

How stress influences our morality

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Abstract

Several studies show that stress can influence moral judgment and behavior. In personal moral dilemmas—scenarios where someone has to be harmed by physical contact in order to save several others—participants under stress tend to make more deontological judgments than non-stressed participants, i.e. they agree less with harming someone for the greater good. Other studies demonstrate that stress can increase pro-social behavior for in-group members but decrease it for out-group members. The dual-process theory of moral judgment in combination with an evolutionary perspective on emotional reactions seems to explain these results: stress might inhibit controlled reasoning and trigger people's automatic emotional intuitions. In other words, when it comes to morality, stress seems to make us prone to follow our gut reactions instead of our elaborate reasoning.

Keywords: stress, morality, decision-making, judgment, intuition, emotion, reasoning

How stress influences our morality

All of us are stressed every now and then. There are phenomena we usually associate with stress, like health risks and feelings like fear, panic, or insecurity. But stress might also have effects we normally don't think of; recent studies suggest it can dramatically influence our decision-making in a number of—perhaps unexpected—ways. This becomes particularly relevant in the moral context: people who are put under stress behave more compassionately in some situations, yet the opposite can be true in other situations. Why is this and what does this tell us about our morality? Maybe the comedian Tim Allen was right, when he said: “You don't know what people are really like until they're under a lot of stress.”

Consider this dilemma: A trolley is racing down the railway tracks towards five people who cannot escape. You are standing on a bridge under which it will pass. Next to you, as it happens, stands a very large man. By pushing him over the bridge, and thus killing him, you could stop the trolley and save the five people. Should you push the man? This question is tough and people—even philosophers—have very different views about it.

The question of the appropriateness of killing someone to save several others has been debated among philosophers for centuries and exemplifies a distinction in moral philosophy between *utilitarianism* (e.g. Bentham, 1789; Mill, 1861) and *deontology* (e.g. Kant, 1785). Utilitarianism focuses on the consequences of one's actions and assumes that the right thing to do is whatever maximizes the wellbeing of everyone. Deontology, on the other hand, prescribes a set of rules that should always be adhered to—to a large extent, independently of the consequences, like the prohibition of murder for example. Hence, in the trolley dilemma above, a utilitarian might push the large man and accept the loss of one person in favor of five others whereas a deontologist would not.

In the last decade, scientists have started to explore the underlying psychological mechanisms involved in such moral judgments. Psychologists often measure people's moral tendencies by having them judge hypothetical moral dilemmas such as the trolley scenario. Let us first take a closer look at how moral psychologists explain the psychological mechanisms involved in moral judgments. Thereafter, we will have a look on how stress influences these judgments.

Automatic and controlled moral judgments

Moral psychologist Joshua Greene proposed a *dual-process theory of moral judgment*, suggesting that we have two competing moral subsystems (Greene, Nystrom, Engell, Darley, & Cohen, 2004). The theory is analogous to Daniel Kahneman's more general "thinking fast and slow" or System 1 and System 2 assumption (Kahneman, 2011). In a nutshell, the dual-process theory of moral judgment assumes that deontological judgments are mainly driven by fast, automatic, and emotional intuitions (gut reactions), whereas utilitarian judgments usually involve slower and more controlled reasoning. When people are faced with a "personal" dilemma—one that, like the trolley dilemma, involves physically harming someone—a strong negative emotional reaction is provoked resulting in characteristically deontological judgments (Greene, 2007). Nevertheless, we can also switch to a more controlled mode of thinking in order to overcome this first gut reaction and perform a deliberative assessment of the situation, e.g. a utilitarian cost-benefit analysis of the anticipated consequences.

Accumulating evidence from behavioral experiments and neuroimaging studies supports this theory. fMRI studies, for example, reveal that brain areas associated with emotional processing, such as the ventromedial prefrontal cortex (vmPFC) and the amygdala, are more active when people judge personal moral dilemmas (Greene et al., 2004), e.g. when they judge

the appropriateness of pushing someone off a bridge to save five people, compared to when the action is less personal (i.e. when no physical contact is involved). This is in line with Greene's assumption that deontological responses stem from emotional reactions triggered in specific circumstances such as personal moral dilemmas. In another experiment, participants were primed to think more deliberately by completing the Cognitive Reflection Test before answering moral dilemmas. The Cognitive Reflection Test contains a set of questions, which require suppressing the intuitive incorrect answer (Frederick, 2005). Participants who first completed the Cognitive Reflection were twice as likely to give utilitarian judgments to personal moral dilemmas than participants who didn't (Paxton, Ungar, & Greene, 2012). These and many other findings suggest that the dual-process theory captures important aspects of our moral thinking. But how does all this relate to stress?

Stress triggers our moral gut reactions

When talking about stress, it is important to distinguish between *acute* and *chronic stress*. Acute stress is short-lived and usually brought about in specific, often challenging, situations such as riding a roller coaster. Chronic stress, on the other hand, is long lasting, emotionally painful and results from exposure to stressors over a prolonged period, like traumatic experiences. The findings presented in this article are about *acute stress* only. Acute stress is a physiological reaction and involves the activation of the sympathetic nervous system (Rohleder & Nater, 2009) and the release of the "stress hormone" cortisol among other hormones such as adrenaline and noradrenaline (Kirschbaum & Hellhammer, 1994). As studies show, brain areas responsible for cognitive and emotional processing, such as the prefrontal cortex or the limbic system, can be affected by stress. This can have a profound effect on people's cognitive functions: when people are stressed, they tend to make riskier decisions, show impaired strategic

reasoning (Leder, Häusser, & Mojzisch, 2013), insufficiently adjust their automatic responses, and are less likely to consider all relevant options of a decision (Starcke & Brand, 2012).

Taking into account these findings, and in particular the fact that stress activates some of the same brain regions responsible for emotional processing, we can assume that stress should have an effect on moral decision-making as well. According to the dual-process theory of moral judgment, deontological judgments are expected to increase when controlled reasoning is inhibited. Stress does that by triggering people's automatic emotional intuitions. This keeps people from thinking the situation over, which could override their gut reactions. Therefore, people should be less prone to engage in utilitarian reasoning in trolley-like dilemmas when they are stressed. This is exactly what Youssef and colleagues found. In one experiment, participants were put under acute stress by using a well-established standardized psychological stressor called Trier Social Stress Test (TSST), involving public speaking and difficult arithmetic tasks (Kirschbaum et al., 1993). Compared to the non-stressed control group, the stressed participants not only showed physiological responses like higher levels of cortisol, but were also more deontological in their decision-making when faced with personal moral dilemmas (Youssef et al., 2012). Hence, as hypothesized, the stressed participants seemed more prone to follow their emotional intuitions.

Another study conducted by Starcke, Ludwig, and Brand (2012) confirmed—and extended—these findings, observing that in addition to changes in judgments, participants took longer to come to a decision when they were stressed. This is in line with the finding that reaction times are significantly higher when people have to complete a simultaneous demanding task while judging moral dilemmas, even though answers remain the same (Greene, Morelli, Lowenberg, Nvstrom, & Cohen, 2008). This seems to indicate that people, even when distracted

by either another task or by stress, are motivated to try to give a deliberate answer—they just need more time. But, in cases where people are under time pressure and thus are unable to think deliberately, they tend to give more deontological responses (Suter & Hertwig, 2011). As we can see, this is all in line with the dual-process theory of moral judgment.

Moral judgments seem to be affected by stress only when the situation elicits an emotional reaction strong enough to be impacted by the stress reactions such as trolley-like personal moral dilemmas. For example, Starcke, Polzer, Wolf, and Brand (2011) used everyday moral dilemmas that were less extreme compared to the trolley dilemma, for example, asking participants whether they would leave a message to the owner of a car that they had accidentally scratched. They did observe an association between people's cortisol levels and egoistic judgments in those dilemmas considered to be most emotional. However, the researchers failed to find a significant difference in judgments between stressed and non-stressed participants, presumably because the moral vignettes used in this study did not elicit emotions that were strong enough to cause a difference compared to trolley-like personal moral dilemmas.

Nonetheless, many of us are confronted with highly emotional moral situations in real life in which our judgments could be influenced by stress. For example, people might be more prone to help a child beggar on the street if they feel stressed after an uncomfortable meeting at work. Even more worryingly, doctors who face life-and-death decisions might be influenced by the daily stress they experience.

Stress can increase or decrease pro-social behavior

Does the fact that stress enhances emotional reactions mean that people behave more pro-socially when they are stressed as claimed in [Kelly McGonigal's TED talk](#)? The answer is: it depends.

Social psychologists define pro-social behavior as voluntary actions that are intended to benefit others (Dovidio, Piliavin, Schroeder, & Penner, 2006). This can be motivated by either selfish (egoistic) or selfless (altruistic) reasons (Piliavin, 2009). The relation of pro-social behavior to deontology and utilitarianism is less obvious because of differing normative interpretations of pro-sociality. In the trolley dilemma, for example, a deontologist might say that not pushing the man down the bridge is the pro-social and thus morally right action. A utilitarian, however, would argue that sacrificing one person in order to save five is more pro-social overall. Another crucial difference between the two ethical systems is their entailed scope of concern for others. Deontology obliges you to help those close to you, such as family members or people that you interact with. However, it does not pose the same obligation to help individuals that are less proximate to you. Utilitarianism, on the other hand, poses a duty to help everybody to the same extent irrespective of his or her distance to you. As a result, utilitarianism might feel more counterintuitive in certain contexts compared to deontology. This distinction between deontology and utilitarianism will prove useful when we take a look at the experimental findings.

As a study by von Dawans and her colleagues shows, acutely stressed people behave more pro-socially in microeconomic experiments where they (anonymously) have to interact with real people (Von Dawans, Fischbacher, Kirschbaum, Fehr, & Heinrichs, 2012). When participants received money and could either keep it for themselves or share it with another participant, stressed participants, on average, shared more. Participants under stress were also more willing to trust others more and acted themselves in a more trustworthy manner compared to non-stressed participants. As shown by another study by Vinkers and colleagues, this phenomenon cannot be transferred to altruistic behavior in general: stressed participants donated less money to the charity Unicef than their unstressed counterparts (Vinkers et al., 2013).

Apparently, for stress to increase pro-social behavior it is necessary to be confronted with an actual other person (even if he is a stranger). A possible explanation might be that people under acute stress behave more pro-socially towards their peers in order to seek comfort and support (“tend and befriend” hypothesis; Taylor et al., 2000). This makes sense from an evolutionary perspective. Cooperation evolved in order to maximize the proliferation of our ancestors’ genes (Dawkins, 1976). For that reason, our innate morality is tweaked in such a way that we intuitively help actual people, from whom we can expect reciprocal help in return, but not abstract institutions like charities. Thus, the intuitive response can sometimes be pro-social (towards actual people) and sometimes not (towards abstract institutions).

If this is correct, stress is expected to enhance pro-social behavior only if the *intuitive* response to the current situation is to behave pro-socially. That’s why the same stimulus can lead to very different moral decisions depending on the intuitive response that is triggered. To identify which response this will be, it can be helpful to adopt an evolutionary perspective again and ask ourselves which reaction would have been evolutionarily adaptive in a specific situation. What follows is that, while stress usually increases deontological judgment, it can both increase or decrease utilitarian judgment: stress decreases utilitarian responses in situations when the utilitarian answer is counterintuitive and more controlled cost-benefit reasoning would be necessary to overcome first emotional intuitions, as we have seen in the trolley dilemma. But stress can also increase utilitarian responses in situations where the emotional intuition is in line with utilitarianism, for example when helping actual people one is interacting with (cf. Von Dawans et al., 2012). Note that moral intuitions might also be shaped via cultural or individual learning. But generally, many of these intuitions seem to stem from our evolutionary past (Greene, 2013).

Implications

The experimental findings presented in this article are based on unrealistic scenarios like the trolley dilemma that one probably—or at least hopefully—will not encounter in real life. Still, we face moral decisions every day, for instance when deciding whether to help a beggar, to cooperate with strangers or to donate to charity. These are moral decisions that, as we have seen, can be affected by stress. Presumably, stress experienced in real life situations, whether it is in cases of emergency, during a job interview, or in traffic, is of much higher intensity than the stress induced in laboratory settings. Considering the high prevalence of stress, the implications of the presented findings could be even greater than one might assume based on the experimental findings.

The conclusions drawn from these studies seem to raise an important question: if our moral judgments are so dependent on stress, which of our judgments should we rely on—the ones elicited by stress or the ones we come to after careful consideration? Most people would probably not regard a physiological reaction, such as stress, as a relevant normative factor that should have a qualified influence on our moral values. Instead, our reflective moral judgments seem to represent better what we really care about. This should make us suspicious of the normative validity of emotional intuitions in general. Thus, in order to identify our moral values, we should not blindly follow our gut reactions, but try to think more deliberately about what we care about.

For example, as stated we might be more prone to help a poor beggar on the street when we are stressed. Here, even after careful reflection we might come to the conclusion that this emotional reaction elicited by stress is the morally right thing to do after all. However, in other situations this might not be the case. As we have seen we are less prone to donate money to

charity when stressed (cf. Vinkers et al., 2013). But is this reaction really in line with what we consider to be the morally right thing to do after careful reflection? After all, if we care about the wellbeing of the single beggar, why then should the many more people's lives, potentially benefiting from our donation, count less? This depends of course on one's moral stance, like utilitarianism or deontology. But it should at least give us a reason to pause and try to think twice whether we want to endorse our emotional reactions elicited by stress or not.

Conclusion

In summary, several studies demonstrate that acute stress affects our moral decision-making. It does so by increasing emotional intuitions elicited by the current situation. In moral dilemmas where it is to be decided whether someone should be killed for the greater good, stress decreases utilitarian answers. In other contexts, stress can both increase and decrease pro-social behavior. The dual-process theory of moral judgment in combination with an evolutionary perspective on emotional reactions makes sense of these seemingly contradictory results.

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Definitions

Acute Stress: physiological reaction to a challenging situation involving the activation of the sympathetic nervous system and the release of the hormone cortisol, adrenaline and noradrenaline

Dual-process theory: representing two different modes of thinking: a fast, intuitive and emotional one, and a slow, deliberative and logical one

Tend and befriend: assumption that humans, among other animals, seek social support and protect their offspring when under threat

Moral dilemma: a complex situation involving a conflict between moral requirements, in which to obey one would result in transgressing another; moral psychologists distinguish between “personal” and “impersonal” moral dilemmas; an example of a personal moral dilemma is the footbridge version of the trolley problem, involving physically pushing someone from a bridge in order to save many others; an example of an impersonal moral dilemma is the switch version of the trolley problem, involving hitting a switch in order to steer the trolley to another track where it kills only one instead many other people; personal moral dilemmas tend to trigger stronger emotional reactions than impersonal ones and thus tend to result in stronger deontological judgments than impersonal moral dilemmas

Utilitarianism: theory in moral philosophy suggesting the right thing to do is whatever maximizes aggregate wellbeing

Deontology: theory in moral philosophy prescribing a set of rules that should always be adhered to, such as the prohibition of murder

Ventromedial prefrontal cortex: brain area located in the frontal lobe, is implicated in the inhibition of emotional processes, decision-making, and the processing of risk and fear

Amygdala: brain area (group of nuclei) located in the medial temporal lobe and part of the limbic system; plays a role in processes of memory, decision-making, and emotional reactions.