On the Costs of Self-interested Economic Behavior : How Does Stinginess Get Under the Skin?

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How Does Stinginess Get Under the Skin?

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Abstract

The present study examined how financial decisions 'get under the skin'. Participants played an economic game in which they could donate some of their payment to another student. Affect was measured afterward and salivary cortisol was measured before and afterward. Participants who kept more money for themselves reported less positive affect, more negative affect, and more shame. Shame predicted higher levels of post-game cortisol, controlling for pre-game cortisol; stingy economic behavior therefore produced a significant indirect effect on cortisol via shame. Thus, shame and cortisol represent plausible emotional and biological pathways linking everyday decisions with downstream consequences for health.

Keywords

- *cortisol*
- *emotions*
- *financial decision making*
- *shame*

DO THE KINDS of economic decisions people make every day have downstream consequences for their health? When the bill comes after lunch with a friend, or a homeless man asks for spare change, or a Greenpeace volunteer requests a donation, individuals are faced with the opportunity to behave in a relatively generous or stingy fashion. In the present research, by modeling these kinds of social dilemmas in a controlled setting, we explored the emotional and biological pathways through which financial decisions may 'get under the skin'. We hypothesized that when individuals are presented with the opportunity to share their money with another person, the amount of money they choose to give will influence their subsequent emotional response, which in turn will shape physiological processes, including the secretion of the stress hormone cortisol.

Consistent with this hypothesis, recent research suggests that people may reap emotional dividends from using their financial resources to benefits others (Dunn, Aknin, & Norton, 2008; Harbaugh, Mayr, & Burghart, 2007). Examining a nationally representative sample of over 600 Americans, Dunn et al. (2008) found that individuals who spent more money prosocially (on gifts for others and charitable donations) reported greater happiness, even after controlling for income. To test the causal influence of prosocial spending on happiness, Dunn et al. (2008) conducted an experiment in which participants were given $5 or $20 in the morning and randomly assigned to spend the money either on others or on themselves by 5pm that day. Participants who were randomly assigned to spend the windfall on others were almost one standard deviation happier at the end of the day than participants assigned to spend the windfall on themselves, regardless of the size of the windfall. Similarly, in a neuroimaging study, participants were given $100 and provided with the opportunity to donate some of their windfall to a local food bank; when participants gave away their money to charity, they exhibited increased activation in neural areas associated with receiving rewards (Harbaugh et al., 2007). Taken together, this emerging body of research implies that generosity and stinginess may have potent emotional consequences.

Emotional responses, in turn, are believed to represent a critical pathway through which psychosocial variables can influence physical health (e.g. Cohen & Pressman, 2006; Polk, Cohen, Doyle, Skoner, & Kirschbaum, 2005). One physiological system that appears particularly tied to the vicissitudes of emotional experience is the hypothalamic-pituitary-adrenal (HPA) axis (Polk et al., 2005). As part of the neuroendocrine system, the HPA axis is activated in response to stress and regulates the immune and metabolic systems through the release of hormones such as cortisol (Miller, Chen, & Zhou, 2007; Phillips, 2007; Sapolsky, Romero, & Munck, 2000). Cortisol secretion in response to stress may be adaptive in the short term; however, frequent or prolonged elevation of cortisol in response to stress can cause 'wear and tear' on the body, creating vulnerability to disease (McEwen, 1998). Therefore, cortisol has been identified as a key mechanism in explaining the negative effects of stress on health (Dickerson & Kemeny, 2004; McEwen, 1998; Miller et al., 2007). In particular, the *emotional responses* provoked by stress may shape the secretion of cortisol (Dickerson & Kemeny, 2004; Polk et al., 2005). Existing research has linked negative affect to increased cortisol and positive affect to decreased cortisol, although the evidence is somewhat mixed (for a review, see Pressman & Cohen, 2005). In addition, a small but compelling body of research suggests that the emotional experience of shame may be closely tied to increased cortisol (Dickerson, Myeck, & Zaldivar, 2008; Grunewald, Kemeny, Azi, & Fahey, 2004; Lewis & Ramsay, 2002). Thus, extant research provides intriguing, if tentative, evidence that emotional responses to the ups and downs of daily life may govern the release of cortisol, with long-term implications for health.

In the present research, then, we examined whether a specific economic decision can influence emotional responses and thereby shape cortisol levels. Specifically, we asked participants to play a version of a widely studied economic game known as the 'dictator game', in which they received $10 and had to decide how much of this sum to share with a paired recipient. We assessed affective responses following the game, as well as measuring cortisol levels before and afterward.

Method

Participants

Fifty students (72% females; M_{age} = 23.2) at the University of British Columbia completed this study (which was approved by the university's behavioral research ethics board) during an 11am course lecture, in return for $10. Participants' age

and gender were not significantly related to any of our independent or dependent variables and therefore will not be discussed further. Each participant was yoked to a paired recipient, another student in the classroom who completed a consent form, but did not provide cortisol samples; these paired recipients received monetary compensation only if their yoked participant chose to donate to them.

Dictator game

After signing consent forms, participants completed a single-item measure of general happiness (Abdel-Khalek, 2006). Participants were then given 10 $1 coins as compensation for participation and were asked to sign a receipt acknowledging this payment. Next, participants were informed that they had the option of donating some of their payment to a yoked recipient. They were told they would have to deliver the sum to the recipient, who could not challenge their decision and who would only receive the amount they decided to donate. Before learning the identity of their yoked recipient, participants placed whatever amount they wished to donate (from $0–$10) in an envelope. Participants then got up and delivered their donation to their yoked recipient, who was holding the same participant number as them.

Affect

After this exchange, participants were asked to rate their current mood again using the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) by reporting the extent to which they currently felt 10 positive affect (e.g. excited, strong, inspired) and 10 negative affect (e.g. ashamed, upset, nervous) words on a scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*); the PANAS enabled us to create indices of PA ($\alpha = .90$) and NA ($\alpha = .80$), as well as examining responses to the specific item 'ashamed'.

Cortisol

Participants provided salivary cortisol samples by chewing lightly on a cotton roll called a Salivette (Sarstedt Corp., Numbrecht, Germany) immediately before and after the dictator game, as well as 15 and 45 minutes afterward, as the body typically takes at least 10 minutes to mount a cortisol response (Kirschbaum, Klauer, Filipp, & Hellhammer, 1995). Useable cortisol samples were successfully obtained for all participants at all time points. Thus, all participants provided cortisol samples at the same time of day, with the four cortisol samples collected at specified time points between 11am–noon, thereby minimizing between-subject error variance stemming from the diurnal pattern of cortisol secretion. Free cortisol levels in saliva were measured using a commercially available chemiluminescence assay (IBL, Hamburg, Germany). The intra and interassay coefficients of variation were below 8 percent. Cortisol values that were collected at 15 and 45 minutes after the dictator game were first log transformed to reduce substantial skewness and were then averaged to create a post-game composite value. Because there are substantial individual differences in baseline cortisol levels (Kirschbaum & Hellhammer, 1994), all analyses of post-game cortisol used pre-game cortisol as a control variable.

Results

Donations and affect

To examine how giving money away influenced participants' feelings after the game, we entered donation amount and baseline happiness into multiple linear regressions predicting positive affect, negative affect, and shame following the game. Controlling for baseline levels of happiness, participants who gave more money away (M = $4.48, SD = 2.59) reported higher positive affect ($\beta = .32$, $p = .03$) and lower negative affect ($\beta = -.41$, $p = .003$), along with less shame ($\beta = -.39$, $p = .006$), immediately following the dictator game.

Affect and cortisol

To examine the relationship between affect and cortisol, we first entered positive affect into a multiple linear regression predicting post-game cortisol, controlling for pre-game cortisol. Positive affect was not significantly related to cortisol ($\beta = .10$, $p = .28$). Replacing PA with NA in this regression, we also found no effect of NA ($\beta = .06$, $p = .55$). When PA and NA were entered into this regression simultaneously, neither PA nor NA significantly predicted cortisol, p's $> .27$. However, when we entered shame into a regression predicting post-game cortisol, we found that higher levels of shame immediately after the game predicted elevated levels of cortisol 15–45 minutes later ($\beta = .18$, $p = .05$), controlling for cortisol levels prior to the game ($\beta = .75$ $p < .001$).

Mediation

Because the amount of money dictators gave away predicted shame and shame in turn predicted cortisol

levels, we tested whether there was an indirect effect of donation amount on post-game cortisol (controlling for pre-game cortisol) via shame. We used a bootstrapping analysis to test for mediation, as Shrout and Bolger (2002) recommend for studies with samples sizes between 20–80. There was a significant indirect effect of donation amount on post-game cortisol that was completely mediated by shame (indirect effect = –.012, SE = .007, 95% confidence interval: –.029, –.002). The bivariate effect of donation amount on cortisol was not significant (β = –.001, NS). However, current theorizing (Collins, Graham, & Flaherty, 1998; MacKinnon, Krull, & Lockwood, 2000; Shrout & Bolger, 2002) suggests that the absence of a bivariate effect should not preclude testing an indirect effect when the independent variable (i.e. donation amount) is expected to have a distal causal effect on the dependent variable (i.e. cortisol) via its influence on an intervening mediator (i.e. emotional response).

Discussion

The present research suggests that stingy economic behavior can produce a feeling of shame, which in turn drives secretion of the stress hormone cortisol. To the best of our knowledge, this study is the first to identify the pathways through which a specific economic decision may 'get under the skin' to influence a health-related, biological process. Although we examined economic behavior in the controlled context of a dictator game, previous research suggests that the level of generosity individuals exhibit in the dictator game is correlated with their financial generosity (e.g. donations to charity) in daily life (Bekkers, 2007). Thus, individuals who exhibited stinginess in our dictator game may also respond this way when faced with similar decisions on a day-to-day basis, and over time, such behavior may have compounding consequences for health.

Of course, simply walking down a city street presents numerous opportunities for generous or stingy behavior, and it seems implausible that every such decision would hold implications for cortisol. Our research addresses this issue by demonstrating that stingy economic behavior predicts cortisol secretion only to the extent that stinginess provokes shame; there was no direct effect of dictators' allocation decisions on cortisol, but rather a significant indirect effect that was entirely mediated by shame. When individuals are faced with an opportunity to behave in a generous or stingy fashion in daily life, then, we would expect downstream implications for cortisol to the extent that they perceive their behavior as exposing a flaw or moral shortcoming to a real or imagined audience, inducing shame (Tangney, 1995). Thus, the impact of generous or stingy economic decisions on cortisol may depend on both dispositional factors, such as proneness to shame, and situational factors, such as the degree to which the decision holds implications for one's moral character.

While the results from this study offer new insight into the potential biological consequences of stingy economic decisions, it is not without limitations. Because this study was conducted in a controlled setting using an economic game, there are inherent limits on its external validity, and testing the same hypotheses in the context of a field study with a larger sample size and higher stakes economic decisions would be worthwhile. Another potential limitation of the present research is that we used a single-item measure of shame. In past work examining the relationship between shame and cortisol, researchers have also employed very brief affective measures of shame, typically asking participants to rate how 'ashamed' they feel, as well as rating their feelings on one to three additional descriptors (e.g. embarrassed, humiliated; Dickerson, Kemeny, Aziz, Kim, & Fahey, 2004b; Dickerson et al., 2008; Gruenewald et al., 2004). When these researchers have included cognitive appraisal measures of shame such as the State Shame and Guilt Scale (Marschall, Sanftner, & Tangney, 1994), very high correlations between the cognitive and affective components have been observed (r = .83; Dickerson et al., 2008) and similar patterns of results have emerged for these two components (Gruenewald et al., 2004). Therefore, in assessing links between shame and cortisol, brief affective measures seem to be adequate. Given that single-item measures have lower reliability than longer measures, thereby reducing the likelihood of detecting an effect, the fact that we observed a significant correlation between shame and cortisol suggests that the relationship between these variables is quite robust. Thus, the present research provides support for Social Self-Preservation Theory, which posits that acute threats to the 'social self' induce shame and lead to increased cortisol, as part of a coordinated response to social threats (Dickerson, Gruenewald, & Kemeny, 2004a).

A second possible limitation of the current study is that we did not pre-screen participants or control for the myriad health and lifestyle factors that can

influence cortisol levels, such as birth control use (Durber, Lawsone, & Daly, 1976), cigarette smoking (Wilkins et al., 1982), chronic stress (Miller et al., 2007), and autoimmune diseases (McEwen, 1998). Rather than measuring the many variables that can influence cortisol levels, we assessed baseline levels of cortisol before the dictator game, using this as a control variable in our analyses of post-game cortisol in order to account for potential 'noise' in the data that could arise from background factors not assessed. Because controlling for variables such as smoking might have further reduced error variance, the fact that we were able to detect a significant indirect effect of donation amount on post-game cortisol even in the absence of such additional controls underscores the robustness of our effect. While it is conceivable that a variable such as smoking might represent a confound, in order for smoking to represent a critical 'third variable', one would have to posit: (a) that nicotine led people to make less generous allocations in the dictator game; and (b) that nicotine increased cortisol secretion in response to the specific experience of playing the dictator game, above and beyond baseline levels of cortisol.

Finally, it is worth reiterating that we studied a sample of college students who were healthy enough to attend class, and that neither age nor gender were significantly related to the predictor or outcome variables in this study, making it unlikely that the many biological factors related to gender and age (e.g. birth control use, arthritis) could represent confounds. Of course, it is conceivable that personality factors (e.g. neuroticism) or social desirability concerns could have acted as confounding variables. As explained earlier, however, such confounds would only explain our results if the confounding variable (e.g. neuroticism) affected both allocation decisions and increases in cortisol during the game, controlling for baseline cortisol. Still, assessing personality, social desirability, and health status would enable future research to rule out alternative explanations more conclusively. By not including such extensive measures in the present study, we were able to gather initial evidence for our hypothesis with minimal participant burden during a course lecture, allowing us to study a fairly homogenous sample while holding time of day and time of semester constant.

Although it would be worthwhile for future studies to include more extensive measures, the present study provides initial evidence that generous or stingy economic decisions may trigger a chain reaction of emotional and biological responses when such decisions carry implications for the value of the social self. Therefore, the present findings may contribute to our understanding of the robust association between prosocial behavior and health outcomes (Post & Neimark, 2007). Intriguing new research suggests that providing others with support may carry greater health benefits than receiving support (Brown, Consedine, & Magai, 2005; Brown, Nesse, Vinokur, & Smith, 2003; Schwartz & Sendor, 1999). For example, controlling for a number of potential confounds, Brown et al. (2005) found that older adults who provided more material and emotional support to others reported better health, whereas receiving these forms of support was unrelated to health. While researchers have documented strong links between helping others and self-reported health, as well as morbidity and mortality (Post & Neimark, 2007), relatively little is known about how helping others might get under the skin. Our findings provide initial, suggestive evidence that shame and cortisol represent plausible emotional and biological pathways that might link everyday decisions about whether to help others with downstream consequences for one's own health.

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