



## Original Article

## On the relationship of emotional abilities and prosocial behavior

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## ABSTRACT

The ability to perceive and infer the meaning of facial expressions has been considered a critical component of emotional intelligence being essential for successful social functioning: Longitudinal findings suggest that the ability to recognize emotion cues is related to positive social interactions. Moreover, pronounced recognition abilities for at least some emotions facilitate prosocial behavior in everyday situations. Integrating paradigms from behavioral economics and psychometrics, we used an interdisciplinary approach to study the relationship between prosociality as trait cooperativeness and the ability to recognize emotions in others. We measured emotion recognition accuracy (ERA) using a multivariate test battery. We captured prosocial behavior in standard socio-economic games, along with spontaneous emotion expressions. Structural equation modeling revealed no significant relationship between overall ERA and prosocial behavior. However, modeling emotion-specific factors suggested that more prosocial individuals are better in recognizing fear and tend to express more spontaneous emotions during the prisoner's dilemma. In all, cooperative individuals seem to be more sensitive to the distress of others and more expressive, possibly fostering reciprocal interactions with like-minded others.

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## 1. Introduction

Many humans are not only interested in their own welfare, but also care about the well-being of others. Reciprocity contributes to the emergence of cooperation in an asocial world and prevents the invasion of egoistic behavior once a cooperative equilibrium is established (Axelrod & Hamilton, 1981). However, little is known about which psychological variables foster reciprocity. Only recently, researchers in the emerging field of neuroeconomics, started empirically investigating the factors underlying individual prosocial behavior in social interactions. A substantial amount of research has concentrated on the role of empathy, referring to the affective and cognitive reactions of one individual to the inferred experiences of another (Davis, 1983) in social decisions (e.g. Eisenberg & Miller, 1987; Singer, 2006; Singer & Steinbeis, 2009). For instance, Batson's empathy–altruism hypothesis states that the prosocial motivation evoked by empathy is directed toward increasing the welfare of a person in need (Batson et al., 1991). The idea behind this hypothesis is that empathic concern reflects a general sensitivity to the emotional state of a person in need, which includes an enhanced

sensitivity to the bodily reactions of the other person. Batson and Moran (1999) tested the empathy–altruism hypothesis experimentally by inducing empathy with a story about a sad event. Participants were instructed to imagine how the protagonist feels. Subsequently, they showed more altruistic behavior in a one-shot prisoner's dilemma than a control group, which was instructed to judge the story objectively (also see Batson & Ahmad, 2001; Rumble, Van Lange, & Parks, 2010).

## 1.1. Social game paradigms

In the prisoner's dilemma (PD) participants can cooperate or defect with a second player, such that individual earnings are maximized by defection but collective earnings are maximized by cooperation. More specifically, there are four possible outcomes in each game, namely mutual cooperation (CC), cooperation of the participant but defection of the co-player (CD) and vice-versa (DC), as well as mutual defection (DD). If the following payoffs hold true  $DC > CC > DD > CD$  the rational choice is to defect since this maximizes individual earnings (Nash, 1950). Nevertheless, in one-shot PD games, where partners are encountered only once, people tend to cooperate with a rate of 42% (Sally, 1995), displaying altruistic, cooperative behavior (Lee, 2008). Accounts of cooperative behavior in PD assume stable individual differences (Brosig, 2002; Kuhlman & Marshello, 1975). For example, Yamagishi et al. (2013) observed participants in different versions of PD and other standard economic games such as dictator and trust games and

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found strong consistencies across these games. Interestingly, consistent prosocial behavior across games was related to social value orientation (SVO) in general. SVO measures the magnitude of concern for others by assessing individuals' preferences with a series of allocation games, which represent outcomes for self and outcomes for others. Individual differences in SVO are predictive of altruistic behavior such as donations to noble causes (Van Lange, Bekkers, Schuyt, & Vugt, 2007).

Most research on the relationship between empathy and prosocial behavior has induced empathic states (Batson & Ahmad, 2001; Batson & Moran, 1999; Leiberg, Klimecki, & Singer, 2011; Rumble et al., 2010), or relied on self-reports of trait empathy (Edele, Dziobek, & Keller, 2013; Pavey, Greitemeyer, & Sparks, 2012). Both approaches may be compromised by effects of social desirability (Lucas & Baird, 2006). This assumption is supported by the comprehensive literature on distortions of self-reported personality traits (see Ziegler, MacCann, & Roberts, 2011) and of measures of trait emotional intelligence (e.g. Kluepfer, 2008), including empathy (e.g. Kämpfe, Penzhorn, Schikora, Dünzl, & Schneidenbach, 2009). The trait perspective on empathy as ability, as taken in this paper, is more robust against social bias. However, hitherto it attracted less research attention.

### 1.2. Emotion recognition and prosociality

Emotion recognition accuracy (ERA) from faces has been conceptualized as a performance measure of emotional intelligence, next to other abilities, such as assessing, understanding, and managing one's own and also other people's emotions (Mayer, Salovey, Caruso, & Sitarenios, 2001). ERA is commonly measured with standardized procedures where discrete emotional facial expressions have to be identified. ERA is related to, but separable from, general cognitive ability factors (Gf and Gc) (e.g. Mayer, Roberts, & Barsade, 2008) and is associated with better social adjustment and mental health (Carton, Kessler, & Pape, 1999; Izard et al., 2001; Nowicki & Duke, 1994). Other studies suggest a link between ERA and prosocial behavior (Côté et al., 2011). Hence, on the one hand, ERA promotes the effectiveness of economic negotiations, both in terms of creating value (joint outcome) and a greater share for oneself (Elfenbein, Foo, White, Tan, & Aik, 2007). On the other hand, ERA is negatively correlated with self-interested manipulative behaviors such as Machiavellianism (Wai & Tiliopoulos, 2012).

More specifically, and in line with the literature on social signaling functions of different emotion categories (Van Kleef, De Dreu, & Manstead, 2010), the ability to recognize emotion expressions of distress such as fear and sadness has been linked to prosocial behavior (Marsh & Ambady, 2007; Marsh & Blair, 2008; Marsh, Kozak, & Ambady, 2007). Thus, participants who more accurately identified fear in a standard facial expression recognition task, also donated more to victims in a classic altruistic paradigm, acted more favorably in an alleged attractiveness rating task of other participants or reported more sympathy and desire to help. Furthermore, a meta-analysis by Marsh and Blair (2008) suggests a link between antisocial behavior and specific deficits in recognizing fearful and sad expressions. The relationship between prosocial behavior and fear recognition can be explained by violence inhibition theory (Blair, 1995) or a concern mechanism (Nichols, 2001); according to these accounts the correct interpretation of another's distress cues induces empathic processes that decrease the likelihood of antisocial behavior and increase the likelihood of prosocial behavior.

To sum up, there are several studies on the relationship between ERA and prosociality; however, they differ largely in their measurement of prosocial orientation, often introducing measurement error such as social desirability or problems with face validity (e.g. donating to a fictive character).

### 1.3. Emotion expression and prosociality

Interestingly, apart from emotion recognition also emotion expression may be associated with prosocial behavior. Inspired by the

assumption in evolution theory that cooperation among non-kin may evolve in a population through the identification of honest and non-falsifiable signals (Dawkins, 1976; Hamilton, 1964) it is argued that non-verbal signals such as emotional expressivity can act as a marker for cooperative behavior or trustworthiness (DeSteno et al., 2012; Frank, 1988; Scharlemann, Eckel, Kacelnik, & Wilson, 2001). Expressivity may help to identify cooperative individuals since cooperators display higher levels of positive emotions such as Duchenne (spontaneous) smiles compared to non-cooperators (Brown, Palameta, & Moore, 2003; Mehu, Grammer, & Dunbar, 2007). Reed, Zeglen, and Schmidt (2012) measured positive and negative facial actions displayed among strangers during an acquaintance period. Facial actions related to joy predicted cooperative decisions during a subsequent one-shot PD game, whereas displays of contempt predicted non-cooperative decisions. Schug, Matsumoto, Horita, Yamagishi, and Bonnet (2010) examined the expression of negative emotions in game partners when faced with unfair behavior. Cooperators, defined by their propositions in the ultimatum game, displayed greater amounts of positive as well as negative spontaneous emotional expressions when responding to unfair offers, suggesting that cooperators may be generally more expressive than non-cooperators. The authors speculate that general emotional expressivity might be a more dependable signal of cooperativeness than the display of positive emotion alone. In line with an interactionist account of biopsychological personality research (Stemmler & Wacker, 2010) that conceptualizes traits as dispositions that are only operative in certain situational contexts we assessed the trait of emotional expressivity in a well-defined and experimentally manipulated interval of the PD, namely the feedback of the co-player's decision to cooperate or defect. This allowed us to study spontaneous emotional expressions in a situational context. Participants were exposed to meaningful stimuli and therefore motivated to show specific emotional reactions when learning about whether their co-player decided to cooperate or defect. We tried to construct an ecologically valid and reciprocal interaction situation by displaying each co-player's face on screen and informing the participants that their co-players would also see their own picture.

### 1.4. The present study

In order to test the relationship of receptive and expressive emotional abilities with prosocial behavior we applied a multivariate approach with a focus on interindividual differences. Participants played three social dilemma games widely used in behavioral economics and undertook three standardized tests of ERA for six emotion expressions: anger, disgust, fear, happiness, sadness, and surprise. We also recorded spontaneous emotion expressions in response to feedback about the co-player's cooperation or defection. Furthermore, participants completed a questionnaire of social value orientation and emotion-specific empathy. By using several independent indicators, we modeled the relationship between the constructs of ERA and prosocial behavior as latent factor levels – abstracting from measurement error and task specificity. Importantly we tested the association of each basic emotion to prosocial behavior, which allowed us to determine differential social signaling functions of different emotion categories. In contrast to most of the research regarding the influence of empathy or ERA on prosocial orientation, we measured prosociality in terms of cooperative choices, alas actual behavior. We consider it important to know whether the expected association between emotional ability and prosociality generalizes beyond lab procedures of helping behavior (e.g. donation) to standard measures of social preferences.

We expected overall ERA and empathy to predict prosocial behavior. Moreover, as postulated by the empathy–altruism hypothesis the relationship between overall ERA and prosociality may be partly mediated by empathy. Regarding the signaling function of specific emotion categories, we expected prosocial behavior to be most strongly associated with the ability to recognize distress-related emotions such as fear. Furthermore, we predicted that cooperators display more spontaneous

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