk and a surrogate decides for them to do so, then if the risk runs afoul, the surrogate might get blamed for the poor outcome; consequently, perhaps the surrogate *should* choose the safer option for the person. Importantly, for the sake of this study, we are only interested in what people *should* do, not how people *should* decide for others. We only measure beliefs about what the decision target *should* do.

The Role of Shoulds in Self-Other Differences

People hold *shoulds* not only for their own behavior, but for others' behavior as well. One manifestation of the prevalence of other-regarding *shoulds* is social norms. Social norms are based on social evaluations and/or sanctions, in which evaluations refer to "statements of should or ought, or should not or ought not," and sanctions refer to rewards or punishments that incentivize approved behavior (Labovitz & Hagedorn, 1973, p. 284). Because social norms permeate society (Burgoon, 1993), we know that *shoulds* for others do likewise. The *shoulds* we hold for others are strong enough to trigger aversive emotions like embarrassment or anger whenever we see others violate them (e.g., Berthoz, Armony, Blair, & Dolan, 2002; Burns, 2008).

Given that *shoulds* influence decisions and that they permeate society, it seems reasonable that *shoulds* may cause self-other differences in decision-making. *Shoulds* may bring about self-other differences in decision making through two possible avenues: mediation and moderation. Models for each are described below.

Mediational model. The *shoulds* we hold for others may differ from the *shoulds* we hold for ourselves. If the *shoulds* then exert proportional influence for each target, decisions for self and other may differ. This model is mediational (see Figure 1).

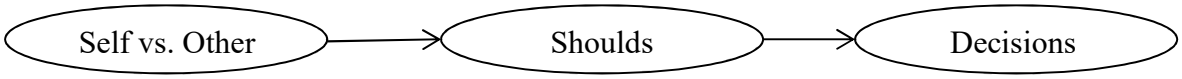

Figure 1. Mediational model in which the self vs. other distinction differentially produces *shoulds* which then correspondingly influence decisions.

The mediational model requires *shoulds* to differ for self and other. One field that explores self-other differences in *shoulds* (though not by that name) is moral psychology. To moral psychologists, holding double standards when evaluating a behavior done by oneself versus another person is a type of moral hypocrisy (De Bock, Vermeir, & van Kenhove, 2013; Graham, Meindl, Koleva, Iyer, & Johnson, 2015; Xiao et al., 2015). A number of studies have found that certain behaviors become more or less acceptable when performed by others than by oneself (Lammers, 2012; Lammers et al., 2010; Polman & Ruttan, 2012). For example, Xiao and colleagues (2015) found that moral decisions for others are less utilitarian than for self, indicating that people believe that different behaviors are right for others and self. Rybash and colleagues (Rybash, Hoyer, & Roodin, 1984; Rybash, Roodin, & Lonky, 1981) demonstrated that young adults (though not older adults) use higher-level moral reasoning strategies for other-decisions and lower-level strategies for self-decisions, which could obviously lead to different *shoulds* for the two targets. Thus, research into moral psychology demonstrates that there can be self-other differences in *shoulds*.

Self-other differences in *shoulds* may arise when decision makers believe that the two targets differ in some important way, as described above. Because we are not interested in this explanation, in the current study we attempt to control for differing

attributes of self and other by having participants rate *shoulds* for a specific friend (since friends are presumably similar to one another in some important ways) and by instructing participants to respond as if one key attribute – relationship status – is identical for each target, i.e., that both self and other are single.

In situations involving risk, *shoulds* might be more risk-seeking or more risk-averse for one target than another. These differences may follow the evaluation that people make of the risky situation. For example, Blalock (2011) found that people evaluate risk-taking in relationship situations to be less socially valued when deciding for others than self. This evaluation might lead to more risk-averse *shoulds* for others than self in relationship decisions.

In other situations, differences in evaluation might lead to more risk-seeking *shoulds* for others than self. For instance, Bruk, Scholl, and Bless (2018) found that people more positively evaluate voluntarily displaying vulnerability (a risky behavior) when others do so than when doing so themselves. Because displaying vulnerability is evaluated more positively for others and more negatively for self, people may hold a *should* to take this particular risk for others but not for self.

Emotion may drive the differing evaluations behind differing *shoulds*. Although we defined *shoulds* as the perceived obligation to behave a certain way, thus far we have primarily described them as cognitive beliefs. But, as the term obligation implies, *shoulds* surely involve an affective component. According to the social intuitionist model of moral judgment, the affective component of *shoulds* may be the foundation for the cognitive dimension, with the cognitive dimension only arising as *ex post facto* justification for our emotional intuitions (Haidt, 2001). Because emotion may lie at the

heart of *shoulds*, having a stronger emotional reaction to a potential risk, such as increased fear at potential losses or excitement at potential gains, may influence whether a person believes they *should* take that risk. Risk-as-feelings and construal level theory propose that self-decisions involve stronger affect than do other-decisions. In keeping with these theories, the relatively intense emotion of self-decisions may cause one to evaluate a risk, for instance, as offering the chance to yield a very exciting reward, but the reward would not be as exciting when considered for others. In turn, the difference in evaluation may then polarize *shoulds* for self relative to others, making the person believe that they *should* take the risk but that others *should* not.

Moderational model. Even if *shoulds* are the same for self and other, they may bring about self-other differences in decision-making by driving decisions more strongly for one target than for the other. This is a moderational model because the self-other distinction influences the relationship between *shoulds* and decisions (see Figure 2). Put differently, the correlation between *shoulds* and decisions may be different depending on whether the tasks are completed for self or other. For instance, *shoulds* may directly lead to decisions for others if decisions for others depend predominantly upon *shoulds*; however, *shoulds* may only be loosely related to decisions for self if decisions for self are more driven by other factors such as convenience or affect.

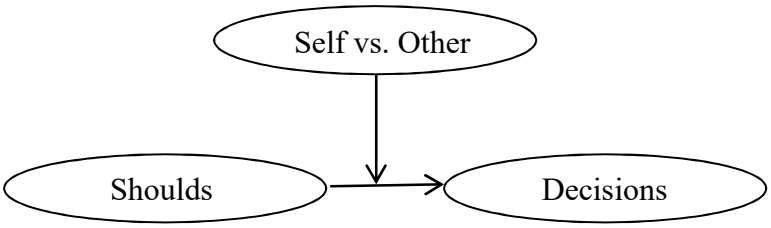

Figure 2. Moderation model in which the self vs. other distinction cause *shoulds* to differentially influence decisions.

The differential influence of *shoulds* on decisions for self and other is consistent with at least some of the results from the moral hypocrisy literature. Xiao and colleagues (2015) had participants decide for themselves or advise others whether or not to intervene in the classic trolley problem and its footbridge variant. In these scenarios, a runaway trolley will hit and kill five or more workers below unless someone intervenes. Intervening in the trolley problem involves flipping a switch so that the trolley goes down a different line where it kills only one worker. Intervening in the footbridge problem involves pushing a very fat person off an overpass onto the tracks to stop the trolley before it hits the workers. Xiao and colleagues found no self-other differences in the trolley problem, but in the footbridge problem, people were less likely to advise others to intervene than they were to do so themselves. Because decisions for others followed the "more conventionally morally acceptable choice" to not push a man off the bridge (p. 8), then assuming that *shoulds* were the same for self and other, decisions for others were more closely linked with moral *shoulds* than were decisions for self. If *shoulds* drove the decisions, then this is an example of the moderational model in which *shoulds* drove decisions more for others than for self.

Although none of the prevailing theories of self-other differences in decision-making discuss *shoulds*, one mechanism that could bring about moderation is based on similar logic as risk-as-feelings and construal level theory. According to these theories, the intense emotion associated with a self-decision may interfere with relatively cognitive

considerations like *shoulds.*[2] Consequently, even when a person believes in the abstract that self and other *should* do the same thing, decisions for self may be swayed more by emotions like fear at possible losses or excitement at possible gains, leading self-decisions away from *shoulds*. In contrast, decisions for others may be swayed more by abstract beliefs about proper behavior since these decisions would be unimpeded by emotion.

Another possible mechanism could follow the logic established by social values theory. According to social values theory, social values sway decisions for others more than for self (Stone & Allgaier, 2008). Since value begs to be followed, there is a *should* to follow the social value. Importantly, the *should* associated with the social value is the same for self and other because the value is perceived to be held by society. Just as social values theory proposes that social values are more influential for other-decisions than self-decisions despite the equivalency of the value, the *should* affiliated with the social value may also be more influential for other-decisions than self-decisions. Thus, if *shoulds* are primarily produced by perceived social values, social values theory is in keeping with the moderational model.

Present Research

The primary purpose of this research is to test the role of *shoulds* in self-other differences in decision making under risk. Participants read eight physical health or relationship scenarios that solicited a decision either to take a risk or to avoid it. We

[2] For a discussion of emotions interfering with cognition, also known as "emotional interference," see, e.g., Song et al. (2017). Note that although recent psychological research has challenged the notion that *shoulds* are relatively cognitive, as argued above, the traditional view, following Kohlberg (e.g., 1981, 1969) and others, is that morality is the realm of the mind and often in direct contrast to the sensual, affective responses of the body. In the long history of moral thought, the notion that moral judgments might be expressions of feeling rather than judgments of reason was not proposed until 1906 by Westermarck (Blanshard, 2014).

varied how risky each scenario was along nine degrees, ranging from the risk "definitely would not" turn out well/poorly to "definitely would" would turn out well/poorly (see Appendices 1 and 2 for examples). For each of the nine circumstances per scenario, participants indicated whether they thought the target (self or other) *should* take the risk, and they made a decision for that target. We combined participants' responses into measures of risk propensity per person to describe how risk-taking their decisions are and how risk-taking their *shoulds* are. We then used these measures to evaluate whether either of the two new models that we have proposed are correct.

Following the pattern set by previous research, we examined decisions that involve relationship and physical health/safety scenarios. These domains are informative because self-other trends flip between them, with people choosing more risk-seeking behavior for others in relationship scenarios but more risk-seeking behavior for themselves in health scenarios (Atanasov et al., 2019). This flip has allowed research to eliminate some potential explanations, such as whether risk preferences for others differ from self in a consistent direction. Including both domains provides the additional benefit that the data can act as a self-replication, with the second domain providing a replication opportunity for whatever effect is found in the first domain. For our study, in order to test each domain separately, we computed participants' risk propensity scores separately by domain.

This study has two broad research questions relating to the mediational and moderational models, respectively, with various sub-components, as follows.

Q1: Do *shoulds* mediate the relationship between decision target (self/other) and decisions? Answering this question requires three steps:

1a. Are there self-other differences in decisions? This question is akin to a manipulation check. In order for us to find that a difference in *shoulds* relates to a difference in decision making, we must first confirm that there are differences in decision making. Based on previous research, we predict that decisions will be more risk-averse for others than self in the physical health domain but more risk-seeking for others than self in the relationships domain (Atanasov et al., 2019).

1b. Are there self-other differences in shoulds? In order for mediation to occur, *shoulds* must experience the same domain flip that appears in decisions. Consequently, the mediational model predicts that *shoulds* for others must be more risk-seeking in relationship scenarios but more risk-averse in physical health scenarios, compared to *shoulds* for self.

A number of factors might cause this pattern. One possible explanation relates to evaluation. Recall how one study found that people value revealing personal vulnerability more when others do so than when doing so themselves (Bruk et al., 2018). Because taking a risk to pursue a relationship often requires displaying vulnerability (e.g., by confessing one's feelings), then a more positive evaluation of this risk may cause *shoulds* to favor risk-taking for others more than for self in relationship scenarios.

Similarly, evaluations of risk might push *shoulds* in the opposite direction for physical health scenarios. For example, the perception of physical safety risk is related to feeling invulnerable (Mbaye & Kouabenan, 2013). Following the predictions made by risk-as-feelings and construal level theory, that feeling of invulnerability may be weaker

when considering a dilemma for others than for oneself. In turn, when evaluating what a person *should* do, feelings of invulnerability may push *shoulds* away from risk-taking for others and toward it for self.

An entirely different explanation for the domain flip might relate to the assessment of the costs and benefits of making a decision. Recall that Xiao and colleagues (2015) found that moral *shoulds* for self are more utilitarian than moral *shoulds* for others, meaning that self-*shoulds* are more sensitive to the consequences of a decision, including its costs and benefits, than are other-*shoulds*. The increased utilitarianism of self-*shoulds* might interact with an artifact of the relationship and health scenarios that have been used in the literature. In the seminal studies of self-other differences between these two domains (e.g., Beisswanger et al., 2003; Stone & Allgaier, 2008), taking a risk in relationship scenarios always involves exerting more effort than usual (e.g., by going up and talking to a cute stranger rather than doing nothing) whereas taking a risk in health scenarios often involves avoiding extra effort (e.g., by ignoring a rash rather than visiting a doctor). Because self-*shoulds* are more utilitarian, they may be more attuned to the costs associated with extra effort. In turn, *shoulds* for self may be risk-averse in relationships and more risk-seeking in physical health scenarios.

Regardless of the reason why *shoulds* might be more risk-seeking for others in relationship scenarios but more risk-averse for others in physical health scenarios, the key prediction of the mediational model is that this trend will be manifest in *shoulds*. The aim of the current research is not to try to determine conclusively why these *shoulds* would be different, but rather to evaluate whether they are different in the first place.

1c. Do self-other differences in shoulds mediate self-other differences in decisions? If there are self-other differences in *shoulds*, then supposing that *shoulds* partially drive behavior (cf. Higgins, 1987), self-other differences in *shoulds* may mediate self-other differences in decisions. For this to be the case, there must be a positive relationship (i.e., correlation) between *shoulds* and decisions, and *shoulds* for self must be more risk-seeking in the physical health domain but more risk-averse in the relationships domain, compared to *shoulds* for others. Finally, self-other differences in decisions must diminish when controlling for self-other differences in *shoulds*.

Q2: Does decision target (self/other) moderate the relationship between *shoulds* and decisions? Answering this question requires two steps:

2a: Are there self-other differences in decisions? This question is identical to 1a above. Again, the prediction is that decisions will be more risk-seeking for others in relationship scenarios and more risk-averse for others in physical health scenarios, compared to decisions for others.

2b: Do shoulds differentially predict decisions for self and other? In the two decision domains that we test, previous research has indicated that risk-taking is valued in relationship decisions but risk-aversion is valued in physical health decisions (Stone & Allgaier, 2008). Furthermore, social value drives decisions for others more than for self (e.g., Dore et al., 2014; Garcia-Retamero & Galesic, 2012b; Petrova, Garcia-Retamero, & Pligt, 2016; Stone & Allgaier, 2008). On the assumption that *shoulds* are based at least in part on social values, then according to the moderational model, *shoulds* and decisions will be more closely aligned (i.e., correlated) for others than for self in both domains. That is, the relationship between *shoulds* and decisions is moderated by the self-other

distinction. Note that according to the moderational model, *shoulds* need not be identical for self and other, though they can be.

METHOD

Participants

233 subjects (127 male) from a mid-sized liberal arts university in the southern United States participated in the experiment for partial credit towards their introduction to psychology research requirement. Rather than conducting a formal power analysis, we chose this number for three reasons. First, a power analysis would have been difficult because studies in the self-other literature have shown a wide range of effect sizes, from a Cohen's *d* of 0.01 to 1.06 (Atanasov et al., 2019). Second, we were unable to find any previous studies that compute the relationship between decisions and *shoulds* as we conceptualize them here, so it was unclear what we might expect to find. And finally, we had a logistical concern that participants must come to the experiment on two separate occasions (see "Design and procedure" below), which limited our ability to collect data online reliably. Given these three obstacles, we maximized the number of subjects possible by sampling as much of the research pool of departmental psychology students as possible. Subjects were not preselected based on any criteria.

Materials

Scenarios. Participants responded to eight scenarios that have previously revealed self-other differences in decision making. Scenarios involved two different domains: relationships and physical health/safety. These domains were selected because they have previously revealed large self-other differences in decision making (Atanasov et al., 2019), which enabled us to investigate the relationship between these differences and *shoulds*. Of the scenarios that produced the greatest self-other differences in previous research (Blalock, 2011), we selected four per domain that seemed the most ecologically

sound and likely to elicit variation in responses. Relationship scenarios (male self condition) are presented in Appendix 1, and physical health scenarios (female friend condition) are presented in Appendix 2.

Measures. For each scenario, participants indicated both their decisions and their *shoulds* in two separate sessions. Following the majority of previous work in the literature (e.g., Beisswanger et al., 2003), participants made binary decisions in which they had to choose either a risk-seeking option or a risk-averse option per scenario. However, in order to increase the sensitivity of our measure beyond only one binary choice, we followed the logic of Holt and Laury (2002) and Garcia-Retamero and Galesic (2012a) and had participants make multiple binary choices per scenario with slightly different circumstances for each choice. Participants considered each scenario at nine varying levels of risk, seven of which varied the likelihood of a good/bad outcome occurring from being very likely to very unlikely, and two of which involved certainty that a good/bad outcome definitely would result or definitely would not result. Participants saw each scenario only once per task (decisions, *shoulds*), and the nine likelihoods were listed beneath it in ascending order (see Figure 3). This approach allowed participants to see clearly the level of risk at which they wished to switch from selecting the risk-averse option to selecting the risk-seeking option.

We averaged the total number of risk-seeking options each participant selected per scenario per task (decisions, *shoulds*) into composite scores per person. Because previous research has found a large effect of decision domain (e.g., relationship vs. health/safety) on self-other differences in decision making (Atanasov et al., 2019), we

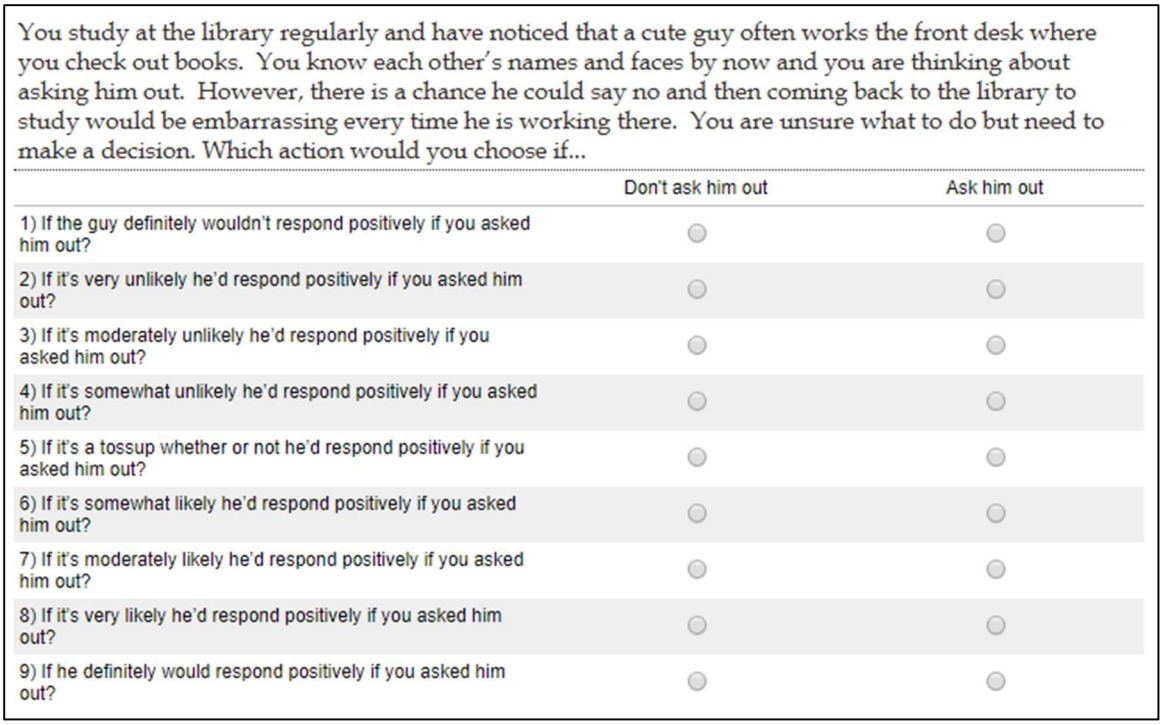

Figure 3. Participant view of a sample scenario.

averaged decision and *should* scores separately by domain. Thus, for each participant, we computed four average risk scores: one for relationship decisions, one for health decisions, one for relationship *shoulds*, and one for health *shoulds*. Risk scores for both decisions and *shoulds* had a 10-point range from 0 (completely risk-averse) to 9 (completely risk-seeking) per domain.

Design and procedure. We used a 2 (decision target: self vs. other) x 2 (domain: relationship vs. health) x 2 (task: decisions vs. *shoulds*) x 2 (task order: decisions first vs. *shoulds* first) mixed design in which decision target and task order were manipulated between-subjects and domain and task were manipulated within-subjects.

All participants responded to both relationship and health scenarios. Participants responded to all scenarios twice: once regarding decisions and once regarding *shoulds*. The decision and *should* variants of one relationship scenario are displayed in Appendix

3. Since participants answered both decisions and *shoulds*, one concern was that answering both types of items together could artificially inflate their correlation. In an attempt to make the responses to the decision and *should* items as separate as possible, participation occurred in two sessions (up to 20 participants each) separated by at least seven days, with participants making decisions in one session and reporting *shoulds* in the other. We hoped that the delay would cause participants to forget their responses to the first task. Task order (decisions first, *shoulds* first) was block randomized. The eight scenarios were presented in one of two possible orders, with one order the reverse of the other, both of which interweaved relationship scenarios with health scenarios.

To further disguise the purpose of the experiment, participants completed a number of cognitively-oriented distractor tasks at the end of the first session. Distractor tasks included the candle problem (Duncker, 1945), the marshmallow problem (Wujec, 2012), and the War of the Ghosts passage. Prompts for the distractor tasks are listed in Appendix 4.

Some participants responded for themselves while others responded for a same-sex friend whom they identified by initials. We had participants think of a specific friend to ensure that they care about the "other" for whom they are deciding so that that they care about the decision. Decision target was manipulated between-subjects for two reasons. First, previous studies (e.g., Beisswanger et al., 2003) have manipulated self and other between-subjects to positive effect. And second, using a between-subjects design allowed us to rule out demand characteristics as an explanation for any self-other differences we find.

RESULTS

Exclusions

Of the 233 participants that completed the first part of the study, at the time of writing, 37 (23 male) did not complete the second part of the study and so were excluded from all analyses. Other subjects were excluded from certain analyses due to irregularities in their responses, as follows.

Because subjects responded to a range of likelihoods for the good or bad outcome occurring in each scenario, we were able to detect certain instances when participants responded in a way that could not realistically reflect their opinions. Participants who did so on either decisions or *shoulds* items were excluded from the analyses for those items.

We explored two main errors: backward answering and random answering. Backward answering refers to participants reporting willingness to take a risk when the bad outcome "definitely would" occur but being unwilling to take the risk when the good outcome "definitely would" occur. Such answers are illogical and demonstrate either that the participants were confused and answered backward, selecting the risk-seeking option when they meant to select the risk-averse option, or that they did not understand the items. If a participant answered backward for at least one scenario on a given task and domain, we could not average their remaining items to yield them a composite score for that task and domain. This is because the average level of risk per scenario could vary, with some scenarios eliciting more risky behavior than others. Consequently, averaging any remaining scenarios could skew that participant's results toward or away from risky behavior. Therefore, if a participant made an error on even a single scenario per task and domain, we excluded their data for that task and domain.

We used the same approach when handling random answering. We detected random answering when participants flipped whether they would take the risk-seeking or risk-averse option more than once in their responses to a given scenario. Flipping more than once is illogical because it indicates that participants would avoid a risk when, for instance, a bad outcome is "very likely" or "slightly likely" to result, but not when it is "moderately likely" to result. In our study, 33 participants made at least one of these two types of error in at least one scenario. For the tasks and domains where participants made at least one error, they were excluded because they had incomplete data.

Two participants were included despite irregularities. One student had to complete the second session of the study remotely due to a family emergency. The other responded to the scenarios in different orders for the two sessions due to experimenter error. These participants were included because neither the study location nor the scenario order were key variables of interest. Analyses excluding these two participants did not differ meaningfully from the analyses reported below. In total, 197 participants (101 for self, 96 for others) provided at least partially usable data.

Descriptive Results

Descriptive results of *shoulds* and decisions scores for self and other in both domains are presented in Table 1. In keeping with previous research (e.g., Atanasov et al., 2019), people were generally more risk-taking in relationship scenarios than health scenarios. Notably, relationship scores were normally distributed and clustered around the middle of the 10-point scale whereas physical health scores were clustered around the lower, risk-averse end. This floor effect for physical health scenarios appears to have depressed physical health variances, particularly when responding for others.

Table 1. Mean (SD) participant risk scores, *N*, and range per domain and task.

Relationship domain

	Decision	*N*	Min	Max	Should	*N*	Min	Max
Self	4.40 (1.62)	94	1.00	8.25	4.44 (1.67)	95	0.50	9.00
Other	5.28 (1.58)	91	1.50	9.00	5.34 (1.56)	93	1.25	9.00

Physical health domain

	Decision	*N*	Min	Max	Should	*N*	Min	Max
Self	3.64 (1.56)	93	0.00	8.00	2.90 (1.47)	93	0.00	6.75
Other	2.93 (1.22)	87	0.25	6.25	2.92 (1.29)	89	0.50	6.00

Note. The scale ranged from 0-9, with higher numbers indicating that respondents endorsed taking risks against worse and worse odds of a good outcome occurring.

The four average scores per participant (decisions/*shoulds* in both domains) were each calculated from four items, one for each scenario in that task/domain. As such, the average scores may be thought of as scales comprising four items. Reliability for these scales in the relationship domain was acceptable (Cronbach's $\alpha = .79$ for decisions; $\alpha = .81$ for *shoulds*) partially reflecting the relatively similar nature of the items in that domain. In the physical health domain, however, where the four scenarios involved more diversified concerns, alphas were lower (decisions $\alpha = .56$; *shoulds* $\alpha = .57$)

Correlations between *shoulds* and decisions were significant (at $p < .001$) for both the relationship ($r = .68$) and health scenarios ($r = .48$), with the correlation for relationship scenarios being greater than the correlation for health scenarios ($z = 2.84$, $p = .004$).

Main Analyses

Q1: Do *shoulds* mediate the relationship between decision target (self/other) and decisions? This analysis involved three sub-components.

1a. Are there self-other differences in decisions? For this analysis, we determined whether the decision target influences decisions as measured by the average number of risk-seeking decisions each participant made per scenario. To test for self-other differences in decision making as well as to check for potentially concerning interactions, we conducted two four-way ANOVAs (one per domain) with the independent variables decision target, gender, task order, and scenario order.

As predicted, for relationship dilemmas, decisions were more risk-seeking for others ($M = 5.28$, $SD = 1.58$) than for self ($M = 4.40$, $SD = 1.62$), $F(1, 169) = 14.18$, $p < .001$. Also as predicted, for health dilemmas, decisions were less risk-seeking for others ($M = 2.93$, $SD = 1.22$) than for self ($M = 3.64$, $SD = 1.56$), $F(1, 164) = 11.87$, $p = .001$.

Of the 28 interactions (seven per task per domain) that we examined between decision target and combinations of the other three independent variables, only one – the interaction between decision target and scenario order – was significant ($p = .03$), and that for physical health decisions only. Because this was the only significant interaction involving our key variable (decision target), and because of the non-intuitive and non-replicated nature of the interaction, we assume the result arose by chance.[3]

[3] Although not relevant to the primary goals of this study, there were some other main effects. There was a main effect of gender in both tasks in the relationships domain. Male relationship decisions ($M = 5.12$, $SD = 1.74$) were more risk-seeking than female relationship decisions ($M = 4.58$, $SD = 1.52$), $F(1, 184) = 7.78$, $p = .006$. Male relationship *shoulds* ($M = 5.20$, $SD = 1.57$) were also more risk-seeking than female relationship *shoulds* ($M = 4.58$, $SD = 1.73$), $F(1, 189) = 8.94$, $p = .003$. However, there was no main effect of gender in physical health decisions ($p = .54$), and only a marginal effect of gender in physical health *shoulds*, with males ($M = 3.12$, $SD = 1.35$) holding riskier *shoulds* than females ($M = 2.78$, $SD = 1.41$), $F(1, 184) = 3.17$, $p = .077$. There was no main effect of task order in decisions or *shoulds* for relationship scenarios or for physical health decisions ($ps > .15$). However, there was a main effect of task order on physical health *shoulds*, with participants who reported *shoulds* in Session 1 ($M = 3.43$, $SD = 1.26$) reporting more risk-seeking *shoulds* than participants who reported *shoulds* in Session 2 ($M = 2.42$, $SD = 1.33$), $F(1, 184) = 30.72$, $p < .001$.

1b. Are there self-other differences in shoulds? This analysis was identical to the analysis with decisions in Q1 above except that it used the average scores for *shoulds* rather than for decisions. We conducted two four-way ANOVAs (one per domain) comparing *shoulds* based on decision target, gender, task order, and scenario order.

As the mediational model predicted, for relationship dilemmas, *shoulds* for others ($M = 5.34$, $SD = 1.56$) were more risk-seeking than *shoulds* for self ($M = 4.44$, $SD = 1.67$), $F(1, 172) = 15.47$, $p < .001$. However, contrary to the prediction of the mediational model, for health dilemmas, *shoulds* involved similar risk for others ($M = 2.92$, $SD = 1.29$) and self ($M = 2.90$, $SD = 1.47$), $F(1, 166) = .03$, $p = .86$.

1c. Do self-other differences in shoulds mediate self-other differences in decisions? Because there were no self-other differences in health-related *shoulds* for self and other, there can be no mediation for health scenarios. Yet given the significant associations between decision target, decisions, and *shoulds* in relationship scenarios, we proceeded to test whether *shoulds* mediate the relationship between decision target and decisions following Baron and Kenny's (1986) method.

As can be seen in Figure 4, in relationship scenarios, *shoulds* fully mediated the relationship between decision target and decisions. The mediation was full because after accounting for the influence of *shoulds* (pathways *a* and *b* in the figure), the relationship between decision target and decisions (*c*) ceased to be significant (*c*'). A Sobel test supported the existence of the indirect path (c – c'), $z = 3.64$, $p < .001$.

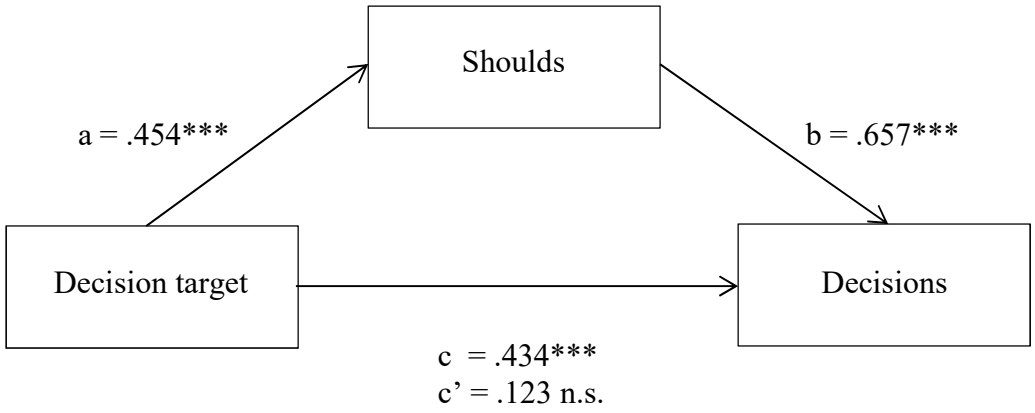

Figure 4. Unstandardized regression coefficients by which *shoulds* mediated the association between decision target (self/other) and decisions in the relationships domain. *** $p < .001$.

For the sake of comparison, we present the non-significant mediational model for physical health scenarios in Figure 5. Notice the non-significance of pathway *a* and the resulting minimal difference between pathways *c* and *c'*. A Sobel test confirmed that the mediational pathway was non-significant, $z = .58$, $p = .56$.

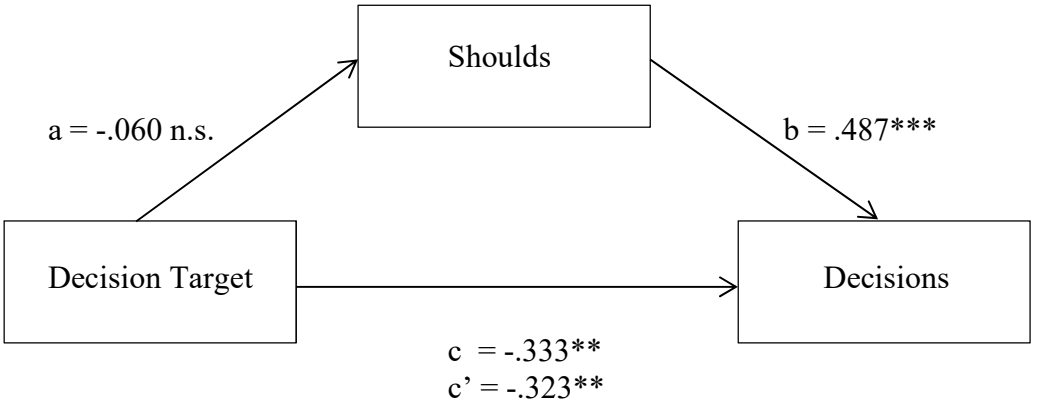

Figure 5. Unstandardized regression coefficients indicating that *shoulds* did not significantly mediate the association between decision target (self/other) and decisions in the physical health domain. ** $p < .01$ *** $p < .001$.

Q2: Does decision target (self/other) moderate the relationship between *shoulds* and decisions? This analysis involved two sub-components, the first of which is identical to 1a above.

2a. Are there self-other differences in decisions? As described in 1a above, for relationship dilemmas, decisions were more risk-seeking for others ($M = 5.28$, $SD = 1.58$) than for self ($M = 4.40$, $SD = 1.62$), $F(1, 169) = 14.18$, $p < .001$. For health dilemmas, decisions were less risk-seeking for others ($M = 2.93$, $SD = 1.22$) than for self ($M = 3.63$, $SD = 1.56$), $F(1, 164) = 11.87$, $p = .001$.

2b: Do shoulds differentially predict decisions for self and other? Correlations between *shoulds* and decisions were significant ($p < .001$) in both domains for both self (relationship: $r = .64$; health: $r = .47$) and others (relationship: $r = .68$; health: $r = .53$). To test if these correlations were different for the two targets, we looked for an interaction effect in a moderated multiple regression. Specifically, in the regression equation, we predicted decisions based on decision target (self/other), *shoulds*, and the interaction between them (*shoulds**target). To improve interpretability, all three variables were centered.

The moderation prediction is that there will be an interaction whereby the *should*-decision relationship is stronger for others than self. The key result of interest in the moderated regression equation, then, is the interaction term. If this term is statistically significant, it indicates that *shoulds* better predict decisions for others than for self (or vice versa). Results are displayed in Table 2.

Table 2. Moderated Multiple Regression Results for Main Analysis

Relationship scenarios		Physical health scenarios	
Predictor	Standardized β	Predictor	Standardized β
Step 1		Step 1	
Self vs. other	.075	Self vs. other	-.223***
Shoulds	.665***	Shoulds	.475***
Step 2		Step 2	
Self vs. other	.074	Self vs. other	-.225***
Shoulds	.660***	Shoulds	.475***
Shoulds X Self vs. other	.026	Shoulds X Self vs. other	-.002

Note. Predicting decisions from decision target, *shoulds*, and their interaction in relationship and physical health scenarios. Self was coded as -1, other as 1. * $p < .05$. ** $p < .01$. *** $p \leq .001$.

Step 1 in the table provides the results for the main effect of decision target and *shoulds* in keeping with the results reported in the mediational analyses above (e.g., Figures 4 and 5). The important novel finding from these regressions was in Step 2, that there was no significant moderation effect; the interaction between *shoulds* and decision target was non-significant for both relationship scenarios (β = .026, $p = .66$) and physical health scenarios (β = -.002, $p = .97$). *Shoulds* were therefore not differentially influential for self vs. other decisions.

To give us the best chance of finding a significant interaction effect, we re-ran the moderation regressions to include any main effects that were significant from previous analyses. The interaction term remained non-significant both for relationship scenarios (β = .015, $p = .78$) and physical health scenarios (β = .003, $p = .97$).

Individual Scenario Analyses

One drawback to the mediational and moderational analyses above is that they combine individuals' total *shoulds* and decisions per domain. In other words, rather than

revealing whether a particular *should* is related to a particular decision, it reveals something like whether someone's overall *shoulds* propensity is related to their overall risk propensity. In an attempt to circumvent this problem, we repeated each of the above analyses for one relationship scenario and one health scenario, yielding two additional mediational and moderational models. These models reveal whether the same trends occurred when *shoulds* are considered at the scenario level rather than the person level. The scenarios were selected because participants made the fewest errors on them, and therefore the maximum amount of data could contribute to the analyses. The two scenarios were the restaurant scenario (relationship scenario #2 in Appendix 1) and the rash scenario (physical health scenario #3 in Appendix 2).

Q1. Do *shoulds* mediate the relationship between decision target (self/other) and decisions?

1a. Are there self-other differences in decisions? Results mirrored the main analyses above. The relationship decision was more risk-seeking for others ($M = 5.84$, $SD = 2.09$) than for self ($M = 4.91$, $SD = 2.45$), $F(1, 177) = 7.56$, $p = .007$. The physical health decision was the opposite, with less risk-seeking for others ($M = 1.82$, $SD = 1.66$) than for self ($M = 2.62$, $SD = 2.12$), $F(1, 174) = 9.45$, $p = .002$.

1b. Are there self-other differences in shoulds? Results again mirrored the main analyses. Relationship *shoulds* were more risk-seeking for others ($M = 5.63$, $SD = 2.10$) than for self ($M = 4.61$, $SD = 2.31$), $F(1, 175) = 10.90$, $p = .001$. Physical health *shoulds* did not significantly differ for others ($M = 1.88$, $SD = 1.58$) and self ($M = 2.15$, $SD = 1.81$), $F(1, 179) = 1.11$, $p = .29$.

1c. Do self-other differences in shoulds mediate self-other differences in decisions? Correlations between *shoulds* and decisions were significant for both the relationship scenario ($r = .531$, $p < .001$) and the health scenario ($r = .401$, $p < .001$). However, because there were no self-other differences in *shoulds* for the health scenario, mediation could only occur for the relationship scenario. Once again, *shoulds* fully mediated the relationship between decision target and decisions in the relationship scenario, as shown in Figure 6. A Sobel test supported the existence of the indirect path (c – c'), $z = 2.30$, $p = .02$.

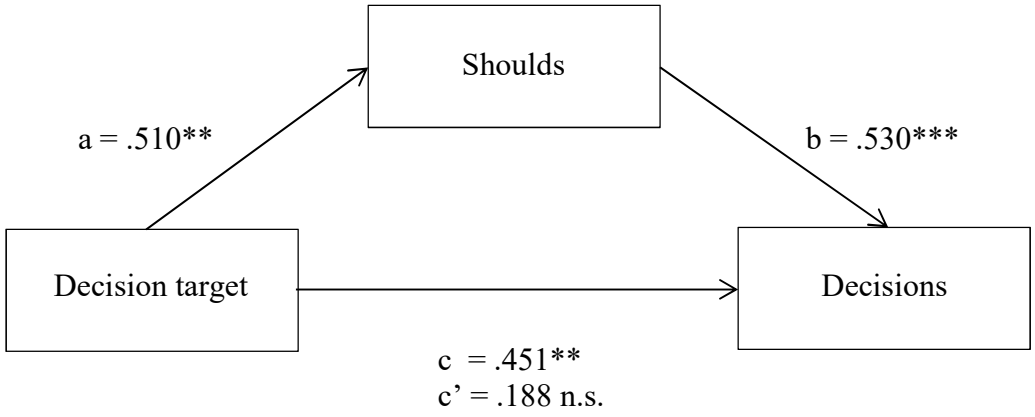

Figure 6. Unstandardized regression coefficients by which *shoulds* mediated the association between decision target (self/other) and decisions in the relationship scenario. ** $p < .01$ *** $p < .001$.

For the sake of comparison, we present the non-significant mediational model for the physical health scenario in Figure 7. A Sobel test confirmed that the mediational pathway did not reach significance, $z = 1.51$, $p = .13$.

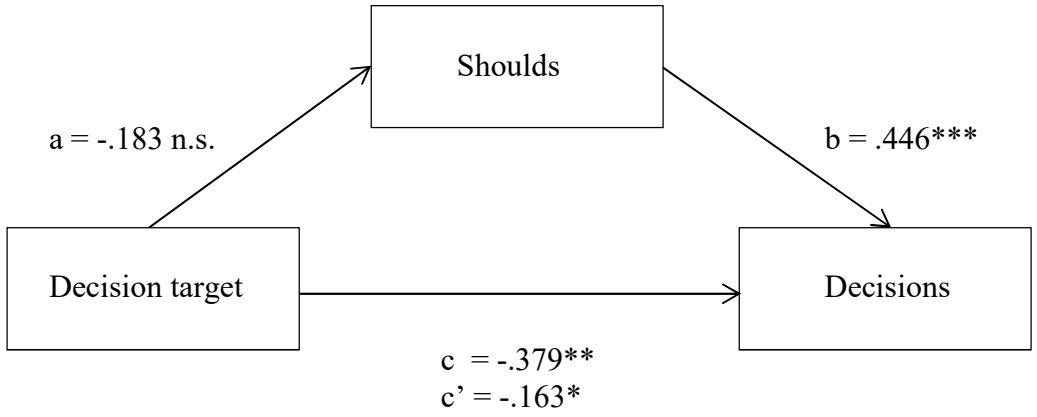

Figure 7. Unstandardized regression coefficients indicating that *shoulds* did not significantly mediate the association between decision target (self/other) and decisions in the physical health scenario. * $p < .05$ ** $p < .01$ *** $p < .001$.

Q2: Does decision target (self/other) moderate the relationship between *shoulds* and decisions? Results again mirrored the main analyses from before, with correlations between *shoulds* and decisions were significant ($p \leq .001$) in both domains for both self (relationship: $r = .43$; health: $r = .33$) and others (relationship: $r = .62$; health: $r = .49$). Once again, decision target did not moderate the relationship between *shoulds* and decisions for either the relationship scenario or the physical health scenario. Results are presented in Table 3.

Table 3. Moderated Multiple Regression Results for Individual Scenarios

Relationship scenarios		Physical health scenarios	
Predictor	Standardized β	Predictor	Standardized β
Step 1		Step 1	
Self vs. other	.082	Self vs. other	-.163*
Shoulds	.513***	Shoulds	.387***
Step 2		Step 2	
Self vs. other	.080	Self vs. other	-.162*
Shoulds	.520***	Shoulds	.397***
Shoulds X Self vs. other	.071	Shoulds X Self vs. other	-.060

Note. Predicting decisions from decision target, *shoulds*, and their interaction in the individual relationship and physical health scenarios. Self was coded as -1, other as 1. * $p < .05$. ** $p < .01$. *** $p < .001$.

DISCUSSION

The primary goal of this research was to test whether *shoulds*, or perceived obligations to behave a certain way, play a role in self-other differences in decision making under risk. First, we replicated the finding of previous research (e.g., Atansov et al., 2019) that decisions for others are more risk-seeking in the relationship domain but more risk-averse in the physical safety domain compared to decisions for self. Then we examined two ways in which *shoulds* might explain this effect.

We found evidence that in our relationship situations, *shoulds* fully explained self-other differences in decision making. Full mediation occurred both on the average level, combining subjects' risk propensity for *shoulds* and decisions across scenarios, as well as at the individual scenario level, examining only participants' *shoulds* and decisions in a single situation. These findings suggest that self-other differences in relationship decisions may arise because people believe that others should take risks that they themselves should not take. However, because we did not find any evidence for mediation in physical health scenarios, health decisions may not be based as strongly on *shoulds*.

The moderational model, in which decisions adhere to *shoulds* more strongly when decisions are for others than self, was not supported in either relationship or health dilemmas. Below, we discuss possible explanations behind both the mediational and moderational results as well as address how these results relate to extant theories about self-other differences in decision making. We close with possible directions for future research.

Why did we find mediation for relationship scenarios but not physical safety scenarios?

A number of factors might explain the inconsistent mediation results we found. First, in certain circumstances but not others, people may hold fundamentally different moral standards or ideals for others than they hold for themselves (e.g., Xiao et al., 2015). If so, *shoulds* for self and other may coincide at some times but not others.

Beliefs about target attributes might shape *shoulds* for self and others. When considering what a given target should do, *shoulds* may be different when a person believes that they and their friend possess different relationship-related attributes, or different physical health attributes, or both. In our study, we found that in relationship dilemmas, *shoulds* for others are more risk-seeking than *shoulds* for self by about one point on our 10-point measure. On average, this difference translates to believing that a friend should approach an attractive stranger when the odds of success or failure are a tossup, but one should only approach the stranger oneself if the odds are at least slightly in one's favor. This trend may occur, for instance, when individuals believe that their friends are more attractive or more likely to succeed in relationship pursuits than they are. The extra edge a friend might have could be perceived to tip the 50-50 odds of the tossup in favor of success for a friend but not do so for oneself.

In the current study, we attempted to control for one key difference in attributes by prompting participants to respond as if they or the friend for whom they rated *shoulds* were single. However, we did not measure or control for other differences like attractiveness. Our manipulation did explicitly control for the odds that the decision maker or their friend would succeed or fail, but other factors might have been weighted

more heavily in participant ratings. Previous research has shown that decisions made for others tend to disproportionately depend upon a single, important factor rather than on multiple factors (Kray & Gonzalez, 1999). If the most important factor when making a relationship decision for a friend is the perceived likability of that friend, then perhaps *should* judgments for friends weight likability more heavily and comparatively discount the stated probabilities compared to judgments for self.

Attributes such as likability are salient when thinking about *both* friends *and* relationship dilemmas. Consequently, it might be relatively easy for a judge to access information about these attributes and use that information when evaluating *shoulds*. Then, as friends are perceived to be more likable or otherwise eligible than self, self-other differences in *shoulds* may emerge. It is less clear that the sort of physical attributes that might influence *shoulds* in physical health dilemmas are salient when thinking about both friends and physical health dilemmas. It is also less intuitive that people might perceive their friends to be more or less physically resilient than they are themselves. Without physical differences between self and others comparable to the social differences we proposed for relationship scenarios, there might not be cause for self-other differences in *shoulds* in physical health dilemmas. Thus, we cannot rule out the possibility that perceived self-other differences in attributes caused self-other differences in relationship *shoulds* but not physical health *shoulds*. This is one limitation of the current study.

Differences in affect, as suggested by risk-as-feelings or construal level theory, might also explain the differing results per domain. In order to do so, however, affect would have to differ not only between domains but also between tasks since we found self-other differences in physical health decisions but not physical health *shoulds*. Such

an interaction between domain and task is not intuitively obvious. This interaction may occur when decisions and *shoulds* depend on sufficiently different processes that happen to align for relationship dilemmas but not for physical health dilemmas. In our study, we did find that relationship decisions and *shoulds* are more strongly correlated than physical health decisions and *shoulds.* So such an interaction may be feasible.

The differing results per domain might also be due to differing evaluations of a behavior for self and other. Recall, for instance, that displaying vulnerability is evaluated more positively when others do so than when done oneself (Bruk et al., 2018). *Shoulds* and decisions are presumably based upon some different evaluations since *shoulds* necessarily involve the evaluation of whether a certain course is right or best whereas decisions might or might not involve this consideration. In order for differing evaluations per task to cause our results, evaluations of *shoulds* and decisions would have to be aligned for relationship dilemmas but not physical health dilemmas. This might occur for various reasons, such as that risk-taking in our relationship scenarios always required extra effort but risk-taking in physical health scenarios did not. If *shoulds* for self are more impacted by an assessment of how much effort would be required than are *shoulds* for others, the necessary interaction between domains and tasks could result.

One final factor might explain the mediation trends we found. As described above, ratings for physical health tasks elicited a narrower range of responses than did relationship tasks; relationship ratings spanned the scale while health ratings were predominantly risk-averse. Perhaps the reduced range for physical health ratings limited the sensitivity and therefore power of our measure to pick up significant differences that exist in the real world.

Why was there not support for moderation?

The simplest explanation for why we failed to find a moderation effect is that there may be no moderation effect in the real world; *shoulds* and decisions might be linked equally strongly for self and other. However, our finding was surprising giving current theories about self-other differences in decision-making, as we explore below.

According to risk-as-feelings and construal level theory, self-decisions involve a more emotionally-driven, contextualized response while other-decisions, with less emotion, are based on more abstract and de-contextualized factors (Polman, 2012). If *shoulds* are based on relatively abstract, de-contextualized rules or virtues, consistent with the claims of deontology or virtue ethics, then we might expect that *shoulds* would predict decisions for others more than for self. However, we did not find this. One possible reason may be that the *shoulds* we measured in relationship and physical health scenarios might not have tapped into abstract considerations like morality, rendering the expectation moot. Alternatively, research over the past 20 years has found that *shoulds* might depend more on emotion than was previously believed (e.g., Haidt, 2001). In either case, the self-other difference predicted by risk-as-feelings and construal level theory may be irrelevant. On the other hand, if *shoulds* actually are relatively abstract, then our findings might challenge the validity of risk-as-feelings and construal level theories.

Our results also conflict with the prediction based on similar logic to social values theory. Social values theory proposes that decisions for others are based on the social value of a particular choice (Stone & Allgaier, 2008). Because value begs to be followed, there are presumably *shoulds* to make socially valued decisions when deciding for others. Because social values are more important in decisions for others than self, we might

predict *shoulds* to be more connected with decisions for others than for self. However, our results did not support this view. One reason could be that, despite the argument that value begs to be followed, *shoulds* are not closely related to social values. There are undoubtedly reasons why one might hold a certain *should* for self or others that contrasts with social values, such as when personal and social values conflict (Mueller & Wornhoff, 1990). In such cases, decision target could moderate the relationship between social values and decisions but not between *shoulds* and decisions.

Future Directions

One of the most surprising trends we observed was that *shoulds* fully mediated decisions for self and other in relationship scenarios but did not at all mediate decisions in physical health scenarios. At present, we have only been able to speculate about why this may be. Future research is needed to explain this trend and further explore conceptual explanations behind *shoulds* and decisions for self and other.

A number of features of the present study could be improved or broadened. For example, because we only included four scenarios per domain, our results may not generalize to all risk-taking dilemmas involving relationships or physical health. More scenarios of a greater variety could expand generalizability. Introducing scenarios in new domains might also clarify some findings. For instance, perhaps *shoulds* mediate decisions in most real-world domains but not physical health decisions. If so, identifying the unique qualities about physical health decisions could illuminate the processes at work.

Another design feature of our study could be altered for future research. Participants reported *shoulds* and decisions in two different sessions separated by at least

a week. This design aspect resulted in some attrition and also may have caused participants to be in a different state of mind when completing each task. These consequences likely introduced extra noise into the dataset, potentially reducing the appearance of significant results. Future research could have participants complete both measures in a single session to reduce unwanted variance.

In the current study, although our measure elicited a wide range of responses for relationship scenarios, the response range was restricted in physical health scenarios. It might be desirable in the future to select scenarios that tend to elicit as wide a range of *shoulds* as possible in order to have maximal sensitivity to account for self-other differences. Using a different measurement approach might also be desirable. Rather than specifying the odds of a good or bad outcome occurring, a different measure might change the potential outcomes at stake in order to present new opportunities to find self-other differences. For example, participants could indicate whether they should take a certain health risk if it could result in progressively worse health problems, ranging from a cold to a major illness to broken bones to potential death. Such outcomes are conceptually more variable than progressively worse odds, and so they could elicit more differences in *shoulds* for self and other.

In the present study, decisions for others were made exclusively for specific friends whom participants identified by initials. Other research into self-other differences in decision making has explored the effect of differing "other" targets, such as deciding for a known vs. an unknown person and a close friend vs. a distant friend (e.g., Sun et al., 2017). Exploring *shoulds* for these various others might shed light on the causes of self-

other differences in *shoulds* and therefore on the potential mediational or moderational influences of *shoulds* on decision making.

The current study extended the literature on self-other decision making by exploring the influence of *shoulds*. Future research could also explore other potential causes of self-other differences in *shoulds* or decisions. For instance, if target attributes such as perceived likability, social skills, or physical resilience influence *shoulds*, then these attributes may be the primary factors that change decisions for self and other, with *shoulds* merely being the mechanism by which the attributes bring about change. It may also be worth exploring various attributes of the scenario, such as the difficulty, desirability, or value of one option versus the other option. If future work finds no mediational effect for these personal or scenario attributes, then that would strengthen the claim that *shoulds* uniquely account for self-other differences in decisions.

Central to the correct interpretation of our results is what participants understood our *shoulds* prompt to mean. This remains somewhat unclear. Our prompt instructed participants to report what they or their friend "***should*** do (i.e., what the best or right thing for you[r friend] to do is)." Although we interpret this phrasing to elicit *shoulds*, participants may have had different interpretations. For instance, if a subject focused on the term "best", then perhaps they interpreted the prompt to be the same as a decision, since presumably people generally assume that the course they choose is optimal given their circumstances. We are optimistic that this did not routinely happen, though, because *shoulds* and decisions differed some of the time (e.g., physical health scenarios for self) and because correlations between *shoulds* and decisions were far from perfect, ranging from .33 to .81. Thus, at least most participants must have understood the two prompts to

be soliciting different types of responses. Nevertheless, variability in interpretation of the *shoulds* prompt may have added error variance to responses. Future research may benefit from alternative strategies or wording to elicit *shoulds*.

The current study has a number of implications for prevailing theories into self-other differences in decision making that warrant further explanation. First, consider social values theory. Our results provide an alternative and perhaps broader explanation for self-other differences than SVT. According to SVT, decisions for others are driven by the social value of a decision. Social value itself must contribute to *shoulds*, since social value is closely connected to norms. However, *shoulds* as conceptualized here are broader than social values, since they can also be influenced by personal values, including those that might conflict with social values. Future research could first identify how social values relate to *shoulds*. For example, presumably social value often but not always predicts *shoulds.* Then, studies could test the competing explanations of *shoulds* and social values, perhaps by identifying areas in which personal values (and personal *shoulds*) are pitted against social values. If under such circumstances decisions are more aligned with social values than *shoulds*, then that would support SVT. Findings to the contrary could indicate that previous links between self-other decisions and social values may merely operate through the channel of *shoulds*; that is, social values are only uniquely predictive of decisions for others because social values influence *shoulds*, and *shoulds* influence decisions.

Future research could also explore how different types of *shoulds* influence decisions for others. Recall how we identified that *shoulds* in decision making for others may either take the form of what others *should* do, or they may take the form of what one

should decide for others, and that these two *shoulds* may point to opposite choices. Although in the current study we focused on the former type of *should*, social values theory posits that decisions for others are based on the latter type of *should* because there is an injunctive norm (i.e., the latter type of *should*) to decide for others a certain way. Future research could explore whether the two types of *shoulds* differently predict decisions for others.

Although the above discussion focuses on an injunctive norm, descriptive norms may also influence *shoulds*. For instance, descriptive norms influence behavior independently from injunctive norms (e.g., Göckeritz et al., 2010). As such, descriptive norms may be a nuisance variable that influence decisions independently of *shoulds*. Future research could explore the influence of descriptive norms both on *should* and on behavior.

Now, consider the implications of the present work for risk-as-feelings and construal level theory. First, the current study found the same domain flip, with decisions for others being more risk-seeking in relationship scenarios but less risk-seeking in physical health scenarios. This domain trend challenges risk-as-feelings and construal level theory because these theories do not predict this domain flip (Atanasov et al., 2019).

Additionally, depending on what *shoulds* are (i.e., whether they are abstract cognitions or involve more affect), then our results might challenge risk-as-feelings and construal level theory on other grounds. According to these two theories, self-decisions involve greater context-based emotion whereas decisions for others involve greater abstract reason. In the current study, we did not find any significant moderation whereby *shoulds* were more closely linked to decisions for others than decisions for self. If

shoulds are abstract and cognitive rather than contextually-driven and relatively affective, then these theories would predict that *shoulds* would be more closely aligned with decisions for others than self. Since we did not find this, then our results may challenge risk-as-feelings and construal level theory. However, since *shoulds* may indeed involve more affect than has traditionally been believed, our results need not necessarily disprove these theories. Future research could explore how different components of *shoulds* (i.e., cognitive beliefs, affective reactions) differentially influence decisions for self and others. Such work would then shed light on the validity of risk-as-feelings and construal-level theory.

Finally, given how routinely people make decisions on others' behalf, research into self-other differences in decision making has many implications in the real world. Our study revealed that, for relationship situations at least, self-other differences occur because of self-other differences in *shoulds*. If one's goal is to ensure that decisions for others are consistent with decisions for self, one point for intervention may therefore be to change the *shoulds* that people hold for others. Future research could develop and test such interventions among those who frequently make decisions for others, such as financial advisors, legal counsel, or politicians. As *shoulds* for others more closely align with *shoulds* for self, self-other differences in decision making may then disappear.

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Appendix 1

Relationship scenarios for male self (modified from Blalock [2011])

1. You study at the library regularly and have noticed that a cute girl often works the front desk where you check out books. You know each other's names and faces by now and you are thinking about asking her out. However, there is a chance she could say no and then coming back to the library to study would be embarrassing every time she is working there. You are unsure what to do but need to make a decision. Which action would you choose if...

    1) If the girl definitely wouldn't respond positively if you asked her out?
    2) If it's very unlikely she'd respond positively if you asked her out?
    3) If it's moderately unlikely she'd respond positively if you asked her out?
    4) If it's somewhat unlikely she'd respond positively if you asked her out?
    5) If it's a tossup whether or not she'd respond positively if you asked her out?
    6) If it's somewhat likely she'd respond positively if you asked her out?
    7) If it's moderately likely she'd respond positively if you asked her out?
    8) If it's very likely she'd respond positively if you asked her out?
    9) If she definitely would respond positively if you asked her out?

2. You are at a restaurant with some friends. The waitress that has been serving you is attractive and you think she has been flirting with you. When you go to leave, you think about putting your name and number down on the check so that she will see it after you leave. You are a bit embarrassed, however. You are unsure what to do but need to make a decision. Which action would you choose if...

    1) If the girl definitely wouldn't respond positively if you wrote down your name and number?
    2) If it's very unlikely she'd respond positively if you wrote down your name and number?
    3) If it's moderately unlikely she'd respond positively if you wrote down your name and number?
    4) If it's somewhat unlikely she'd respond positively if you wrote down your name and number?
    5) If it's a tossup whether or not she'd respond positively if you wrote down your name and number?
    6) If it's somewhat likely she'd respond positively if you wrote down your name and number?
    7) If it's moderately likely she'd respond positively if you wrote down your name and number?

8) If it's very likely she'd respond positively if you wrote down your name and number?
9) If she definitely would respond positively if you wrote down your name and number?

3. You have been interested in dating a close friend of yours for a while. You think she might be interested in you too, but you're not sure and you're worried about saying anything that might affect your friendship. You are unsure what to do but need to make a decision. Which action would you choose if...

   1) If the girl definitely wouldn't respond positively if you told her how you feel?
   2) If it's very unlikely she'd respond positively if you told her how you feel?
   3) If it's moderately unlikely she'd respond positively if you told her how you feel?
   4) If it's somewhat unlikely she'd respond positively if you told her how you feel?
   5) If it's a tossup whether or not she'd respond positively if you told her how you feel?
   6) If it's somewhat likely she'd respond positively if you told her how you feel?
   7) If it's moderately likely she'd respond positively if you told her how you feel?
   8) If it's very likely she'd respond positively if you told her how you feel?
   9) If she definitely would respond positively if you told her how you feel?

4. While walking on campus you notice a cute girl in a stand selling t-shirts. You would like to stop and talk to her. Doing so could mean the beginning of a new and interesting relationship, or it could turn out poorly and you may get stuck just buying a shirt you don't want. You are unsure what to do but need to make a decision. Which action would you choose if...

   1) If the girl definitely wouldn't respond positively if you stop and talk to her?
   2) If it's very unlikely she'd respond positively if you stop and talk to her?
   3) If it's moderately unlikely she'd respond positively if you stop and talk to her?
   4) If it's somewhat unlikely she'd respond positively if you stop and talk to her?
   5) If it's a tossup whether or not she'd respond positively if you stop and talk to her?
   6) If it's somewhat likely she'd respond positively if you stop and talk to her?
   7) If it's moderately likely she'd respond positively if you stop and talk to her?
   8) If it's very likely she'd respond positively if you stop and talk to her?
   9) If she definitely would respond positively if you stop and talk to her?

APPENDIX 2

Physical health scenarios for female friend (modified from Blalock [2011])

1. Your friend is a huge football fan. She goes to almost every game, and her team is playing in a very important game this coming Saturday. However, your friend was very sick and is just now recovering. She knows it won't be good for her to go to the game, because it will be very cold out and delay her getting better, but she's been looking forward to it. Your friend is unsure what to do and asks you to decide for her. Which action would you choose for your friend if…

    1) If she definitely wouldn't get sick again if she went to the game?
    2) If it's very unlikely she'd get sick again if she went to the game?
    3) If it's moderately unlikely she'd get sick again if she went to the game?
    4) If it's somewhat unlikely she'd get sick again if she went to the game?
    5) If it's a tossup whether or not she'd get sick again if she went to the game?
    6) If it's somewhat likely she'd get sick again if she went to the game?
    7) If it's moderately likely she'd get sick again if she went to the game?
    8) If it's very likely she'd get sick again if she went to the game?
    9) If she definitely would get sick again if she went to the game?

2. Your friend recently broke her ankle. Over the past few months she has recovered and is walking pretty well on it now, but she still favors it slightly. Your friend is also on a tennis team and has a big singles match coming up against her rival. Your friend knows if she takes some painkillers, it will make it possible for her to play on her ankle for the match. However, doing so could mean injuring her ankle worse because she's not aware of the pain. Your friend is unsure what to do and asks you to decide for her. Which action would you choose for your friend if…

    1) If she definitely wouldn't injure her ankle worse if she takes the painkillers and plays the match?
    2) If it's very unlikely she'd injure her ankle worse if she takes the painkillers and plays the match?
    3) If it's moderately unlikely she'd injure her ankle worse if she takes the painkillers and plays the match?
    4) If it's somewhat unlikely she'd injure her ankle worse if she takes the painkillers and plays the match?
    5) If it's a tossup whether or not she's injure her ankle worse if she takes the painkillers and plays the match?
    6) If it's somewhat likely she'd injure her ankle worse if she takes the painkillers and plays the match?
    7) If it's moderately likely she'd injure her ankle worse if she takes the painkillers and plays the match?

8) If it's very likely she'd injure her ankle worse if she takes the painkillers and plays the match?
9) If she definitely would injure her ankle worse if she takes the painkillers and plays the match?

3. Over the last few days your friend has noticed a rash developing on her side. It started off small, but it now looks big and nasty. The rash doesn't hurt or feel uncomfortable at all, but she is still a bit concerned. Student health might be able to give her something to help the rash, but it would be extremely inconvenient and time consuming to go, and even then they might say it's nothing. If your friend doesn't go, the rash might just go away, or it could become worse and problematic. Your friend is unsure what to do and asks you to decide for her. Which action would you choose for your friend if…

   1) If the rash definitely wouldn't get worse if she leaves it alone and hopes it goes away?
   2) If it's very unlikely the rash would get worse if she leaves it alone and hopes it goes away?
   3) If it's moderately unlikely the rash would get worse if she leaves it alone and hopes it goes away?
   4) If it's somewhat unlikely the rash would get worse if she leaves it alone and hopes it goes away?
   5) If it's a tossup whether or not the rash would get worse if she leaves it alone and hopes it goes away?
   6) If it's somewhat likely the rash would get worse if she leaves it alone and hopes it goes away?
   7) If it's moderately likely the rash would get worse if she leaves it alone and hopes it goes away?
   8) If it's very likely the rash would get worse if she leaves it alone and hopes it goes away?
   9) If the rash definitely would get worse if she leaves it alone and hopes it goes away?

4. Your friend is boarding the plane for a flight and she is nearing her seat. She sees that the person who will be sitting next to her is already seated and clearly sick with what seems like the flu. Your friend would really rather not get sick. Your friend knows that she can ask the flight attendant to help her find another seat away from this sick passenger without being rude, but it would be a bit of a hassle to do so since she would have to wait until all the passengers were seated. Your friend is unsure what to do and asks you to decide for her. Which action would you choose for your friend if…

1) If she definitely wouldn't get sick if she stays seated next to the sick passenger?
2) If it's very unlikely she'd get sick if she stays seated next to the sick passenger?
3) If it's moderately unlikely she'd get sick if she stays seated next to the sick passenger?
4) If it's somewhat unlikely she'd get sick if she stays seated next to the sick passenger?
5) If it's a tossup whether or not she'd get sick if she stays seated next to the sick passenger?
6) If it's somewhat likely she'd get sick if she stays seated next to the sick passenger?
7) If it's moderately likely she'd get sick if she stays seated next to the sick passenger?
8) If it's very likely she'd get sick if she stays seated next to the sick passenger?
9) If she definitely would get sick if she stays seated next to the sick passenger?

APPENDIX 3

Shoulds items use the same scenarios as decisions scenarios. However, rather than asking what decision the subject would make, they are adapted to ask what participants *should* do. The first relationships scenario from Appendix 1 is presented below in its decision and *should* variants for self and other.

Decision for self:

You study at the library regularly and have noticed that a cute girl often works the front desk where you check out books. You know each other's names and faces by now and you are thinking about asking her out. However, there is a chance she could say no and then coming back to the library to study would be embarrassing every time she is working there. You are unsure what to do but need to make a decision. Which action would you choose if...

1) If the girl definitely wouldn't respond positively if you asked her out?
2) If it's very unlikely she'd respond positively if you asked her out?
3) If it's moderately unlikely she'd respond positively if you asked her out?
4) If it's somewhat unlikely she'd respond positively if you asked her out?
5) If it's a tossup whether or not she'd respond positively if you asked her out?
6) If it's somewhat likely she'd respond positively if you asked her out?
7) If it's moderately likely she'd respond positively if you asked her out?
8) If it's very likely she'd respond positively if you asked her out?
9) If she definitely would respond positively if you asked her out?

Decision for other:

Your friend studies at the library regularly and has noticed that a cute girl often works the front desk where he checks out books. Your friend and the girl know each other's names and faces by now and your friend is thinking about asking her out. However, there is a chance she could say no and then coming back to the library to study would be embarrassing every time she is working there. Your friend is unsure what to do and asks you to decide for him. Which action would you choose for your friend if…

1) If the girl definitely wouldn't respond positively if he asked her out?
2) If it's very unlikely she'd respond positively if he asked her out?
3) If it's moderately unlikely she'd respond positively if he asked her out?
4) If it's somewhat unlikely she'd respond positively if he asked her out?
5) If it's a tossup whether or not she'd respond positively if he asked her out?

6) If it's somewhat likely she'd respond positively if he asked her out?
7) If it's moderately likely she'd respond positively if he asked her out?
8) If it's very likely she'd respond positively if he asked her out?
9) If she definitely would respond positively if he asked her out?

Should for self:

You study at the library regularly and have noticed that a cute girl often works the front desk where you check out books. You know each other's names and faces by now and you are thinking about asking her out. However, there is a chance she could say no and then coming back to the library to study would be embarrassing every time she is working there. You are trying to decide what you ***should*** do (i.e., what the best or right thing for you to do is). Which action ***should*** you choose if...

1) If the girl definitely wouldn't respond positively if you asked her out?
2) If it's very unlikely she'd respond positively if you asked her out?
3) If it's moderately unlikely she'd respond positively if you asked her out?
4) If it's somewhat unlikely she'd respond positively if you asked her out?
5) If it's a tossup whether or not she'd respond positively if you asked her out?
6) If it's somewhat likely she'd respond positively if you asked her out?
7) If it's moderately likely she'd respond positively if you asked her out?
8) If it's very likely she'd respond positively if you asked her out?
9) If she definitely would respond positively if you asked her out?

Should for other:

Your friend studies at the library regularly and has noticed that a cute girl often works the front desk where he checks out books. Your friend and the girl know each other's names and faces by now and your friend is thinking about asking her out. However, there is a chance she could say no and then coming back to the library to study would be embarrassing every time she is working there. You are trying to decide what your friend ***should*** do (i.e., what the best or right thing for your friend to do is). Which action ***should*** your friend choose if…

1) If the girl definitely wouldn't respond positively if he asked her out?
2) If it's very unlikely she'd respond positively if he asked her out?
3) If it's moderately unlikely she'd respond positively if he asked her out?
4) If it's somewhat unlikely she'd respond positively if he asked her out?
5) If it's a tossup whether or not she'd respond positively if he asked her out?
6) If it's somewhat likely she'd respond positively if he asked her out?
7) If it's moderately likely she'd respond positively if he asked her out?
8) If it's very likely she'd respond positively if he asked her out?
9) If she definitely would respond positively if he asked her out?

APPENDIX 4

Distractor tasks

Duncker's (1945) candle problem: (rephrased from the original)
Using only a candle, a book of matches, and a box of tacks, how would you attach the candle to the wall so that it can burn without dripping wax onto the floor? Please take a few minutes to describe what you would do below.

The marshmallow challenge (Wujec, 2010):
When competing in a design challenge, your team is tasked with building the tallest freestanding structure possible out of four unusual materials: 20 sticks of spaghetti, one yard of tape, one yard of string, and one marshmallow. Your team must complete the structure within 8 minutes, and to win, the marshmallow must be on top. How will you design your structure? Please take a few minutes to describe what you will do below.

War with the Ghosts
The 19th century Bartlett "War of the Ghosts" passage is presented below. Please read this and give us your honest impressions of this passage. There is no right or wrong answer, and we are simply interested in your impressions.

One night two young men from Egulac went down to the river to hunt seals and while they were there it became foggy and calm. Then they heard war-cries, and they thought: "Maybe this is a war-party." They escaped to the shore, and hid behind a log. Now canoes came up, and they heard the noise of paddles, and saw one canoe coming up to them. There were five men in the canoe, and they said:
"What do you think? We wish to take you along. We are going up the river to make war on the people."
One of the young men said,"I have no arrows."
"Arrows are in the canoe," they said.
"I will not go along. I might be killed. My relatives do not know where I have gone. But you," he said, turning to the other, "may go with them."
So one of the young men went, but the other returned home.
And the warriors went on up the river to a town on the other side of Kalama. The people came down to the water and they began to fight, and many were killed. But presently the young man heard one of the warriors say, "Quick, let us go home: that Indian has been hit." Now he thought: "Oh, they are ghosts." He did not feel sick, but they said he had been shot.
So the canoes went back to Egulac and the young man went ashore to his house and made a fire. And he told everybody and said: "Behold I accompanied the ghosts, and we went to fight. Many of our fellows were killed, and many of those who attacked us were killed. They said I was hit, and I did not feel sick."
He told it all, and then he became quiet. When the sun rose he fell down. Something black came out of his mouth. His face became contorted. The people jumped up and cried.

He was dead.

_____

What are your impressions of this story?

Ryan Smout CV

Education

WAKE FOREST UNIVERSITY – Winston-Salem, NC Aug 2017 – May 2019
M.A., Psychology

UNIVERSITY OF RICHMOND – Richmond, VA May 2011
B.S., Psychology, Latin
Summa cum laude; departmental honors in Psychology; Phi Beta Kappa; Psi Chi Honor Society; Outstanding Psychology Student award, 2011; Outstanding Student Research award, 2011; Bowen Award for the graduating senior most proficient in Latin, 2011

Research Experience

Master's thesis August 2018 – May 2019
Wake Forest University
An investigation into whether people make different decisions for themselves than for others because they think that they themselves are under different moral or normative obligations than others are

First Year Master's Project August 2017 – present
Wake Forest University
A meta-analysis of self-other differences in decision-making under risk

Graduate Research Assistant August 2018 – present
Wake Forest University
Paid assistantship through the Engineering and Character Education project, which seeks to design and implement programs throughout the university's engineering department to help students develop character virtues

Graduate Research Assistant August 2017 – August 2018
Wake Forest University
Paid assistantship through the Beacon project, which was a three-year grant funded by the Templeton Foundation to study moral exemplars

Honors Research May 2010 to August 2011
University of Richmond

Primary investigator on two independent, cross-departmental studies investigating how English speakers process Latin and how Latin educational curricula can help or hinder processing; received two student research grants for independent projects from the university

Research Assistant August 2009 to May 2010
University of Richmond
Volunteered in the lab of Dr. David Landy, studying cognitive processing of mathematical expressions

Publications

Atanasov, P., Smout, R., & Stone, E. R. (in preparation). *Self-other differences in decision-making under risk: A meta-analysis*.

Landy, D., Brookes, D., & Smout, R. (2011). *Modeling abstract numeric relations using concrete notations*. In L. Carlson, C. Hoelscher & T. F. Shipley (Eds.), Proceedings of the 33rd Annual Conference of the Cognitive Science Society (pp. 1359-1364). Austin: TX: Cognitive Science Society.

Presentations

Smout, R., Atanasov, P., & Stone, E. R. (2018, November). *Meta-analysis of risk taking for self and others*. Poster presented at the annual meeting of the Society for Judgment and Decision Making, New Orleans, LA.

Smout, R. (2013, May). *Eye movements and reading Latin: What happens, and what could?* Keynote address of original research presented at the annual meeting of the Classical Association of Virginia, Richmond, VA.

Professional Counseling Experience

Community-Based Counselor April 2013 to Aug 2017
National Counseling Group, Richmond, VA
Provided mental health skill-building services to low-income individuals with a primary diagnosis of Schizophrenia, Major Depression, and Bipolar disorders; designed and implemented individualized treatment plans based on research-backed interventions, such as CBT and Mindfulness; received multiple company awards for providing excellent customer service

Mentor January 2012 to April 2013
Intercept Youth Services, Richmond, VA
Provided therapeutic mentoring services to teenagers with troubled backgrounds by engaging youth in community activities, life skills coaching, symptom management skills, and additional trainings as necessary

Additional Skills

Teaching: Served as a Teaching Fellow from 2009 to 2011, teaching six lab sections for the University of Richmond's Introduction to Psychology course; several years' experience as an instructor in a church education system

Software: R, SPSS, Excel, Qualtrics, Mechanical Turk