

Moral Uncertainty Promotes Prosocial Behavior:
Exploring the Self-Signaling Motivation for Prosocial Behavior

by

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ABSTRACT

Self-signaling theory posits that individuals engage in prosocial behavior in order to gain positive information about the self. Previous self-regulatory approaches to prosocial behavior have primarily focused on helping as means to self-repair (e.g., the negative state relief model), or as a means to stay self-consistent (e.g., self-verification theory), thus overlooking the motivation to obtain self-knowledge. Four studies tested a key prediction of self-signaling theory, that uncertainty about the self as a good and moral person should increase prosocial behavior, while certainty should decrease it. Study one used a correlational design to examine the relationship between personal uncertainty and volunteerism. Study two manipulated uncertainty about a positive moral characteristic and measured subsequent agreement to help. Study three examined the effect of uncertainty about a negative moral trait on helping behavior. Finally, study four manipulated both uncertainty, and the valence of self-information, while measuring charitable donations. All four studies find the hypothesized positive relationship between uncertainty and prosocial behavior. These findings support the idea that individuals help in order to gain information indicating they are good and virtuous, thus decreasing uncertainty about the self. Limitations, implications, and future directions are discussed.

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INTRODUCTION

The study of moral behavior has played a leading role in the history of social psychology. Morality has provided a context for studying important psychological processes, such as empathy (Batson, 1998) and persuasion (Freedman & Fraser, 1966), while simultaneously holding its own significance, encompassing behaviors with deep societal and humanistic consequences. Indeed, manifestations of morality including volunteerism, charity, and simply treating others with kindness are of fundamental importance to the operation of society. While there is clearly no shortage of research dealing with moral behavior, debate surrounding its motivational underpinnings has raged in the psychological literature (see Dovidio, Piliavin, Schroeder, & Penner, 2006 for a review). I propose a new perspective that serves to both synthesize previous findings, and generate novel predictions. In this view of moral behavior, doing good can be understood as part of a self-informational process. In other words, individuals may behave morally, in some situations, to reveal positive qualities about themselves to themselves. To support this proposition, I present four studies demonstrating that various acts of good will are caused by uncertainty about the self. Prior to detailing the current endeavors undertaken to empirically conjoin uncertainty and morality, it is useful to review research that has previously explored moral behavior's role in self-regulation.

Several self-regulatory processes employ moral behaviors to achieve their various ends. For instance, people seem more inclined to help others when they are feeling down (Cialdini et al, 1987), and especially when they are feeling the bite of consciousness after perpetrating or remembering a wrong-doing (Carlson & Miller, 1987; Sachdeva, Iliev, & Medin, 2009). These findings indicate that performing good deeds can right the ship when one is feeling sad or guilty. Other research indicates moral behavior may be driven by a motivation to maintain a coherent and consistent self-image (Strenta & DeJong, 1981). These two processes, although important in

their own right, tend to overshadow a third self-regulatory motivation: moral behavior driven by the quest for self-knowledge. Recently, this perspective has become more prominent as a unified theory called self-signaling (Bodner & Prelec, 2003).

Self-signaling, which shall be described in more detail below, suggests that two sources of utility result from making a decision: outcome utility and *diagnostic utility* (Bodner & Prelec, 2003). Outcome utility is the garden variety pleasure or displeasure that comes from the result of the decision (e.g., the pleasure involved in devouring a tempting snack). Diagnostic utility is the pleasure or displeasure that results from learning about one's self as a consequence of that decision. For instance, if an individual is not certain about how gluttonous he or she is, choosing to consume a calorie-rich meal might signal a lack of self control, and thus be somewhat unpleasant. In this respect, self-signaling draws heavily on self-perception theory (Bem, 1972), which posits that people gain self-knowledge through observing their actions. Self-signaling, however, adds that self-perception has a motivational function, rewarding good deeds with a more virtuous self-image, and the positive feelings that accompany such positive information (i.e., diagnostic utility).

Adding self-signaling into the mix of competing and complementary self-regulation theories introduces new predictions about the relationship between the self concept and the decision to behave morally. For instance, it suggests that moral behaviors providing a clear indication of pure intentions should be preferred over ones corrupted by the possibility of selfish purposes, because the former provides a stronger moral signal (Chin & Schooler, in preparation). And indeed, research reviewed below suggests that under certain circumstances people are sensitive to the informational value of their moral actions. More relevant to the current studies is the prediction that individuals feeling especially uncertain about their self-concept should be more motivated to help. These people, whether they are currently feeling wicked or virtuous,

have more information to gain from their actions. Current motivational models of morality cannot easily accommodate this proposed uncertainty effect. Prior to fully describing the self-signaling motivation in relation to helping, I will briefly review the aforementioned self-centric motivations for moral behavior. Overall, this summary aims to provide context for the current studies and highlight gaps in the current understanding of benevolence.

Moral Self-Regulation

Both research and common sense tend to agree that people who see themselves as kind and helpful will behave more morally than those who have a lower self regard in this domain. Correspondence between a person's moral self-evaluation and his or her behavior has roots in a literature dealing with attitude-behavior consistency (Ajzen, 1982), which has provided an armature for a great deal of research in personality and social psychology. In addition to this research on consistency, another research tradition has focused on the motivation to see the self more positively. This work, commonly categorized as self-enhancement, established that people will go to lengths to view themselves in a positive light, even perhaps unrealistically so at times (Taylor & Brown, 1988). Although these two frameworks provide valuable insights on the motivation to do good, they make opposing predictions in some cases.

A more comprehensive account of moral self-regulation benefits from attention to the self-informational value carried by moral acts. The review below indicates that the current perspectives inadequately incorporate deficits and surpluses of self-information as motivational forces. Self-enhancement theories do not posit a motivating role for uncertainty about the self. Consistency and coherency theories do measure certainty and uncertainty, but focus more on the role of certainty in providing a firm basis for behaving in accordance with one's self view.

These theories do not endow uncertainty with any specific motivational effects. Beginning with self-enhancement strivings, these perspectives are reviewed below.

Negative Affect and Prosocial Behavior

A great host of research has tested the idea that people help in order to make themselves feel better. This work, spurred by a debate over whether prosociality is ever truly altruistic, provides a generous number of data points relevant to the current discussion. Early research on this topic focused on specific emotions. These studies found that manipulations causing feelings of embarrassment (Apsler, 1975), feelings of deviance (from believing oneself to be an outlier on a personality test; Filter & Gross, 1975) and cognitive dissonance (Kidd & Berkowitz, 1976) promoted helping. Still other studies found that generalized sadness (such as through remembering a sad experience) was all that was needed to increase moral behavior (e.g., Cialdini, Baumann, & Kenrick, 1981; Cialdini & Kenrick, 1976; Cialdini, Darby, & Vincent, 1973; Regan, 1971). Some argued that helping was motivated by a desire to repair one's self-image, such as when guilt was showed to increase helping (Regan, Williams, & Sparling, 1972), and others posited a desire to maintain social justice as the driving factor (Lerner, 1970). These views could not, however, account for the sadness findings, nor why observing a tragedy would lead to helping in a completely unrelated domain (e.g., helping a group unrelated to the tragedy does not provide justice to the original group). These observations led to the negative state relief (NSR) model.

Cialdini and colleagues' NSR (1987) model provides a framework for explaining how negative moods and emotions might motivate helping. They proposed that one source of helping behavior comes from the motivation to reduce negative feelings caused by seeing or hearing a being in distress. Because people hold the implicit or explicit belief that helping can improve

their mood, they are motivated to help in order to relieve the negative state caused by observing another in need, whether they were the cause of the problem or not. The NSR perspective, by definition, views prosocial behavior as self-enhancing in that it is specifically motivated by the desire to feel better. Several clever studies support the NSR view, such as those showing that believing one's mood is frozen (Manucia, Baumann, & Cialdini, 1984), or will improve for other reasons (Schaller & Cialdini, 1987), attenuates the effect of sadness on helping. NSR, however, has been criticized on several key points.

Carlson and Miller (1987) performed a large meta-analysis of the negative mood and helping literature, and found little support for the NSR model. Specifically, they correlated effect sizes with the extent to which independent raters felt a negative mood induction would lead to strong or weak negative moods. NSR predicts that the worse a participant feels, the more likely he or she would be to engage in helping. Carlson and Miller, however, found no relationship between the strength of the mood induction and a study's effect size. Carlson and Miller also looked at the relationship between the distastefulness of the helping act and effect size. They suggested that if the NSR model was indeed accurate representation of the current data, then people should seek relatively easy and enjoyable helping acts when sad. After all, if helping is a way to recover one's good feelings, then performing a particularly demanding and unsavory task seems counterproductive. Contradictory to NSR, they found that the distastefulness of the act actually correlated positively with effect size. In essence, this means that being in a negative mood prompts helping more when that helping act is relatively distasteful. This meta-analytic finding suggests a self-informational motive, in that when feeling down, the best way to mood repair is to engage in activities that more clearly signal a purity of intention, even if the performance of these acts is something of a downer.

Carlson and Miller's (1987) analysis was more supportive of the objective self-awareness model (Rogers, Miller, Mayer, & Duval, 1982), suggesting that negative states related to personal fault, such as guilt, are mainly responsible for motivating helping. They found that guilt was strongly related to effect size in that studies containing manipulations that raters felt would cause guilt showed a stronger relationship between negative affect and helping. Further, they found a correlation between the responsibility the participant ostensibly felt in causing the negative mood induction and effect size. These findings indicate that that moral behavior should be especially preferred when one's self-view as a good and kind person has been diminished or put into question. Such results cast moral behavior's role in the self-regulation process as largely driven by shortages and surpluses of positive self-regard, as opposed to mood per se. The following research documenting an effect of negative self-evaluations on helping supports this notion.

Negative Self-Evaluations and Prosocial Behavior

The research reviewed above supported the idea that moral behavior is sometimes motivated by a desire to feel better. Stronger effects appear, however, when people want to feel better *about themselves*. In fact, in some of the studies reviewed above, it is hard to distinguish between effects of mood and effects of self-evaluation, as the purported mood manipulations also likely affected self-evaluations. For instance, lying to another person (Freedman, Wallington, & Bless, 1967; McMillen, 1971), causing harm to another person (Harris & Samerotte, 1976), and feeling responsible for breaking equipment (Cunningham, Steinberg, & Grev, 1980) almost certainly have mood effects, but they also likely affect the participants' self views. Furthermore, research demonstrated that participants who were praised demonstrated less of an interest in helping others (Ciladini, Darby, & Vincent, 1973). These researchers postulated that praise

improved mood, thus nullifying the need for helping's hedonic reward. However, praise is more theoretically akin to self-evaluation than mood, once again supporting the idea that moral behavior is more driven by deficits of positive self-regard than positive affect.

While many of the studies purporting to examine a mood maintenance motivation may have inadvertently been also studying a self-evaluative motive, few studies have explicitly sought to demonstrate prosocial behavior motivated by deficits and surpluses of positive self-regard. Although not specifically in the domain of prosocial behavior, previous research has demonstrated that building up moral credentials allows individuals to behave in ways that could be construed as prejudicial. For instance Monin & Miller (2001) found that participants given the opportunity to establish a non-prejudicial pattern of behavior earlier in a study were later more prone to act in a way that was logical given the circumstances, but potentially harmful to a member of a traditionally stereotyped group. This moral credential effect seems to generalize to prosocial behavior.

Sachdeva, Iliev, and Medin (2009) recently performed a study examining moral deficits and credentials, in which they sought to demonstrate that feeling immoral motivates prosociality, while feeling excessively moral dampens helping behavior. Through manipulating moral self-regard by asking participants to write positive or negative moral stories about themselves and measuring donations to charity, these researchers supported their hypotheses. This work fits well with the finding that that confession with a priest decreases charitable donations, possibly because confessors feel absolved and no longer need to donate to clear their conscience (Harris, Benson, & Hall, 1975). In the jargon of Monin and Miller (2001) and, Sachdeva, Iliev, and Medin (2009), confession gives people *license* to behave less morally. Results from these studies suggest that viewing mood repair and maintenance as a motivator of helping is a bit too

narrow. Instead, helping may also be motivated by a desire to feel better though gaining information that the self is altruistic and virtuous.

Moral Self-Image

The findings cited above, which described the compensatory moral behavior that is prompted by diminished self-evaluations, fit well into models positing a motivation to maintain a positive self-image. Self-affirmation (Aronson et al, 1999; Sherman & Cohen, 2002) is one such theory, suggesting individuals will go to great lengths to maintain the integrity of their self-images. Integrity, in self-affirmation theory, generally refers to seeing one's self as a good and appropriate person. While what exactly it means to be a good person can vary, it is reasonable to say that being kind and helpful to others is an important value in American culture.

As threats to one's moral self-image are clearly relevant to self-affirmation theory, it is useful to explore the repercussions of such threats in terms of self-affirmation theory. Self-affirmation suggests that individuals experiencing a threatened moral self-image may, in lieu of directly engaging in a compensatory behavior or rationalizing the threat in some other way, seek to reaffirm their adherence to an unrelated value. These people are reminded that their self-worth doesn't hinge on the aspect of self that is currently threatened, and can thus move on in a more reasoned fashion. For example, in one study characteristic of this literature, participants were less likely to engage in self-protective stereotyping of others after they had engaged in a self-affirmation of an important value (Fein & Spencer, 1997).

This study of stereotyping and self-affirmation highlights a fundamental aspect of self-affirmation theory, namely that sources of self-worth are seen as fungible. In other words, people can reaffirm their self worth in a domain distinct from that of the current threat. In the context of the study above, participants who self-affirmed their worth were less likely to engage

in self-protective stereotyping although the value being affirmed did not necessarily have anything to do with the stereotyping. This fluidity in the compensation system adds a wrinkle to the model of compensatory moral behavior discussed thus far, suggesting that those with a threatened moral self-image need not help in order to rectify their current state. Instead, an unrelated self-affirmation may suffice in the short run.

Self-affirmation theory also reinforces the notion that mood repair need not underlie the compensatory process. In fact, a good deal of research finds that self-affirmation does not improve mood (Fein & Spencer, 1997; Schmeichel & Martens, 2005; Sherman et al, 2000). Additionally, mood manipulations do not seem to motivate self-affirmations in the way in which a mood repair mechanism would predict (Steele et al, 1993). As a whole, self-affirmation research lends support the idea that threats to one's self image will prompt compensatory cognitions and actions. It complicates the picture, however, suggesting that such thoughts and behaviors need not be specific to threat per se, but to some other subjectively important source of virtue.

Self-Coherent Morality

Another line of research suggests that self-evaluations influence prosociality in a different way, by providing a meaningful standard for people to follow. For instance, such a view would suggest that a person with an especially moral self-image should be more likely to behave that way. This perspective is less interested with prosocial behavior as a means to acquire and maintain high self-regard, but instead as means to maintain consistent self-regard. This coherence motivation is, in fact, treated as an assumption in research dealing with how changes in self-perception influence subsequent behavior.

Research on the overjustification effect (Deci, Koestner, & Ryan, 1999) finds that an intrinsic interest in a task can be undermined by extrinsic rewards. The classic overjustification finding resulted from rewarding children for drawing with magic markers, a behavior they once spontaneously engaged in. Researchers found that rather than reinforcing the behavior, children became less inclined to draw after the extrinsic reward was removed (Lepper, Greene, & Nisbett, 1973). It is commonly accepted that this behavioral change is driven by self-perception. Individuals come to view their behavior as driven by a desire for the extrinsic reward, and thus conclude that they are not all that interested in the task for its own merits. As a result, they engage in the behavior less frequently and with less gusto. This form of attitude-behavior consistency is presumed to be driven by a coherency motivation.

While the overjustification effect has not been systematically studied in the context of moral behavior, a similar phenomenon has been. The food-in-the-door compliance method (FITD; see Ciladini & Goldstein, 2004 for a review) is also believed to be mediated by changes in self-perception. FITD is demonstrated by first making a small request of the target, and after they agree, making a larger request. This method has been statistically shown to work better than simply making a single request. Meta-analyses place the effect's r between .09 and .17 (Beaman et al, 1983; Dillard, Hunter & Burgoon, 1984; Fern, Monroe, & Avila, 1986). Some FITD theorists (Burger, 1999; Rittle, 1981) believe that the phenomenon works through changes in self-evaluations, as the target essentially comes to believe he or she is a better, more helpful person after performing the first small favor (i.e., the foot is in the door). This positive self-evaluative shift then causes the mark to behave more helpfully in response to the second, larger request (i.e., the door swings open) in an effort to remain consistent with the improved self-view.

As FITD is often studied within the context of helping behavior, it provides the current review with several data points regarding self-coherence and moral behavior. In fact, the

original FITD study measured prosocial behavior, finding that if asked for a small favor prior to helping, homeowners more readily displayed signs in their front yard encouraging safe driving (Freedman & Fraser, 1966). However, findings are mixed regarding whether changes in self-evaluation directly mediate the FITD effect (i.e., that initial compliance causes people to see themselves as more helpful, which then leads to further compliance). Some studies have failed to find any evidence for self-evaluations as mediators of FITD (e.g., Gorassini & Olson, 1995; Dillard, Hunter, & Burgoon, 1984), while others have revealed promising results (Burger & Caldwell, 2003). In one of these studies, Burger and Caldwell (2003) tested people who signed a homelessness petition. A portion of these people were told they were very helpful after signing. Participants in this condition evaluated themselves as more altruistic and were also more likely to help again. While direct evidence like Burger and Caldwell's remains scant, the current view in the literature favors this self-perception mechanism (Cialdini & Goldstein, 2004) because of a wealth of indirect evidence (Burger, 1999).

The overall pattern of FITD findings indicates that changes in self-evaluations indeed guide changes in helping behavior. For instance, Burger (1999) performed a meta-analysis of 30 years of FITD findings, dividing studies based on variables related to their impact on self-evaluations. In one area of particular theoretical interest, Burger found the FITD effect to be stronger in studies in which participants actually carried out the initial helping task, as opposed to simply agreeing to do so at some point in the future. Indeed, self-perception should be stronger when one can actually view him or herself perform the behavior in question. This meta-analytic finding, although indirect, indicates that self-evaluative changes do motivate future helping.

In addition to pinpointing studies in which participants actually carried out the initial task, Burger (1999) identified studies in which participants were praised or labeled as helpful

for their preliminary compliance. This procedure should also increase the likelihood that participants would change their self-evaluation in response to helping. Indeed, this meta-analysis found that participants labeled after helping showed a larger FITD effect than those who were not labeled. While the findings from Burger's meta-analysis provide useful indirect support for the notion that individuals help in order to stay consistent with a prior self-view, another study tried a more direct tactic.

Rather than relying on an initial helping act to alter self-evaluations, Strenta and DeJong (1981) simply told participants that they were good and helpful, and observed subsequent prosocial behavior. In this study's key condition, participants were told that an ostensibly reliable computer test found that they were helpful, thoughtful and reliable. In another condition participants were told that the test found that they were intelligent. This condition served as a control because it was positive, yet neutral with respect to prosociality. In two other control conditions participants either received no feedback, or were simply told that the test measures kindness, but that they would not receive the results. This final condition was included to control for making prosociality salient. Afterwards, a confederate dropped a stack of papers while the participant walked down the hall, surreptitiously counting the number of papers the participant picked up. Strenta and DeJong found that only participants receiving prosocial feedback about themselves were significantly more helpful than those in the control conditions. By circumventing the initial step of FITD, Strenta and DeJong's study supports the notion that individuals will behave morally in order to be consistent with a previously established self-evaluation.

The above findings, which indicate that changes in self-perception can guide future moral behavior, are in line with a broader class of motivation known as self-verification. Self-verification suggests that people are motivated to maintain a coherent sense of self, and will seek

this out (Swann, Rentfrow, & Guinn, 2003) even if that self-concept is negative. For example, Swann, Stein-Seroussi, and Giesler (1992) found that participants with a negative self-view chose to interact with an evaluator who shared that view, as opposed to one with a favorable impression. These participants ostensibly preferred coherence to what they viewed as unwarranted positivity.

Although the evidence cited above indicates that people may do good in order to maintain a coherently high self view, there has been considerably less research on prosociality motivated by coherency of negative self-evaluations. The negative condition is of key importance because it can rule out the interpretation that doing good was simply motivated by a desire to feel better about the self (i.e., self-enhancement). The aforementioned Sachdeva, Iliev, & Medin (2009) study, which found that charitable donation was increased after writing a negative moral story about the self, provides an example. However, it evidenced self-enhancement rather than coherence. This apparent discrepancy, although limited to a single data point, may be better understood with the knowledge that certainty plays an important part in the self-verification process.

Self-Coherence and Certainty

Research on self-verification suggests that self-certainty may cause individuals to be more prone to seek confirmatory information about the self (Swann & Ely, 1984). For instance, Maracek and Metee (1972) studied the way in which people with high or low self esteem would modulate their behavior in response to success feedback. In particular, would low self-esteem participants accept success feedback and work to maintain this standard, or rebel against it, thus reinforcing their prior self notion? In an important addition to previous studies, these researchers not only split participants by high and low self-esteem, but also by the participant's certainty and

uncertainty surrounding self-esteem, two variables that proved statistically unrelated. This study found that only those participants certain in their low self-esteem failed to achieve after success feedback. The authors postulated that certainty about a trait provides a stronger framework from which to self-verify. Further, failing to verify a trait that one is certain about signals a greater deal of incoherence than failing to verify an uncertain trait.

Since Marecek and Metee's (1972) study, additional research has supported uncertainty's role in self-verification. This research, however, has not measured moral behavior and has been rather sporadic. For instance, Pelham (1991) verified the independence of certainty and self-evaluations, also demonstrating that certainty is a construct separate from importance of self-evaluations. Other studies have demonstrated a key role for self-certainty and uncertainty in the self-verification process. For instance, Swann and Ely (1984) demonstrated that self-certainty is pivotal in determining the impression people give off to others. In this study, participants high in self-certainty behaved consistently with their self-view, while uncertain participants were more likely to modulate their behavior according to the preconceived notions of their interaction partners.

The overall pattern of results from self-verification studies that take certainty and uncertainty into account is relatively consistent. These studies find that certainty is crucial to the self-verification process, as only self-evaluations that are held with conviction are used as a basis for maintaining a coherent self-image. While these authors mostly focused on certainty, the findings can be reinterpreted as demonstrating what occurs when individuals feel uncertain about aspects of the self. As much as certainty encourages self-verification, it can be said that uncertainty provides a respite, especially among those with low self-views, from the drive to be self-coherent. Although the motivation to maintain a coherent self concept is surely a strong

one, it can be self-defeating among those possessing a priori negative self-evaluations (e.g., Hixon & Swann, 1993; Swann, Wenzlaff, Krull, & Pelham, 1992).

Uncertainty's moderating function in the Maracek and Metee (1972) study indicates it could also play an important role in moral self-regulation. For instance, recall Sachdeva, Iliev and Medin's (2009) moral cleansing effect, in which they found that participants who wrote a negative moral story about the self donated more to charity. What these participants actually felt may have been more akin to self-doubt, as they were students at a top US university who probably held a generally high self-image to begin with. Had the manipulation been strong enough to create certainty about their self image, then participants may have simply gone along with this view. Further, in Monin and Miller's (2001) study of moral credentials and prejudicial behavior, reaffirming a self-view as a non-prejudiced person allowed more freedom of action, potentially because of increased certainty, thus curtailing the need to self-signal. This possibility suggests uncertainty may be of further use in exploring how individuals regulate their moral self-image.

Restricting the study of uncertainty to self-verification strivings may in fact provide an incomplete picture. For example, on top of the documented phenomenon of engaging in moral behavior to repair or maintain one's self image (i.e., self-enhancement), personal uncertainty may provide an added incentive to do good. Specifically, uncertainty as a feeling may draw attention to a portion of the self-concept that is relatively unknown, arousing curiosity about the self that one is motivated to resolve. This feeling may well interact with self-enhancement strivings, as people seek to self-improve in domains featuring the most uncertainty. Certainty, on the other hand, suggests there is little left to learn about the self, thus shutting off this additional source of motivation. The majority of the theories and models described thus far do not take uncertainty into account, and thus may be incomplete. Postulating a self-signaling drive

fills in morality's motivational landscape by explicitly predicting that uncertainty should possess its own motivational powers. For this reason, self-signaling and recent research on uncertainty are described in greater detail in the following section.

Self-Signaling and Uncertainty

The preceding chapter described the manner in which self-regulatory processes invoke moral behaviors in order to maintain a self-concept that is both positive and coherent. However, current theories focus either on enhancement or coherence which are at least sometimes at odds with one another, and thus inadequately describe the totality of the existing data. Furthermore, neither theory posits a strong role for uncertainty in motivating prosocial behavior. Although some self-verification theorists take the dimension of certainty and uncertainty into account (Swann, Rentfrow, & Guinn, 2003), it is usually to say that only certain self-evaluations are verified. Emerging research on uncertainty, which is described below, suggests that this standard self-verification view may be shortsighted, as uncertainty seems to have motivational impact in its own right.

New predictions may stem from components of self-enhancement and -verification, as individuals strive to self-enhance in areas where their self-evaluations are especially uncertain. This is a case for self-signaling, such that positive and negative actions can reveal corresponding information about the self. Learning such information has value in itself, as people feel better when they gain positive information, and worse when they gain negative information (Bodner & Prelec, 2003). Although previous research has been diligent in recognizing that decisions are made with anticipated outcome utility in mind, only recently have researchers begun to speculate about the potential role of uncertainty as a personal motivator.

Self-Signaling Overview

In its original conception, self-signaling was presented as a useful theoretical model for understanding previous psychological findings (Bodner & Prelec, 2003). Notably, self-signaling theorists described Quattrone & Tversky's (1984) study, which found that people are willing to endure greater pain when told that a high pain tolerance is associated with longevity. This finding is perplexing under traditional models of utility, which expect that people would prefer to avoid such a seemingly unnecessary source of pain. Under self-signaling, however, this pain seeking is interpreted as resulting from a motivation to infer possessing the trait of good health.

Two recent studies have been specifically inspired by the self-signaling model. Dhar and Wertenbroch (in preparation) found that choosing a healthy option among several unhealthy options makes people feel better than choosing the same option among less tempting alternatives. Standard utility models have difficulty explaining this outcome because in the end, the same choice was made by both groups. Self-signaling, however, incorporates this finding nicely as it recognizes that choosing to be healthy when temptation is strong conveys more positive information about one's self-control.

In the area of dishonesty, Mazar, Amir, and Ariely (2009) have found converging results. Their results indicate that people will engage in small acts of deception and theft, but only up to the point when such behavior would begin to signal darker desires. Further, participants in their studies were much more dishonest when the behavior could be attributed away to other causes, thus diminishing the negative diagnostic utility that would normally follow devious acts. In one example of this phenomenon, they found that participants were more willing to cheat when rewarded with tokens that could be redeemed for money, than when rewarded with money itself. Cheating to obtain tokens, albeit ones that were directly redeemable for cash, allowed participants to make a more self-serving attribution for their dishonest behavior, and thus avoid

the negative diagnostic consequences that usually go along with stealing. The authors suggest such an effect may be a cause of the high levels of employee theft (e.g., stealing office supplies) in workplaces.

Although self-signaling has led to important advances in temptation and dishonesty research, it has been relatively underused otherwise. Notably, it would seem to have significant implications for research on prosociality and moral behaviors. Bénabou and Tirole (2006) touched on this, theorizing about the effect of incentives on charitable behavior. The main thrust of this theoretical paper suggests that the presence of social- and self-signaling motivations create an overjustification effect, as helpers become unclear as to whether their good deeds were driven by selfish or selfless motives. This argument centers around the notion that incentives for charity (Andreoni, 1990) can make both the observers and the helper unclear about why he or she helped, thus interfering with the actual fulfillment of these social and self reputational rewards. Bénabou and Tirole (2006) do not, however, delve into the psychology of how affect and self-evaluations fluctuate as a response to salient rewards and the conditions that may make such fluctuations especially likely, nor do they introduce novel experimental studies.

As noted above, several psychological studies measuring moral behavior are consistent with a self-signaling explanation. In fact, existing counterintuitive findings may be better understood with self-signaling. Recall, for example, the Carlson and Miller (1987) meta-analytic finding demonstrating that that negative moods led to more helping when the helping behavior was especially distasteful. This result is perplexing from a from a standard outcome utility perspective, because helping is counterproductive if the act itself carries only negative affect. Factoring in diagnostic utility helps make sense of Carlson and Miller's finding, offering the explanation that distasteful acts signal a purity of intention. Such acts are quite informative about one's character because it has hard to imagine that helping was motivated by anything

other than a selfless and giving nature. Traditional self-regulatory models for helping, however, do not capture this self-informational aspect of moral behavior.

Emerging findings indicating a martyrdom effect (Olivola & Shafir, in preparation) are also made increasingly interpretable by self-signaling. The martyrdom effect is an experimentally documented increased willingness to contribute to charitable causes when that contribution involves pain and effort. For example, participants in these studies were prepared to donate more when the charitable event they were to engage in was painful and effortful (e.g., a 20-mile charity walk), as opposed to easy and enjoyable (e.g., a picnic). The association between effortful donation and its self-signaling of heroic characteristics may account for a portion of the martyrdom effect.

The Uncertainty Assumption

The motivation to self-signal assumes some level of self-uncertainty (Bodner & Prelec, 2003). With regard to the pain example (Quattrone & Tversky, 1984), a person who somehow knew exactly when he or she would die would have no reason to endure the frigid waters of longevity. This trial would tell nothing not already known. In the realm of helpfulness, a person completely certain that he or she is generous and altruistic would gain no diagnostic utility from helping for the same reason – there is nothing left to learn about the self in this regard. On the other hand, someone more uncertain about his or her prosociality stands to gain more self-knowledge, and thus more diagnostic utility. Self-signaling theory would therefore suggest that, independent of one's current self-evaluation, increased uncertainty surrounding this self-evaluation should promote helping. This prediction is the focus of the current set of studies, and represents the first test of this key assumption of self-signaling theory.

As reviewed above, self-verification researchers have studied the effect of self-evaluative certainty on self-verifying behaviors. In addition to demonstrating certainty-uncertainty's statistical independence from self-evaluations (e.g., Krosnick, Boninger, Chuang, Berent, Carnot, 1993; Pelham & Swann, 1989), this research found that uncertain self-evaluations are less likely to be self-verified than those held with certainty (Maracek & Metee, 1972). Another way of interpreting these findings involves looking at the other side of the coin, focusing instead on the effects of uncertainty. By allowing the acceptance of positive information in the Maracek & Metee (1972) study, uncertainty can be seen as providing the freedom to break away from self-verifying ruts people can become embroiled in, and eventually self-improve. This perspective accords with the current theoretical (i.e., self-signaling) model suggesting that uncertainty highlights a gap in self-knowledge, thus providing an opportunity to strive for diagnostic utility. A variety of other lines of research have found that states of uncertainty can be highly motivating of certainty seeking behavior, both with respect to the self and situation. These studies have not yet, however, begun to posit that uncertainty can motivate everyday acts of good will.

Numerous studies have demonstrated that uncertainty motivates certainty seeking behaviors, both with respect to the self and the situation. Beginning with studies focusing on the self, research on the self-assessment motivation (Trope, 1986) has dealt with the ways in which people strive for accurate evaluation of their capabilities, a motivation that some believe has been much overlooked (Sedikides & Strube, 1995). Participants in self-assessment studies demonstrate this motivation by choosing to answer test questions that are diagnostic of their abilities, as opposed to ones that are not. This inclination towards self-assessment appears stronger when participants are primed to feel more uncertain about their abilities (Trope & Brickman, 1975). Applied research has found converging evidence for this self-assessment motive. These studies have found that, in the workplace, employees who are highly uncertain

about their skill-level are especially motivated to seek performance feedback from supervisors (Ashneel & Lievens, 2007). This study, although correlational, demonstrates that those higher in uncertainty about their work-related competencies seek more feedback from their supervisors.

Still other studies find that uncertainty promotes behaviors aimed at reducing uncertainty about the self in a more social context. For example, research demonstrates that subjective uncertainty can motivate group membership and social categorization (Hogg, 2000). In the interest of demonstrating a link between uncertainty and in-group bias, Grieve and Hogg (1999) subjected participants to the minimal group paradigm (i.e., separating participants into groups without sufficient explanation), which is believed to increase uncertainty. Some participants were given a chance to decrease this uncertainty (low uncertainty condition), while others were not given such an opportunity (high uncertainty condition). This high uncertainty group demonstrated typical the typical pattern of results generated by the minimal groups paradigm, such as in-group bias and greater in-group identification, while the low uncertainty group did not. A manipulation check verified that the high-uncertainty group indeed reported more feelings of uncertainty than did the low-uncertainty group. These studies suggest that feelings of subjective uncertainty contribute to the well documented motivation to identify with one's group and show favoritism towards that group (Tajfel, 1978).

Also from a social perspective, Van den Bos (2001) demonstrates an important place for uncertainty in how people react to being treated unfairly by others. He found that uncertainty moderates reactions to manipulations of procedural justice – only participants who had just written about feeling uncertain reacted negatively to losing their say in how much reward they would receive later in the study. This finding suggests that the need for justice hinges on its capacity to infer a sense of certainty. In both studies of in-group bias and procedural justice,

uncertainty appears to increase the chance that people will engage in some behavior that clarifies their position relative to others, and thus reduce uncertainty.

From a more general standpoint, Heine, Proulx, and Vohs (2006) propose that uncertainty results from violations of expected relations between people, places, objects and ideas. People then engage in *meaning maintenance* in their strivings to compensate for perceived violations of such expectations. For example, violations of meaning have been shown to motivate compensation through increased punishment of criminals (Proulx & Heine, 2008), and increased implicit learning (Proulx & Heine, 2009). Other perturbations of one's conception of reality seem to cause similar variety of uncertainty-reducing behaviors, such as seeing patterns in chaos (Whitson & Galinsky, 2008), and increased religious belief (Kay, Gaucher, Napier, Callan, & Laurin, 2008). These studies indicate that uncertainty can motivate a wide variety of certainty-seeking behaviors in areas seemingly unrelated to the current source of uncertainty.

The above studies demonstrate that uncertainty can cause several types of certainty-seeking behaviors. These findings go well beyond the certainty/uncertainty component in previous self-verification research, which found that only self-evaluations held with certainty are verified. For instance, uncertainty promoted behaviors as varied as taking a diagnostic test (Trope, 1986), asking others for information that would resolve uncertainty (Ashneel & Lievens, 2007), and seeking retributive justice in a domain far removed from the source of the uncertainty (Proulx & Heine, 2008). The current research suggests an additional effect, that uncertainty may inspire behaviors that themselves carry high informational value about the self. In other words, some behaviors, although they are not as obviously certainty-seeking as taking a test or asking others for personal feedback, are quite informative about the self. Moral acts would seem to broadcast an especially strong signal about the actor's character. Therefore self-signaling

predicts that uncertainty will increase the chances one engages in moral behavior. The current studies test this relationship.

Experimental Overview

Although moral behavior has been studied extensively, ambiguity still exists over how individuals regulate their moral self-image. When studying this process, it is crucial to note that moral behaviors tend to carry a prodigious amount of positive social information, indicating the actor possesses numerous desirable traits. Furthermore, moral actions that seem particularly selfless or even self-sacrificial tend to convey more informational value about the actor's intentions, and thus are more laudable. Self-signaling extends this phenomenon, suggesting that helping also carries information within the self.

While self-perception – the idea that people learn about themselves through observing their behavior – is nothing new, the idea that people can be motivated by the self-perceptive rewards of a behavior represents a significant advance. The research reviewed above, although indirect, supports a self-signaling explanation for moral behavior. For instance, people seem to prefer moral acts when the diagnosticity of that act is clear (Carlson & Miller, 1987; Olivola & Shafir, in preparation). Further, good deeds are especially likely when one is experiencing a deficit of positive self-regard (Sachdeva, Ilic, & Medin, 2009), a prick of guilt (Harris & Samerotte, 1976), or a moment of doubt (Kidd & Berkowitz, 1976).

In a similar vein, uncertainty seems to be endowed with strong motivational properties. It arouses a host of behaviors, from group membership, to test taking. Combining the idea of self-signaling with the burgeoning methodological advances of the uncertainty field may help to clarify this picture. A key aspect of self-signaling, and one that has heretofore been untested is that at least a minor level of uncertainty must exist with the signaler. Furthermore, greater levels

of uncertainty should increase helping, as uncertainty presents the opportunity to learn more about the self, obtaining more diagnostic utility in the process. Therefore, this paper's overarching hypothesis is that uncertainty about one's moral character will increase prosocial behavior. Prior to laying out the methodology used to test this hypothesis, divergences between this prediction and those made by similar theories are discussed.

The prediction that uncertainty promotes prosocial behavior is not easily reconciled with a traditional self-enhancement view of moral behavior. Self-enhancement theories do not endow uncertainty with motivational properties in its own right. For instance, consider the case of receiving a negative feedback about one's moral character. Self-enhancement would likely predict that feedback that is framed as certain should be more damaging to the self concept than uncertain feedback, and thus more motivating of self-enhancing behavior. On the other side of the coin, this traditional self-enhancement perspective would suggest uncertainty about negative traits is more equivocal, and thus shouldn't be especially motivating of compensatory behaviors. Self-signaling, on the other hand predicts the opposite. Uncertainty signals that there is more to learn from moral actions, thus promoting a greater magnitude of benevolence.

The notion that uncertainty plays a role in motivating compensatory moral behaviors may fit well with recent theorizing about self-affirmation theory. Sherman and Cohen (2006) have suggested that self-certainty serves a function in the self-affirmation process. Specifically, they propose that self-affirmations may make individuals more certain of themselves, and thus make them less susceptible to threats to self-integrity. Such a perspective is not incompatible with self-signaling, which would also suggest that self-certainty provides a buffer against threats to the self. However, self-signaling theory would add that uncertainty may not necessarily be a negative, as it could promote moral acts aimed at improving the self-image. Further, uncertain individuals may have even more diagnostic information to gain from self-signaling behaviors.

The current hypothesis, that moral uncertainty begets moral behavior, is at odds with self-verification under certain circumstances. For example, consider a situation in which people receive positive feedback about their moral character. Under the armature of self-verification, certainty surrounding a self-evaluation provides a stronger basis for action. Therefore, such a view would predict that certain feedback about possessing a moral characteristic should be more motivating than uncertain feedback. The present hypothesis, however, predicts the opposite. Consistent with the current self-signaling framework, uncertainty provides the opportunity to glean more positive information about the self, even among those with a currently positive self image. Therefore, the current working hypothesis predicts more helping among those with a positive and uncertain self-view, as opposed to those who are more certain.

The present studies attempted resolve some of these conflicting predictions about uncertainty's role in promoting prosocial behavior. The primary methodological tactic employed by these studies involved measuring or manipulating uncertainty and observing its effect on helping behavior. In doing so, these studies attempted to hold self-evaluations as constant as possible, as it was important to not simply replicate findings indicating that people help in order to improve a momentary shortage of positive self-regard.

Study one sought to demonstrate a correlational relationship between uncertainty and prosocial behavior through self-report measures of moral characteristics and helping. Studies two through four used various experimental designs to approximate uncertainty's effect on prosocial behavior. Study two manipulated uncertainty through a false personality feedback paradigm and measured agreement to help the experimenter. Study three was largely a replication of study two, but with participants receiving negative feedback as opposed to positive. Finally study three included both positive and negative feedback, while requiring participants donate money to a wildfire relief fund in order to help.

STUDY ONE: GENEROSITY, CERTAINTY, AND VOLUNTEERISM

Background

To begin to test the relationship between personal uncertainty and helping behaviors, a large-scale correlational study was performed. The purpose of this study was to seek preliminary evidence for a link between uncertainty about possessing prosocial characteristics and helping, using self-reported measures of these variables. In particular, study one asked participants how frequently they volunteer.

Participants

Participants were 639 undergraduates (518 female, 121, male) at the University of California Santa Barbara (UCSB). These participants answered the questions described below, along with several others as part of an online questionnaire for course credit.

Materials and Measures

Three items were included in study one. The first item asked participants how generous they viewed themselves on a scale of one to nine. Participants clicked on a bubble above a number to indicate their choice. The second item asked participants to rate how certain they were of their generosity self-rating, from 0-100% by typing in a percentage with no fractions allowed. Finally, the third item asked participants how many hours they tend to volunteer in a typical month. The volunteer item was also in a free response format such that participants simply typed in the number of hours they volunteer, rounded to nearest whole number. All three questions were presented on the same page.

Procedure

Participants logged onto the subject pool website and answered questions, one at a time. The entire questionnaire took about one hour to complete, while the items relevant to study one took approximately one minute. Participants were free to login from wherever they wished (e.g., home, work, the school library).

Results and Discussion

To approximate the influence of self-reported generosity and certainty on helping behavior, these two predictors were entered into a regression with volunteerism as the dependent measure. Perhaps not surprisingly, this analysis revealed a strong positive relationship between self reported generosity and volunteerism, $\beta = .721$, 95% CI [.671, .772]. In short, this effect indicates that those who rated themselves as more generous volunteered more frequently. More interesting was that certainty in one's generosity level independently and negatively predicted volunteering, $\beta = -.234$, 95% CI [-.285, -.184]. This result suggests that holding generosity constant, increased certainty predicts less volunteering. To control for the possibility that these effects were influenced by an interaction between generosity and certainty (e.g., perhaps only highly certain individuals showed a relationship between generosity and helping), the generosity X certainty interaction term was tested. This term proved small, and statistically non-significant, $\beta = -.004$, 95% CI [-.020, .082], suggesting no interaction between generosity and certainty in predicting self-reported helping.

As the model described above contained substantial deviation from normality present in the residuals, a parametric analysis may have resulted in biased standard errors. Therefore, these results were reanalyzed by non-parametric tests, specifically through bias-corrected confidence intervals generated by resampling methods using 3999 resamples (e.g., see Davison & Hinkley,

1997; Efron & Tibshirani, 1993). The results using these methods replicated the findings above, with respect to both generosity, 95% CI [.509, .876], and certainty, 95% CI [-.442, -.081], predicting hours volunteered. Although these methods produced wider confidence intervals as compared to the parametric tests, neither contained zero, indicating $ps < .05$.

Study one's results indicate that uncertainty about one's level of generosity is correlated with increased volunteering. This effect remained significant even while controlling for self-reported generosity itself, suggesting uncertainty may have a motivating effect separate from self-regulation simply defined. Study one also evidenced a hint of self-verifying behavior as participants with higher self reported generosity reported more volunteerism. However, the results did not fit the typical self-verification view of certainty and uncertainty, which would predict an interaction, such that self-ratings held with certainty are more predictive of behavioral effects. In fact, the data was more indicative uncertainty independently influencing volunteerism. Of course, the correlational and self-report nature of study one hamper any firm conclusions.

While its findings are intriguing, study one comes with a host of limitations; most obvious among these is that this first study was correlational and thus cannot infer that uncertainty caused volunteering. Further, volunteering was self-reported, leaving open the possibility that participants were not accurate or honest in reporting their helping habits. To account for the bulk of these limitations, study two was designed as a laboratory study manipulating uncertainty.

STUDY TWO: UNCERTAINTY AND AN EXPERIMENTER IN NEED

Background

Given study one's limitation as a correlational study, study two's main purpose was to provide causal evidence linking uncertainty about moral characteristics and helping behavior. To create uncertainty, participants took a computer-based test that seemed to include self-report and implicit measures of personality. The implicit portion of this test did not actually measure anything and was used to present false personality feedback. For the sake of methodological verisimilitude, the sham implicit measure closely resembled an implicit associations test (IAT; Greenwald et al, 2002). Participants were then randomly assigned to receive feedback about their personality, this feedback varying in the amount of certainty the computer supposedly ascribed to it. The personality description itself was the same regardless of the certainty level in an attempt to control self-evaluations and focus on the effect of certainty and uncertainty.

After the experimental manipulations participants were given the chance to agree to perform a small helping task in the future. While this agreement was in no ways binding, I hoped it would approximate the participants' desire to help in the moment. Finally, study two also included a response inhibition task designed to examine whether uncertain participants experienced increased enduring activation of helping concepts. Such an effect could provide meditational evidence indicating how uncertainty might influence helping.

Participants and Design

Participants were 45 undergraduate students (23 female and 22 male) at UCSB, who participated in exchange for course credit in a psychology class. Participants received one of three sets of false dispositional feedback designed to make them feel certain or uncertain about

their compassionateness. This feedback described the participant as compassionate, with certainty or uncertainty. A third control group did not receive feedback about compassion. In other words, study two used a one-way, between subjects design manipulating certainty about compassionateness (certain vs. uncertain vs. control).

The computer software allowed me to record the length of time participants spent reading their compassion feedback screen (detailed below). Five participants stayed on this screen, a full page of text, for less than four seconds (the next lowest was 11 seconds). These participants were excluded from the analyses as it was assumed they could not have had time to read it – therefore not experiencing the experimental manipulation – and likely did not care enough to do so. Further, three participants experienced a computer error and their incomplete data was excluded as well.

Materials and Measures

Sham Personality Test. Uncertainty was manipulated by a computer-administered personality test. The first portion of this test asked standard personality questions culled from the ten item personality inventory (TIPI; Gosling, Rentfrow, & Swann, 2003), as well some distracter questions generated by the author. These questions probed various areas of personality, such as extraversion and neuroticism (see Appendix A for examples). In total, this self-report section included 20 items requiring a response on a 1 (disagree strongly) to 5 (agree strongly) Likert scale. After all questions were completed, the computer program then moved on to what was described as a reaction time based measure of personality, which was framed as a more objective measure.

The supposed reaction time measure of personality was designed to resemble an IAT. Much like an IAT, the computer presented images on the screen, one at a time. Participants were

to classify these 30 emotional images as “good” or “bad” and “human” or “non-human” as quickly as possible as their response times supposedly revealed something about their personalities. Participants pressed the “E” key to indicate the adjective on the left side of the screen accorded with the image, and the “I” key to indicate the adjective on the right side of the screen went along with the image. On half of the trials the types of categories were combined such that participants had to select “good or non-human” or “bad or human.” Actual responses were likely meaningless, as the task was only designed to give the appearance of being an objective psychological test related to several aspects of personality.

Upon termination of the sham personality test, participants received feedback about their personality. The first page of feedback, an additional attempt to establish diagnostic verisimilitude, offered information about the participant’s level of extraversion. This feedback was derived from the participants’ earlier self-reported responses from the TIPI questions embedded in the computer program. Afterwards, the computer displayed one of three sets of feedback regarding how compassionate the computer program deemed them: certain, uncertain, and control (no compassion feedback). In the certain and uncertain conditions, the feedback described the participant as compassionate and concerned with the outcomes of others. In the certain condition, the certainty of this feedback was labeled as 97% and in the uncertainty condition the certainty was labeled as 52%. These were the three conditions in the study.

Inhibition Task. In order to measure activation of thoughts related to helping, a procedure similar to the Stroop task (Stroop, 1938) was used. The classic Stroop task involves participants reporting the color of ink a word is printed in, while attempting to ignore that the letters in the word spell out a color. This task, however, also demonstrates that participants have more difficulty reporting the color if the word is simply related to something they have been thinking about. On this matter Geller and Shaver (1976) say, “In general it appears that latency

of color naming for a particular word will increase whenever a subject has been thinking about something related to that word.” Such a task seemed useful for the present purposes as a non-reactive measure of the extent participants were thinking about helping related concepts after receiving their personality feedback.

This Stroop-like thought inhibition task was embedded in the same program as the sham personality test. Veiled as a color perception task, participants viewed red or blue words and were instructed to report the color of the words as quickly as possible by pressing a button on the keyboard. Participants pressed “E” to indicate the word was blue and “I” to indicate it was red. After a practice session, participants viewed ten words related to helping and ten control words presented randomly, individually and in succession. Prior to each word display, a 250ms fixation was presented.

The list of helping-related words was generated by the author (see Appendix B for full word list), and the control words were generated through a search through an online database (MRC Database, University of Western Australia). Each control word was matched to a helping word, to be of the same length and as close as possible in usage frequency (Kucera & Francis, 1967).

Procedures

Upon entering the lab, participants were directed to individual cubicles containing a computer and a folder containing several questionnaires. The experimenter told participants that the computer would present two unrelated tasks, paired together because neither took the entire duration of the study. The participant then learned that the first task was part of an effort to validate a more objective way of measuring personality using a computer program developed by the principal investigator. The experimenter took care to note that the personality test may

display some results, and that it was important to note that these results would be of two distinct varieties. Participants were told they would see both personality feedback and the certainty surrounding that feedback, which were two separate pieces of information. The experimenter said, “So if the computer says it believes you are open to new experiences, but that it is 75% confident in that, do not take that to mean you are 75% open to new experiences. Some sets of responses are harder to calculate than others, and the 75% reflects this uncertainty.” The conversation continued until it could be verbally verified that the participant understood this distinction. This procedure was used to help to solidify the independence between feedback content and certainty in the participant’s mind.

After describing the personality test, the experimenter told participants that afterwards, the computer would automatically move on to a cognitive task. Finally, it would terminate, and they should fill out some additional questionnaires in a folder next to the computer. The rest of the instructions were embedded in the computer program. Participants then started the computer program, which began with the sham personality test and then moved immediately to the response inhibition task. As the program ended, it reminded participants to fill out the follow-up questionnaire. The follow-up questionnaire contained an item that requested help from the participant. It said that the investigator needed help completing his dissertation research in time, and the participant could check yes or no to indicate if he or she would be willing to fill out some additional questionnaires by email, without compensation. The rest of the follow-up asked participants to recall their feedback to the personality test, and then write out the purpose of the experiments according to their understanding of them. It also included several background questions, such as gender and university major. Upon finishing this questionnaire, participants returned it to the folder and exited to the main testing room where they were debriefed and probed for suspicion.

Results and Discussion

I hypothesized that uncertainty would increase both agreement to help and activation of thoughts about helping, as measured by the response inhibition task. Further, it was predicted that helping related thoughts should also mediate changes in the intent to help. To begin to explore these issues, the difference between participants' response times to helping-related and control words was calculated (see table 1). As predicted, uncertainty increased these corrected response times, $F(2, 42) = 4.31, p = .02$, such that uncertain participants experienced greater interference ($M = 36.60, SD = 47.97$), as compared to certain ($M = -21.64, SD = 48.82$) and control ($M = 6.72, SD = 66.37$) participants according to a planned contrast, $t(42) = 2.45, p = .019$. There was no significant effect of feedback on response times to control words on their own, $F(2, 42) = .369, p = .694$. There was also no overall effect of feedback on response times to helping words, $F(2, 42) = 1.36, p = .267$. However, a planned contrast comparing responses to helping words in the uncertain condition to the certain condition revealed a marginal effect, $t(42) = 1.92, p = .068$. Comparing response times to helping words in the uncertain condition to the combined certain and control conditions combined revealed a similar trend, $t(42) = 1.602, p = .117$.

The above analysis preliminarily suggests that the certainty and uncertainty of feedback affected the way in which participants responded to helping related words. This analysis uncovered a trend, such that uncertainty feedback affected response times to helping related words. After correcting for response times to control words, which may serve as a baseline speed of response, this effect of uncertainty on response time becomes significant. It could be argued that response times to control words may have been differentially affected by condition, and that the effect of condition on the difference between helping and control words reflects such an effect. This explanation seems unlikely, as responses to control words were remarkably

similar, with nothing approaching a statistically significant effect. Further there was a marginally significant difference between certain and uncertain participants on response time, before control words were even factored in. These points suggest that responses to control words serve more of a control function, and are not a separate dimension of interest.

The next step in the analysis was to determine if the uncertainty of feedback influenced participants' willingness to help. An initial test of the experimental condition's overall effect on helping found a marginally significant result, $\chi^2(2, N = 45) = 5.63, p = .06$. Planned contrast tests found that this difference was mostly driven by participants in the uncertain condition ($M = 53.85\%$, $SD = .52$) agreeing to help more than participants in the certain ($M = 16.67\%$, $SD = .38$) and control conditions ($M = 21.43\%$, $SD = .43$). For example, directly comparing helping agreement in the uncertain condition to the control and certain conditions collapsed together revealed a significant difference, $\chi^2(1, N = 45) = 5.54, p = .019$. There was also a statistically significant difference between certain and uncertain conditions, $\chi^2(1, N = 31) = 4.78, p = .029$. Finally, those in the uncertain condition were marginally more likely to help than control participants, $\chi^2(1, N = 31) = 3.04, p = .081$. Taken together, these results mirror the findings from the response inhibition portion of the study quite closely. Just as participants in the uncertain condition seemed to have more trouble ignoring words related to helping compared to the other conditions, these participants also seemed to decide in favor of helping more frequently.

The results of study two were consistent with the proposed meditational model. This model suggests that uncertainty increases enduring activation of helping-related cognitions, which in turn sways people towards deciding to help, given a salient opportunity is present. Analyses reported above found that uncertainty indeed increased response latencies to helping related words, indicating increased enduring cognitive activation of prosocial concepts. It

remains to be seen, however, if such activation would independently predict agreement to help. A linear regression analysis supported this notion, finding that increased response times to helping relative to control words independently predicted helping, statistically controlling for experimental condition. $\beta = .52$, 95% CI [.25, .80]. In the proposed meditational model, the finding that uncertainty increases latencies to helping related words represents the A path. The B path is response latency's effect on helping. The next step was to test the significance of the A*B meditational path (see Figure 1).

The statistical test of the A*B meditational path was tested with bootstrapping methods. The bias-corrected confidence interval was tested through resampling methods using 3999 resamples (Shrout & Bolger, 2002). The results from this test were consistent with a meditational model, such that uncertainty increased activation of helping related thoughts, which increased helping, $\beta = .24$, 95% CI [.09, .41]. As the bias-corrected confidence interval did not contain zero, it can be concluded that $p < .05$.

The findings from study two support the hypothesis that uncertainty about oneself as a compassionate and caring person can increase helping. Participants given dispositional compassion feedback framed as relatively uncertain agreed to help the study's investigator by marking "yes" on an anonymous form. Further, those given uncertain feedback also appeared to have a greater degree of helping-related thoughts on their mind, as compared to those receiving certain feedback. This conclusion was drawn from the finding that it took uncertain feedback-receiving participants longer to report the color of words related to helping. Taking longer to report the color of these helping words was also correlated with increased helping. Together, these results strongly imply that uncertainty about one's compassionateness causes increased enduring thought about helping, and eventually moral behavior, if the opportunity arises.

The data, thus far, have indicated that personal uncertainty can motivate moral behaviors. Study one found that uncertainty about one's level of generosity was related to higher levels of volunteerism. Meanwhile, study two tested this relationship with an experimental design, finding that uncertainty about compassionateness caused more helping. Study two's results do not fit well with a standard self-verification view of certainty, in which certain self-judgments are more predictive of behavior than those held with uncertainty. In fact, certain moral feedback marginally suppressed helping, while uncertain feedback enhanced helping. The findings from study two align more closely with a self-signaling framework, in which personal uncertainty motivates self-revelatory behavior. However, these previous two studies are limited in that they have only tested uncertainty surrounding positive characteristics.

There are reasons to believe that uncertainty about negative prosocial characteristics may have different motivational properties than uncertainty surrounding positive traits. For example, some researchers have proposed that uncertainty can amplify and extend affective states, as uncertain information is difficult to assimilate into current mental models (Wilson, Centerbar, Kermer, & Gilbert, 2005). In this fashion, uncertainty may have simply prolonged positive affect resulting from the positive feedback in study two. Helping behavior may then have been caused by a better mood in some form of mood-behavior correspondence (e.g., Isen, 1970). Such a result does not require a self-signaling explanation, as behavior is mood driven, and not tied to any form of self-informational process.

Study three was designed to build on the current studies and resolve sources of ambiguity. Primarily, study three differed from its predecessors by manipulating feedback about negative moral characteristics. If study two's results were indeed driven by prolonged positive affect in the uncertain condition, then the same logic would conclude negative-uncertain feedback would especially depress helping behavior. On the contrary, self-signaling suggests

that negative uncertainty should still cause increased helping, as it highlights the same gap in self-knowledge. As affect is relevant to both this critical alternative explanation for the data thus far, and previous research (i.e., negative state relief), study three also included mood measures.

In addition to the above concerns, studies one and two were also both limited in that they measured helping somewhat indirectly (self-reported volunteering and agreement to help in the future, respectively). Although these studies found results consistent with the proposed view of uncertainty, these helping measures were perhaps too easily counterfeited, casting doubt on these studies' approximation of reality. Toward resolving this source of doubt, the helping behavior was changed from mere agreement to help at some point in the future, to an actual, immediate form of helping.

STUDY THREE: UNCERTAINTY AND OFFICE BLOOPERS

Background

Study three was designed to test the effect of negative subjective uncertainty on helping. In particular, this study experimentally manipulated certainty and uncertainty about lacking compassion. To broaden the applicability of the current set of studies, study three also featured a new measure of moral behavior. One could argue that study two did not necessarily tap into moral behavior, but rather agreement to behave morally at some point in the future. Further, some may have not actually intended to respond to the forthcoming email, and thus may have not actually been willing to help at all. Study one did not rule these factors out either, leaving open the possibility that participants were being less than accurate in reporting their helping behaviors. In order to help resolve these doubts about the dependent measure, moral behavior in study three was operationalized as the number of pens participants picked up after a clumsy confederate dropped several of them. Assisting a confederate pick up dropped items has a long history of use as a measure of prosocial and moral behavior (e.g., Latané & Dabbs, 1975; Strenta & DeJong, 1981; Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007).

In addition to a new measure of moral behavior, study three also measured positive and negative affect. A traditional self-regulatory account of moral behavior (e.g., Cialdini et al, 1987) would predict that feeling bad increases prosociality because helping is seen as mood-inflating. In order to demonstrate that this view was incomplete, it was important to measure mood, so as to rule it out as the sole cause of helping.

Participants and Design

Participants were 36 undergraduate students (23 female and 13 male) at UCSB participating in exchange for course credit in a psychology class. Participants received one of three sets of false dispositional feedback regarding a computer program's assessment of them as non-compassionate. This feedback described the participant as non-compassionate, with certainty or uncertainty. The control group did not receive feedback about compassion. In other words, study two employed a one-way, between subjects design manipulating certainty about being non-compassionate (certain vs. uncertain vs. control).

Materials and Measures

Sham Personality Test (2). Study three, like study two, used a sham personality test to manipulate feelings of uncertainty. This second version, however, was designed to elicit more believability, and help make sure that more participants were interested in their feedback. In study two, five participants did not read their feedback slide, and study three sought to improve on this number.

Study three used a sham physiological measure of personality as a guise for giving feedback about compassion. The participant's left index finger was attached to a device that measured heart rate. A graph of the participant's heart rate was then displayed on a computer screen to bolster the procedure's powers of dissimulated scientific authority. The rest of the sham personality test was administered by a computer program. This program displayed instructions stating that the participant would view several emotional images, both positive and negative. The participant should simply view them and react naturally, as the program measured heart rate in response to these images. The program then displayed 30 images for five seconds each. Afterwards, the computer displayed a screen stating that it was printing out personality

feedback based on analysis of the participant's heart rate in reaction to certain images. In fact, the experimenter printed predetermined feedback, depending on the condition the participant was assigned to, as well as accurate extraversion results from the TIPI. The feedback forms (see Appendix C for an example) were similar to those presented in study two, including accurate extraversion ratings to enhance believability.

Procedures

After entering the lab and being greeted by an experimenter, participants were shown into a room containing a desk and a computer with a finger-attaching heart rate sensor. The experimenter informed participants they would be taking part in a computer-based personality test designed by the lab's principal investigator to be more objective than standard tests. First, however, participants were told they must fill out a preliminary questionnaire, which was the TIPI. The participant was then connected to the heart rate monitor and the computer program for the sham personality test (described above) was initialized. The experimenter returned just as the program terminated and explained the format of the results and left the participant alone to read them. When the participant indicated that he or she had finished reading the feedback, the experimenter returned and gave the participant the positive and negative affect schedule (PANAS; Watson, Clark, & Tellegen, 1988) to fill out. Afterwards, the experimenter told the participant that she needed to prepare the room for the next participant, and to return to the main room to fill out some final questionnaires.

As the participant was completing these questionnaires in the main room, a different experimenter reached over to get a pen from a cup next to the participant. While retrieving this pen, the experimenter purposefully knocked the entire cup of 20 pens over onto the floor near the participant, exclaiming "Oops!" The experimenter then surreptitiously counted the number of

pens the participant picked up to help. Finally, the first experimenter returned from the testing room to probe the participant for suspicion and debrief.

Results and Discussion

Study three was designed to test the hypothesis that uncertainty about being non-compassionate would increase helping relative to control and certain conditions. Furthermore, it was expected that certainty about being non-compassionate would decrease helping relative to control and uncertain participants. These hypotheses are derived from self-signaling theory, which postulates that people are good, in part, to learn good things about themselves. If they are already quite certain of themselves, then there is less to learn, and thus less motivation to do good.

Results were consistent with the hypothesis that uncertainty increases prosocial behavior. A one-way ANOVA tested the overall effect of uncertainty on picking up dropped pens, finding a statistically significant effect, $F(2, 35) = 33.01, p < .001$ (see table 2). A planned contrast between pens picked up by those in the uncertain condition ($M = 11.17, SD = 2.13$) and those in the control condition ($M = 8.50, SD = 1.62$) revealed a statistically significant effect, $t(33) = 3.50, p = .001$. This finding indicates that participants receiving uncertain feedback were more helpful in the pen dropping crisis than controls. Comparing participants in the certain condition ($M = 5.00, SD = 1.81$) with control participants showed an effect such that certainty depressed helping, $t(33) = -4.60, p < .001$.

The current study provided a chance to examine the effect of uncertainty and certainty on mood. It was also designed to test whether mood played a part in motivating helping behavior. For these purposes, the positive and negative scales within the PANAS were calculated. A one-way ANOVA revealed no overall effect of experimental condition on positive affect, $F(2, 35) =$

.90, $p = .418$. The same analysis on negative affect, however, revealed a significant effect, $F(2, 35) = 3.24, p = .05$ (see table 2). Planned contrasts revealed that this overall effect was driven by a difference between the certain non-compassionate condition and the control condition.

Specifically, participants receiving certain, non-compassionate feedback ($M = 1.47, SD = .37$) felt significantly worse than control participants ($M = 1.17, SD = .19$), $t(33) = 2.54, p = .02$.

Those in the uncertain non-compassionate condition ($M = 1.34, SD = .27$) showed a similar (but non-significant) pattern of results when compared to controls, $t(33) = 1.34, p = .19$.

The results for negative affect indicated that participants who learned that a personality test had deemed them non-compassionate felt worse than those who did not. Further, this effect was somewhat (although not statistically significantly) stronger when feedback was certain.

These findings are not altogether surprising as people generally do not like receiving negative feedback (Swann, Wenzlaff, Krull, & Pelham, 1992, study 4). It remained to be seen, however, whether mood accounted for differences in helping behavior. On the surface, this mood account did not seem likely because the uncertain and certain conditions barely differed in terms of negative affect, yet their pen-retrieving behavior diverged greatly.

Despite the lack of an apparent relationship, a more formal test of mood's effect on helping was in order. An analysis of covariance (ANCOVA), found that the experimental manipulation of uncertainty still significantly influenced helping when negative affect was controlled for, $F(2, 35) = 29.90, p < .001$. Furthermore, a linear regression with negative affect predicting helping did not yield a statistically significant result, $\beta = -.236, p = .166$. There was a trend, however, with negative affect decreasing helping.

The results from study three are relatively straightforward. They demonstrated that uncertainty surrounding negative self-evaluations motivated helping, while certainty suppressed helping relative to controls. These findings replicate the basic effect found in studies one and

two of uncertainty promoting moral behavior. Study three goes beyond previous findings by finding that uncertainty about a negative quality can also inspire helping, a result more consistent with self-signaling than a purely mood driven effect.

In studies one and two, positive uncertainty increased helping. It was possible that learning that one was good, but that this was uncertain, was an especially positive feeling. This account fits well with what some researchers have called the pleasures of uncertainty (Wilson, Centerbar, Kermer, & Gilbert, 2005), or in other words that uncertainty about good things can extend positive moods in the long run. From this standpoint, negative uncertainty should be especially aversive, and perhaps have the opposite effect on helping. The results of study three did not support this hypothesis, instead finding that the effect of uncertain negative states mirrored that of positive states, proving especially motivating of helping behaviors. While it seems clear that participants were not acting in accordance with their current affective state, it also appears they were not primarily motivated by a desire to repair their current affective state.

The results from study three do not readily fit into a traditional negative state relief explanation for moral behavior. The condition involving feedback that was negative and certain can be seen as the most concretely damaging to the participants' self-images. This feedback informed the participants that they lacked compassion and that the program was quite confident in this rating. In the uncertain condition, however, the veracity of this feedback was equivocal. If participants indeed interpreted this feedback as intended, a self-enhancement view of moral behavior would likely hypothesize that those in the negative certain condition, having a more tarnished self-image to fix, would later help out the most. This was not the case as, in fact, it was the uncertain protocol that inspired the greatest magnitude of helping behavior. The motivating force of uncertainty, evident in study three, is more in line with a self-signaling explanation.

Results from the mood measures reinforce the notion that one's affective state played less of a role than one's uncertainty about his or her moral character. In fact, mood rather weakly influenced helping, and it appeared to be uncertainty and certainty that swung helping to high and low extremes. Further, controlling for mood did not impact the statistical significance of the results. Within the realm of mood, the results fit much better with a self-signaling explanation, as opposed to a more traditional self-regulatory account.

An analysis of both mood and uncertainty effects indicate that it is not simply feeling bad, but feeling uncertain that increases helping. Participants in either non-compassionate group felt nearly the same levels of negative affective, yet their helping behavior varied wildly based on the certainty manipulation. Uncertainty, in this study, may offer the chance for redemption on the cheap. These people may feel bad, but realize they can easily change this self-evaluation through a small helping act. Those in the certain condition, however, may feel that there is less to learn about the self, and any behavioral changes now would be of only marginal effectiveness. In effect, uncertainty highlights a gap in self knowledge, and motivates the filling in of that gap.

Furthermore, study three extends the type of helping behavior studied thus far. Study one relied on self reported volunteering, and study two measured mere agreement to help. Both of these measures are limited in that the participant could have easily engaged in self- or experimenter- deception. It is fairly easy and perhaps quite tempting to be dishonest how much one helps. Rectifying this point of ambiguity, study three used the hard-to-fake behavior of physically assisting an experimenter with a minor lab mishap. Because the results for study three replicated its predecessors, credence is granted to the notion that this body of work has conceptually measured prosocial behavior, and not simply several unrelated acts.

Unlike studies one and two, the results from study three conform more readily to a self-verification explanation. Recall that self-verification predicts that self-views held with certainty

tend to be used as a guide for action. In study three, participants who received certain information indicating that they lacked compassion indeed behaved less compassionately when a confederate required help. However, when the personality feedback was less certain, participants apparently did not use it to guide their action, instead choosing to be more helpful. Alternatively, the certain feedback may have not provided a basis for action, but rather decreased the motivation to engage in self-informational behavior. Recall that in study two, certain feedback about a compassionate personality did not motivate helping, but instead marginally decreased it. Study four's aims included resolving this point of ambiguity, as well others that emerged during the course of the previous studies.

While the effect of uncertainty on helping has been consistent across both negative and positive feedback, no single study in the current paper has manipulated both valence of feedback and uncertainty. This is problematic because these studies have been different in other regards (e.g., type of sham personality test), and are thus difficult to compare. Study four, was therefore designed to manipulate both uncertainty and valence of feedback within the same study. To further extend the implications of these studies, a novel helping behavior was measured. Study four used a monetary donation measure of helping, one that should prove most costly as participants would have to give up their own money to help, rather than simply bending down to pick up fallen pens.

STUDY FOUR: FIGHTING FIRES WITH UNCERTAINTY

Background

Study four endeavored to test the effect of positive and negative uncertainty on moral behavior. By including positive and negative personality feedback within a single experiment, study four provided the potential to replicate studies two and three, while possibly uncovering new findings. For example, both studies two and three found that uncertainty enhanced helping and certainty depressed helping. Study three's results are interpretable as a self-verification effect because certain feedback caused behavior that accorded with feedback (i.e., certain feedback about a lack of compassion decreased prosocial behavior). In study two, however, certain feedback about possessing a prosocial trait caused behavior that diverged with this trait, a finding that is consistent with self-signaling, but not self-verification. However, these studies were methodologically dissimilar, making comparisons difficult. Study four expands on these studies by including positive and negative feedback within one study.

A strict self-enhancement perspective focuses heavily on mood recovery as a motivator for prosocial behavior (NSR; Cialdini et al, 1987). Study three did find that negative feedback decreased participants' mood. This mood decrease, however, did not seem to drive the demonstrated helping effects. Once again, this study presented participants with negative feedback about themselves, and thus the mood results only reflect one side of the coin. Study four presented the opportunity to measure mood in response to positive feedback. Furthermore, mood was measured more extensively in study four, including the Subjective Happiness Scale (SHS; Lyubomirsky, 1999) in addition to the PANAS. I hypothesized that that study four's results would fit with the findings up to this point, exposing an effect for uncertainty in increasing prosociality, independent of mood and feedback valence.

Participants and Design

Participants were 48 undergraduate students (32 female and 16 male) at UCSB participating in exchange for \$10. Participants received dispositional feedback that varied on two dimensions. The feedback indicated that the participant was compassionate or non-compassionate. It also referred to this feedback as either being highly certain or highly uncertain. As a result, study four employed a 2 X 2, between subjects design, feedback valence (compassionate vs. non-compassionate) X certainty (certain vs. uncertain).

Materials and Measures

To manipulate feedback valence and uncertainty, study four used the same sham physiological personality test that proved effective in study three. Study four differed with regard to the type of helping behavior examined, measuring donation to charity. In addition to the PANAS, which was used in study three, study four included the SHS. The SHS is focused on happiness, rather than generalized affect. Prosocial behavior was operationalized as the dollar amount that participants chose to donate.

Procedures

Participants entered the lab and were greeted by an experimenter. At this point, participants provided consent to take part in the study, and were paid \$10 in the form five \$1 bills and one \$5 bill. This particular form of payment was used to ensure that all participants would have the necessary change to donate to the charity collector later on in the study. After payment, they were administered the same sham heart rate based personality test detailed in study three. Upon finishing this test, participants filled out mood measures and were told that the

main testing room had been overbooked and that they must go to the lab's secondary room located in a building next to the psychology department. Although most participants were familiar with this building that also serves as a common location for classes, they were given directions and a brightly colored map. This map also served the purpose of indicating to the confederate/charity collector that this was a participant in the study and not a regular passerby.

When the participant was crossing the sidewalk to the alleged run-off lab room, he or she was approached by a confederate. The confederate, carrying a clipboard with information about the charity, asked the participant to donate to a relief fund for the Jesusita wildfire. This wildfire had recently ravaged the area around the UCSB campus and was extensively covered in the local news. Furthermore, it had caused widespread evacuations among UCSB faculty, student and staff. As a result, it was expected that this charity would elicit donations without being related to any divisive political beliefs. Afterwards, participants continued on to the secondary lab room where they filled out supplementary questionnaires. An experimenter then probed participants for suspicion and eventually debriefed them about the full nature of the study.

Results and Discussion

I hypothesized that, like previous studies, uncertainty would increase helping (i.e., the dollar amount given by participants). The design of this study also allowed a comparison of the uncertainty effect across positively and negatively valenced feedback. To examine these questions, the data was subjected to a 2 (uncertain vs. certain) X 2 (compassionate vs. non-compassionate) ANOVA. Two main effects emerged (see Figure 2). First, in keeping with the prior experiments, uncertainty increased helping, such that participants who received uncertain feedback donated more ($M = .92$, $SD = .89$) than those receiving certain feedback ($M = .42$, $SD = .64$), $F(1, 44) = 5.25$, $p = .027$. With regard to feedback valence, participants who were told they

were non-compassionate ($M = .90$, $SD = .93$) gave more than those told they were compassionate ($M = .44$, $SD = .60$), $F(1, 44) = 4.42$, $p = .041$. There was no interaction ($F < 1$) between these two manipulations, indicating that personal uncertainty encourages prosociality regardless of whether the uncertainty surrounds positive or negative information.

Analyzing the pattern of whether participants chose to give or not revealed a similar pattern, but did not reach statistical significance. Collapsed across valence of feedback, 62.5% of the participants in the uncertain condition gave ($SD = .49$), while 37.5% of those in certain condition contributed to the relief fund ($SD = .49$), $F(1, 44) = 3.05$, $p = .088$. With respect to valence of feedback, 58.3% of participants in the non-compassionate feedback condition gave ($SD = .50$), as compared to 41.7% in the compassionate feedback group ($SD = .50$), $F(1, 44) = 1.35$, $p = .251$.

The presence of two main effects and the absence of an interaction suggest that uncertainty and feedback valence operate independently of each other in the context of study four. In other words, regardless of whether uncertainty surrounded positive or negative self-information, uncertain participants behaved more charitably. This uncertainty effect is consistent with the overarching hypothesis that moral uncertainty can motivate moral behavior. Study four's results also suggest that uncertainty's motivating effect generalizes to another type of moral behavior: donation to charity. In addition, these effects resonate with implications regarding the role of more traditional self-regulatory motives for prosocial behavior.

A traditional self-verification perspective predicts that within the positive feedback group, certainty should cause increased helping relative to uncertainty. Under this model, certain participants should have used their self-evaluations as basis for engaging in self-coherent behavior. Instead, study four replicated study two, finding that uncertainty increased prosociality, an effect that suggests the drive for self-insight won out over that to self-verify.

Once again, the suppressive effect of certainty in the negative feedback condition can be interpreted as a self-verification effect. But given the nearly identical effects of uncertainty in study four's positive and negative conditions, it seems more likely that uncertainty highlighted an opportunity to engage in self-signaling behavior, while certainty suggested there was little left to learn about the self. However, limitations in the present studies obfuscate any firm conclusions regarding the presence of self-verification effects.

Self-verification hinges on preconceived notions about the self influencing future behavior. Study four did not measure prosocial self-evaluations prior to the experiment and thus any self-verification interpretations are necessarily tenuous. The behavioral effects presented thus far suggest that the personality feedback utilized in the current studies indeed substantially affected participants. However, it is a greater leap to propose this feedback altered participants' self-evaluations at a fundamental and enduring level. In fact, participants likely entered the study with a wide range of self-views that may have interacted with the experimental manipulations in a complex way. As the present studies did not measure preconceived prosociality, self-verification interpretations are greatly limited.

In terms of variables complicating the interpretation of the current data, it is also worth mentioning that study four employed an especially demanding measure of helping. Study four uncovered a main effect consistent with self-enhancement, such that negative feedback promoted a great amount of donations than positive feedback. While this would also seem to speak against self-verification, study four was the only study to measure such a costly form of helping. Self-verification strivings may have been hampered by the monetary cost involved in behaving in accordance with the positive feedback. In other words, any self-verification motivation may have been washed out by the monetary costs of self-verifying. In this regard, a control condition establishing a baseline level of helping would have been useful.

Previous studies measuring monetary donation (Sachdeva, Iliev, & Medin, 2009) have found both moral licensing and cleansing effects. The main effect for feedback valence in study four may have been either. For example, participants receiving positive feedback may have helped less because they felt they had the moral credentials to keep their money and not feel too bad about it. On the other hand, those receiving negative feedback may have helped more in order to morally cleanse themselves. Or, both of these effects could be present in the data. In other words, self-enhancing interpretations drawn from study four are also limited by the lack of a control condition.

The most straightforward explanation of study four's findings is that uncertainty provided a source of motivation independent of feedback valence. This conclusion is supported by the lack of an interaction between feedback valence and uncertainty, suggesting this effect of uncertainty was not moderated by the positivity or negativity of feedback. Therefore it seems that regardless of whether or not one is feeling particularly virtuous, some degree of self-doubt is efficacious in promoting prosocial behavior. Still, a thorough analysis of how the dependent and independent measures varied with mood is useful in ruling out an effect that is driven only by a desire to feel happier.

Affect and Happiness Results

Mood was measured more extensively in study four than in previous studies in order to comprehensively examine the experimental conditions' effect on mood, as well as how mood might influence helping. Subjecting positive affect measured by the PANAS to a 2 (uncertain vs. certain) X 2 (compassionate vs. non-compassionate) ANOVA revealed no significant effects. There was a trend such that certainty influenced positive affect, $F(1, 44) = 1.70, p = .20$. In this case, those in the certain condition ($M = 3.06, SD = 1.28$) were happier than those in the

uncertain condition ($M = 2.65$, $SD = .84$). These results suggest a slight happiness benefit for certain feedback, although this effect is small and statistically non-significant. In contrast to study three, negative affect from the PANAS was virtually unaffected by the experimental manipulations ($F_s < .2$)

Study four also measured happiness with the Subjective Happiness Scale. When the four items in this scale were subjected to a factor analysis with varimax rotation, a single factor emerged. The 2 (uncertain vs. certain) X 2 (compassionate vs. non-compassionate) ANOVA used above was applied to this factor, finding no significant effects (all $F_s < 1$). The general pattern of results, although extremely weak, was consistent with the expected pattern, with greater happiness resulting from positive feedback ($M = 1.12$, $SD = 1.09$) relative to negative ($M = -.11$, $SD = .91$), and greater happiness from certainty ($M = .06$, $SD = .81$) relative to uncertainty ($M = -.06$, $SD = 1.18$). These results support findings from the PANAS, suggestive of the notion that the experimental manipulations did not impact mood to a meaningful extent.

Although uncertainty and valence of compassion feedback did not appear to influence mood measured through either the PANAS or SHS, it remained possible that affect played some role in influencing charitable donations. To test this possibility, a series of three (uncertain vs. certain) X 2 (compassionate vs. non-compassionate) ANCOVAs were run with positive PANAS affect, negative PANAS affect and the SHS composite score as covariates. This method of statistically controlling for affect did not change the statistical significance of the uncertainty and feedback valence main effects. These results suggest that mood did not play a mediating role in the effects of uncertainty and feedback valence on helping behavior.

Although the behavioral results in study four indicated a self-enhancement motivation, such that those receiving negative feedback donated more than those receiving positive feedback, the lack of significant mood effects suggests that the compensation may not be strictly hedonic in

nature. This notion adds a wrinkle to some theories of prosocial behavior, which view such behaviors as a source of general affective relief (e.g., NSR). The independent effect of uncertainty in study four (as well as studies prior), indicates that people also seek to rectify a deficit of self-information. These feelings of uncertainty may not have been reflected in the traditional mood measures used in the current studies. It may be useful for subsequent studies to attempt to measure feelings of uncertainty, both as a manipulation check, and as a possible mediating variable. Future studies should also do a more comprehensive job of measuring moral self-evaluations, as these measures may have been influenced more than positive and negative affect.

Overall, study four found evidence for both an uncertainty reduction motivation, as well as a general compensatory motive. With regards to the compensatory motive, study four replicated previous studies finding that when a helping act is relatively costly, as with monetary donations, negative personal information promotes more helping than positive information (Sachdeva, Iliiev, & Medin, 2009). Going beyond previous research, study four demonstrated an effect of uncertainty regardless of feedback valence, finding that participants receiving more ambiguous feedback donated more to charity.

GENERAL DISCUSSION

The motivational underpinnings of moral behavior have been studied from many different angles, focusing on intentions as diverse as monetary self interest (e.g., tax credits; Reddy, 1980) and genuine empathic concern (Batson, 1998). The current paper proposes a novel approach, borrowing components from previous research on self-verification and -enhancement motives. This approach suggests that helping behaviors possess self-informational properties, revealing to the actor that he or she is the type of person that engages in such acts of good will. This attribution, casting oneself in the role of the Samaritan, contributes to a more positive self image and helps to rectify a deficit of self-knowledge. The current research takes the first steps towards verifying this perspective, demonstrating that a salient lack of self-information can inspire prosocial behavior. More precisely, the research transcribed above demonstrated that uncertainty about one's prosocial qualities motivated helping.

The primary methodological strategy used by the above studies was isolating the effect of uncertainty from the participants' more general self-evaluations, and assessing its impact on helping. Study one took a correlational route, measuring the impact of uncertainty about one's generosity. This study found that this uncertainty, holding generosity itself constant, related positively to one's volunteering habits. In short, participants more uncertain in their generosity tended to volunteer more. The remainder of the studies expanded on study one using experimental methods.

Studies two through four utilized a false personality feedback paradigm to manipulate participants' uncertainty about their compassionateness. Although a variety of procedures were used, each study employed the tactic of including accurate personality feedback along with the false feedback in order to increase the test's sense of dissimulated psychological truth. Study two utilized a sham IAT in order to present participants with feedback about compassionateness.

Participants receiving uncertain feedback were more likely to agree to help the experimenter by filling out additional questionnaires in the future. Further, uncertain participants had more difficulty ignoring words related to helping during a subsequent color-naming task. This finding indicates that uncertainty increases prolonged cognitive activation of helping-related concepts, a phenomenon that seems to underpin behavioral effects. Indeed, study two's data were consistent with this meditational model of uncertainty predicting response times to helping-related words, which in turn predicted helping.

Study three built on the previous results, expanding the findings into the realm of negative uncertainty. Towards this end, participants were told they were not compassionate, with certainty or uncertainty. The results of study three demonstrated that negative uncertainty had a similar effect on helping to that of positive uncertainty. Participants made to feel uncertain about being non-compassionate were most helpful, while certain participants helped less than controls. This suppression of helping in the certain condition replicated a trend found in study two, in which certainty marginally decreased agreement to help. In addition to expanding into negative self-evaluations, study three used a more transparent behavioral helping measure: picking up pens that a confederate had tipped onto the ground.

The results from study three also represent a significant divergence from traditional models of moral self-regulation (Cialdini et al, 1987; Sachdeva, Iliev, & Medin, 2009). Study three's non-compassionate certain feedback offered the strongest evidence to participants about their lack of a prosocial trait, a condition that motivated the least helping. Models positing only a self-repair function for moral behavior would predict that this negative-certain condition should inspire the greatest amount of helping. Participants in study three, however, seemed to feel that helping after such feedback would not be worthwhile, perhaps because there was little they could do in the face of such certain feedback.

Finally, study four included both positive and negative compassion feedback in order to compare their relative effects, as well as explore a potential interaction between uncertainty and the valence of feedback. Helping, in study four, required a more tangible sacrifice from participants, as they were asked to donate cash to a fire relief fund. This study revealed that uncertainty increased donations independent of the valence of feedback. There was also a separate effect for feedback valence, as participants made to feel non-compassionate helped more, a finding that supports previous thought regarding prosociality's self-enhancing function.

The present studies measured prosociality several ways, from self-reported volunteerism to actual charitable donation. In addition, they spanned correlational and experimental methodologies, both measuring and manipulating uncertainty about moral characteristics. But while these studies varied greatly in how they tapped into the concepts of uncertainty and helping, they are united by a common finding: they demonstrated that uncertainty increased prosocial behavior, while certainty decreased it. Therefore, the findings from the present studies provide evidence documenting a self-signaling motivation for prosocial behavior. In addition, some findings generated in the course of the current research are applicable to previously established self-regulatory models for prosocial behavior.

Study one evidenced a self-verification motivation, finding that self-reported generosity was correlated with higher rates of volunteering. Methodologically, this was the only study geared towards uncovering a self-verification effect, as the subsequent studies did not measure participants' preconceived notions about possessing prosocial and moral characteristics. It is therefore difficult to tell how the false feedback would have interacted with the participant's previous self-view. This shortcoming is described in greater detail in the coming section dealing with limitations and future directions.

Study four uncovered a self-enhancement effect. In this study, participants receiving negative feedback about possessing a prosocial characteristic donated more than those who received positive feedback. This result indicates that, in study four, participants helped in order to rectify a momentary drop in positive self-regard concerning prosociality (or helped less because they felt they had enough moral credentials). From a more general standpoint, all four studies found self-enhancement effects in the sense that, in some conditions, they demonstrated an increase in a behavior that carries positive information about the self. This finding reflects the notion that self-signaling tends to work in conjunction with self-enhancement. However, the current studies did not find evidence for self-enhancement in terms of negative state relief.

Positive and negative affect were measured in studies three and four. Although study three found that negative personality feedback impacted participants' mood, this effect could not fully account for changes in helping behavior. An effect of mood on helping was also absent in study four. These mood results indicate that helping was not solely motivated by a desire to repair a negative mood. They instead suggest that the primary motivator was uncertainty about the self. The present studies, however, did not measure self-reported uncertainty or participants' self-evaluations regarding prosociality. Although the effect of uncertainty was consistent across studies, finding that helping increased both self-rated prosociality and self-rated certainty would assist in the interpretation of the current findings. These limitations are addressed more comprehensively in the following section.

Limitations and Future Directions

In order to manipulate uncertainty, the present studies used a variety of methods to present participants with convincing false feedback about their personality. Although feedback was veiled in different ways, this general method of manipulating the participants' sense of

compassionateness was employed by all three experimental studies. From a methodological standpoint, the current studies were therefore limited in their use of a single manipulation of moral certainty and uncertainty. Although participants did not question the veracity of the compassion feedback, and the studies for the most part achieved their hypothesized effect on behavior, further explorations using alternative uncertainty manipulations would be useful.

An emerging psychological literature dealing with uncertainty provides a freshet of new manipulations designed to create feelings of self doubt. For example, Briñol and Petty (2003) have successfully manipulated uncertainty by having participants write about themselves with their non-dominant hand. These personal descriptions look shaky and tenuous, and thus create uncertainty in the writer. As this manipulation already deals with self-evaluations and is not especially difficult to make use of, it could prove useful in studies similar to the current ones. Most importantly, converging results stemming from this handwriting uncertainty manipulation would help confirm that the effects in the present studies were indeed caused by uncertainty.

As a whole, the current studies found sparse evidence for a self-verification motivation. While this lack of support may be driven by actual differences in how prosocial behavior is motivated, a large portion is likely due to the fact that these studies simply weren't constructed in a manner that allowed for conclusions to be made about a self-coherency motivation. For example, consider the finding from study four showing that those receiving positive-certain feedback donated the least. This finding is difficult to reconcile under a self-verification framework, as such feedback should have provided a strong basis to self-verify and by doing so, donating a relatively large amount to charity. On the other hand, donating money to charity can be seen as the most costly of the moral measures employed by the current research. In fact, previous research has used donation as a measure specifically because it has a tangible personal cost, and thus may decrease as participants accrue counterbalancing moral credit (Sachdeva,

Iliev, & Medin, 2009). It may have been difficult for the self-verification motive to overcome the monetary cost involved in verifying and compete with a condition in which participants were feeling a deficit positive self-regard. In order to both provide a better chance of documenting a self-verification effect, and place study four in a context more similar to that of its preceding studies, a replication with less costly moral behaviors may be in order.

Additional conclusions about self-verification are especially speculative due to the lack of data on self-evaluated prosociality collected prior to the experimental manipulations. A hallmark of self-verification studies is that participants are split along a self-evaluative measure, usually self-esteem. Participants then behave in ways that tend to confirm their preconceived self-notions. I unfortunately lacked the foresight to include such a priori measures of self-rated compassion, and thus could only assume that all participants held a similar self-view prior to the study, which did not interact with the feedback they were presented with. Natural variability in this measure, however, may have caused additional noise in the data, or even skewed it in one direction or another. Studies inspired by the current research would be well advised to include a priori measures of self-evaluated compassion. This concern is indicative of a more general limitation of the current studies, that they not only lacked measures of self-evaluated compassion and uncertainty prior to the study, but also throughout the course of the study.

On the topic of measurement, it would be advisable for future studies to make a greater effort to measure compassion and uncertainty after the experimental manipulation. As a manipulation check, self-reported feelings of uncertainty would go a long way towards supporting the current findings, notably that it was indeed a sense of personal doubt that inspired helping. Previous research attempting to capture these feelings of uncertainty have had mixed results. For example, some have had success capturing uncertainty through self-report measures (Ashneel & Lievens, 2007; Van den Bos, 2001). Other research suggests such measurement of

uncertainty may prove difficult as some such feelings may exist as unconscious arousal (Proulx & Heine, 2008) that is difficult to produce self-reports about. Still, measurements aimed at capturing uncertainty created by the present manipulations would assist in ruling out the effect of a heretofore unspecified construct.

Measuring changes in self-evaluative certainty could also help illuminate the concept of diagnostic utility. Recall that self-signaling theorizes that good deeds can cause good feelings because they tell the actor that he or she possesses positive traits. In short, this diagnostic utility motivates good deeds and steers the actor away from selfish behavior. To verify that uncertainty indeed inspired actions that carried diagnostic utility, measured changes in certainty about compassionateness would be highly useful. Furthermore, prospective studies might also measure changes in subjective well-being, with the eventual goal of demonstrating that changes in certainty about possessing positive qualities mediate changes in happiness.

Finding that self-evaluative improvements mediate increases in subjective well-being would help to provide a more complete understanding of how moral behavior can cause happiness. Several experimental studies have demonstrated that acts such as helping another person pick up dropped items (Harris, 1977, study 3; Williamson & Clark, 1989), filling out additional questionnaires for an experimenter (Yinon & Landau, 1987) and spending money on others (Dunn, Aknin, & Norton, 2008) can lead to an increase in happiness. On the other hand, others have failed to find support for this relationship of moral behavior on mood (Harris, 1977, study 2; Batson et al, 1987; O'Malley & Andrews, 1983). This puzzling inconsistency may be reconciled by understanding the hedonic rewards of moral behavior as diagnostic utility. In other words, doing good causes happiness, because these do-gooders first experience an improved self-image.

If diagnostic utility is indeed a large source of the hedonic rewards derived from moral behavior, then the fragility of this effect is more easily reconciled. Diagnostic utility, as part of a self-informational process, requires that individuals attribute their moral behavior to their own desire to do good, and not some other extrinsic motivation. For instance, if participants felt like they were coerced into helping by the experimenter, they would have no reason to think better of themselves, and thus not feel any better. This process resembles a self-orientated version of Kelley's (1972) discounting principle, which states that people will only make inferences about an actor's characteristics when the actor's behavior is seen as unconstrained by the situation. Otherwise, the behavior's diagnosticity is discounted. In this case, however, both the actor and the one making the inference are the same person: the self. Studies of moral behavior and happiness must therefore strike a precarious balance. They cannot overtly force participants to do good as to avoid discounting and they cannot risk self-selection effects resulting from too many participants declining to help. Therefore, they must rely on small acts of compassion that are performed by most participants, but result in weak effects. A recent series of studies by Weinstein and Ryan (2010) illustrates this idea well, finding that forced helping does not improve well-being, while autonomous helping indeed has beneficial effects.

Studies that do demonstrate an effect of morality on mood appear to make use of processes that foster diagnosticity of the moral act. For instance, verbal praise (Deci, Koestner, & Ryan, 1999) and labeling individuals as helpful (Burger, 1999) ensure that participants update their self concepts as a result of helping. These individuals, with the positive diagnostic implications of their behaviors at the forefront of their mind, are likely to feel quite good. Perhaps this is why studies that do find an effect of moral behavior on mood involve an act that is more social in nature (e.g., Harris, 1977; Dunn, Aknin, & Norton, 2008), or an act for which

the participant is praised (Williamson & Clark, 1989). In order to reap the mood benefits of helping, it seems important that the helping behavior affects one's self-concept.

In addition to praise and labeling, manipulations that obfuscate the self-signaling impact of behaviors should be avoided in studies that seek to find empirical evidence for diagnostic utility. Most obviously, actual performance of the moral act is superior to mere agreement to do so, in causing participants to change their self-perceptions (Freedman & Fraser, 1966; Burger, 1999). This is not surprising if indeed people do observe their own actions to infer their beliefs and attitudes (Bem, 1972). Extrinsic rewards may undermine this process, as evidenced by studies that rewarded participants for their helpfulness. These studies tend to demonstrate no effect of helping on self-perceptions (Burger & Caldwell, 2003; Zuckerman, Iazzaro, & Waldgeir, 1979).

Even simple reflection about one's motives for doing good seems to get in the way of reaping the self-evaluative benefits of morality. Batson, Fultz, Schoenrade, and Paduano (1987) gave participants an opportunity to help an experimenter and then presented participants with a selfish reason for their helping by telling them that good deeds can cause personal happiness. Then some participants were instructed to spend a few minutes reflecting about their reasons for deciding to help the experimenter. These researchers found that asking participants to reflect on their reasons for helping caused them to rate themselves as less altruistic than helpers who did not reflect. Therefore it seems important that circumstances surrounding the helping act (e.g., self-reflection) do not impair this act's capability to convey information about the self.

Although the above tersely summarized self-perception literature points out the types helping acts that are most likely to improve happiness, it is no substitute for studies providing direct meditational evidence for diagnostic utility. Studies aiming to make a significant impact in understanding how moral behavior improves mood should strive to comprehensively measure

self-evaluations, certainty in these self-evaluations, and mood in response to helping. A more complete understanding of self-signaling and diagnostic utility can help illuminate the sometimes puzzling human inclination towards benevolence. Therefore, research aimed at building on the present studies would be well advised to include pre and post measures of certainty and self-rated prosociality in order to more fully capture the notion of diagnostic utility.

Improved measurement of self-rated prosociality and certainty would also help uncover the mechanisms at work in the current studies. While the present research demonstrated a consistent effect of uncertainty on moral behavior, how this effect works in considerably less clear. Study two suggested a cognitive mechanism, as positive uncertainty prolonged activation of helping-related ideas. It is still an open (and empirical) question, however, whether this cognitive activation mechanism is the only one at play, or whether it works in conjunction with others. The current studies measured negative affect, which proved a poor mediator. Self-reported feelings of uncertainty or negative and positive moral self-worth, however, may very well play a role in increasing helping. It would also be revealing if participants reporting greater amounts of negative affect *and* uncertainty displayed high levels of prosociality, as from a self-signaling perspective, these individuals had the most to gain from their good deeds. Improved measurement should likely provide efficacious in helping to reveal the motivational underpinnings of moral behavior.

The methodologies employed by the current studies, as well as their findings, may have implications for work on self-affirmation theory. As reviewed above, self-affirmation researchers have recently proposed that self-affirmation may play a part in increasing self-certainty. Therefore, future research may find that self-affirmation is more likely after threats that include an element of uncertainty. Such a finding would lend more direct support to the idea

that self-affirmations are effective, in part, in their ability to improve self-certainty about a desired trait.

The present research was careful to present participants with an opportunity to do a good deed directly after, or nearly directly after the false feedback regarding their moral characteristics. Given what is known about compensatory processes, a greater delay between feedback and the helping opportunity may have diminished the observed effects, or eliminated them entirely. For example, self-affirmation theory would suggest that threats to one's integrity could also cause rationalizations or self-affirmations of one's worth in other areas (Sherman & Cohen, 2006). Had participants engaged in such cognitions, the motivation to self-signal may have been diminished. While this is merely conjecture, further studies could easily test such ideas by presenting participants with an opportunity to self-affirm prior to helping. If indeed self-affirmation and self-signaling draw on the same threat to integrity, those in the self-affirmation condition should show decreased helping. Note, however, that the idea that self-signaling is a form of self-affirmation cannot fully account for increased helping after positive-uncertain feedback, as such feedback likely does not constitute a threat to self-integrity.

The current studies also bring up interesting questions about the role of uncertainty in motivating bad deeds. For instance, self-signaling theory posits that people prefer to reveal positive information about the self, and avoid obtaining negative information. Therefore, uncertainty may cause one to try extra hard to avoid doing bad, as any act could sway this uncertain self-evaluation. For instance, someone who is uncertain about how gluttonous he or she is may try especially hard to avoid overeating. However, a view that holds that uncertainty is aversive in and of itself might predict that uncertain people will behave immorally, if given a salient opportunity to do so – just to relieve the uncertainty. Given these diverging predictions, research measuring immoral behavior seems potentially highly efficacious. Sensitive measures

of cheating (Vohs & Schooler, 2008) and stealing (Mazar, Amir, & Ariely, 2009) are available to these prospective studies.

Conclusion

The current findings span multiple designs, including both experimental and correlational methods. As a whole, the results indicate that people 1) regularly lack an enduring sense of their moral self-worth and 2) are highly motivated to engage in prosocial behavior in order to self-signal to themselves that they possess this desirable trait.

By successfully supporting a series of counterintuitive predictions regarding the impact of uncertainty on prosocial behavior, the present set of studies offers the most compelling evidence to date for the existence of self-signaling as a fundamental human motivation. It appears that people will readily engage in behaviors in order to signal to themselves that they have desirable traits that they are uncertain of possessing. A striking aspect of this phenomenon is the fact that if individuals explicitly realized that they were engaging in self-signaling it would entirely defeat its purpose; the behavior would lose its value in signaling information about the individual's enduring moral character. These behaviors are motivated by self-signaling rewards, yet the actor must remain ignorant of this in order to maintain such a motivation. Therefore self-signaling may provide a compelling example of the intriguing but empirically elusive notion of self-deception (Gur & Sackheim 1979; Quattrone & Tversky, 1984 ; Paulhus, 2008).

Above all else, the studies presented above document the motivational potency of uncertainty. While doing so, they substantiate the premium individuals place on self-knowledge. Together, these notions speak to what is perhaps a fundamental paradox of human motivation. Personal uncertainty can be powerfully motivating through providing a salient, perhaps visceral, warning sign indicating entrance into the interstices of self-understanding. But at the same time

there is a cost to achieving self- knowledge: as it reduces uncertainty, it also reduces the motivation to engage in prosocial behaviors. In other words, self-certainty may pave the way for complacency. To know thyself may be a noble quest that is best if never fully realized.

TABLES

Table 1

Study 2 mean reaction times for helping and control words, as well as the difference between the two categories of words, displayed across experimental conditions

	<u>Condition</u>		
	Certain	Control	Uncertain
Word Type			
Helping	478.03 (48.92) ^a	486.02 (92.89) ^{ab}	518.35 (63.20) ^{b†}
Control	499.67 (74.64) ^a	479.29 (83.46) ^a	481.75 (60.42) ^a
Helping – Control	-21.64 (48.81) ^a	6.72 (66.37) ^{ab}	36.60 (46.97) ^b

Note. Standard deviations are in parentheses. Within each row, means not sharing a common superscript differ significantly according to planned contrasts, $p < .05$; $† p = .068$.

Table 2

Study 3 mean pens rescued, and negative affect across experimental conditions

	<u>Condition</u>		
	Certain	Control	Uncertain
Pens	5.00 (1.81) ^a	8.50 (1.62) ^b	11.17 (2.13) ^c
Negative Affect	1.47 (.37) ^b	1.17 (.19) ^a	1.34 (.27) ^{ab}

Note. Standard deviations are in parentheses. Within each row, means not sharing a common superscript differ significantly according to planned contrasts, $p < .05$

FIGURES

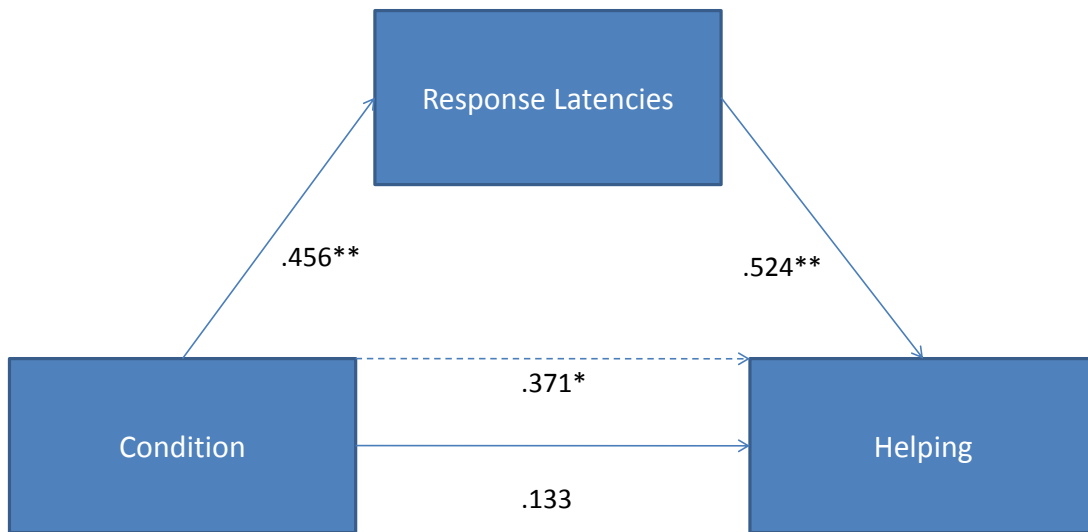


Figure 1. Study 2 meditational results. This model suggests that uncertainty causes increased thoughts about helping, which in turn causes more helping agreement.

Note. Condition X Latency path is $\beta = .24$, 95% CI [.09, .41]

* $p < .05$; ** $p < .001$

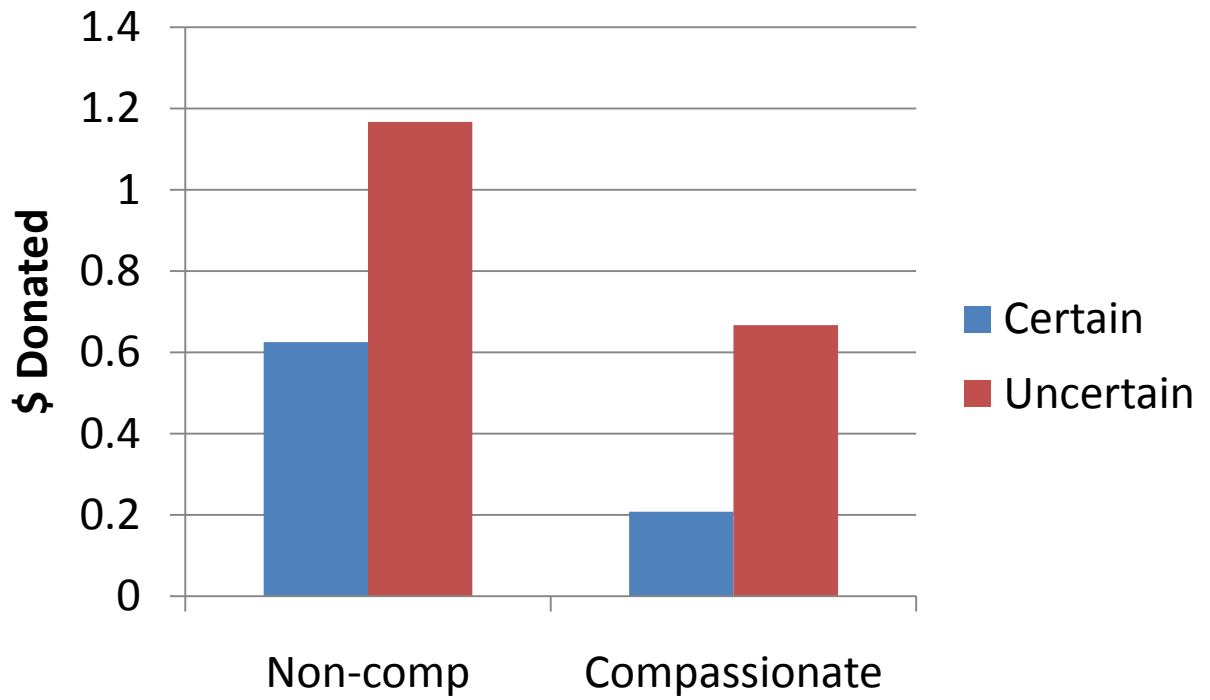


Figure 2. Study 4 analysis of variance results depicting amount of money donated, broken down by uncertainty and valence of feedback conditions.

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APPENDICES

Appendix A

Example Personality Questions:

I see myself as someone who is talkative.

I see myself as someone who tends to find fault with others.

I see myself as someone who can be somewhat careless.

I see myself as someone who is relaxed, handles stress well.

I see myself as someone who is curious about many different things.

I see myself as someone who starts quarrels with others.

I see myself as someone who is outgoing and enthusiastic.

I see myself as someone who generates a lot of enthusiasm.

I see myself as someone who has a forgiving nature.

I see myself as someone who worries a lot.

I see myself as someone who is generally trusting.

I see myself as someone who tends to be lazy.

I see myself as someone who is emotionally stable, not easily upset.

I see myself as someone who has an assertive personality.

Response scale:

1 – disagree strongly

2 – disagree a little

3 – neither agree nor disagree

4 – agree a little

5 – agree strongly

Appendix B

Words used in study 2 response inhibition task.

Helping-related words

volunteer, charity, need, gift, assist, save, revive, contribute, donate, offering, altruism, generosity, goodwill, samaritan, hero, guard, advise, provider, benefactor, give,

Control words

container, exhaust, find, gate, import, pull, govern, investment, aspire, calendar, archaism, relaxation, gossamer, sandpaper, item, brain, inform, planners, irrigation, pile

Appendix C

Feedback Form

About the last phase of the study

The device you were hooked up to was designed to read physiological measures of emotion and feeling. The device records heart rate, organizes and then stores this data. These readings are then compared with the times during which the different slides were viewed. The computer then uses an experimental program to analyze your physiological response in reaction to the time series of the slides. It then computes your level of compassion in relation to other measures.

Results

The results of this study indicate that you are a non-compassionate person.

In general, non-compassionate people tend to care about the outcomes of other people less than the average person. They are not especially generous, cooperative, responsible, considerate, and helpful. The feelings they exhibit in response to emotional situations are less than that of average people.

Accuracy/Certainty

The program used to calculate your compassion score is not always perfectly accurate. Some responses are more difficult than others to code and calculate.


The certainty rating of your score is 97%.

For comparative purposes:

- A certainty rating above 90% indicates high certainty about your score
- A certainty rating between 70 and 90% represents a strong level of certainty.
- A certainty rating between 50 and 70% represents some predicative validity
- A certainty rating below 50% represents low certainty, the computer was mostly unable to estimate your compassion score.

Appendix D

Human Ethics Approval

		<p>The University of British Columbia Office of Research Services Behavioural Research Ethics Board Suite 102, 6190 Agronomy Road, Vancouver, B.C. V6T 1Z3</p>	
CERTIFICATE OF APPROVAL - FULL BOARD			
PRINCIPAL INVESTIGATOR: Steven J. Heine		INSTITUTION / DEPARTMENT: UBC/Arts/Psychology, Department of	UBC BREB NUMBER: H09-02466
INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:			
Institution N/A		Site N/A	
Other locations where the research will be conducted: University of California Santa Barbara			
CO-INVESTIGATOR(S): Jason Chin			
SPONSORING AGENCIES: University of British Columbia - "The Pursuit of Happiness: A Self-Signaling Account of Prosocial Behavior"			
PROJECT TITLE: Personality and Motivation			
REB MEETING DATE: October 8, 2009		CERTIFICATE EXPIRY DATE: October 8, 2010	
DOCUMENTS INCLUDED IN THIS APPROVAL:			DATE APPROVED: October 16, 2009
Document Name		Version	Date
Consent Forms:			
Heart rate study consent		1	September 17, 2009
Heart rate for reaction time study		1	September 17, 2009
Advertisements:			
Website descriptioni		1	September 17, 2009
Questionnaire, Questionnaire Cover Letter, Tests:			
Request for help 1		1	September 17, 2009
Mood measure		1	September 17, 2009
Feedback forms		1	September 17, 2009
ten item personality inventory		1	September 17, 2009
Mass Questionnaire		1	September 17, 2009
Other Documents:			
Deception form		1	September 17, 2009
Debriefv2		2	October 11, 2009
The application for ethical review and the document(s) listed above have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human subjects.			
Approval is issued on behalf of the Behavioural Research Ethics Board and signed electronically by one of the following:			
_____ Dr. M. Judith Lynam, Chair Dr. Ken Craig, Chair Dr. Jim Rupert, Associate Chair Dr. Laurie Ford, Associate Chair Dr. Anita Ho, Associate Chair			