Evolution and Human Behavior 35 (2014) 140–147

Contents lists available at ScienceDirect

Evolution and Human Behavior

journal homepage: www.ehbonline.org

Original Article

When the selfish suffer: evidence for selective prosocial emotional and physiological responses to suffering egoists☆

Jennifer Stellar [a,*], Matthew Feinberg [b], Dacher Keltner [a]

[a] Department of Psychology, University of California, Berkeley, 3120 Tolman Hall, Berkeley, CA 94720, USA
[b] Center for Compassion and Altruism Research and Education, Stanford, 306 Jordan Hall, Palo Alto, CA, 94305, USA

ARTICLE INFO

Article history:
Initial receipt 11 November 2012
Final revision received 4 December 2013

Keywords:
Egoism
Prosociality
Emotion
Physiology

ABSTRACT

Prosociality is fundamental to social relationships, but providing it indiscriminately risks exploitation by egoists. Past work demonstrates that individuals avoid these risks through a more selective form of prosociality, cooperating less and sharing fewer resources with egoists (e.g. Axelrod & Hamilton, 1981). The evolution of cooperation. *Science*, *211*(4489), 1390–1396). We extend this work to explore whether individuals experience reduced prosocial affective and physiological responses to egoists in situations where they are suffering. In two studies, participants learned of a target's egoistic or non-egoistic traits, and then encountered the target suffering. Suffering egoists evoked less compassion in others than non-egoists and elicited physiological responses that diverged from patterns associated with compassion and social engagement (reduced heart rate and greater respiratory sinus arrhythmia activity). Participants' feelings of distrust toward egoists explained these attenuated emotional and physiological responses. These results build upon studies of prosocial behavior by suggesting that individuals experience reduced prosocial emotional and physiological responses toward suffering egoists.

1. Introduction

Individuals who are indiscriminately prosocial risk being exploited by egoists, who reliably focus on maximizing positive outcomes for themselves without regard to the needs of others (Van Lange, Otten, De Bruin, & Joireman, 1997). Given the costs and risks of exploitation, it has been argued that for prosocial tendencies to have evolved and persisted as a stable strategy, they need to be bounded by considerations of the person in need, and in particular that individual's likelihood of future cooperation (e.g., Axelrod & Hamilton, 1981). Evidence in support of this claim finds that people can readily detect the egoistic tendencies of others and modify their behavior by cooperating less and sharing fewer resources with them (e.g., Brown, Palameta, & Moore, 2003). These findings complement emergent work on indirect reciprocity, which suggests that individuals use reputational information about how prosocial someone has been in past interactions with others when deciding whether or not to cooperate with that person (Nowak & Sigmund, 2005). Even prosocially minded individuals will defect in a social dilemma when paired with a person who has displayed egoistic tendencies toward others in the past. This more selective form of prosociality appears to be fundamental, emerging early in human development. Children as young as three months show a preference for prosocial over antisocial individuals (Hamlin, Wynn, & Bloom, 2010) and by three years of age children tend to refrain from helping those who had previously harmed another person (Vaish, Carpenter, & Tomasello, 2010).

Guided by a social functionalist approach to emotions, we extend the theoretical and empirical work on selective prosociality to the realm of affective experience and physiology. We hypothesize that individuals who learn a person has egoistic qualities will experience less compassion, and show attenuated physiological responses thought to be associated with compassion, when they witness that person suffer. We focus on contexts where another is suffering because such situations typically evoke strong affective responses in others and represent a critical opportunity for prosocial responding. We measure compassion using self-reports and two physiological measures, heart rate and respiratory sinus arrhythmia, which have been associated with the experience of compassion and social engagement.

1.1. Attenuated compassion for suffering egoists

Within the social-functionalist framework, it is posited that emotions evolved to serve particular functions that enhance the likelihood of reproduction and survival (Keltner & Haidt, 2001; Niedenthal & Brauer, 2012). To achieve this end, emotions coordinate independent systems, such as peripheral physiology, attention, and memory, to prioritize adaptive behaviors and strategic decision-

☆ Author note. The raw data for this study can be found at: https://sites.google.com/site/jenniferestellar/published-data.

* Corresponding author at: University of California, Berkeley, 3120 Tolman Hall, Berkeley, CA, 94720, USA.
E-mail address: jstellar@berkeley.edu (J. Stellar).

1090-5138/$ – see front matter © 2014 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.evolhumbehav.2013.12.001

making (Cosmides & Tooby, 2000; Loewenstein & Lerner, 2003). Here we focus on compassion, which typically motivates prosocial behavior such as caretaking, support-giving, and helping (e.g. Eisenberg & Miller, 1987).

Compassion is defined as feeling sorrow or concern for someone who is suffering, coupled with the desire to alleviate that suffering (Eisenberg et al., 1994). Theorists contend that compassion originally evolved to encourage caretaking behaviors towards vulnerable offspring (Hrdy, 1999; Goetz, Keltner, & Simon-Thomas, 2010). Later, the propensity to experience compassion extended beyond the bounds of kinship, promoting altruistic behavior, which facilitated the formation of long-term, reciprocally beneficial relationships (Trivers, 1971). A meta-analysis supports this claim, revealing that compassion and compassion-related emotions reliably promote prosocial behavior towards those in need (Eisenberg & Miller, 1987). For instance, reports of sympathy after watching a video of a woman in a car accident predicted willingness to volunteer hours to help that woman (Eisenberg et al., 1989). Inducing compassion for others also increases levels of cooperation in economic games (Batson & Moran, 1999). Empathic concern, which is akin to compassion, features prominently in Batson's empathy–altruism model (Batson, Duncan, Ackerman, Buckley, & Birch, 1981). In relevant research, participants who felt greater compassion were more willing to trade places with a confederate who was receiving painful shocks even when escape from the situation was relatively easy.[1] Compassion predicts a more genuine form of altruism motivated by the desire to reduce another's suffering, which cannot be explained by more egoistic motivations such as a desire to reduce one's own distress (Batson, O'Quin, Fultz, Vanderplas, & Isen, 1983), receive benefits, or avoid punishment for not helping (Batson et al., 1988). Overall, then, such work suggests that the experience of compassion increases the likelihood of prosocial behavior toward individuals in need.

An affective approach to evolutionary game theory would suggest that egoists may be able to exploit others through several means, including eliciting compassion (Axelrod & Hamilton, 1981). The risks of exploitation would be reduced, however, if affective responses to suffering, such as compassion were contingent upon the prosocial tendencies of the person in need. Initial evidence supports this claim. Male participants who were personally exploited in an economic game showed reduced activation in empathy-related neural networks when they later saw the culprit in pain (Singer et al., 2006). In this way a bounded affective response to suffering could be an important component of a selectively prosocial strategy. Given this reasoning and select empirical evidence, we predict that individuals will experience reduced compassion towards a suffering egoist compared to a cooperator.

1.2. Differential physiological responding to egoists

In the present investigation, alongside self-report measures we also gather measures of two peripheral physiological responses, heart rate (HR) and respiratory sinus arrhythmia (RSA). Peripheral physiological changes covary with episodes of specific emotions (for recent review, see Keltner, Oatley, & Jenkins, 2013). They are less subject to conscious control than subjective experiences, and less vulnerable to self-report biases. Self-reports of compassion, in particular, are susceptible to social-desirability concerns and demand effects. In addition, researchers tend to measure self-reported emotions after the presentation of a stimulus, which makes such reports vulnerable to biases such as duration neglect and over-emphasis on the peak emotional moments as well as the end of the emotional experience (Fredrickson & Kahneman, 1993). In contrast, physiological responses are collected continuously during the experience of the emotion. Thus, including peripheral physiological responses helps avoid the potential biases of self-reports.

Within the study of prosocial behavior, there is increasing evidence suggesting that compassionate responses to suffering covary with a particular pattern of peripheral physiological activity. Specifically, studies find that the experience of compassion in response to witnessing another person suffer is reflected in slowing of HR, which also predicts downstream helping behavior (e.g. Eisenberg et al., 1989; Stellar, Manzo, Kraus, & Keltner, 2012). Recent research has established that HR deceleration differentiates between more or less compassionate responses to suffering, with greater self-reported compassion associated with greater slowing of HR (Stellar et al., 2012).

Additionally, emergent evidence suggests that the vagus nerve, a branch of the parasympathetic autonomic nervous system, may show greater activation during compassionate responses to others' suffering (e.g. Fabes, Eisenberg, Karbon, Troyer, & Switzer, 1994). The vagus nerve is the 10th cranial nerve and projects to certain skeletal muscles, organs involved in digestion, and most importantly, to the heart where it helps determine heart rate (Berntson, Cacioppo, & Quigley, 1993). Increases in activation of the vagus nerve slow the heart and decreases in activation speed it up. Although not definitive, this relationship suggests that decreases in heart rate may indicate increased vagus nerve activity. Researchers use a non-invasive index, called RSA to assess vagal activity. RSA combines two principles: 1) inhalation temporarily suppresses vagal activity and exhalation allows for vagus nerve to regain control 2) heart rate slows with greater vagal activation and speeds up with lower vagal activation. As a result greater RSA, or variability in heart rate due to respiration, is thought to index greater vagal activation, while lower RSA indexes reduced vagal activation.

Empirical work links greater vagus nerve activity to traits associated with compassion and social connection as well as the experience of prosocial states. Resting vagal tone is correlated with agreeableness, a facet of personality associated with a tendency to be compassionate and cooperative (Oveis et al., 2009), and a broader prosocial disposition in a sample of boys (Eisenberg et al., 1996). Vulnerabilities characterized by reduced social connection and empathy, such as autism, are associated with lower baseline RSA compared to normal populations (Ming, Julu, Brimacombe, Connor, & Daniels, 2005). In a recent study, adults with high baseline levels of RSA reported greater feelings of connection to others and increases in baseline RSA over time covaried with increases in reported social connection (Kok & Fredrickson, 2010).

Evidence that vagal activation relates specifically to the experience of compassion is mounting. For instance, children with high baseline RSA exposed to the crying of an infant were more likely to talk to that infant and offer help (Fabes et al., 1994). In a series of four studies, Stellar and Keltner (2013) show that the experience of compassion reliably elicits greater vagal activity compared to other positive emotions. In light of these empirical advances, we expect egoists to evoke reduced levels of compassion-related physiological responses (i.e. smaller decreases in HR and lower RSA activity for egoists) compared to cooperators.

1.3. Mediating role of distrust and anger

In the present investigation, we seek to explain why egoists evoke reduced compassion and prosocial physiological responses in others. To do so, we focus on distrust and anger, two states associated with less cooperative, more antagonistic behavior (e.g. Fehr & Gächter, 2002; Feinberg, Willer, & Keltner, 2012). We expect that distrust and anger will explain why individuals demonstrate decreased compassionate responding for suffering egoists. Our reasoning is based on two lines of evidence.

[1] We use the term compassion rather than empathy for a few reasons. Empathy is defined as the ability to see the perspective of others and share their emotions, whereas compassion is a complementary emotional response to another's suffering. Compassion fits the criteria for a discrete emotion, unlike empathy (Ekman, 1992), and is elicited solely by suffering, whereas empathy can be felt in response to a variety of states that others experience (e.g. joy). We do believe compassion, sympathy, and empathic concern represent the same construct and use the terms interchangeably.