



Electromyographically assessed empathic concern and empathic happiness predict increased prosocial behavior in adults

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ABSTRACT

The relation between empathy subtypes and prosocial behavior was investigated in a sample of healthy adults. “Empathic concern” and “empathic happiness”, defined as negative and positive vicarious emotion (respectively) combined with an other-oriented feeling of “goodwill” (i.e. a thought to do good to others/see others happy), were elicited in 68 adult participants who watched video clips extracted from the television show *Extreme Makeover: Home Edition*. Prosocial behavior was quantified via performance on a non-monetary altruistic decision-making task involving book selection and donation. Empathic concern and empathic happiness were measured via self-report (immediately following each video clip) and via facial electromyography recorded from corrugator (active during frowning) and zygomatic (active during smiling) facial regions. Facial electromyographic signs of (a) empathic concern (i.e. frowning) during sad video clips, and (b) empathic happiness (i.e. smiling) during happy video clips, predicted increased prosocial behavior in the form of increased goodwill-themed book selection/donation.

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1. Introduction

Empathy can be defined as an emotional state triggered by the formation of an internally generated replica of the emotional state of another combined with an other-oriented feeling of goodwill (Light et al., 2009). “Goodwill” is defined as a thought to do good to others and/or a desire to see others happy. Implicit in this definition of goodwill is an underlying desire for the well-being (eudemonia) of someone else, not simply relief from suffering (i.e. the absence of suffering does not necessarily imply the presence of joy). This definition stems from the Buddhist conceptualization of “metta” in that goodwill means concern for the happiness of others. We conceptualize goodwill (a) as a precipitating emotional state and (b) as a behavioral outcome. In general, goodwill feelings may be present in a number of situations (e.g. during prayer, meditation, or other everyday activities). Goodwill behavior can be quantified via observation (e.g. by counting donations, volunteer time, etc.). We conceptualize goodwill feelings as a sort of attitude promoting prosocial behavior, such as the wishes one may hold for other human beings to be happy and free from suffering (as is espoused by several

versions of Buddhist meditation practice, e.g. Sweet & Johnson, 1990); and goodwill behavior is one outcome of such feelings.

Hotly debated questions related to empathy include: what are the active ingredients that lead us to experience empathy? And what are the antecedents of prosocial behavior? In regard to the first question, Batson, Fultz, and Schoenrade (1987), Batson (1991) and Batson, Eklund, Chermok, Hoyt, and Ortiz (2007), proposed two main antecedents of empathy: (a) perceiving the target as in need and (b) adopting the target’s perspective (i.e. perspective-taking). Over the last 50 years, laboratory manipulations of perspective-taking have frequently been used to evoke empathy (Davis, 1996). However, in line with the first antecedent described in (a) above, Batson has argued that another pathway to empathy (separate from perspective-taking) involves the empathizer conceptualizing the target’s “value” (Batson, Turk, Shaw, & Klein, 1995; Batson et al., 2007). We conceptualize “value” as a tendency for an individual to carry a relatively stable (yet individually variable) mental representation of *how much* they are concerned about the happiness and/or well-being of other people. Activation of this conceptualization (when faced with the suffering or joy of another) may be an important route to empathy. Of note, our use of the term “value” differs from that of Batson and others in that we are not referring to the “likeability” of the target, but are referring to the empathizer’s general trait level of concern for the happiness of others. Such as, in general, how much do you value the happiness of others? How important is it that other people experience positive emotions in

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their life? We expected this facet to relate to positive emotion in general, given the notion that individual happiness may increase the likelihood that a person will reflect on the happiness of others and be concerned with promoting it.

Ultimately, this “value” factor—which we more specifically refer to as “goodwill”—, prosocial behavior, and its relation to “empathic concern” (a subtype of empathy that generally refers to feelings of sympathy, compassion, and tenderness; Batson, 1991; Batson et al., 1987, 2007; Eisenberg, Hofer, Sulik, & Liew, 2013) and “empathic happiness” (referred to as “empathic joy” by Batson et al. (1995) or as “sympathetic joy” by Buddhists), was investigated in the present study. *Empathic happiness* is defined here as the combined ability to share in the positive emotional experience of another and experience an other-oriented feeling of goodwill.

In regard to the second question posed above, an important consideration concerns the *type* of prosocial behavior evoked. For example, do the antecedents of charitable monetary giving differ from the antecedents of volunteering one’s time? Prior research (The Center on Philanthropy at Indiana University, 2014) indicates that whereas 88% of American adults give *money* to charities, only roughly 50% of American adults volunteer their *time* to nonprofit organizations. Specifically, American adults volunteered 15.2 billion hours of service, worth an estimated value of \$296.2 billion in 2011, versus monetary donations totaling \$217.79 billion in 2011 (National Philanthropic Trust, 2014). This suggests that non-monetary giving has a larger impact on society relative to strictly monetary giving, and thus is worthy of study. Thus, this form of giving served as the primary dependent variable in the present investigation. Overall, little research has been done to elucidate whether empathy prompted by goodwill (rather than by explicit perspective-taking) can account for variability in non-monetary giving in adulthood. The present study was carried out in order to begin to fill this gap in the literature.

1.1. The present study

The psychophysiological correlates of the hypothesized constituent components of empathy (e.g. empathic concern, empathic happiness, and goodwill) were investigated, and the relationship between those constituent parts and subsequent non-monetary prosocial behavior was also investigated. *Empathic concern* and *empathic happiness* were elicited in 68 adults using video-clips extracted from the television show *Extreme Makeover: Home Edition*. The show elicits peak sadness and happiness in the first and second half, respectively. We hypothesized that viewing select video clips would elicit empathy in the form of empathic concern or empathic happiness, which in turn would possibly prompt prosocial behavior. To measure prosocial behavior, a task that called on adult participant’s willingness to take the *time*, but not their money, to do something nice for someone else was utilized. Specifically, we predicted that prosocial behavior would be measurable as the number and type of books selected for children via a charitable program in our area. We predicted that highly empathic participants would select more books to donate to children, even though they were not compensated for their time. In addition, to test the hypothesis that empathic concern and empathic happiness contain elements of goodwill, we predicted that highly empathic participants would be more likely to choose books with a goodwill-theme, versus other non-goodwill themed books. Specific hypotheses are described below.

1.2. Hypothesis 1: does electromyographically measured empathic concern and empathic happiness predict non-monetary prosocial behavior?

Participants who demonstrated more empathic concern or empathic happiness while watching video clips (quantified via

self-report and/or concomitant increased corrugator or zygomatic EMG facial activity, respectively) were predicted to select a greater number of goodwill-themed books (rather than science-themed or fairytale-themed books) relative to participants who did not demonstrate empathy in response to video clips. We reasoned that highly empathic participants would focus on and choose stimuli (i.e. books) that were congruent with their affective state (Bower, 1981; Gasper & Clore, 2002; Pavey, Greitemeyer, & Sparks, 2012; Rowe, Hirsh, & Anderson, 2007), and thus would select books with a goodwill-theme. In other words, if goodwill is a component of empathic concern and empathic happiness, then it should be observable as selection of books that have a goodwill-theme. Furthermore, we thought that greater expression of empathic happiness or empathic concern during video clip viewing would relate to subsequent positive affect during book selection. This hypothesis is based on the observation that both empathic concern and empathic happiness related to positive emotion in a sample of children (Light et al., 2009).

1.3. Hypothesis 2: does positive affect characterize the goodwill response?

It was also predicted that the specific psychophysiological correlate of goodwill (i.e. what happens psychophysiological during selection of goodwill-themed books?) would be positive affect quantifiable as increased zygomatic activity (i.e. increased smiling) during book selection periods. This was hypothesized because the literature suggests that prosocial behavior “feels good” (Moll et al., 2006) so we expected to see this manifest as a relationship between increased smiling during book donation periods (particularly during the selection of goodwill-themed books).

1.4. Study design

The Public Goods Game, a behavioral economic decision making task, provides a unique means to measure goodwill (i.e. “value”) and prosocial behavior and their relation to empathic concern and empathic happiness in adulthood. In the typical Public Goods game, an individual is assigned to a group and has an initial allotment of money. Each person can add money to their private stock or contribute all or a part of it to a “public good.” These types of tasks have been used to investigate how individuals in society can be prompted to contribute to the maintenance of necessary institutions (e.g. public schools) when individuals may lack incentive to contribute voluntarily, e.g. by paying taxes. Interestingly, substantial individual differences emerge when people play this game (Hichri, 2005; Hichri & Kirman, 2007). This scatter in the data could be explained by any number of individual differences (Anderson, Goeree, & Holt, 1998), including individual differences in empathy. However, because of various constraints of the traditional Public Goods game, including the emphasis placed on money, the lack of evidence that performance on the task relates to/predicts actual real-world behavior (e.g. volunteer hours), and lack of ecological validity, we created a task with some, but not all, of the characteristics of a Public Goods game. For example, instead of giving participants the opportunity to spend money, participants were asked to take the time to make choices during the course of the experiment that could affect the well-being and education of *actual* children in the Madison Metropolitan School District. Essentially, the public good in our experiment was educational resources (i.e. books) for use by public school children.

The basis of this approach is drawn from previous research. Researchers define “moral behavior” or prosocial behavior as behavior that is socially responsive to the needs of others (Eisenberg et al., 2013). An individual who donates time and one who gives money have both engaged in “moral behavior.” Thus,

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