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Errors in Moral Forecasting: Perceptions of Affect Shape the Gap Between Moral Behaviors and Moral Forecasts

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Abstract

Research in moral decision making has shown that there may not be a one-to-one relationship between peoples' moral forecasts and behaviors. Although past work suggests that physiological arousal may account for part of the behavior-forecasting discrepancy, whether or not perceptions of affect play an important determinant remains unclear. Here, we investigate whether this discrepancy may arise because people fail to anticipate how they will feel in morally significant situations. In Study 1, forecasters predicted cheating significantly more on a test than participants in a behavior condition actually cheated. Importantly, forecasters who received false somatic feedback, indicative of high arousal, produced forecasts that aligned more closely with behaviors. In Study 2, forecasters who misattributed their arousal to an extraneous source forecasted cheating significantly more. In Study 3, higher dispositional emotional awareness was related to less forecasted cheating. These findings suggest that perceptions of affect play a key role in the behavior-forecasting dissociation.

Keywords

morality, emotions, affective experience, moral forecasting, moral behavior

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> But the relations between thought and action are very far from being as simple as is commonly supposed.
>
> —Jean Piaget (1932/1997, p. 176)

Within the past several decades, social psychology has welcomed an ever-growing body of research on morality. Both intrinsically fascinating and consequential in nature, moral psychology has gained a great deal of popularity—so much so that one would be hard pressed to find a psychologist who is not familiar with the classic trolley dilemma (Foot, 1967). For years, then, study participants have been imagining themselves smothering crying babies, pushing men off bridges, and diverting trolleys toward people tied down to train tracks, in an attempt to help psychologists understand the mechanics of morality. Although these studies have helped us learn a great deal about the basic processes involved in moral reasoning, it is not entirely clear how individuals' responses to hypothetical moral dilemmas map onto real-life moral decision making. In other words, do individuals' predicted moral behaviors map on to their actual moral behaviors?

Overwhelmingly, the answer seems to be "no." Classic research on attitudes as well as more contemporary research on moral forecasting suggest that individuals' forecasts, or predictions about what they might do, may not accurately reflect their actual behaviors (Blasi, 1980; FeldmanHall et al., 2012; Festinger, 1957; LaPiere, 1934; Teper, Inzlicht, & Page-Gould, 2011). But why is this the case? And more importantly, what can we do to align individuals' moral forecasts more closely with their behaviors? We hypothesize that the affective intensity of morally significant situations is underestimated during moral forecasts. Consequently, the discrepancy between moral forecasting and moral behavior should be reduced to the degree that affect is subjectively experienced and considered during the moral forecasting process and exacerbated when affect is dampened or falsely attributed to an unrelated source.

Moral decision making involves forming judgments about or acting in accordance with what one considers "right" and "wrong." For the purposes of the current paper, we focus specifically on moral decision making in the domains of

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harm and fairness, as these are the moral foundations that seem to be most widely endorsed (Haidt & Graham, 2007). The goal of the current article is to further clarify why people's moral actions do not always match their predictions. We hypothesize that differences in the intensity of the affective experience is one key to understanding this process, and we examine this in terms of experimentally manipulated perceptions of affective experience and individual differences in emotional awareness—the extent to which people are able to identify and describe their emotional states (Bagby, Parker, & Taylor, 1994).

Although some of our past work has highlighted that a discrepancy in physiological arousal is a key factor in the behavior-forecasting gap (Teper et al., 2011), in the current article, we extend this work to test the hypothesis that the difference in physiological arousal observed in our previous study was a response to the perceived affective experience of being immersed in a moral dilemma. In particular, we aimed to more comprehensively explore the role of affective experience in the relationship between peoples' moral forecasts and behaviors. Because affective experience is thought to consist of several important, yet often dissociable, components (e.g., Mauss, Levenson, McCarter, Wilhelm, & Gross, 2005), including physiology, appraisals, and subjective experience (Russell, 2003), we wondered whether the affective processes that explain the behavior-forecasting gap might extend beyond mere physiological arousal. Specifically, we were interested in testing whether perceptions of affect might play a unique role in the discrepancy between people's behaviors and forecasts.

Why Behaviors Do Not Always Reflect Attitudes

Understanding the way in which individuals arrive at moral judgments sheds light on the broader scope of individuals' beliefs about what is right and wrong. Moreover, it should help to shed light on how people actually behave in morally relevant situations. However, decades of research imply that there exists a significant discrepancy between individuals' beliefs and individuals' actions (Festinger, 1957; LaPiere, 1934), suggesting that we cannot completely rely on people's reasoning about hypothetical moral dilemmas to tell us about real-life moral behavior (Blasi, 1980).

Perhaps most notably, work on cognitive dissonance has shown that individuals often engage in behavior that is incongruous with their attitudes (Festinger, 1957). Empirical evidence for this theory existed as early as the 1930s. In one field study, although 92% of hotel personnel said they would deny accommodations to Chinese guests when asked over the phone, almost no one denied Chinese guests in person (LaPiere, 1934). Recent work in the field of moral psychology reflects these ideas quite closely and has found that peoples' moral judgments do not predict their behavioral intentions (Tassy, Oullier, Mancini, & Wicker, 2013), that responses to hypothetical moral dilemmas do not match with behaviors in virtual reality contexts (Patil, Cogoni, Zangrando, Chittaro, & Silani, 2014), and perhaps most notably that peoples' moral forecasts are often incongruous with their behaviors in actual moral dilemmas (Epley & Dunning, 2000; FeldmanHall et al., 2012; Teper et al., 2011). In short, a plethora of research gives us good reason to believe that predictions about one's behavior might not reflect actual behavior.

Several theorists have proposed reasons for this dissociation, such as self-serving biases (Pronin, Lin, & Ross, 2002) and limited contextual information (FeldmanHall et al., 2012). However, an ever-growing body of recent research suggests that affective processes may also play an important role in the relationship between actual and hypothetical decision making.

The Role of Affect in the Attitude–Behavior Discrepancy

Perhaps most applicable to the current work is a recent study that examined the relationship between actual and forecasted moral behavior, finding that individuals who had the chance to cheat when trying to win a monetary prize cheated significantly less than participants who were asked to forecast their cheating behavior in the same situation (Teper et al., 2011). Interestingly, this discrepancy between forecasts and actual behavior was accounted for by differences in physiological arousal—as assessed by skin conductance and various measures of cardiac responsivity—such that individuals predicting their behavior forecasted cheating more because they exhibited lower levels of physiological arousal than participants who were immersed in the moral dilemma.

Related research on affective forecasting has found that individuals have poor insight about their future affective states. For example, people tend to overestimate their negative affect after certain events such as romantic breakups, being denied tenure, and moving to an undesirable location (Wilson & Gilbert, 2003, 2005). In other words, individuals may forecast responding to a hypothetical situation with one emotion, when in actuality, they will respond with a different emotion. Thus, if emotions are important for driving actions (Loewenstein, 1996; Loewenstein, Weber, Hsee, & Welch, 2001; Zeelenberg, Nelissen, Breugelmans, & Pieters, 2008), it is easy to see why individuals might not be able to accurately predict their moral behavior. Essentially, if people cannot predict how they will *feel* in a given situation, it seems unlikely that they would be able to predict how they will *act*.

Research on the somatic markers hypothesis has similarly discussed the importance of affect for decision making. This work has shown that physiological responses to risky stimuli precede the behavioral decision to avoid those stimuli, and people who do not exhibit heightened physiological arousal to risky stimuli are unsuccessful at determining risk (Damasio, 1994). Related work on the hot–cold empathy

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gap—a bias that causes people to underestimate the role of visceral experience in decision making—has repeatedly found that people fail to appreciate the extent to which affective experiences fuel behaviors (Joel, Teper, & MacDonald, 2014; Van Boven, Loewenstein, & Dunning, 2005). For instance, during states of "low-craving," smokers tend to underestimate the extent to which their future cravings will influence their behavior (Sayette, Loewenstein, Griffin, & Black, 2008). It seems then that errors in behavioral forecasting may reflect an inability to access the intense emotional states inherent to real-life situations.

Emotions and Moral Actions

There is good reason to believe that emotional experience is instrumental in driving moral behavior (see Teper, Zhong, & Inzlicht, 2015 for review). Emotions serve an informational (Schwarz & Clore, 1983, 1988) and motivational role (Frijda, 1986; Tomkins, 1982; Zeelenberg & Pieters, 2006) in moral decision-making contexts (Mazar, On, & Ariely, 2008). While the cognitive experience and evaluation of an emotional state may provide an individual with information to act (Schwarz, 2001), the visceral experience of the emotion may serve as an additional motivator for action (Damasio, 1994; Loewenstein, 1996; Zeelenberg et al., 2008). For instance, for an individual about to cheat, the recognition of guilt provides information that cheating is morally wrong, and the visceral experience of guilt may serve as motivation, because individuals are typically motivated to avoid such negative affect (Cialdini, Darby, & Vincent, 1973; Cialdini et al., 1987). For instance, both induced and self-reported guilt have been associated with increases in prosocial behavior (de Hooge, Nelissen, Bruegelmans, & Zeelenberg, 2011; Gino & Pierce, 2009).

The results of recent experiments suggest that emotions or affective experiences not only influence real-life moral decision making in general, but that they can also, under some circumstances, motivate people to do the "right thing" (Teper et al., 2015). For instance, participants who experience more physiological arousal cheat significantly less for monetary gain (Teper et al., 2011) and also intervene more quickly in emergency settings (Gaertner & Dovidio, 1977), presumably because they are motivated to relieve the feelings of distress. Further research suggests that participants act more morally when they are simply led to believe that they are physiologically aroused, supporting the notion that affective experience can serve as information (Gu, Zhong, & Page-Gould, 2013). Because the results of such studies suggest that individuals rely heavily on affective cues when engaging in real-life moral decision making, we hypothesized that manipulating perceptions of affect during forecasting should influence moral forecasts. Specifically, we predicted that introducing or removing affect should produce forecasts that are more or less moral, respectively, to the extent that affective experience drives moral behavior in the specific situation at hand. Although past work has provided clues about the nature of the dissociation between moral forecasts and behaviors, suggesting that differences in physiological arousal may play a role (Teper et al., 2011), whether or not perceived affective experience is a significant determinant remains an open question.

The Facets of Emotional Experience

The current consensus in emotion research is that emotions consist of three main components: subjective experience, changes in physiological arousal, and behavioral expression (Ekman, 1992; Izard, 1977; Lang, 1988; Lazarus, 1991; Levenson, 1994; Scherer, 1984; Tomkins, 1982). From a theoretical standpoint, some emotion theorists have argued for a constructionist view of emotions, highlighting the importance of both automatic and deliberate appraisals (Lazarus, 1991), awareness (Russell, 2003), and attributions (Schachter & Singer, 1962; Schwarz & Clore, 1983) above and beyond mere valence and arousal (Lindquist, Siegel, Quigley, & Barrett, 2013). Importantly, research is beginning to suggest that there may be little coherence among the various emotional facets (Barrett, 2006; Mauss et al., 2005; Mauss & Robinson, 2009; Schachter & Wheeler, 1962). These findings are further corroborated by work showing that physiological and behavioral expression of affective states can occur without conscious experience of the affective state (Winkielman & Berridge, 2004; Winkielman, Berridge, & Wilbarger, 2005; Zemack-Rugar, Bettman, & Fitzsimons, 2007). Thus, if we are interested in discerning the role that emotions play in the relationship between moral behaviors and forecasts, it is important to study all aspects of the emotional experience.

To date, research has focused on the role that physiological correlates of emotion play in the relationship between moral behaviors and moral forecasts. It remains unclear, however, whether physiological reactions to real-life moral scenarios directly produce the discrepancy between action and forecasts (e.g., a faster heartbeat directly stops a person from cheating), or whether appraisal and awareness also play a role (e.g., a person notices the increase in heart rate and decides not to cheat). Here, we aimed to delve deeper into the role of affective experience in the behavior-forecasting gap by examining several key constituents of emotion, namely, perceptions and attributions of affective experience (Schachter & Singer, 1962; Weiner, 1985), as well as emotional awareness (Russell, 2003). We not only manipulated perceptions of affect to see whether this would shift individuals' moral forecasts toward or away from actual moral behavior but also examined whether people who are more subjectively aware of their emotions would exhibit more congruence between their moral forecasts and moral behavior.

Overview of Experiments

Through a series of three studies, we explore the nature of the dissociation between moral action and moral forecasting

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by investigating the role that perceptions of affective experience play in this relationship. Here, we define "perceptions of affective experience" as the awareness and interpretation of affective cues. In Studies 1 and 2, we test the dissociation between behaviors and forecasts with a math task on which participants have the chance to cheat or forecast cheating. Critically, we also test our hypothesis that perceptions of affect play a causal role in moral forecasting by experimentally manipulating these perceptions. In Study 1, we explore how manipulating perceived arousal influences moral forecasting by providing participants with false somatic feedback. In Study 2, we explore how explicitly manipulating attributions of affect influences participants' moral behaviors and forecasts by cuing participants to attribute their arousal to an extraneous source. Finally, in Study 3, we investigate whether subjective, self-reported differences in affective experience influence moral behaviors and forecasts. We do this by exploring how individual differences in emotional awareness, as measured by trait alexithymia, moderate the relationship between moral behavior and moral forecasting.

Study 1

Past work has suggested that the dissociation between moral actions and moral forecasts is driven by differences in physiological arousal (Teper et al., 2011). It remains unclear, however, whether this effect is attributable to the physiological arousal itself or, at least in part, to the accompanying perception of the affective experience. In Study 1, we wondered whether experimentally manipulating participants' perceptions of physiological stress would affect their moral forecasts. Because emotions provide us with information about our current situation (Schwarz & Clore, 1988) and because we often use these feelings when making judgments and decisions (Schwarz & Clore, 1983), we wondered whether we could align individuals' moral forecasts more closely to real-life behaviors by providing participants in a forecasting condition with false somatic feedback. Somatic feedback has been previously linked with increases in self-directed attention (Fenigstein & Carver, 1978). In another study, false somatic feedback indicative of arousal resulted in increased prosocial behavior (Gu et al., 2012), presumably because individuals used this feedback as information about their current state (Schwarz & Clore, 1988). As such, we predicted that participants who received somatic feedback that signaled a state of high arousal would produce moral forecasts that more closely matched moral behaviors. If such feedback influences participants' responses, this would suggest that perceptions of affective experience play an important role in moral forecasting. For this study, we used a math task paradigm as our measure of moral behavior/forecasting on which participants had the chance to cheat or forecast cheating (Teper & Inzlicht, 2011; Teper et al., 2011).

Method

One hundred twenty-six participants were recruited for this study from the University of Toronto Scarborough for course credit. We had planned to stop data collection at the end of the semester. On arrival, each participant was led to a computer station in a cubicle. Two participants were excluded from all analyses because they guessed the purpose of our experiment, and an additional participant was excluded because he or she questioned the authenticity of the heartbeat audio. Finally, two participants had missing data. Including these participants did not statistically change our results. This left 121 participants in the sample (72% female, M_{age} = 18.57). Participants were randomly assigned to one of three conditions in a between-subjects design: (a) moral action, (b) moral forecasting with normal heartbeat, or (c) moral forecasting with fast heartbeat. In the moral action condition, participants completed a math task on which they had the chance to cheat. Participants in this condition were not provided with any somatic feedback. Participants in the forecasting conditions had to predict their behavior for this same moral dilemma. In the forecasting conditions, participants were also asked to test the volume and clarity of an ostensible heart monitor for an unrelated study, which included a bogus electrode that was attached to their non-dominant inner wrist and a headset. To manipulate perceived heartbeat, we played a prerecorded heartbeat sound through the headset. Participants were told that they were listening to their own heartbeat. Participants in the normal heartbeat condition listened to a heartbeat of 60 beats/min, whereas participants in the fast heartbeat condition listened to a heartbeat of 96 beats/min. These two paces were selected according to the American Heart Association's (2012a, 2012b) definition of relaxed and high heart rates. Participants were asked to listen to this heartbeat audio while completing the moral forecasting part of the experiment. Finally, participants were also asked to complete several personality questionnaires.[1]

Math task. Participants assigned to the action condition were required to complete a math test on the computer consisting of 15 simple but tedious arithmetic problems (e.g., 45 + 679 + 8 + 11 + 234 + 50 − 71 − 1 − 524 − 25 = ?) without the use of pencil or paper. Participants were informed of a "glitch" in the software such that pressing the spacebar would reveal the answer to the current math problem on the screen. We then told participants, "Although we have no way of knowing whether or not you press the spacebar, we would really appreciate your honest participation." In reality, key presses were recorded. Finally, we informed participants that they would be rewarded with $5 CAD if they answered 10 or more questions correctly. In the two forecasting conditions, we presented each of the 15 math questions to participants on the computer and asked them to indicate whether or not they would reveal the answer to each question, one by one. In essence, the participants in the forecasting condition

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completed the exact same task as the participants in the action condition. However, instead of inputting an answer to each question into a textbox, the forecasters had to click on a "yes" or "no" button to indicate their intention to cheat. They did not have to answer the math questions. The similar nature of the actual and hypothetical versions of the math task reduces the possibility that forecasting errors would result due to a lack of contextual information (FeldmanHall et al., 2012).

Results

The main objective of Study 1 was to explore the influence that providing somatic feedback might have on participants' moral forecasts. We conducted a Poisson regression because our outcome variable was a count of the number of math problems on which people cheated or forecasted they would cheat and, thus, was Poisson-distributed and not normally distributed. Cheating behavior was regressed on condition as our predictor term. Given that condition was a three-level categorical variable (i.e., moral forecasting with high heart rate, moral forecasting with relaxed heart rate, moral action), we used the model comparison approach formalized by Cohen and Cohen (1983, Chapter 4) that yields chi-square statistics to test the significance of the category. Consistent with past findings, our results revealed an overall effect of condition on cheating/predicted cheating, *Wald* $\chi^2 = 56.37$, $p < .001$, $V = .48$. We had used contrast coding for the condition variable to conduct a priori contrasts, revealing not only that participants in the action condition cheated significantly less ($\lambda = 1.19$) than participants in the two forecasting conditions taken together ($\lambda = 3.34$), $b = 1.06$, $SE = .15$, *Wald* $\chi^2 = 48.48$, $p < .001$, 95% confidence interval (CI) = [0.76, 1.36], $d = 1.64$, but also that participants in the normal heartbeat condition predicted cheating significantly more ($\lambda = 3.89$) than participants in the fast heartbeat condition predicted cheating ($\lambda = 2.78$), $b = -0.34$, $SE = .13$, *Wald* $\chi^2 = 6.71$, $p = .01$, 95% CI = [−0.59, −0.08], $d = 0.48$ (Figure 1). Interestingly, participants in the fast heartbeat condition still predicted cheating significantly more than participants in the action condition actually cheated, $b = -0.85$, $SE = .18$, *Wald* $\chi^2 = 23.55$, $p < .001$, 95% CI = [−1.20, −0.51], $d = 0.98$. See Table 1 for means and *SD*s of cheating across conditions. Taken together, the results of this study imply that providing participants with somatic feedback that signals a state of high arousal serves to significantly reduce the gap between forecasting and behavior but that it does not completely eliminate the action-forecasting discrepancy.

Discussion

Our findings in Study 1 suggest that although participants tend to predict behaving less morally than they might actually behave in a moral dilemma, their moral forecasts can be influenced to more closely match actual behavior when they are provided with somatic information indicative of physiological arousal. These findings provide evidence for the critical role of perceived affective experience in the relationship between moral behaviors and forecasts. In other words, it seems that manipulating perceived affect divorced from actual physiology is sufficient in influencing individuals' moral forecasts. This idea is corroborated by preliminary research, which has found that false somatic feedback does not alter individuals' actual somatic experience (Gu, Zhong, & Page-Gould, 2013). Interestingly, we also observed a significant difference between participants' moral behaviors and their counterparts' moral forecasts in the fast heartbeat condition. This finding suggests that even when forecasters perceive affective experience that more closely mirrors the affect inherent to actual moral dilemmas, this may not be sufficient in completely eliminating the behavior-forecasting discrepancy.

The idea that experiencing an actual moral dilemma versus predicting one's behavior in a moral dilemma might elicit different affective states has until now only been supported with physiological data (Patil et al., 2014; Teper et al., 2011). The results of Study 1 suggest that these discrepancies may reflect more than mere physiology. Because participants' forecasts were significantly influenced by the type of somatic feedback they received, we can posit that perceptions of affective experience also play an important role in moral

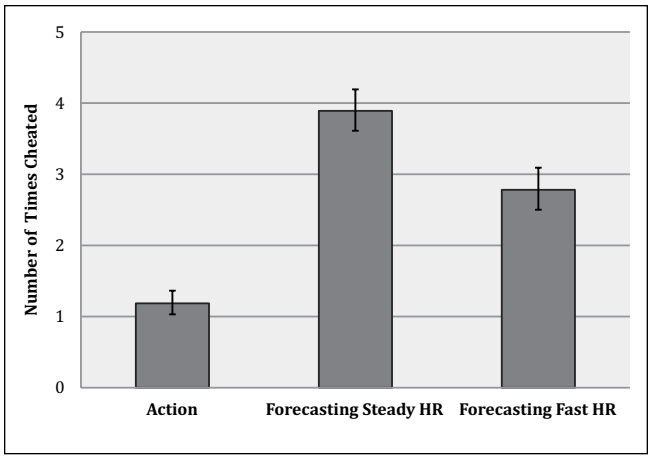

Figure 1. Mean number of times cheated/forecasted cheating as a function of condition.
Note. HR = heart rate.

Table 1. Means and *SD*s for Times Cheated/Forecasted Cheating in Study 1, Across Conditions.

Condition	*M*	*SD*
Action	1.19	3.02
Steady HR Forecasting	3.89	4.79
Fast HR Forecasting	2.78	4.01

Note. HR = heart rate.

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forecasting. In Study 2, we aimed to further explore the way in which perceived affect shapes the moral behavior–moral forecasting relationship by manipulating participants' attributions of affective experience.

Study 2

In Study 1, we found preliminary evidence for the hypothesis that changes in perceived affective experience serve to align individuals' moral forecasts more closely to actual moral behavior. In Study 2, our goal was to more fully explore the role of perceived affect by testing the way in which attributions of arousal influence the relationship between moral behavior and moral forecasts.

Misattribution of Arousal

Appraisal theories of emotion posit the labels given to an affective state are context dependent. In other words, the same physiological state can receive one label in one situation and a different label in another (Schachter & Singer, 1962). As such, states of arousal can be diminished or "explained away" when attributed to extraneous sources (Inzlicht & Al-Khindi, 2012). In one study, insomniacs were given a sugar pill that they were told would either make them calm or anxious. Participants who took the pill with the anxiety-like side effects were able to fall asleep faster, ostensibly because they were able to "explain away" their actual anxiety by attributing it to the pill (Storms & Nisbett, 1970). In a different study, participants exhibited less fear of electric shocks when they were able to attribute their negative affect to a persistent loud noise (Ross, Rodin, & Zimbardo, 1969). Consistent with the idea that states of arousal deter transgressions, research has found that participants who are given a pill that they are told will make them feel anxious cheat significantly more (Dienstbier, 1972) and are less likely to offer help to Black confederates (Gaertner & Dovidio, 1977). This is ostensibly because the actual arousal that participants experience in such moral dilemmas becomes diminished when participants are able to attribute this arousal to an extraneous source. In other words, when people do not see the arousal as being connected to their behavior, this arousal ceases to affect them. Thus, if participants who are able to attribute their arousal to an external source forecast cheating more, this would provide further evidence that perceptions of affect play a causal role in the moral forecasting process.

Method

One hundred seventy-four participants were recruited for this study from the University of Toronto Scarborough for course credit. We had planned to stop data collection at the end of the semester. Six participants were excluded from all analyses due to missing data. Five participants were excluded because they suspected we were recording cheating behavior, and an additional 10 participants were excluded because they questioned the authenticity of the "herbal supplement" they consumed. Finally, 4 additional participants were excluded because they did not complete the experiment.[2] Including these participants did not statistically change our results. This left 149 participants in the sample (72% male, M_{age} = 18.04). Participants were randomly assigned to one of four conditions in a 2 (morality condition) × 2 (anxious pill vs. benign pill) between-subjects design. We used the same math task paradigm as in Study 1.

Herbal supplement paradigm. Participants were informed that they would be participating in a study that investigated the effects of an herbal supplement, which we called "Panax Senticocus," on cognitive performance. On arrival, each participant was led to a computer station in a cubicle where they were given an herbal supplement in the form of a capsule. In reality, this capsule contained chamomile tealeaves. In the anxious pill condition, participants were told that the supplement would have some mild but completely harmless side effects such as an increased heart rate and that it might make them feel anxious and jittery. In the benign pill condition, participants were not told about any side effects. Before beginning the main study tasks, participants were told that they would have to complete several personality questionnaires while the herbal supplement took effect.[3] Participants then proceeded to complete the math task with the chance to cheat or forecasted their behavior in this same dilemma. To the extent that arousal is important for moral decision making (i.e., Dienstbier, 1972; Teper et al., 2011), we expected that participants who were in the anxious pill conditions would cheat more and predict cheating more than those in the benign pill conditions because they would be able to "explain away" any arousal they might be experiencing by attributing it to the pill. Such findings would provide evidence for the idea that the way in which we appraise or attribute our affective experiences may significantly influence our moral behavior and moral forecasts.

Our overarching goal in Study 2 was to further test the hypothesis that perceived affective experience plays an important role in driving both behaviors and forecasts. Because previous work suggests that arousal is important in influencing moral behaviors as well as moral forecasts (Teper et al., 2011), we predicted that both forecasted and actual cheating behavior would increase in the misattribution conditions (i.e., physiological arousal would not be attributed to the moral weight of the math task), irrespective of action condition.

Results

To assess how the misattribution of arousal affected moral behavior and moral forecasting, we conducted a Poisson regression of morality condition (−1 = action, 1 = forecasting), pill type (−1 = anxious, 1 = benign), and the interaction

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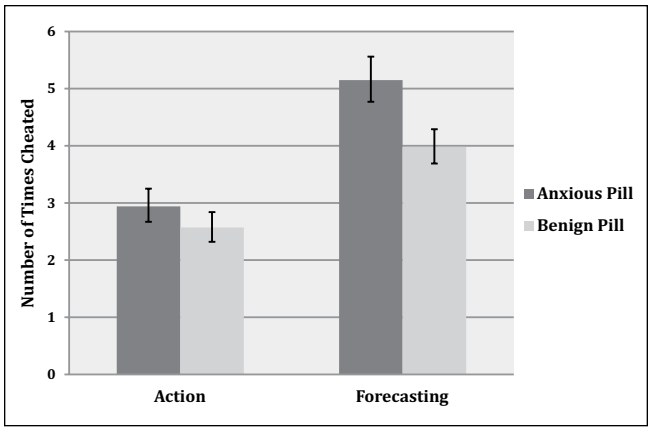

Figure 2. Mean number of times cheated/forecasted cheating as a function of condition.

Table 2. Means and *SD*s for Times Cheated/Forecasted Cheating in Study 2, Across Conditions.

Condition	*M*	*SD*
Action/anxious pill	2.94	4.96
Forecasting/anxious pill	5.15	4.72
Action/benign pill	2.57	4.29
Forecasting/benign pill	3.98	4.69

term as predictors. Consistent with past results, this analysis revealed a main effect of action/forecasting on cheating whereby participants in the action condition cheated significantly less ($\lambda = 2.75$) than participants in the forecasting condition predicted cheating ($\lambda = 4.53$), $b = 0.25$, $SE = .04$, *Wald* $\chi^2 = 31.26$, $p < .001$, 95% CI = [0.16, 0.34], $d = 1.03$. As predicted, this analysis also revealed a main effect of pill type whereby participants who were told the pill would cause anxiety-like side effects cheated more and also forecasted cheating more ($\lambda = 3.89$) than participants who were not told about any side effects ($\lambda = 3.20$), $b = -0.10$, $SE = .04$, *Wald* $\chi^2 = 4.90$, $p = .027$, 95% CI = [−0.19, −0.01], $d = 0.37$. These results suggest that when participants are able to attribute their arousal to an external source (i.e., an herbal supplement), they are more likely to cheat and also predict cheating more. The interaction between action/forecasting and pill type, however, was not significant, $b = -0.03$, $SE = .04$, *Wald* $\chi^2 = 0.47$, 95% CI = [−0.12, 0.06], $p > .49$ (Figure 2). See Table 2 for means and *SD*s of cheating across conditions.

Discussion

The results of Study 2 provide further evidence for the role of perceived affective experience in moral decision making. Taken together with the results of Study 1, the fact that participants in the current study cheated more and forecasted cheating more when they were able to attribute their anxiety to the herbal supplement demonstrates that the source to which people attribute their affect plays an important role in the relationship between moral forecasting and moral behavior. Although the absence of a significant interaction in our analysis prevented us from probing the interaction for simple effects, a visual inspection of our data suggests that the misattribution of arousal paradigm was most effective among forecasters. Although this pattern should be interpreted with caution, it may imply that it is easier to manipulate the affective processes that drive moral forecasts than the affective processes that fuel moral behaviors. Thus, one limitation of this study is the possibility that we may have not had sufficient power to detect a significant interaction.

Study 3

The results of Studies 1 and 2 suggest that manipulating perceptions of affective experience can alter the relationship between moral behaviors and forecasts. The aim of Study 3 was to explore the mechanism by which access to such affective experience might improve individuals' moral forecasting abilities and to test whether our phenomenon occurs in the real world, free of experimental manipulations. Specifically, we wondered about the role that individual differences in emotional awareness might play in moderating moral forecasts and hypothesized that individuals who are particularly low in emotional awareness (i.e., the subjective experience of such arousal) might exhibit exacerbated forecasting errors. In this study, we used the same math task paradigm as in Studies 1 and 2. We also assessed participants' emotional awareness using the Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994).

Alexithymia is a sub-clinical trait that varies in magnitude among individuals. It is characterized by the inability to identify emotional feelings, a difficulty distinguishing between and describing feelings, and an externally oriented cognitive style and impoverished fantasy life (Nemiah, Freyberger, & Sifneos, 1976). Individuals who score high on trait alexithymia typically exhibit low "psychological mindedness" or personal insight (Taylor, Bagby, & Parker, 1997). They also display lower levels of emotional intelligence (Parker, Taylor, & Bagby, 2001), which is thought to reflect the ability to use emotion as information to guide one's thinking and actions (Salovey & Mayer, 1989). More recent work has found that alexithymics may exhibit deficits in empathy (Bird et al., 2010) as well as perspective taking (Moriguchi et al., 2006). In other words, alexithymia seems to tap into emotional awareness—and for this reason, we wondered whether exploring variations in this personality trait might reveal to us the mechanism by which the experience and awareness of emotional states influence moral forecasting. Furthermore, the ability to put feelings into words allows us to focus on experiences (Ben-Ze'ev, 2000), and as such, deficits in this domain may predict an ability to produce forecasts that align with behaviors. Altogether, because

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alexithymia captures metacognitive emotional awareness more so than actual emotional experience (but see FeldmanHall, Dagleish, & Mobbs, 2013), we predicted that participants who scored high on trait alexithymia would make more extreme moral forecasting errors but that variations in this personality trait would not predict actual cheating rates in the moral action condition.

Method

One hundred twenty-two participants were recruited for this study from the University of Toronto Scarborough for course credit. We had planned to stop data collection at the end of the semester. A total of 7 participants were excluded from the sample because they guessed the purpose of our experiment during the suspicion probe, leaving 115 participants in the sample (60% female; M_{age} = 18.61, SD = 2.55). Including these participants did not statistically change our results. On arrival, each participant was led to a private cubicle, where all study materials were presented on a computer. Participants were randomly assigned to one of two conditions: (a) moral action or (b) moral forecasting, in which they either had to complete the same math task we used in Study 2 or forecast their behavior in this moral dilemma.[4] On completion of the math task, participants filled out several individual difference measures,[5] including the TAS-20, which assesses trait emotional awareness.

TAS-20. To measure trait alexithymia among our participants, we administered the TAS-20 (Bagby, Parker, & Taylor, 1994, α = .84), which has been previously shown to be a valid and reliable measure of trait alexithymia (Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994). For this scale, participants had to indicate the degree to which they agreed with each of the 20 statements on a 5-point Likert-type scale, ranging from *strongly disagree* to *strongly agree* (e.g., I am often confused about what emotion I am feeling, I don't know what's going on inside me). Higher values on the TAS-20 reflect greater alexithymia and thus less emotional awareness. The mean TAS-20 score for our sample was M = 2.68, SD = .49.

Results

To assess how trait alexithymia moderates moral behavior and moral forecasting, we conducted a Poisson regression analysis of cheated/predicted cheating with condition (−1 = action, 1 = forecasting), alexithymia (mean centered), and the interaction term as predictors. We report estimated mean counts (λ), rather than the log of means for ease of interpretation. This analysis revealed a significant main effect of morality condition on cheating, where participants in the action condition cheated significantly less than participants in the forecasting condition predicted cheating, b = 0.36, SE = .06, $Wald\ \chi^2$ = 36.01, p < .001, 95% CI = [0.24, 0.48], d = 1.35.

Table 3. Bivariate Correlations Between TAS-20 Scores and Number of Times Cheated/Forecasted Cheating, Across Conditions.

Condition	*r*	*n*
Action	−.01	56
Forecasting	.25*	59

Note. TAS-20 = Toronto Alexithymia Scale.
*p = .057.

There was also a main effect of alexithymia on cheating, b = 0.27, SE = .13, $Wald\ \chi^2$ = 4.47, p = .035, 95% CI = [0.02, 0.51], d = 0.40. We also found a significant interaction between condition and alexithymia, b = 0.29, SE = .13, $Wald\ \chi^2$ = 5.42, p = .02, 95% CI = [0.05, 0.54], d = 0.44. Simple slopes analyses revealed that although trait alexithymia had no influence on cheating rates in the moral action condition, b = −0.03, SE = .22, $Wald\ \chi^2$ = 0.02, p = .90, 95% CI = [−0.45, 0.40], it did moderate predicted cheating in the moral forecasting condition, suggesting that the main effect of alexithymia was primarily driven by the forecasting conditions. Indeed, participants high in trait alexithymia predicted cheating significantly more (λ = 5.11) than participants low in trait alexithymia (λ = 2.96), b = 0.56, SE = .13, $Wald\ \chi^2$ = 19.34, p < .001, 95% CI = [0.31, 0.81], d = 0.90. See Table 3 for bivariate correlations between alexithymia and cheating across conditions. Finally, we wanted to explore whether trait alexithymia influenced the relationship between moral action and moral forecasting. Simple slopes analyses suggest that participants high in trait alexithymia exhibit a strong discrepancy between actual cheating (λ = 1.87) and predicted cheating (λ = 5.11), b = 0.50, SE = .08, $Wald\ \chi^2$ = 42.65, p < .001, 95% CI = [0.35, 0.65], d = 1.54. These analyses revealed that participants low in alexithymia also exhibit a discrepancy between actual behavior (λ = 1.92) and predicted behavior (λ = 2.96), b = 0.22, SE = .09, $Wald\ \chi^2$ = 5.41, p = .02, 95% CI = [0.03, 0.40], d = 0.44, but that this discrepancy may be smaller than for those high in alexithymia (Figure 3). See Table 4 for means and SDs of cheating across conditions. Taken together, these findings suggest that individuals who are particularly high in alexithymia (i.e., low on emotional awareness) may be especially prone to making moral forecasting errors, presumably because they are not able to properly use their feelings as information. However, our results also suggest that individuals who are low in alexithymia (i.e., high on emotional awareness) may not be entirely immune to such forecasting errors either.

Discussion

The results of Study 3 imply that individual differences in emotional awareness or emotional acuity may moderate moral forecasting and suggest that this phenomenon exists in the real world. Specifically, it seems that individuals who score high

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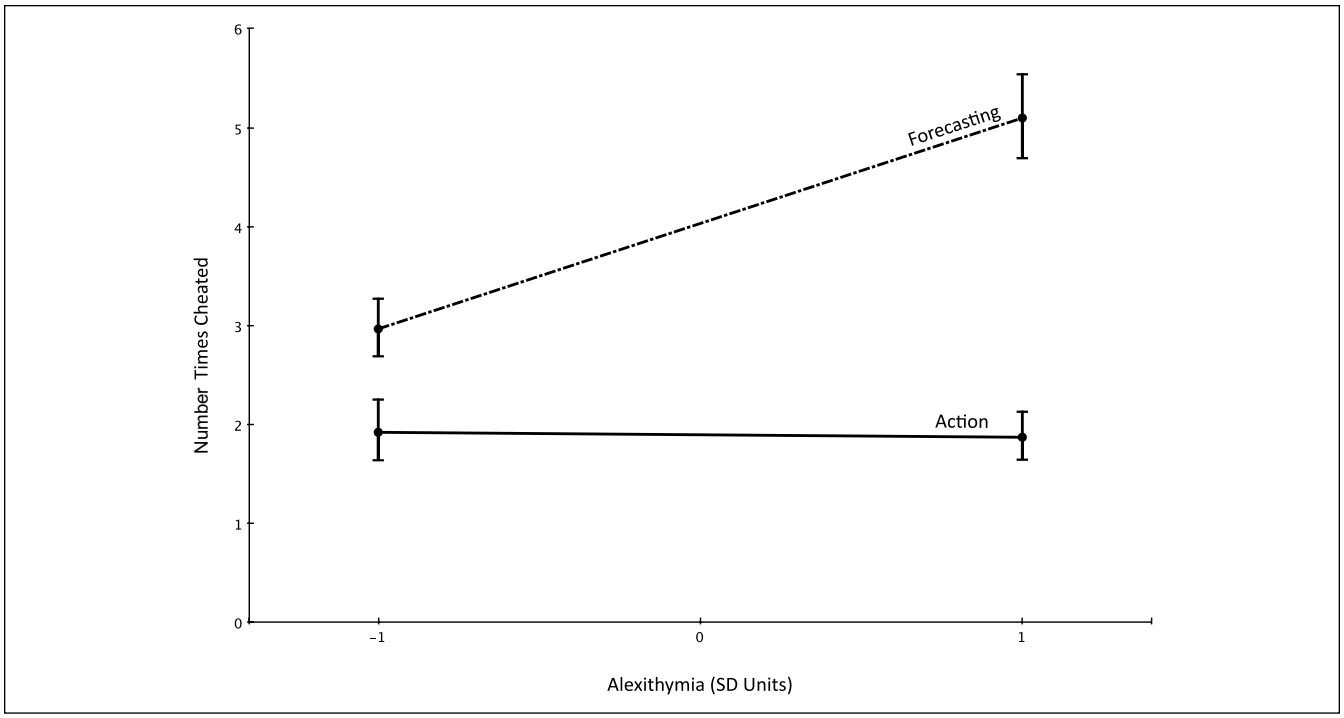

Figure 3. Mean number of times cheated/forecasted cheating as a function of condition, as moderated by trait alexithymia.

Table 4. Means and *SD*s for Times Cheated/Forecasted Cheating in Study 3, Across Conditions.

Condition	*M*	*SD*
Action/low alexithymia	1.92	3.58
Action/high alexithymia	1.87	3.62
Forecasting/low alexithymia	2.96	4.28
Forecasting/high alexithymia	5.11	5.00

*Note. SD*s taken from median split of alexithymia.

on trait alexithymia (i.e., report low emotional awareness) exhibit exacerbated moral forecasting errors. Interestingly, we observed a significant behavior-forecasting dissociation even among individuals who scored low on trait alexithymia (i.e., report high emotional awareness). We suspect this is the case because alexithymia measures one's ability to identify and describe feelings, as well as their propensity for externally oriented thinking, rather than their propensity to keenly *feel* their emotions. In other words, these data suggest that while having high emotional insight may provide individuals with a forecasting "edge," it is not sufficient in eliminating forecasting errors altogether. These results are consistent with that of Study 1 and seem to suggest that perceived affective experience alone may not be sufficient in completely attenuating the gap between forecasts and behaviors. Indeed, even individuals who exhibited high emotional awareness were not fully immune to making forecasting errors. Finally, the finding that variations in this personality trait had no bearing on actual cheating behavior suggests that moral forecasts might be more malleable than moral behaviors.

General Discussion

Contrary to the widespread notion that people's self-views are clouded by positive illusions (e.g., Baumeister, 1998; Epley & Dunning, 2000; Sedikides, 1993; Taylor & Brown, 1988), here we report findings showing that people sometimes underestimate their own morality. Moreover, we find evidence that this gap between forecasting and action is explained, at least in part, by the inability of forecasters to simulate the emotional experience of committing an immoral act. We find that when this simulation process is enhanced (e.g., by false somatic feedback), this gap is attenuated. These findings suggest that because people do not fully invoke the affective experience of going through the dilemma, they underestimate the forces that keep them from transgressing. Interestingly, our findings also suggest that when people misattribute the arousal inherent to moral decision making, they act and forecast acting less morally.

In Studies 1 and 2, we tested the possibility that the discrepancy between moral action and forecasting might arise because people are unable to accurately simulate the affective character of a moral dilemma. If this is the case, enhancing this simulation process should lead to moral forecasts that more closely map on to the way that people actually behave. Conversely, "explaining away" or misattributing the affect that is elicited by the moral dilemma should cause people to

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act and predict acting less morally. In Study 1, participants were given false somatic feedback that indicated that their heart was beating rapidly. Compared with participants who thought that their heart was beating at a normal rate, perceiving that their heart rate was elevated led participants to predict that they would cheat less often. Thus, it seems that falsely mimicking part of the physiological experience of being in the moral dilemma made participants' forecasts more closely reflect actual behaviors. In Study 2, we found further confirmation that the perceived source of arousal plays an important role in the relationship between moral behaviors and forecasts. We found that participants who were given an "herbal supplement" with alleged side effects of an increased heart rate forecasted cheating more and actually cheated more on the math task. Then, in Study 3, we examined the way in which individual differences in subjective affective experience relate to the behavior-forecasting gap by looking at alexithymia as a potential moderator of moral forecasting. We reasoned that if moral forecasting errors stem from an inability to accurately forecast the emotional state of the dilemma, emotional awareness should facilitate moral forecasts that more closely match actual behaviors. This seems to be the case, as illustrated by the finding that lower alexithymia (i.e., higher emotional awareness) was associated with forecasts that more closely matched the behavior of people in the action condition. Our findings here suggest that the perceived affective experience plays an important role in moderating the relationship between moral behaviors and forecasts—an explanation that goes above and beyond the idea that moral forecasting fails to be accurate purely due to a lack of physiological arousal during the forecasting process.

Although we suggest that there are ways to align peoples' moral forecasts more closely with their behaviors, it is important to note that these efforts at improvement still fall short of completely attenuating the behavior-forecasting gap. We believe that this gap remains because our manipulations affect the perceptual, but not motivational or visceral, aspects of emotion. This interpretation is corroborated by the fact that false somatic feedback does not induce physiological changes such as increases in actual heart rate. Similarly, alexithymia measures awareness of emotion but not the intensity of actual experience (but see Bird et al., 2010), and as such, the forecasts of people low on alexithymia may still lack access to the physiological intensity of the actual situation. Perhaps what is needed to achieve full forecasting accuracy then, are manipulations that will simulate both the perceptual *and* visceral aspects of emotional experience.

Limitations

Taken together, these findings provide support for the idea that people underestimate their own morality because, in part, they fail to imagine how emotions will influence their behavior when they are actually faced with a moral dilemma. One limitation of the studies reported here is that we do not have self-report measures of emotion, and thus, we cannot isolate the discrete emotions that are responsible for driving moral behavior and shifting moral forecasts to more closely align with those behaviors. As a result, these data do not reveal whether prosocial emotions deter transgressions or whether paradigm-specific emotions related to a fear of getting caught on the math task may be the key drivers. We made the methodological choice to omit self-reports of emotional experience because of the difficulties of measuring emotions without altering them. Previous work has demonstrated that labeling an emotion or making attributions about its source can change the experience of that emotion as well as its influence on subsequent behavior (Lieberman et al., 2007; Pennebaker, 1997; Schachter & Singer, 1962; Schwarz & Clore, 1988). An alternative to measuring self-reported emotion while it is being experienced would be to ask participants to reflect on their emotions after the fact, but there is reason to believe that people may not be able to do this accurately (Kahneman, Fredrickson, Schreiber, & Redelmeier, 1993). Future research can attempt to measure emotions online through the use of methods like electromyography to capture subtle movements of facial muscles associated with the display of discrete emotions.

Although we document people's tendency to *underestimate* their morality, there also appear to be times when people *overestimate* their morality (e.g., Epley & Dunning, 2000; FeldmanHall et al., 2012). Our interpretation of the current findings does not imply that people will always act more morally than they think; rather, we suggest that people have trouble simulating the emotions that they will experience in a moral situation. In some cases, those emotions might include guilt or shame and, thus, encourage people to act morally as we see in the studies documented here. In other cases, however, those emotions might include a strong desire for the outcomes of an immoral act (e.g., stealing money or committing adultery), and in these cases, people might end up acting more immorally than they would have expected if they had imagined the situation in the absence of those emotions. For instance, the moral overestimation effects that have been previously reported might be a function of the high monetary payoff for immoral behavior (i.e., approximately 4 times higher than what we offered in our experiments). It seems plausible that the ostensible approach-related emotions associated with this reward may have been underestimated by the forecasters (FeldmanHall et al., 2012). Another possibility is that certain transgressions are construed as less morally acceptable than others. For example, delivering electric shocks to a confederate for monetary gain might sound less morally acceptable than cheating on a test for monetary gain, and perceived moral wrongness might also explain why people were less likely to forecast immoral behavior in the former context (FeldmanHall et al., 2012). Although we do not know exactly how morally acceptable our participants found cheating on a math test to be, recent work suggests that college students (i.e., typical study participants) perceive cheating for monetary gain to be fairly immoral (Meindl & Graham, 2014).

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Finally, another series of studies has found that participants might overestimate their prosociality (Epley & Dunning, 2000). We argue that this pattern of results might be explained by the fact that these studies did not use "pure" measures of morality. For example, some experiments did not allow for a "fair" option, forcing participants to allot all benefits to themselves or all benefits to the confederate. One of the dependent variables was the Prisoner's Dilemma game, in which trust plays a larger role than prosociality. Charity donations, which were also measured, are often influenced by diffusion of responsibility. All of these factors might subtract from the emotional intensity of these paradigms and might explain why moral behavior rates in the aforementioned studies were so low. Future research that attempts to isolate the different emotional reactions elicited by different sorts of moral dilemmas might provide a more complete understanding of when people are likely to underestimate their morality and when they are likely to do the opposite.

Conclusion

The findings presented here document an interesting deficit in predicting moral behavior, highlighting a potential problem with neglecting behavioral measures in research on morality—people are often unable to accurately report how they would behave in a moral dilemma. Importantly, this work suggests that this deficit might result from faulty affective forecasts and that there might be methods through which we can attenuate the behavior-forecasting discrepancy. It seems that measuring moral behavior has the potential to provide information that would be unattainable with self-report measures alone (Baumeister, Vohs, & Funder, 2007). Our findings suggest that there may be systematic and predictable biases in the way that people forecast their moral behavior, whether they are responding to a self-report measure of morality or planning their day-to-day lives. A greater understanding of this process has the potential to lead people to make better forecasts by, for instance, making a greater effort to simulate the emotional experience that would characterize the actual situation. Importantly, however, our results suggest that efforts to simulate the affective nature of a situation can sometimes fall short, perhaps because these simulations are lacking the visceral and psychological aspects of emotional experience. As a consequence, people's forecasts may never be a perfect proxy for their behaviors.

Declaration of Conflicting Interests

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Notes

1. Participants completed the Philadelphia Mindfulness Scale (Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008), Situational Test of Emotional Understanding (MacCann & Roberts, 2008), the Social Conservatism Scale (Henningham, 1996), and the Five Factor Mindfulness Questionnaire (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Large chunks of our questionnaire data were lost due to network malfunctions (i.e., MediaLab failed to record participant responses), and thus, no significant associations between these scales and our variables of interest could be explored. As such, we chose to omit them from our "Results" section.
2. Four participants were excluded from analyses because they were forced to rush through the math task due to time constraints. These participants took an unusually long time to complete the experiment and were thus rushed by the experimenter to finish within the allotted 1-hr timeslot. These participants reported rushing through the math task and randomly "guessing" the answers due to time pressure.
3. Participants completed the Big Five Inventory (John & Srivastava, 1999), Philadelphia Mindfulness Scale (Cardaciotto et al., 2008), Situational Test of Emotional Understanding (MacCann & Roberts, 2008), the Social Conservatism Scale (Henningham, 1996), the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988), the TAS-20 (Bagby, Parker, & Taylor, 1994), and the Differential Emotions Scale (Izard, Libero, Putnam, & Haynes, 1993). Large chunks of our questionnaire data were lost due to network malfunctions (i.e., MediaLab failed to record participant responses), and thus, no significant associations between these scales and our variables of interest could be explored. As such, we chose to omit them from our "Results" section.
4. Participants completed the Philadelphia Mindfulness Scale (Cardaciotto et al., 2008), Situational Test of Emotional Understanding, (MacCann & Roberts, 2008), and the Social Conservatism Scale (Henningham, 1996). Because there were no significant correlations between these scales and our variables of interest, we chose to omit them from our "Results" section.
5. Study 3 also included a misattribution of arousal manipulation, in which participants had to consume an "herbal supplement" beverage. In actuality, the beverage consisted of water and food coloring. Half of the participants were informed that the drink would have no side effects, whereas the other half were informed that the drink might make them anxious or jittery. The purpose of this manipulation was to see how misattributing one's arousal to an extraneous source might affect moral behavior and moral forecasts. However, this manipulation did not produce any significant differences in moral behavior or moral forecasting among participants. We suspect that this is mainly because the manipulation was not effective, as approximately 19% of participants suspected the authenticity of the beverage. Our main effect of action versus forecasting ($b = 0.36$, $SE = .06$, $Wald\ \chi^2 = 36.02$, $p < .001$, $d = 1.35$) and the interaction between action versus forecasting and trait alexithymia ($b = 0.29$, $SE = .13$, $Wald\ \chi^2 = 5.40$, $p = .02$, $d = 0.44$) did not change significantly when the misattribution of arousal conditions were entered as a covariate.

Supplemental Material

The online supplemental material is available at http://pspb.sagepub.com/supplemental.

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