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Are We More Moral Than We Think? Exploring the Role of Affect in Moral Behavior and Moral Forecasting

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Abstract

Can people accurately predict how they will act in a moral dilemma? Our research suggests that in some situations, they cannot, and that emotions play a pivotal role in this dissociation between behavior and forecasting. In the current experiment, individuals in a moral action condition cheated significantly less on a math task than participants in a forecasting condition predicted they themselves would cheat. Furthermore, we found that participants in the action condition displayed significantly more physiological arousal, as measured by preejection period, skin conductance response (SCR), and respiratory sinus arrhythmia (RSA), and that the underestimation effect was mediated by SCR and RSA together. This research suggests that the affective arousal present during real-life moral dilemmas may not be fully engaged during moral forecasting, and that this may account for the moral forecasting errors that individuals make. This research has the potential to inform past work in the field of moral psychology, which has largely ignored actual behavior.

Keywords

moral psychology, moral action, moral forecasting, emotion, affective forecasting

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In the past decade, social psychologists have explored the processes underlying moral judgments. However, surprisingly little research has explored moral *behavior*. Psychologists, in other words, have spent much time studying morality via self-report, assuming that such measures reflect moral behavior. There is reason to believe, however, that the relationship between moral forecasting and moral action may be more complex.

In the research we report here, we examined the relationship between actual moral behavior and moral forecasting, while investigating internal processes that might account for any disconnect between the two. Our research rested on the hypothesis that moral action and moral judgment are dissociable, primarily because the internal processes that guide moral behavior are not fully engaged during moral forecasting. In particular, we suspected that real-life moral decision making is more emotional than moral forecasting is.

The Role of Affect in Behavior and Forecasting

Although recent research on moral decision making is of great importance, its focus on judgment is problematic given that attitudes are often incongruent with behaviors (Darley & Batson, 1973; Festinger, 1957) and many of the conclusions drawn about morality have been based on empirical studies of judgment and self-report alone (e.g., Haidt, 2001; Jackson et al., 2008; Reynolds & Ceranic, 2007). We suspect that affect plays an important role in any dissociation between action and judgment. Research on affective forecasting indicates that individuals are not successful at predicting their own emotions in future situations (Wilson & Gilbert, 2005). If emotions correlate with moral behavior, limited access to these emotions will translate to errors in behavioral prediction. Loewenstein's (2005) work on the hot-cold empathy gap provides a good illustration. For example, Van Boven and Loewenstein (2003) suggested that when individuals are not emotionally aroused, they have little appreciation for the role that affect plays in motivating their behavior. This work implies that individuals underestimate the intensity of their emotions in real-life situations.

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Research on the hot-cold empathy gap is compatible with the *somatic-markers hypothesis*, which specifies that emotional signals are important for effective decision making (Damasio, 1994). These somatic markers can be manifest in the central and peripheral nervous systems and are perceived as "feelings" (Bechara & Damasio, 2005). Individuals rely on these feelings to guide socially relevant behavior. The idea that individuals rely on these somatic markers is also consistent with recent work by Valdesolo and DeSteno (2008), who found that affect serves to ground moral decision making. Indeed, research confirms that emotional processes are engaged when individuals make moral judgments (Greene, Sommerville, Nystrom, Darley, & Cohen, 2001). We suggest, however, that these emotional processes may be more active when people are involved in actual moral dilemmas than when they make moral judgments.

Are People More Moral Than They Think?

According to Bechara and Damasio (2005), there exist *primary* and *secondary* emotional inducers. Primary inducers are stimuli that are present within the immediate environment and cause pleasurable or aversive states. Secondary inducers are generated by recalling or imagining an emotional event. Secondary inducers are thought to simulate the somatic state associated with corresponding primary inducers, but typically at a lower level.

Even though moral emotions are present during moral forecasts (Greene et al., 2001), if these emotions are less intense than the emotions experienced during actual moral dilemmas, then individuals may underestimate the strength of their emotions when they are making predictions. And if emotions such as guilt and love drive moral behavior (Pfister & Böhm, 2008), then underestimating affect may result in moral forecasting errors; that is, people may act more morally than they might predict. We tested this hypothesis in the following study.

Method

Procedure

Sixty-seven participants (36 females, 31 males; mean age = 20.03 years) from the University of Toronto participated for course credit.[1] Physiological sensors were applied, and participants were asked to sit still and relax in front of a computer screen for 30 s; this constituted the physiological baseline period. At the conclusion of the 30 s, participants saw a "Recording Stopped" message on the screen. At this point, the experimenter asked participants if they would be willing to participate in another unrelated experiment. The experimenter explained that the recording had been turned off, but that it would be more convenient if the electrodes were removed at the end of the experiment. In fact, physiological responses were recorded throughout.

Participants were then randomly assigned to one of three conditions: moral action, moral forecasting, or control. Participants in the moral action condition had to complete a math test in which they had the opportunity to cheat. This task consisted of 15 simple, but tedious, arithmetic problems (e.g., $45 + 679 + 8 + 11 + 234 + 50 - 71 - 1 - 524 - 25 = ?$). It was modeled after the one used by von Hippel, Lakin, and Shakarchi (2005), who informed participants that a "glitch" in the software would cause the answer to each question to appear on the screen when they pressed the space bar. Participants thought we would have no way of knowing whether or not they pressed the space bar. We informed them that they would be rewarded with $5.00 if they answered 10 or more questions correctly. Participants in the moral forecasting condition were presented with the same 15 math problems one by one, but instead of solving the problems, they indicated whether they would reveal the answer for each question under the circumstances just described. Presenting the problems individually eliminated the possibility that participants would make forecasting errors because of a lack of information about the situation. Finally, participants in the control condition had to complete the same math test, but with no option of cheating; this condition allowed us to separate the arousal elicited by a moral dilemma from the arousal elicited by solving difficult math problems.

Physiological arousal and affect

We focused on physiological measures that have been related to the affective-motivational states of approach, avoidance, and social engagement, as well as to generalized physiological arousal. We hypothesized that the intensity of these autonomic reactions would drive moral behavior.

Preejection period (PEP). PEP reflects the strength of the heart contraction; smaller values indicate stronger contractions. PEP is solely influenced by the sympathetic nervous system, and activity of the sympathetic nervous system is correlated with approach behaviors (Brenner, Beauchaine, & Sylvers, 2005). We hypothesized that the opportunity to cheat for money would activate the sympathetic nervous system, as indexed by significant drops in PEP.

Respiratory sinus arrhythmia (RSA). RSA is a measure derived from heart and respiration rates and is the only noninvasive index of parasympathetic nervous system activity (Berntson, Quigley, & Lozano, 2007). According to Porges's (2001) polyvagal theory, the parasympathetic nervous system evolved to adapt to the complex demands of social coordination. Given associations between RSA and prosocial behavior (Oatley, Keltner, & Jenkins, 2006), we hypothesized that RSA would increase for participants facing real moral dilemmas; we also hypothesized that higher RSA would correlate with more moral behavior.

Skin conductance response (SCR). SCR reflects generalized physiological arousal. We hypothesized that SCR would increase for participants facing real moral dilemmas; we further hypothesized that greater arousal would predict more moral behavior.

Physiological preparation. Physiological measures were obtained simultaneously using a BioNex impedance cardiograph and GSC amplifier (MindWare Technologies, Gahanna, OH), sampling at a frequency of 1000 Hz. Four pregelled spot Ag-AgCl electrodes were attached to the neck and torso, and two pregelled Ag-AgCl electrodes were attached in a Standard Lead-II chest formation. The cardiopulmonary data were cleaned and analyzed in 30-s epochs. These epochs were then averaged across the first 2 min of the stimulus task, and data from the 30-s baseline were subtracted from this average. PEP was calculated as the time in milliseconds between the depolarization of the left ventricle and the opening of the left aortic valve to eject blood. RSA was derived from a power spectral analysis of high-frequency heart rate variability (Berntson et al., 2007). SCR was acquired through two pregelled Ag-AgCl electrodes that were placed on the thenar eminence of participants' nondominant palm. We were interested in the number of nonspecific SCRs (NSSCRs) within each epoch of the baseline and the first 2 min of the task. NSSCRs are observed when skin conductance level increases by 0.05 μS.

Results

Behavioral results: action versus forecasting

The primary goal of this experiment was to explore the relationship between moral action and moral forecasting. We conducted a one-way (action vs. forecasting) ANOVA, which revealed that participants who completed the math task cheated significantly less ($M = 0.96$ problems, $SD = 1.65$) than participants in the forecasting condition predicted ($M = 4.82$, $SD = 5.32$), $F(1, 37) = 10.43$, $p < .01$, $d = 0.98$ (see Fig. 1).[2] In other words, people acted more morally than they would have predicted. We next investigated the role of emotion.

Fig. 1. Mean number of times that participants in the moral action condition cheated on the math test and mean number of times that participants in the moral forecasting condition predicted they would cheat in the same situation. Error bars indicate standard errors.

Psychophysiological results: action vs. forecasting vs. control

Table 1 presents the correlations of the physiological measures with each other and with cheating (actual and forecasted).

PEP. We hypothesized that participants who had the option to behave immorally would exhibit greater PEP decreases during the math task than would participants in the other two groups. Four participants were excluded from the analysis because they were extreme outliers.[3] We found significant differences in PEP reactivity between conditions, $F(2, 40) = 3.64$, $p < .05$ (Fig. 2a). Simple-effects tests revealed that participants in the action condition showed greater decreases in PEP ($M = −9.50$, $SD = 7.65$) than did participants in the forecasting condition ($M = −2.40$, $SD = 10.31$), $p < .05$, $d = 0.78$, and participants in the control condition ($M = −2.42$, $SD = 6.17$), $p < 0.5$, $d = 1.02$. PEP decreases did not differ between the latter two groups, $p > .90$.

RSA. We expected participants in the action condition to exhibit greater RSA reactivity than participants in the other two groups. Three participants were excluded from the analysis because they were extreme outliers. Figure 2b illustrates the significant difference in RSA reactivity across the conditions, $F(2, 42) = 3.77$, $p < .05$. Simple-effects tests revealed that participants in the action condition displayed significantly greater increases in RSA ($M = 0.36$, $SD = 0.72$), compared with participants in the forecasting condition ($M = −0.38$, $SD = 0.33$), $p < .05$, $d = 1.32$, and participants in the control condition ($M = −0.36$, $SD = 1.13$), $p < .05$, $d = 0.76$. The latter two groups exhibited decreases in RSA. As was the case for PEP, the forecasting and control groups did not differ from one another on this physiological measure, $p > .90$.

SCR. Finally, we examined NSSCRs as a correlate of arousal intensity. Figure 2c illustrates the significant differences in NSSCR frequency across the conditions, $F(2, 41) = 4.59$, $p < .05$. Participants in the action condition exhibited more NSSCRs ($M = 2.33$, $SD = 1.34$) than did participants in the forecasting condition ($M = 0.20$, $SD = 2.01$), $p < .01$, $d = 1.25$. In this case, however, we found no significant differences between the

Table 1. Bivariate Correlations Between the Main Variables

Variable	1	2	3	4
1. Cheating	—	.22	−.44*	−.59**
2. Preejection period		—	−.26	−.09
3. Respiratory sinus arrhythmia			—	.02
4. Skin conductance response				—

*$p < .05$. **$p < .01$.

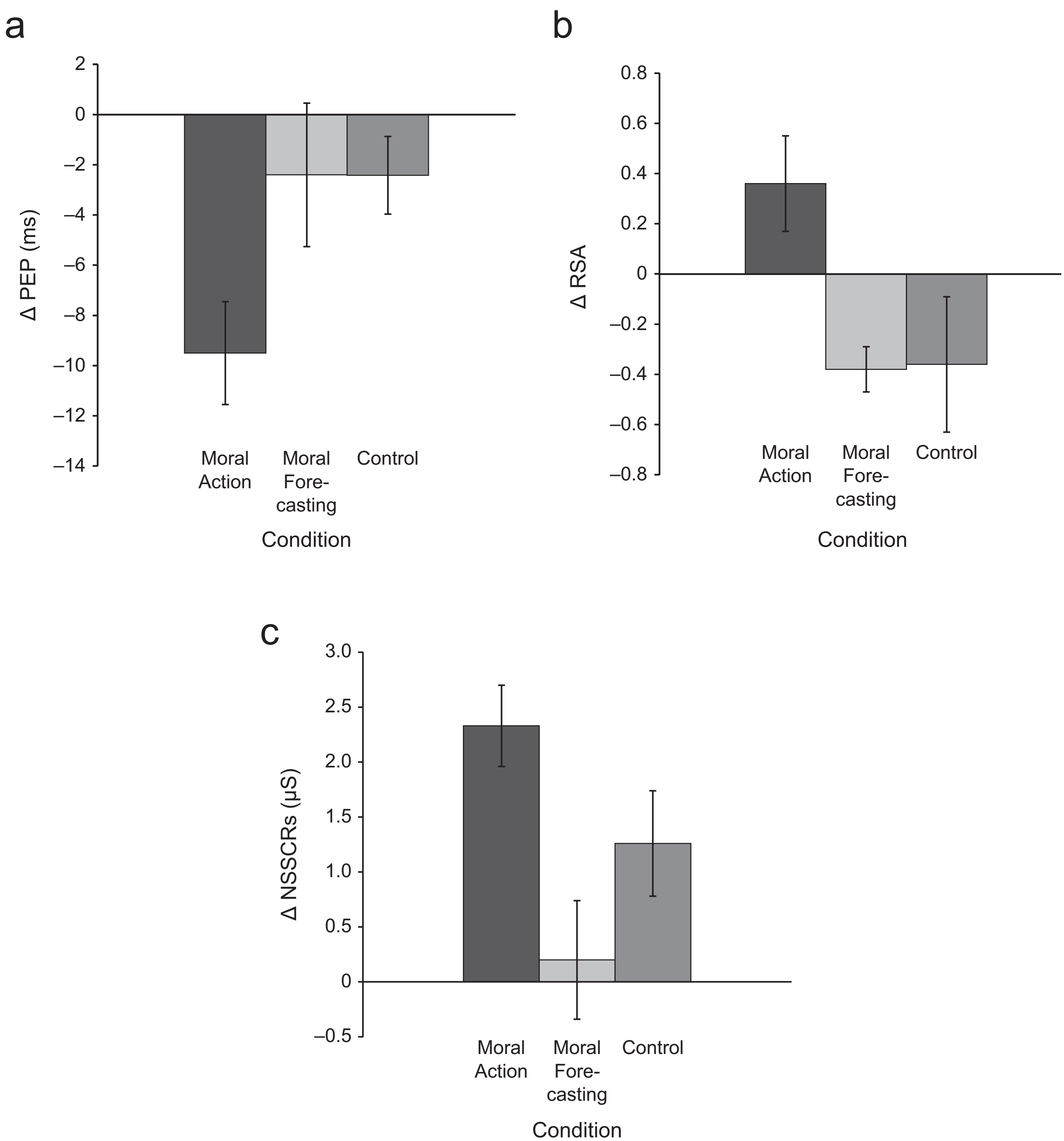

Fig. 2. Results for the psychophysiological indices. The graphs show mean change (task minus baseline) in (a) preejection period (PEP), (b) respiratory sinus arrhythmia (RSA), and (c) nonspecific skin conductance response (NSSCR) as a function of condition. Error bars indicate standard errors.

control (M = 1.26, SD = 1.98) and action conditions, $p > .10$. There was also no significant difference between the control and forecasting conditions, $p > .10$.[4]

Process: mediation of the action-forecasting dissociation

To test the relationship between condition (action or forecasting) and cheating as mediated by PEP, RSA, and SCR, we used a multiple mediation model (i.e., simultaneous mediation by multiple variables). Preacher and Hayes (2008) have recommended that testing a multiple mediation model should involve an analysis of the total indirect effect of the mediators and the specific indirect effects of each mediator. After finding that PEP was not a significant mediator, we focused solely on RSA and SCR. To test the significance of the indirect effects, we used bootstrap analysis with 5,000 samples to obtain parameter estimates for both total and specific indirect effects.

Table 2. Results of the Multiple Mediation Analysis: Psychophysiological Arousal as a Mediator of the Effects of Condition on Cheating

Indirect effect	*SE b*	95% bias-corrected confidence interval
Total	2.65	[0.45, 11.89]*
Respiratory sinus arrhythmia	1.05	[0.17, 5.22]*
Skin conductance response	2.15	[−0.11, 8.66]

*$p < .05$.

Table 2 presents the 95% bias-corrected confidence intervals for the total and indirect effects of RSA and SCR on the relationship between condition and cheating. A confidence interval that does not contain zero indicates a statistically significant indirect effect and, consequently, mediation (Preacher & Hayes, 2008). The absence of zero in the confidence interval for the total indirect effect indicates that the mediating effect of the combination of the two variables was significant. The confidence intervals for specific indirect effects indicate that, as expected, RSA was a significant mediator; however, contrary to predictions, SCR was not. Specifically, condition was negatively related to RSA (b = −0.71), which, in turn, was negatively related to cheating (b = −1.94; see Fig. 3).

Discussion

This research explored the relationship between moral forecasts and moral behavior and the internal processes that drive the two. We found that individuals underestimate their moral capacities (for at least the type of moral dilemma we studied). Furthermore, our results imply that people's moral forecasting errors result from the inability to access the affective experience that occurs during real-life moral dilemmas. We found evidence for this by measuring physiological arousal during moral action and moral forecasting.

Although the results of our experiment, as well as the results of our previous work (Teper & Inzlicht, 2010), might seem inconsistent with work on the self-serving bias (e.g., Batson, Thompson, Seuferling, Whitney, & Strongman, 1999; Epley & Dunning, 2000; Svenson, 1981), we do not feel that this is necessarily the case. The results of the current research do not imply that individuals *always* underestimate their morality. Rather, we interpret our findings to mean that individuals have a hard time forecasting the presence and intensity of their emotional states, and that this difficulty leads to inaccurate predictions. Sometimes, as in the current experiment, emotions elicited by actual situations increase moral behavior; other times, however, these emotions may undermine such behavior. We wonder if the types of emotions elicited by the paradigms that produce the self-serving bias fall into this latter category.

Conclusion

Morality creates the basis for a healthy and functional society, and this is probably why researchers have spent so much time exploring morality. However, it seems that much research has focused on moral reasoning at the cost of studying moral action. Both are important. The current experiment focused on both moral decision making and actual moral behavior. Although it is no surprise that people act differently than they think, it is a surprise that people act more morally than they think they will. In the heat of the moment, emotions can drive individuals to do the "right thing"; but in the absence of emotions, people may imagine themselves as being more selfish than they really are.

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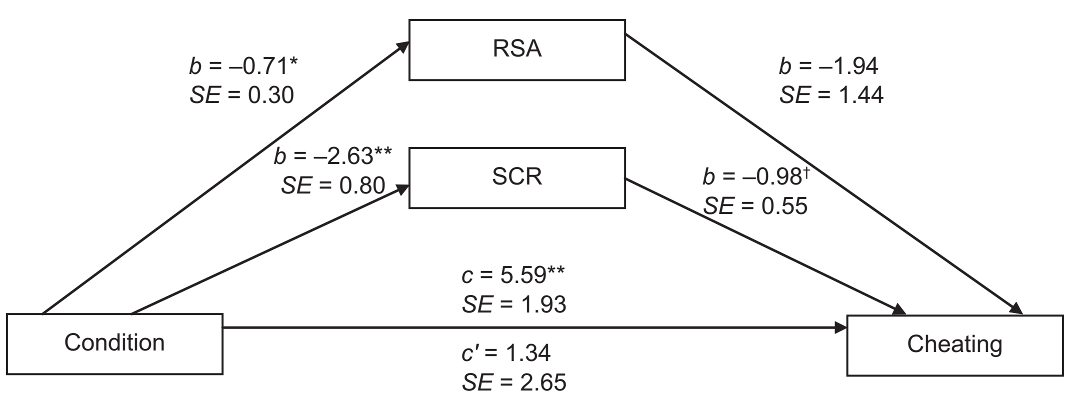

Fig. 3. A multiple mediation model of psychophysiological arousal as a mediator of the relation between condition (action or forecasting) and cheating; *c* is the total effect of condition on cheating, and c′ is the direct effect of condition on cheating. Unstandardized regression coefficients (and the associated standard errors) from a bootstrap procedure are provided along the paths (†$p < .10$; *$p < .05$; **$p < .01$). RSA = respiratory sinus arrhythmia; NSSCR = nonspecific skin conductance response.

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Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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Notes

1. Because of technical and human error, several participants had to be excluded from the psychophysiology analyses. However, excluding these participants did not have a significant effect on our behavioral results; participants in the action condition still cheated significantly less than participants in the forecasting condition predicted they themselves would, $F(1, 35) = 1.84$, $p \geq .05$.
2. The results of a pilot study replicated the action-versus-forecasting effect using a paradigm in which participants in the forecasting condition were asked only once to predict how many times they would cheat on the task, $F(1, 125) = 28.81$, $p < .001$, $d = 0.96$.
3. All outliers were determined by calculating extreme studentized deviate (ESD) scores and using Grubbs's test to probe for significance. All excluded scores were significant outliers, $p < .05$.
4. Although participants in the control condition were not significantly more aroused than those in the forecasting condition, they did show a trend toward more NSSCRs. Additionally, supplemental heart rate data revealed that participants in the control condition exhibited more heart rate acceleration than those in the forecasting condition.

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