

# Personality and Prosocial Behavior: A Theoretical Framework and Meta-Analysis

Isabel Thielmann

University of Koblenz-Landau and VU Amsterdam

Giuliana Spadaro and Daniel Balliet

VU Amsterdam

Decades of research document individual differences in prosocial behavior using controlled experiments that model social interactions in situations of interdependence. However, theoretical and empirical integration of the vast literature on the predictive validity of personality traits to account for these individual differences is missing. Here, we present a theoretical framework that identifies 4 broad situational affordances across interdependent situations (i.e., exploitation, reciprocity, temporal conflict, and dependence under uncertainty) and more specific subaffordances within certain types of interdependent situations (e.g., possibility to increase equality in outcomes) that can determine when, which, and how personality traits should be expressed in prosocial behavior. To test this framework, we meta-analyzed 770 studies reporting on 3,523 effects of 8 broad and 43 narrow personality traits on prosocial behavior in interdependent situations modeled in 6 commonly studied economic games (Dictator Game, Ultimatum Game, Trust Game, Prisoner's Dilemma, Public Goods Game, and Commons Dilemma). Overall, meta-analytic correlations ranged between  $-.18 \leq \rho \leq .26$ , and most traits yielding a significant relation to prosocial behavior had conceptual links to the affordances provided in interdependent situations, most prominently the possibility for exploitation. Moreover, for several traits, correlations within games followed the predicted pattern derived from a theoretical analysis of affordances. On the level of traits, we found that narrow and broad traits alike can account for prosocial behavior, informing the bandwidth-fidelity problem. In sum, the meta-analysis provides a theoretical foundation that can guide future research on prosocial behavior and advance our understanding of individual differences in human prosociality.

## Public Significance Statement


This meta-analysis provides a theoretical framework and empirical test identifying when, how, and which of 51 personality traits account for individual variation in prosocial behavior. The meta-analysis shows that the relations between personality traits and prosocial behavior can be understood in terms of a few situational affordances (e.g., a possibility for exploitation, a possibility for reciprocity, dependence on others under uncertainty) that allow specific traits to become expressed in behavior across a variety of interdependent situations. As such, the meta-analysis provides a theoretical basis for understanding individual differences in prosocial behavior in various situations that individuals face in their everyday social interactions.

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Prosocial behaviors such as generosity, cooperation, and reciprocity support the functioning of a wide range of relationships,

including dyads (Murray & Holmes, 2009; Rusbult & Van Lange, 2003), groups (Fehr, Fischbacher, & Gächter, 2002), and societies

 Isabel Thielmann, Department of Psychology, University of Koblenz-Landau, and Department of Experimental and Applied Psychology, VU Amsterdam; Giuliana Spadaro and Daniel Balliet, Department of Experimental and Applied Psychology, VU Amsterdam.

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Correspondence concerning this article should be addressed to Isabel Thielmann, Department of Psychology, University of Koblenz-Landau, Fortstraße 7, 76829 Landau, Germany. E-mail: [thielmann@uni-landau.de](mailto:thielmann@uni-landau.de)

at large (Nowak, 2006). Broadly speaking, prosocial behaviors refer to all kinds of actions that benefit others, often at a personal cost to the actor. As such, prosocial behaviors can affect the health and wellbeing of romantic partners (Le, Impett, Lemay, Muise, & Tskhay, 2018), promote the productivity of organizations (Podsakoff, Ahearne, & MacKenzie, 1997), enhance the wealth of societies (Knack & Keefer, 1997), and even provide a key solution to global challenges (e.g., climate change; Alston, 2015; Marx & Weber, 2012). Corresponding to this importance and omnipresence, human prosociality has received considerable attention across scientific disciplines, including biology, economics, sociology, and psychology.

Across the numerous disciplines, researchers have adopted a standardized experimental method to study prosocial behavior: economic social decision-making tasks, or simply *games* (Baumard, André, & Sperber, 2013). These game paradigms were developed to model the complexity of real-life interdependent situations in a precise yet parsimonious approach that allows assessing actual prosocial behavior in standardized experimental settings (Murnighan & Wang, 2016; Pruitt & Kimmel, 1977). One of the most well-known games is the Prisoner's Dilemma (Luce & Raiffa, 1957; Rapoport & Chammah, 1965), a situation involving a conflict of interests between maximizing one's personal gain (defection) and maximizing collective gain (cooperation). However, researchers have developed many different games to study prosocial behavior, each representing a specific type of social interaction that provides a useful testbed for theories of prosocial behavior.

One of the most striking observations from thousands of studies using economic games is that individuals are—contrary to the assumptions of classic economic theory (Luce & Raiffa, 1957; von Neumann & Morgenstern, 1944)—not purely selfish, but indeed willing to forgo personal gains for the sake of others' welfare. Importantly, however, these prosocial tendencies yield substantial interindividual variability: Whereas some individuals are willing to benefit others at personal cost, others are mostly self-interested and motivated to maximize their individual profit (e.g., Camerer, 2003; Engel, 2011; Sally, 1995)—and this tendency exhibits stability across games and over time (e.g., Blanco, Engelmann, & Normann, 2011; Peysakhovich, Nowak, & Rand, 2014; Yamagishi et al., 2013). To explain these stable interindividual differences, research on prosocial behavior has increasingly integrated concepts from personality psychology and considered a great variety of characteristics ranging from the broad (factor-level) traits included in basic trait taxonomies, such as the Five Factor Model (FFM; McCrae & Costa, 1987) and the HEXACO model of personality (Ashton & Lee, 2007), to more narrow (facet-level) traits, such as empathy, risk-taking, and trust propensity.

A sweeping conclusion from this research relating personality traits to prosocial behavior is that “the personality of the player matters” (Boone, De Brabander, & van Witteloostuijn, 1999, p. 367). However, no prior research has offered a broad review of this vast literature to allow for empirical and theoretical integration and to deliver refined insights about how (strongly) different traits relate to prosocial behavior across interdependent situations. Even previous meta-analytic efforts have only focused on a few (classes of) traits, one at a time (Balliet, Parks, & Joireman, 2009; Balliet & Van Lange, 2013b; Kline, Bankert, Levitan, & Kraft, 2019;

Pletzer et al., 2018; Zettler, Thielmann, Hilbig, & Moshagen, *in press*; Zhao & Smillie, 2015). We present the first comprehensive meta-analytic review to summarize the entire 60 year history of research studying the relation between personality traits and prosocial behavior in economic games.

As we elaborate in what follows, the meta-analysis offers four main contributions: First, we aim for a theory-driven, comprehensive understanding of *which* traits (most strongly) relate to prosocial behavior across a variety of interdependent situations. Second, we consider the underlying question of *how* personality relates to prosocial behavior in specific situations in terms of key affordances that allow the expression of corresponding psychological processes in behavior. To do so, we develop and test a theoretical framework informed by Interdependence Theory (Kelley & Thibaut, 1978; Thibaut & Kelley, 1959) and prior research that generates hypotheses about which traits should (not) relate to prosocial behavior in which situations. Third, we provide a comparison of personality concepts and frameworks, illuminating how much specificity it requires on the level of traits to account for individual differences in prosocial behavior. Fourth, and finally, we test how several structural features of social interactions (e.g., degree of conflict of interests, repetition of interaction) and aspects of the experimental design (e.g., behavior-contingent incentives, deception) moderate the relation between personality and prosocial behavior.

In what follows, we first briefly introduce how games are used to model interdependent situations and to study prosocial behavior, and we describe the games included in the meta-analysis. Next, we provide an overview of the traits that have been assessed in studies using games, and so are included in the meta-analysis. Then, we present our theoretical framework that generates predictions about which traits should relate to prosocial behavior across and within situations. We end this section by introducing the distinction between broad versus narrow traits (bandwidth-fidelity dilemma) and the moderators we consider in our analysis.

## Economic Games

In essence, economic games “provide a coherent, substantive model of many actual encounters” (Murnighan & Wang, 2016, p. 80) and thereby allow for measuring *actual behavior* (Baumeister, Vohs, & Funder, 2007) in a variety of interdependent situations—wherein each person's behavior can affect their own and others' outcomes—in controlled, experimental settings. Researchers have developed a multitude of different games, all of which are sought to model specific classes of interdependent situations (Kelley et al., 2003; Murnighan & Wang, 2016). In the current meta-analysis, we will focus on a selection of six games that (a) have been most commonly applied in prior research and (b) broadly represent different classes of interdependent situations individuals might encounter in their everyday social interactions. These are the Dictator Game (Forsythe, Horowitz, Savin, & Sefton, 1994), Ultimatum Game (Güth, Schmittberger, & Schwarze, 1982), Trust Game (Berg, Dickhaut, & McCabe, 1995), Prisoner's Dilemma (Luce & Raiffa, 1957; Rapoport & Chammah, 1965), Public Goods Game (Samuelson, 1954), and Commons Dilemma (Hardin,

Table 1

*Economic Game Paradigms Included in the Meta-Analysis, With Corresponding Real-Life Examples of Interdependent Situations*

Game	Decision path	Structure	Real-life examples of situation modeled
Dictator Game	A $\longrightarrow$ B A transfers $x$ to B	A (the dictator) freely decides how much $x$ of an endowment to give to B (the recipient). B has no veto power, that is, she cannot react to A's decision.	Donation decisions (e.g., donating money to a charity, donating blood or organs to a hospital)
Ultimatum Game	A $\longleftrightarrow$ B A transfers $x$ to B; B can accept or reject $x$	A (the proposer) decides how much $x$ of an endowment to give to B (the responder). B has veto power, meaning that she can accept or reject A's offer. If B accepts, outcomes are split as proposed by A; if B rejects, both players receive nothing.	Bargaining with "take it or leave it" offers, (e.g., negotiations about a higher salary between a job applicant and an employer, or about the price of a product between a seller and a customer)
Trust Game	A $\longleftrightarrow$ B A transfers $x$ to B and $x$ is multiplied by $m$ ; B can return any amount $m \cdot x$	A (the trustor) decides how much $x$ of an endowment to give to B (the trustee). $x$ is multiplied by a constant ( $m > 1$ ) and added to B's endowment. B can return any amount $m \cdot x$ to A.	Loaning money to someone; transaction via online purchase systems; hiring a babysitter to take care of one's child
Prisoner's Dilemma	A $\longleftrightarrow$ B A (B) transfers $x$ (y) to B (A) and $x$ (y) is multiplied by $m$	A and B decide independently whether to cooperate (transfer $x/y$ ) or defect. $x/y$ is multiplied by a constant ( $m > 1$ ) and added to A/B's endowment.	Military buildup between nations; use of performance-enhancing drugs in elite sports; colleagues working together on a joint task
Public Goods Game	A $\longrightarrow$ (G) B $\longrightarrow$ (G) ... $\longrightarrow$ (G)  N members of a group transfer $x$ to a group account G and $x$ is multiplied by $m$ ; $\sum x \cdot m$ is equally distributed among all N members	Each member of a group of size $N$ decides how much $x$ of an individual endowment to contribute to a group account. Contributions are multiplied by a constant $m$ ( $1 < m < N$ ) and shared equally across all group members, irrespective of their individual contributions.	Paying taxes; contributions to the public-service broadcaster; doing the housework in a flat share
Commons Dilemma	A $\longleftarrow$ (G) B $\longleftarrow$ (G) ... $\longleftarrow$ (G)  N members of a group take $x$ out of a group account G; $G - \sum x$ is replenished by rate $r$ before next round of extraction starts	Each member of a group of size $N$ decides how much $x$ to take from a common resource. The amount each member takes is no longer available to other group members. After each round, the resource recovers with reproduction rate $r > 1$ . The game ends once the resource is depleted, that is, once extraction exceeds replenishment.	Overconsumption of shared, natural resources (e.g., clean air, timber, fish, etc.)

1968). Table 1 provides an overview of these games, including their basic structure and rules as well as real-life examples of interdependent situations the games model.

Games commonly involve multiple individuals (called *players*) who have certain choice options at their disposal. The combination of players' choices incurs certain individual *outcomes* that involve (real or hypothetical) payoffs (e.g., money). Games that are used to study prosocial behavior tend to involve a conflict of interests—that is, negative interdependence—between players' outcomes: Each player can only maximize her individual outcome at the expense of the other player(s), ultimately minimizing their outcome.<sup>1</sup>

Depending on the specific interdependent situation modeled, different types and classes of games can be distinguished. *Resource allocation games* such as the Dictator Game, Ultimatum Game, and Trust Game are sequential games with two players in asymmetric roles. Specifically, one player first decides how to allocate a certain resource between herself and the other player, who then decides how to react to the first player's decision (unless the reacting player is completely powerless, as in the Dictator Game; see Table 1). For example, in the Trust Game, the trustor first decides how much of her endowment to send to the trustee

who then decides how much of the (multiplied) amount to return to the trustor.

*Social dilemmas* such as the Prisoner's Dilemma, Public Goods Game, and Commons Dilemma are games with two or more players in symmetric roles, who independently and (usually) simultaneously decide whether to cooperate or to defect. The most crucial feature of social dilemmas is that cooperation increases *social welfare*—that is, the sum of all players' outcomes, thus being collectively beneficial—while at the same time decreasing a player's own outcome. In the Public Goods Game, for instance, each member of a group decides how much to contribute to a group account; critically, the sum of contributions is multiplied (increasing social welfare) and split equally among all group members, irrespective of each member's individual contribution. Thus, a member contributing nothing receives the highest out-

<sup>1</sup> This meta-analysis focuses on games involving conflicting interests; it does not include coordination games with largely corresponding interests and positive interdependence between players' outcomes (e.g., Abele, Stasser, & Chartier, 2010; Kelley et al., 2003).

come, but social welfare can only be maximized if everyone contributes.

Beyond distinguishing between different classes of interdependent situations, games offer the flexibility to model diverse variations of a situation. For example, social dilemmas can be modified to contain more or less conflict of interests between players (Rapoport & Chammah, 1965; Vlaev & Chater, 2006) and to involve one-shot or repeated interactions with the same partner over time (e.g., Balliet, Mulder, & Van Lange, 2011; Engel, 2011). Overall, a single game can be implemented in many different ways that can ultimately affect players' willingness to act in a prosocial manner (e.g., Ledyard, 1995; Sally, 1995; Zelmer, 2003).

### Personality Traits and Prosocial Behavior in Economic Games

By definition, "personality traits are probabilistic descriptions of relatively stable patterns of emotion, motivation, cognition, and behavior, in response to classes of stimuli" (DeYoung, 2015, p. 35; for a similar definition, see, e.g., Roberts, 2009). As sketched above, such stable individual patterns have also been consistently documented when using games, most prominently in terms of interindividual differences in the tendency to act in a prosocial manner (e.g., Camerer, 2003; Engel, 2011; Johnson & Mislin, 2011; Sally, 1995) and of intraindividual consistency within and across games (Baumert, Schlösser, & Schmitt, 2014; Blanco et al., 2011; Galizzi & Navarro-Martinez, 2019; Haesevoets, Reinders Folmer, & Van Hiel, 2015; McAuliffe, Forster, Pedersen, & McCullough, 2019; Peysakhovich et al., 2014; Yamagishi et al., 2013). Specifically, research suggests test-retest reliabilities for behavior within games of around .70 to .80 (e.g., Baumert et al., 2014; Yamagishi et al., 2013) and intercorrelations of behaviors between games of around .40 (e.g., Galizzi & Navarro-Martinez, 2019; Haesevoets et al., 2015; Yamagishi et al., 2013).

Psychologists have turned to personality traits to account for individual differences in prosocial behavior ever since they started to use games. Seminal work in the 1960s and 70s, for instance, commonly considered the effect of personality *in general*—as measured via broad lists of adjectives—on prosocial behavior (e.g., Gallo & Winchell, 1970; Wilson, Chun, & Kayatani, 1965), as well as of trait authoritarianism (e.g., Berkowitz, 1968; Deutsch, 1960; Wilson & Robinson, 1968). With the increasing consideration of different personality traits and development of corresponding scales (Weiner & Greene, 2017), this research has to date accumulated to hundreds of studies examining the links of various traits to prosocial behavior.

Table 2 provides a comprehensive summary of traits that have been repeatedly assessed in combination with games and that are thus included in the current meta-analysis. These traits cover a wide variety of constructs, including broad traits as conceptualized in models of basic personality structure (i.e., FFM and HEXACO) and narrower traits that should, by definition, more uniquely capture certain behavioral, cognitive, and/or motivational aspects.

### Situational Affordances for Prosocial Behavior

We propose that personality traits will be more or less relevant for prosocial behavior in interdependent situations, depending on the *situational affordances* (Gibson, 1977; Stoffregen, 2004) the

situations provide. Indeed, the concept of situational affordances plays a key role in several theories on the relation between personality and (social) behavior more generally (e.g., De Vries, Tybur, Pollet, & van Vugt, 2016; Holmes, 2004; Mischel & Shoda, 1995; Rauthmann et al., 2014). Specifically, "situations have properties that provide a context for the expression of motives, goals, values, and preferences" (Reis, 2008, p. 316). As such, "situations afford (make possible) the manifestation of the higher-level 'social person factors'" (Kelley et al., 2003, p. 74). By implication, situational affordances may activate certain traits and thereby form the basis for a trait to become expressed in behavior.

Corresponding to this logic, previous research on prosocial behavior has also—though mostly implicitly—adopted the concept of situational affordances and assumed that situations of interdependence may be understood in terms of the affordances they provide (e.g., Kelley & Thibaut, 1978; Rusbult & Van Lange, 2003). Here, we integrate this prior research to identify four broad affordances in interdependent situations—(a) the possibility for exploitation, (b) the possibility for reciprocity, (c) a temporal conflict between short- and long-term interests, and (d) dependence under uncertainty<sup>2</sup>—each of which allows distinct psychological processes to become expressed in behavior. Psychological processes, as we use the term here, comprise all kinds of related factors within a person that may become expressed in behavior in a specific situation, including attitudes, cognitions, emotions, goals, and motives. As such, psychological processes are inherently tied to personality traits, offering clear predictions about which traits should (not) account for individual differences in prosocial behavior in which situations. That is, on the one hand, the well-defined structure of games (Kelley et al., 2003; von Neumann & Morgenstern, 1944) allows to determine the affordances involved in a game (Table 3). On the other hand, the conceptualizations (Table 2) and operationalizations of traits allow to determine whether a trait is conceptually (positively or negatively) linked to one or more of the psychological processes afforded to be expressed in interdependent situations.<sup>3</sup> Below, we describe each of the four broad affordances, the related psychological processes, and the traits associated with them.<sup>4</sup> Moreover, we delineate the overlap of the four affordances with general

<sup>2</sup> Of note, other affordances may as well be involved in certain situations; however, the four broad affordances considered here arguably refer to the key, most general affordances relevant for behavior across a wide variety of interdependent situations (Kelley et al., 2003; Rusbult & Van Lange, 2003).

<sup>3</sup> A detailed summary of operationalizations of the traits, including sample items, is available in the additional material on the OSF (<https://osf.io/dbuk6/>). For each trait in Table 2, we thoroughly reviewed the conceptualizations and operationalizations of the traits and determined whether the trait has a conceptual (positive or negative) link to one or more of the four broad affordances. Importantly, in this mapping process, we focused on the conceptualizations and operationalizations of the traits, without considering additional empirical evidence that might potentially associate a trait with another affordance as implied by its conceptualization/operationalization. All authors performed this mapping independently, and we discussed any disagreement thoroughly until agreement was reached.

<sup>4</sup> The affordances we propose to be provided in interdependent situations may allow the expression of specific psychological processes which give rise for certain personality traits to influence behavior. Although traits are thus only indirectly linked to affordances—namely through said psychological processes—we will refer to traits as being (conceptually) linked to affordances in what follows, given that affordances ultimately provide the opportunity for traits to become activated and expressed in behavior.



Table 2  
*Traits Included in the Meta-Analysis, With Definitions and Related Situational Affordances*

Trait	Definition	Afforded in the presence of . . .	
		Broad affordance(s)	Subaffordance(s)
Broad traits			
Agreeableness (FFM)	[Individual] differences in the motivation to cooperate (vs. acting selfishly) in resource conflicts (Denissen & Penke, 2008, p. 1285)	exploitation, reciprocity, dependence	max(other), min(own – other), max(own + other)
Agreeableness (HEXACO)	The tendency to be forgiving and tolerant of others, in the sense of cooperating with others even when one might be suffering exploitation by them (Ashton & Lee, 2007, p. 156)	reciprocity	max(other), max(own + other)
Conscientiousness	The proactive side of Conscientiousness is seen most clearly in the need for achievement and commitment to work; the inhibitive side is seen in moral scrupulousness and cautiousness (Costa, McCrae, & Dye, 1991, p. 889)	temporal conflict	—
Emotionality (HEXACO)	Tendencies relevant to the construct of kin altruism . . . , including not only empathic concern and emotional attachment toward close others (who tend to be one's kin) but also the harm-avoidant and help-seeking behaviors that are associated with investment in kin (Ashton & Lee, 2007, p. 156)	—	—
Extraversion	[Individual differences in] engagement in social endeavors (such as socializing, leading, or entertaining) (Ashton & Lee, 2007, p. 156)	—	—
Honesty-humility (HEXACO)	The tendency to be fair and genuine in dealing with others, in the sense of cooperating with others even when one might exploit them without suffering retaliation (Ashton & Lee, 2007, p. 156)	exploitation	max(other), min(own – other), max(own + other)
Neuroticism (FFM)	A broad domain of negative affect, including predispositions to experience anxiety, anger, depression, shame, and other distressing emotions (Costa, Terracciano, & McCrae, 2001, p. 322)	—	—
Openness to experience	[Individual differences in] engagement in idea-related endeavors (such as learning, imagining, and thinking) (Ashton & Lee, 2007, p. 156)	—	—
Narrow traits			
Active prosociality	A disposition that leads people who have more of it to be more compassionate and caring toward others in distress (Batson, Bolen, Cross, & Neuringer-Benefiel, 1986, p. 212) Individual differences in the extent to which . . . other people's interests serve as guides for behavior (Gerbasi & Prentice, 2013, p. 495) Reactions of one individual to the observed experiences of others (Davis, 1983, p. 113) [Individual differences in] perceptions of and reactions to observed . . . or committed injustice (Schmitt, Baumert, Gollwitzer, & Maes, 2010, p. 212); an individual is inequity averse if he dislikes outcomes that are perceived as inequitable (Fehr & Schmidt, 1999, p. 820)	exploitation, reciprocity	max(other)
Altruism		exploitation, reciprocity	max(other), max(own + other)
Concern for others		exploitation, reciprocity	max(other)
Empathy		exploitation, reciprocity	min(own – other)
Inequality aversion		exploitation, reciprocity	

Table 2 (continued)

Trait	Definition	Afforded in the presence of . . .	
		Broad affordance(s)	Subaffordance(s)
Pro-environmentalism	The collection of beliefs, affect, and behavioral intentions a person holds regarding environmentally related activities or issues (Schultz, Shriver, Tabanico, & Khazian, 2004, p. 31)	exploitation, temporal conflict	max(own + other)
Social value orientation	The weights people assign to their own and others' outcomes in situations of interdependence (Balliet, Parks, & Joireman, 2009, p. 533)	exploitation	max(other), min(own – other), max(own + other)
Reactive prosociality			
Forgiveness (vs. retaliation)	Disposition to forgive interpersonal transgressions over time and across situations (Berry, Worthington, O'Connor, Parrott, & Wade, 2005, p. 183)	reciprocity	max(other), min(own – other)
Positive reciprocity	Positive reactions to positively valued behaviours with the emphasis on rewarding someone else's behaviour (Perugini, Gallucci, Presaghi, & Ercolani, 2003, p. 274)	reciprocity	max(other), min(own – other)
Antisocial tendencies			
Aggression	Trait aggressiveness . . . identifies people who are prone to hostile cognitions and angry affect as well as a readiness to engage in physical and verbal aggression (Bettencourt, Talley, Benjamin, & Valentine, 2006, p. 752)	reciprocity, temporal conflict	min(other)
Competitiveness	Individuals' desire to do better than others, their desire to win in interpersonal situations, and their enjoyment of interpersonal competition (Houston, McIntire, Kinnie, & Terry, 2002, p. 286)	exploitation, reciprocity	max(own – other)
Envy	[Tendency to experience a] sense of inferiority . . . [and] ill will, frustration, and a subjective sense of injustice prompted by unflattering comparison (Smith, Parrott, Diener, Hoyle, & Kim, 1999, p. 1010)	exploitation, reciprocity	max(own – other)
Greed	An insatiable desire for more resources, monetary or other (Krekels & Pandelaere, 2015, p. 225)	exploitation, reciprocity	max(own)
Machiavellianism	A duplicitous interpersonal style, characterized by a cynical disregard for morality and a focus on self-interest and personal gain (Muris, Merckelbach, O'gaar, & Meijer, 2017, p. 184)	exploitation	max(own), max(own – other)
Narcissism	A grandiose view of the self, a strong sense of entitlement and superiority, a lack of empathy, and a need for social admiration, as well as tendencies to show dominant, charming, bragging, impulsive, and aggressive behaviors (Back et al., 2013, p. 1014)	exploitation, reciprocity, temporal conflict	max(own), max(own – other)
Psychopathy	A personality trait characterized by enduring antisocial behavior, diminished empathy and remorse, and disinhibited or bold behavior (Muris et al., 2017, p. 184)	exploitation, reciprocity, temporal conflict, dependence	max(own), min(other)
Sadism	The term <i>sadistic personality</i> describes a person who humiliates others, shows a longstanding pattern of cruel or demeaning behavior to others, or intentionally inflicts physical, sexual, or psychological pain or suffering on others in order to assert power and dominance or for pleasure and enjoyment (O'Meara, Davies, & Hammond, 2011, p. 523)	exploitation, reciprocity	min(other)
Beliefs			
Belief in a just world	[Individuals' tendency] to believe that they live in a world where people generally get what they deserve (Lerner & Miller, 1978, p. 1030)	exploitation, dependence	min(own – other)

(table continues)

Table 2 (continued)

Trait	Definition	Afforded in the presence of . . .	
		Broad affordance(s)	Subaffordance(s)
Trust propensity	A person's general willingness to trust others (Mayer, Davis, & Schoorman, 1995, p. 714) [based on the] expectation of partner's goodwill and benign intent (Yamagishi & Yamagishi, 1994, p. 131)	dependence	—
Morality			
Guilt proneness	Predisposition to experience negative feelings about personal wrongdoing, even when the wrongdoing is private (T. R. Cohen, Panter, & Turan, 2012, p. 355)	exploitation	max(other)
Integrity	Integrity involves honesty, trustworthiness, fidelity in keeping one's word and obligations, and incorruptibility, or an unwillingness to violate principles regardless of the temptations, costs, and preferences of others (Schlenker, 2008, p. 1081)	exploitation, reciprocity	max(other), min(own – other)
Identity- and society-related attitudes			
Collectivism	One's tendency to give priority to the collective self over the private self, especially when these two come into conflict (Yamaguchi, Kuhlman, & Sugimori, 1995, p. 659)	exploitation, temporal conflict	max(own + other)
Individualism	Individualists will see themselves as more differentiated and separate from others, and place more importance on asserting their individuality (Bochner, 1994, p. 274)	exploitation	max(own), max(own – other)
Power	Desire for power and a drive to come out on top in a status hierarchy (Grina, Bergh, Akrami, & Sidanius, 2016, p. 114)	exploitation	max(own – other)
Right-wing authoritarianism	Opposing any change in the social status quo, . . . favouring tough punishment of deviance, nonconformity, or innovation, [and] favouring traditional, old-fashioned lifestyles, behavioural norms, and values (Duckitt, Bizumic, Krauss, & Heled, 2010, p. 691)	exploitation, reciprocity	max(own – other)
Social dominance orientation	Individual differences in the preference for group based hierarchy and inequality (Ho et al., 2015, p. 1003)	exploitation	max(own – other)
Self-regulation			
Impulsivity	Tendency to deliberate less than most people of equal ability before taking action (Dickman, 1990, p. 95)	temporal conflict	—
Self-control	The ability to override or change one's inner responses, as well as to interrupt undesired behavioral tendencies (such as impulses) and refrain from acting on them (Tangney, Baumeister, & Boone, 2004, p. 274)	temporal conflict	—
Self-presentation	The extent to which individuals can and do monitor their self-presentation, expressive behavior, and non-verbal affective display (Snyder, 1974, pp. 526/527), [potentially motivated by] the identity concern of one's . . . evaluation (De Cremer & Tyler, 2005, p. 121)	temporal conflict	—
Risk attitudes			
Risk-taking	One's general degree of comfort with facing uncertain gains or losses (Ehrlich & Maestas, 2010, p. 658)	dependence	—
Thinking style			
Intuition	Reliance on and enjoyment of feelings and intuitions in making decisions [and] a high level of ability with respect to one's intuitive impressions and feelings (Pacini & Epstein, 1999, p. 974)	—	—

Table 2 (continued)

Trait	Definition	Afforded in the presence of . . .	
		Broad affordance(s)	Subaffordance(s)
Reflection	Reliance on and enjoyment of thinking in an analytical, logical manner [and] a high level of ability to think logically and analytically (Pacini & Epstein, 1999, p. 974)	—	—
Affect			
Anxiety	The stable tendency to attend to, experience, and report negative emotions such as fears, worries, and anxiety across many situations (Gidron, 2013, p. 1989)	—	—
Negative affect	Individual differences in the tendency to experience negative moods and feelings, including sadness, worry, and anger (Stanton & Watson, 2014, p. 556)	—	—
Positive affect	Individual differences in the tendency to experience positive emotions and feeling states (Stanton & Watson, 2014, p. 556)	—	—
Shame proneness	High shame-prone individuals attribute transgressions and negative outcomes to characterological faults, experiencing global feelings of self-debasement and enduring negative affect (Thompson, Altmann, & Davidson, 2004, p. 613)	—	—
Motivation			
Achievement	Recurrent concern with a standard of excellence and the disposition to derive satisfaction from the mastery of challenging tasks (Schönbrodt & Gerstenberg, 2012, p. 726)	—	—
Affiliation	[Desire] to establish and/or maintain warm and friendly interpersonal relations (French & Chadwick, 1956, p. 296)	—	—
Approach	Proneness to engage in goal-directed efforts and to experience positive feelings when the person is exposed to cues of impending reward (Carver & White, 1994, p. 319)	—	—
Avoidance	Sensitivity to the presence or absence of negative outcomes [and] vigilant avoidance of losses or failures (Lockwood, Jordan, & Kunda, 2002, p. 854)	—	—
Other			
Emotional intelligence	Extent to which [individuals] attend to, process, and utilize affect-laden information of an intrapersonal (e.g., managing one's own emotions) or interpersonal (e.g., managing others' emotions) nature (Petrides & Furnham, 2006, p. 553)	—	—
Locus of control <sup>a</sup>	The degree to which persons expect that a reinforcement or an outcome of their behavior is contingent on their own behavior or personal characteristics versus the degree to which persons expect that the reinforcement or outcome is a function of chance, luck, or fate, is under the control of powerful others, or is simply unpredictable (Rotter, 1990, p. 489)	—	—
Optimism	Generalized expectations of the occurrence of good outcomes in one's life (Scheier & Carver, 1985, p. 239)	—	—
Self-esteem	Individual differences in the evaluation of one's self-worth and self-respect (Gnambs, Scharl, & Schroeders, 2018, p. 14)	—	—

Note. FFM = Five Factor Model; max() = possibility to maximize; min() = possibility to minimize; other = others' outcomes; own = own outcomes.  
<sup>a</sup> In our analysis, higher levels of locus of control imply higher internal locus of control.



Table 3  
*Relation Between Characteristics of Interdependent Situations and Broad Situational Affordances*

Affordance	Situation characteristics
Possibility for exploitation	Power (low asymmetrical dependence); One-shot interaction; Simultaneous interaction <i>or</i> final move in sequential interaction; Conflict of interests
Possibility for reciprocity	Repeated interaction; Sequential interaction as individual reacting to other player(s)
Temporal conflict	Repeated interaction; One-shot <i>and</i> sequential interaction as player acting first <sup>a</sup>
Dependence under uncertainty	Low power (high asymmetrical dependence) <i>or</i> mutual (symmetrical) dependence; Simultaneous choice <i>or</i> sequential interaction as player acting first

<sup>a</sup> This only applies when the second player can react to both a first player's prosocial and selfish behavior. In the Trust Game, for example, the trustee can only react when the trustor behaves in a prosocial manner (i.e., transfers a nonzero amount). Thus, the Trust Game as trustor does not involve temporal conflict as defined here.

taxonomies of situational affordances, namely the DIAMONDS (Rauthmann et al., 2014) and the situation, trait, and outcome activation (STOA) model (De Vries et al., 2016). However, note that the affordances specified here are narrower in scope as they specifically refer to situations of interdependence.

First, interdependent situations may provide an opportunity to exploit others. *Exploitation* is possible whenever an individual can increase her outcome at others' costs, and particularly so if she does not need to fear retaliation by the interaction partner(s). In terms of basic dimensions of interdependence as specified in Interdependence Theory (Kelley & Thibaut, 1978; Thibaut & Kelley, 1959), exploitation is possible in situations of high power (i.e., asymmetry of dependence) and high conflict of interests (i.e., low degree of correspondence), as well as in one-shot interactions (Table 3). In fact, all games included in the meta-analysis provide a possibility for exploitation, except the Ultimatum Game as responder in which the player can either accept the proposer's split or reject it so that both players get nothing (Table 1). In turn, whenever exploitation is possible, the situation allows the expression of unconditional concern for others' welfare (e.g., Rusbult & Van Lange, 2008; Van Lange, 2000). As summarized in Table 2, several traits included in the meta-analysis are associated with this psychological process (e.g., envy, honesty-humility, Machiavellianism, sadism), and so predicted to be expressed in games involving exploitation. The exploitation affordance has conceptual links to DIAMONDS-Deception and STOA-Exploitation.

Second, interdependent situations may provide an opportunity to react to another's prior behavior, that is, to (positively or negatively) reciprocate (e.g., Axelrod & Hamilton, 1981; Trivers, 1971). For example, *reciprocity* is possible in sequential interactions when individuals act as second (reacting) player (e.g., Ultimatum Game as responder, Trust Game as trustee) or when individuals interact repeatedly with each other (Table 3). By contrast, simultaneous decisions in one-shot interactions do not involve reciprocity. When reciprocity is possible, this allows the expression of conditional concern for others' welfare (e.g., Perugini, Gallucci, Presaghi, & Ercolani, 2003), which is related to traits such as aggression, agreeableness, envy, and forgiveness (Table 2). The reciprocity affordance has conceptual links to DIAMONDS-Adversity and STOA-Obstruction.

Third, interdependent situations often involve a *temporal conflict* whereby immediate self-interest (e.g., consuming a resource, taking revenge) can conflict with long-term individual and/or collective interests (e.g., conserving a resource, maintaining a profitable relationship; Parks, Joireman, & Van Lange, 2013; Van Lange, Joireman, Parks, & Van Dijk, 2013). In games, temporal conflict is present during repeated interactions (e.g., in social dilemmas) or when players acting first in sequential games need to consider others' potential reactions to their selfish behavior (e.g., in the Ultimatum Game as proposer; Table 3). When a situation involves temporal conflict, it affords the expression of self-regulation of immediate impulse gratification (e.g., Ainsworth & Baumeister, 2013; Carver & Scheier, 1982), which is associated with traits such as conscientiousness, impulsivity, and self-control (Table 2). The temporal conflict affordance has conceptual links to DIAMONDS- and STOA-Duty.

Finally, interdependent situations may differ in the extent to which one's outcome is dependent on others' unknown behavior. One's outcome may be independent (one has full power), somewhat dependent (all have shared power), or fully dependent (one has no power) on others' actions (see Kelley et al., 2003, for a formalization of symmetric and asymmetric dependence in games).<sup>5</sup> Additionally, one may (or may not) have knowledge about others' behavior in the situation prior to making a decision oneself. When an individual does not have full power (her outcome is dependent on others' behavior) and she only learns about others' behavior after having made her decision, the situation involves *dependence under uncertainty*.

<sup>5</sup> Dependence can vary across situations *symmetrically*—in the case of mutual dependence, whereby each individual's outcomes are equally affected by each other's behavior—and *asymmetrically*, such as with power: More power means that one's outcomes depend relatively less on others' actions (Balliet, Tybur, & Van Lange, 2017; Kelley et al., 2003). Thus, dependence can increase across situations that involve higher amounts of mutual dependence (i.e., when individuals have equal power), and when individuals have relatively less power. Power also determines the degree to which a situation provides a possibility for exploitation. Specifically, if one has full power over the distribution of outcomes (e.g., in the Dictator Game), one can easily exploit the other without fearing negative consequences. By contrast, if interaction partners have shared power (e.g., in the Ultimatum Game), the situation provides much less possibility to exploit others (see Table 3 and Table 5).

In games, dependence under uncertainty is, for instance, present in simultaneous interactions (e.g., social dilemmas) or in sequential interactions for players acting first (e.g., Trust Game as trustor; Table 3). Whenever a situation involves dependence under uncertainty, it affords beliefs about others' prosociality to guide behavior (e.g., Balliet & Van Lange, 2013a, 2013b; Pruitt & Kimmel, 1977; Thielmann & Hilbig, 2015c), which are associated with traits such as belief in a just world, psychopathy, and trust propensity (Table 2). The dependence affordance is the only affordance that has no direct counterpart in other situational taxonomies. As such, this affordance appears to be specific to interdependent situations, as also suggested by prior research relating perceptions of major dimensions of interdependence to the DIAMONDS (Gerpott, Balliet, Columbus, Molho, & De Vries, 2018).

Importantly, situations may not only differ with regard to whether an affordance is present or absent, but also with regard to the *degree* to which an affordance is present. For example, interdependent situations may vary on the degree to which exploitation is possible, depending on factors such as power and conflict of interests (Table 3; see also Footnote 5). To illustrate, in the Ultimatum Game as proposer, exploitation is possible to a relatively weaker degree because the recipient can punish the proposer for selfish behavior (and thus, the proposer has less power than the dictator in the Dictator Game, for instance). By implication, traits linked to an affordance should show relatively smaller (higher) relations with prosocial behavior depending on whether the affordance is present to a relatively weaker (stronger) degree.

Taken together, the above reasoning directly implies that the relations of traits to prosocial behavior in interdependent situations can be expected to result from the broad, situation-specific affordances and corresponding trait activation: Traits that are linked to the psychological processes we propose to be afforded in interdependent situations (i.e., unconditional and conditional concern for others, self-regulation, and beliefs about others' prosociality) may be expressed in prosocial behavior, particularly—or even exclusively—in situations providing the respective affordance(s), and more strongly so in situations providing the affordance to a relatively strong degree. Conversely, traits that are not linked to any of these psychological processes (see Table 2) should show no associations with prosocial behavior, simply because these traits should not be activated in interdependent situations.

### Additional Specific (Sub)Affordances, Social Motives, and Trait Expression

Although the four broad affordances introduced previously are arguably necessary to activate certain traits in an interdependent situation, the mere presence of two of these affordances—exploitation and reciprocity—may not be sufficient for a trait to become activated and expressed in behavior. Specifically, even if two interdependent situations provide the same broad (exploitation and/or reciprocity) affordance(s), there may remain some variability in the outcome structure of the situations that can still determine which psychological processes may be expressed. For example, a trait like inequality aversion, which is related to unconditional concern for others, may not be expressed in prosocial behavior in a situation that provides a possibility for exploitation, but in which at the same time prosocial behavior *maximizes* inequality in outcomes (e.g., in the Trust Game as

trustor in which equality in outcomes is usually established by default; Berg et al., 1995). We refer to such a feature related to the outcome structure of a situation as a *subaffordance* of the exploitation and reciprocity affordances.<sup>6</sup>

Following Interdependence Theory, we identify six subaffordances that allow for the expression of specific *social motives*—and related personality traits—in prosocial behavior (Kelley & Thibaut, 1978; Thibaut & Kelley, 1959). Social motives refer to how individuals weigh own outcomes in relation to others' outcomes (Griesinger & Livingston, 1973; Messick & McClintock, 1968) and they thus refer to specific aspects of the psychological processes of unconditional and conditional concern for others that can be expressed in the presence of the subaffordances. Correspondingly, for all traits linked to unconditional and/or conditional concern for others, we further specified in the presence of which subaffordance(s) they should become activated and expressed (see Table 2), following the same approach as for the mapping of traits and broad affordances (see Footnote 3). Table 4 provides an overview of the six subaffordances and the related social motives we consider here; Figure 1 further provides a graphical illustration of the social motives (see Liebrand, 1984, for a similar visualization).<sup>7</sup> Importantly, although some of the social motives are termed in the same way as personality traits (e.g., altruism, individualism), the (same-named) motives and traits refer to different concepts.

As for the broad affordances, the well-defined structure of interdependent situations and formalization within Game Theory (von Neumann & Morgenstern, 1944) and Interdependence Theory (Kelley & Thibaut, 1978) allows for the identification of the subaffordances and corresponding social motives at play in a game (Thielmann, Böhm, & Hilbig, 2015) to derive predictions about which traits may be activated to become expressed in behavior. Table 5 summarizes which subaffordances (for prosocial vs. selfish behavior) are provided by each game included in this meta-analysis.<sup>8</sup> Specifically, interdependent situations often provide a possibility to maximize others' outcomes (i.e., *max(others)*), which affords the motive of altruism to guide prosocial behavior and which applies to all games considered here. The same holds for the possibility to minimize others' outcomes (i.e., *min(others)*), which affords the motive of spite to guide selfish behavior. Inter-

<sup>6</sup> The exploitation and reciprocity affordances provide opportunities for actions that are targeted at increasing or decreasing own and/or others' outcomes; in turn, the outcomes that can be achieved are determined by the outcome structure of the situation. By contrast, the affordances of temporal conflict and dependence under uncertainty do not provide opportunities for actions that are targeted at achieving certain outcomes for oneself versus others; rather, temporal conflict provides an opportunity to self-regulate one's impulse to behave in a selfish manner, without any reference to the specific outcomes that can be achieved, and dependence under uncertainty provides an opportunity to express one's beliefs about which outcomes others may want to achieve for the self and others.

<sup>7</sup> Social motives are also represented in the model of social value orientation, which can be understood as the dispositional (i.e., stable) tendency to let certain social motives guide behavior (e.g., Liebrand & McClintock, 1988; McClintock, 1972; Murphy & Ackermann, 2014; Van Lange, 1999).

<sup>8</sup> Given that the Prisoner's Dilemma, the Public Goods Game, and the Commons Dilemma involve the same (sub)affordances, we summarize across these three social dilemma games (see also the identical predictions for trait-behavior relations in the preregistration; <https://osf.io/dbuk6/>). However, we report the meta-analytic correlations separated for each game in the online supplemental materials (Tables S9–S11).

Table 4

*Relation Between Characteristics of Interdependent Situations, Subaffordances, and Social Motives*

Situation allows to . . .	Subaffordance	Social motive
. . . maximize others' outcomes	$\max(\text{other})$	altruism
. . . minimize the (absolute) difference between own and others' outcomes	$\min(\text{own} - \text{other})$	fairness
. . . maximize the sum of own and others' outcomes	$\max(\text{own} + \text{other})$	social welfare
. . . maximize one's own outcome	$\max(\text{own})$	individualism
. . . maximize the difference between own and others' outcomes	$\max(\text{own} - \text{other})$	competitiveness
. . . minimize others' outcomes	$\min(\text{other})$	spite

*Note.* Subaffordances are only relevant in situations providing the broader affordances of exploitation and reciprocity. Subaffordances for prosocial motives in the upper part of the table, subaffordances for selfish motives in the lower part of the table. Although the names of some social motives are equivalent to the names of some of the traits (see Table 2), motives and traits refer to distinct constructs.  $\max()$  = possibility to maximize;  $\min()$  = possibility to minimize; other = others' outcomes; own = own outcomes.

dependent situations also often provide a possibility to maximize one's own outcome (i.e.,  $\max(\text{own})$ ) which affords the motive of individualism, and this predicts selfish behavior whenever the prosocial choice brings about individual costs (e.g., in the Dictator Game and social dilemmas), but it can also predict prosocial behavior when the prosocial choice brings about individual benefits (e.g., in the Ultimatum Game as responder). Interdependent situations may also provide a possibility to minimize the difference between own and others' outcomes (i.e.,  $\min(\text{own} - \text{other})$ ), as is, for instance, the case in the Dictator Game and the Trust Game as trustee. These situations afford the expression of the motive of fairness. Conversely, situations may provide a possibility to maximize inequality in outcomes (i.e.,  $\max(\text{own} - \text{other})$ ) which affords the motive of competitiveness to guide selfish behavior, as holds for all games considered here. Finally, interdependent situations may provide a possibility to increase the sum of players' outcomes (i.e.,  $\max(\text{own} + \text{other})$ ; e.g., in social dilemmas), affording the motive of social welfare to guide behavior.

Taken together, the fine-grained structural differences between interdependent situations with regard to which outcomes can be achieved for the self and others provide specific subaffordances for prosocial versus selfish behavior. By implication, other games than the ones considered here may provide very different sets of subaffordances, including situations in which the social motives of altruism, competitiveness, and spite may not guide behavior. Moreover, most (game) situations actually involve multiple subaffordances (see Table 5) and thus multiple social motives can guide the same behavior. Indeed, isolating one specific motive as underlying mechanism of behavior will often require comparison of choices across several games involving different subaffordances (e.g., Bardsley, 2008; Engelmann & Strobel, 2004; Hilbig, Kieslich, Henninger, Thielmann, & Zettler, 2018; Poppe & Utens, 1986; Yamagishi & Sato, 1986) or directly asking individuals about the motives for their choices (e.g., Barrett & Dannenberg, 2012; Colman & Stirk, 1998; Haesevoets, Reinders Folmer, Bostyn, & Van Hiel, 2018; Insko, Wildschut, & Cohen, 2013).

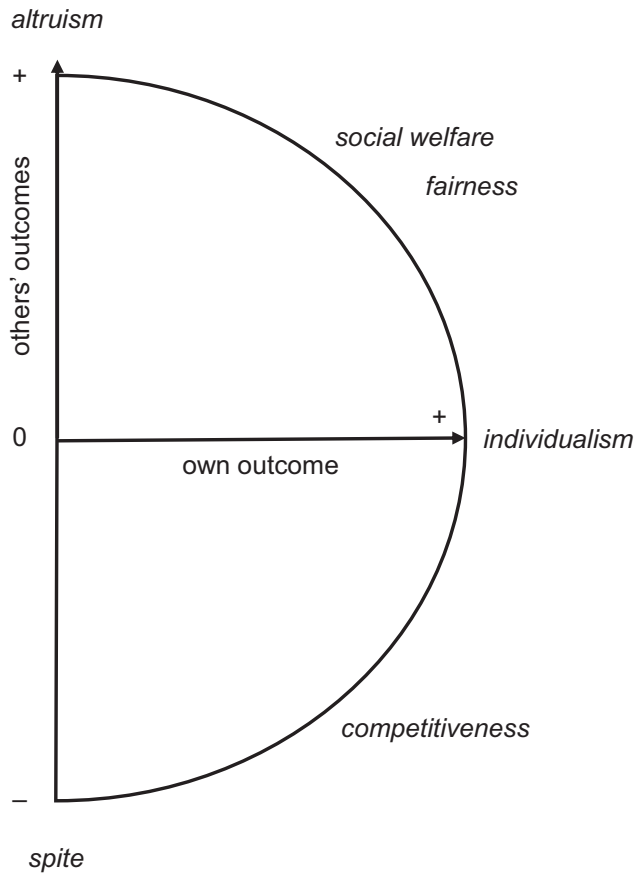
### Mapping Affordances in Games Onto Personality Traits: Overview of Hypotheses

As detailed previously, our framework rests on the notions that (a) the structural features of interdependent situations determine the affordances a situation provides and (b) traits may be activated

in the presence of (some of) the affordances depending on their conceptualization and operationalization. Figure 2 provides an overview of this framework, summarizing which broad affordances and subaffordances allow for the expression of which psychological processes, social motives, and related traits. Integrating these perspectives provides several predictions about which traits should (not) relate to prosocial behavior in which games, as summarized in Table 5.

Specifically, if a trait was linked to a broad affordance and—in case of the affordances of exploitation and reciprocity—a subaffordance provided in a game, we predicted that the trait will relate to prosocial behavior in this game. To illustrate, empathy is predicted to have a positive association with prosocial behavior in all games included in the meta-analysis because this trait should be expressed in the presence of the broad affordances of exploitation and reciprocity—and each game included here either provides a possibility for exploitation, reciprocity, or both—and the subaffordance of  $\max(\text{other})$ , which is again provided in all games considered here. By contrast, we predicted that a trait will not relate to prosocial behavior in a game if (a) the trait was not linked to any of the four broad affordances (e.g., emotional intelligence, extraversion, positive affect), (b) the trait was linked to the affordances of exploitation and/or reciprocity, but not to any of the corresponding subaffordances in the game, or (c) the trait was linked to the affordances of exploitation and/or reciprocity and to multiple subaffordances in the game which, however, afforded conflicting (i.e., prosocial vs. selfish) behaviors. Returning to our example from above, even though inequality aversion is conceptually linked to the affordance of exploitation, we predicted no (positive) association with prosocial behavior in the Trust Game as trustor (which provides a possibility for exploitation). This is because the game does not allow one to minimize the difference between own and others' outcomes—because equality in outcomes is established by default (trustor and trustee receive the same endowment; Berg et al., 1995)—which is, however, the only subaffordance that should allow inequality aversion to become expressed. Likewise, we predicted no (negative) relation between narcissism and prosocial behavior in the Ultimatum Game as responder even though narcissism is related to all (broad and sub)affordances provided in this game. However, the two subaffordances afford different behaviors (i.e., whereas  $\max(\text{own})$  affords prosocial behavior,  $\max(\text{own} -$





**Figure 1.** Social motives guiding behavior in interdependent situations in the presence of corresponding subaffordances. Motives above the  $x$  axis constitute prosocial motives (i.e., individuals positively weigh others' outcomes in their decisions); motives at or below the  $x$  axis constitute selfish motives (i.e., individuals neglect or even negatively weigh others' outcomes in their decisions). Motives that negatively weigh one's own outcome are not depicted here or considered in our theoretical framework because these motives are rarely expressed in behavior in games (Kuhlman & Marshello, 1975; Liebrand & Van Run, 1985) and are thus also usually not assessed (Murphy & Ackermann, 2014). Although the names of some social motives are equivalent to the names of some of the traits (see Table 2), motives and traits refer to distinct constructs.

other) affords selfish behavior), which is why narcissism should not relate to behavior in this game.

Moreover, we considered the *degree* to which a (broad) affordance is present in a game to further specify whether one would expect a relatively strong ( $++/-$   $-$ ) or a relatively weak ( $+/-$ ) relation between a trait and prosocial behavior in a game. As sketched above, the Ultimatum Game as proposer and the Trust Game as trustor, for instance, provide a relatively weaker possibility for exploitation because in both these games the second player (i.e., the recipient and trustee, respectively) has the opportunity to react to the first player's choice—and thus to impose costs on her. Therefore, traits linked to exploitation (e.g., social value orientation) should have a weaker association with behavior in these games than with behavior in the other games in which interaction partners cannot react to one's behavior and the affor-

dance of exploitation is thus present to a stronger degree (e.g., Dictator Game, Trust Game as trustee; see also Table 3).

Taken together, for each trait we first considered whether it was related to a broad affordance present in a game.<sup>9</sup> If a trait was related to the exploitation and/or reciprocity affordances, we further specified whether the trait was also related to a subaffordance provided in the game and if so, whether multiple subaffordances linked to the trait afforded the same or opposing behaviors. Finally, if a trait was identified to relate to behavior in a game, we further specified whether the relation should be relatively strong or weak, depending on the degree to which the related (broad) affordance was present in the game. Figure 3 provides a graphical illustration of this sequential process of generating hypotheses in terms of a decision tree, and Table 6 further demonstrates the application of this decision tree for a few example traits and games. Moreover, Table S2 in the online supplemental materials provides a detailed (verbal) description about how we arrived at the predictions for each trait listed in Table 5. Comparing these predictions with the results of the meta-analysis offers a critical test of whether traits that are conceptually linked to any of the four broad affordances (and subaffordances)—or several of them—are more strongly related to prosocial behavior. As such, the meta-analysis can enhance our understanding of *when* (i.e., in the presence of which affordances) and *how* (i.e., through which social motives) associations between certain personality traits and prosocial behavior in interdependent situations may come about.

### Bandwidth-Fidelity Dilemma and Models of Basic Personality Structure

Traits can differ in their breadth or *bandwidth*, respectively: Whereas narrow traits are relatively specific, homogenous, and facet-like, broad traits are more general, heterogeneous, and factor-like. The choice between narrow and broad traits is traditionally referred to as the bandwidth-fidelity dilemma (Cronbach & Gleser, 1965; Ones & Viswesvaran, 1996): “the more fine-grained, narrow, and specifically defined personality variables are, the greater the conceptual clarity and interpretability of empirical results due to greater homogeneity in the construct being tapped into” (Ones & Viswesvaran, 1996, p. 620). This increased specificity of narrow traits may, in turn, result in a stronger overlap with the to-be-predicted criterion, an argument that has also been raised to account for differences in the relation between attitudes and behavior (e.g., Fishbein & Ajzen, 1975). In line with this reasoning, narrow traits may indeed outperform broad traits in their predictive ability (e.g., Ashton, Paunonen, & Lee, 2014; A. De Vries, De Vries, & Born, 2011; McAbee, Oswald, & Connelly, 2014; Paunonen, Hadlock, Forsterling, & Keinonen, 2003; Steel, Schmidt, Bosco, & Uggerslev, 2019).

Transferred to interdependent situations, narrow traits may yield particularly strong relations to prosocial behavior because they may specifically tap into any of the psychological processes afforded in these situations. However, one may likewise argue that

<sup>9</sup> Given that evidence on the intuitive nature of cooperation (Bouwmeester et al., 2017; Rand et al., 2012) has generally questioned whether traits (and states) related to more deliberate versus intuitive processing should at all relate to prosocial behavior, our analysis of traits linked to self-regulation is thus mostly exploratory (see also our preregistration).

Table 5  
*Situational Affordances Involved in the Games and Corresponding Hypotheses About the Relations of Traits With Prosocial Behavior in These Games*

Game	Dictator Game	Ultimatum Game proposer	Ultimatum Game responder	Trust Game trustor	Trust Game trustee	Social Dilemmas
Broad affordances	EX	(EX), TC, DE	RE, TC	(EX), DE	EX, (RE) <sup>a</sup>	EX, (RE), (TC), DE
Subaffordances for prosocial behavior	max(other), min(low - other)	max(other), min(low - other)	max(other), max(own - other)	max(own + other)	max(other), min(low - other)	max(other), max(own + other)
Subaffordances for selfish behavior	max(own - other), min(other)	max(own), max(own - other), min(other)	max(own - other), min(other)	max(own - other), min(other)	max(own), max(own - other), min(other)	max(own), max(own - other), min(other)
Traits						
Broad traits						
Conscientiousness		++	++			+ <sup>b</sup>
FFM agreeableness	++	+	++	++	++	++
HEXACO agreeableness			++		+	+ <sup>b</sup>
Honesty-humility	++	+		+	++	++
Narrow traits						
Active prosociality						
Altruism, concern for others, empathy	++		++	+	++	++
Inequality aversion	++				++	++
Pro-environmentalism		+	+	+	+	++
Social value orientation	++					
Reactive prosociality						
Forgiveness, positive reciprocity			+		+	+ <sup>b</sup>
Antisocial tendencies						
Aggression			-		-	- <sup>b</sup>
Competitiveness, envy, sadism		-	-			
Greed	-	-	-	-	-	-
Machiavellianism	-	-	+	-	-	-
Narcissism	-	-		-	-	-
Psychopathy	-	-		-	-	-
Beliefs						
Belief in a just world	++			++	++	++
Trust propensity		-		++		++
Morality						
Guilt proneness	++	+		+	++	++
Integrity	++	+	+	+	++	++
Identity- and society-related attitudes						
Collectivism		+	+	+		++
Individualism, power, social dominance orientation	-	-			-	-
Right-wing authoritarianism	-	-	-	-	-	-



Table 5 (continued)

Game	Dictator Game	Ultimatum Game proposer	Ultimatum Game responder	Trust Game trustor	Trust Game trustee	Social Dilemmas
Self-regulation						
Impulsivity	—	—	—			— <sup>b</sup>
Self-control	++	++	++			+ <sup>b</sup>
Self-presentation	++	++	++			+ <sup>b</sup>
Risk attitudes						
Risk-taking	—	—		++		++

*Note.* DE = dependence; EX = exploitation; RE = reciprocity; TC = temporal conflict. Affordances put in parentheses are provided to a relatively weaker degree (i.e., EX for the proposer in the Ultimatum Game and the trustor in the Trust Game; RE for the trustee in the Trust Game) or only apply if the game is played repeatedly (i.e., RE and TC for social dilemmas). max() = possibility to maximize; min() = possibility to minimize; other = others' outcomes; own = own outcomes. Subaffordances are only relevant in situations providing the broader affordances of exploitation and reciprocity. FFM = Five Factor Model. ++/+/— = (relatively) strong positive/negative relation, +/— = (relatively) weak positive/negative relation; predictions apply to expected patterns of relations of certain traits (rows) with prosocial behavior in the different games (columns). If we predicted correlations of similar size for all relevant games, we consistently refer to these by “++” and “—”.<sup>a</sup> Although trustee behavior in the Trust Game represents a reaction, the trustee's endowment is only partly dependent on the trustor's behavior given that trustor and trustee receive the same initial endowment (at least in the original version of the game; Berg, Dickhaut, & McCabe, 1995).<sup>b</sup> Only if the game involves repeated interaction with feedback. Given that the majority of studies used one-shot social dilemmas (see main text), we do not consider them as providing the affordances of reciprocity and temporal conflict in the moderation tests by game type (see Table 8).

broad traits can have higher predictive validity than narrow traits due to capturing several relevant psychological processes at once. In turn, if broad traits relate as strongly to prosocial behavior as narrow traits, this would call for an account of individual differences in prosocial behavior based on broad traits. Specifically, broad traits can be expected to explain a greater variety of behaviors than narrow traits, and specifying more and more narrow traits will necessarily result in construct inflation, at least across criteria. The meta-analysis allows for comparison of the predictive validity of narrow versus broad traits to inform how much specificity is needed on the level of traits to account for individual variation in prosocial behavior.

In a similar vein, we also aimed at offering a critical test of the two most established models of basic personality structure—the FFM (McCrae & Costa, 1987, 1999) and the HEXACO model (Ashton & Lee, 2007; Ashton, Lee, & De Vries, 2014)—with regard to how (well) they account for individual differences in prosocial behavior. Whereas the FFM has become the most frequently used personality model since its conception in the 1980s (Ozer & Benet-Martínez, 2006), the HEXACO model has been proposed more recently based on lexical studies across a variety of languages (Ashton & Lee, 2007; Ashton et al., 2004). A key difference between the two models refers to how trait prosociality is conceptualized.<sup>10</sup> In the FFM, prosocial tendencies are basically a question of agreeableness, which globally captures “the motivation to cooperate (vs. acting selfishly) in resource conflicts” (Denissen & Penke, 2008, p. 1285). By contrast, in the HEXACO model, two types of prosocial tendencies are distinguished—unconditional and conditional tendencies (Trivers, 1971)—and these are captured in honesty-humility and agreeableness (see Table 2 for definitions).

Whether this distinction between unconditional (nonexploitative) and conditional (nonretaliatory) tendencies (Hilbig, Thielmann, Klein, & Henninger, 2016; Hilbig, Zettler, Leist, & Heydasch, 2013) indeed justifies inclusion of an additional (sixth) basic personality dimension, or whether honesty-humility simply represents a blend of FFM agreeableness, has evoked some debate: “honesty and humility correspond conceptually and empirically to the Straightforwardness and Modesty facets of Agreeableness [. . .], as assessed by the Revised NEO Personality Inventory” (McCrae & Costa, 2008, p. 167; for similar arguments, see, e.g., DeYoung, 2015; van Kampen, 2012). The meta-analysis can inform this debate by testing the predictions of the HEXACO model vis-à-vis the FFM in the context of prosocial behavior. Specifically, according to the conceptualizations of honesty-humility and agreeableness in the HEXACO model, honesty-humility should specifically relate to behavior in situations providing an opportunity to exploit others (e.g., Dictator Game). By contrast, HEXACO agreeableness should specifically relate to behavior in situations providing an opportunity to react to others' behavior (e.g., Ultimatum Game as responder; Table 5). FFM agreeableness, in turn, should yield comparable relations to prosocial behavior in all situations: Given the broad nature of FFM agreeableness capturing

<sup>10</sup> Moreover, the HEXACO model incorporates a modified (rotated) version of FFM neuroticism, termed emotionality in the HEXACO model (e.g., Ashton et al., 2014). We therefore consider these two dimensions as separate traits in our meta-analysis.

SITUATIONAL STRUCTURE	Affordances...				
		<b>Exploitation</b>	<b>Reciprocity</b>	<b>Temporal conflict</b>	<b>Dependence under uncertainty</b>
		Opportunity for... max(other) min( own – other ) max(own + other) max(own) max(own – other) min(other)	Opportunity for... max(other) min( own – other ) max(own + other) max(own) max(own – other) min(other)		
PERSON PROCESSES	...allow the expression of...	unconditional concern for others' welfare	conditional concern for others' welfare	self-regulation	beliefs about others' prosociality
		through the motives of... altruism fairness social welfare individualism competitiveness spite	through the motives of... altruism fairness social welfare individualism competitiveness spite		
	...and related traits	e.g., concern for others, empathy, greed, honesty-humility, Machiavellianism, right-wing authoritarianism social value orientation	e.g., HEXACO agreeableness, aggression, empathy envy, forgiveness, positive reciprocity	e.g., collectivism, conscientiousness, impulsivity, pro-environmentalism, self-control, self-presentation	e.g., belief in a just world, FFM agreeableness, psychopathy, risk-taking, trust propensity

Figure 2. Overview of the affordance-based theoretical framework of individual differences in prosocial behavior. FFM = Five Factor Model; max() = possibility to maximize; min() = possibility to minimize; other = others' outcomes; own = own outcomes.

both unconditional and conditional prosocial tendencies (Costa, McCrae, & Dye, 1991), it should be expressed in situations providing a possibility to exploit *and* in situations providing a possibility to reciprocate. Taken together, we therefore expected that HEXACO honesty-humility and agreeableness will show stronger and more differentiated relations with prosocial behavior across games than FFM agreeableness.

### Moderators of the Relation Between Personality and Prosocial Behavior

Interdependent situations as modeled in games can be implemented in different ways, which may ultimately affect behavior. We therefore also aimed at examining how different structural and methodological implementations of the games—including the degree of conflict of interests, repetition of interaction, behavior-contingent incentives, and experimental deception—may influence the observed relations between traits and prosocial behavior.

### Conflict of Interests

A critical feature of interdependent situations modeled in social dilemmas is the degree of conflict of interests: The higher the conflict of interests, the more tempting is exploitation as compared to cooperation. Variation in conflict of interests should thus particularly affect the expression of traits related to unconditional concern for others as afforded by the possibility to exploit (e.g., Hilbig et al., 2018; Zettler, Hilbig, & Heydasch, 2013).

Specifically, we tested the hypothesis that traits positively linked to unconditional concern for others (e.g., social value orientation) yield stronger (more positive) relations with prosocial behavior when conflict of interests is high (i.e., individuals high on these traits may even—and specifically—cooperate when exploitation is tempting). Conversely, for traits negatively linked to unconditional concern for others (e.g., Machiavellianism), one can derive two alternative hypotheses based on prior research. On the one hand, these traits may yield stronger (more negative) relations to prosocial behavior when conflict of interests is *high*, thus showing a reversed pattern as traits positively linked to unconditional concern for others. This hypothesis is implied by the strong negative relation between traits that are positively versus negatively linked to unconditional concern for others (e.g., between honesty-humility and the Dark Triad traits narcissism, Machiavellianism, and psychopathy; Lee et al., 2013; Muris, Merckelbach, Otgaar, & Meijer, 2017). On the other hand, traits that are negatively linked to unconditional concern for others may also yield stronger (more negative) relations with prosocial behavior when conflict of interests is *low*. This hypothesis is implied by evidence on the dark core of personality (Moshagen, Hilbig, & Zettler, 2018), which suggests that dark traits are more than the negative pole of bright traits because they are “additionally defined by inflicting disutility on others” (p. 682). In other words, traits negatively linked to unconditional concern for others seem to particularly capture variance in spiteful (and related) behavior, suggesting

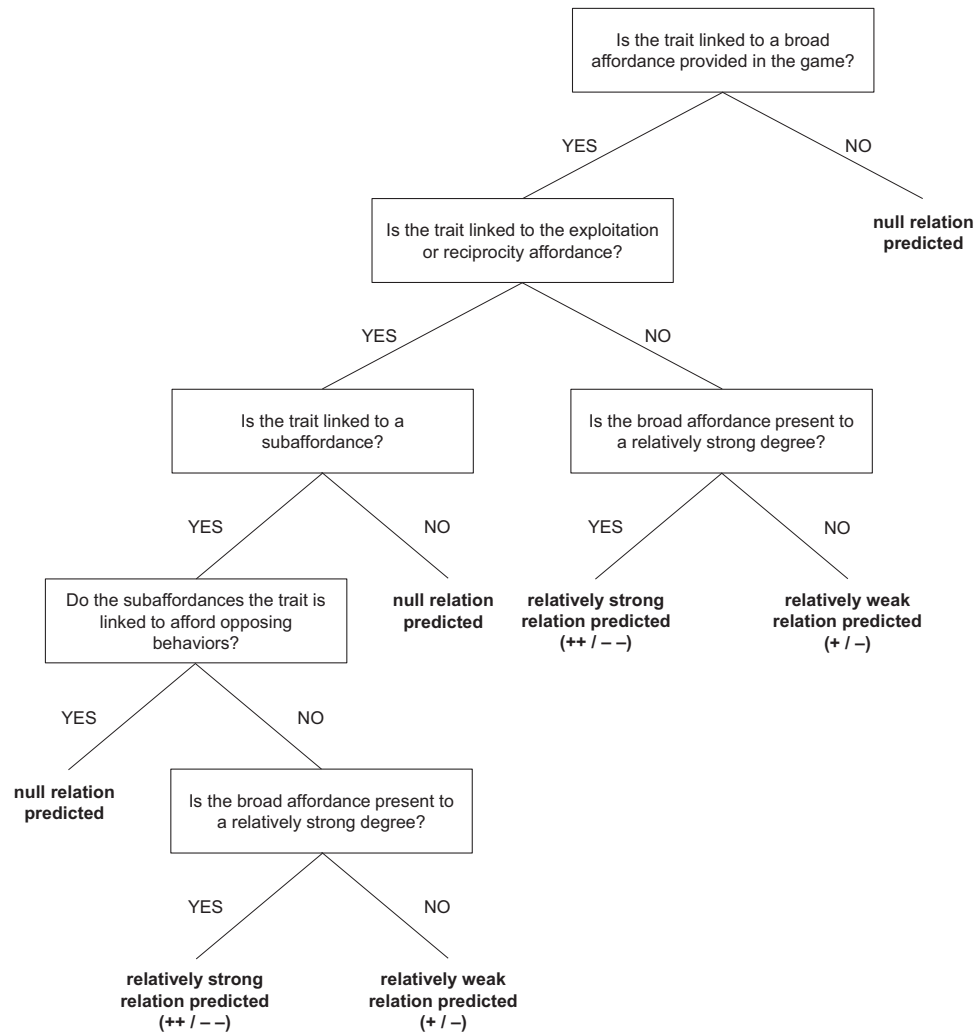


Figure 3. Decision tree for generation of hypotheses.

that individuals high on these traits may even be less willing to cooperate than individuals low on these traits when conflict of interests is low and when their uncooperative behavior can thus create discord in situations that lack it.

### Repetition of Interaction

Another key feature of interdependent situations is repetition of interaction. In one-shot interactions, the same individuals interact with each other only once; in repeated interactions, the same individuals interact with each other for several rounds, (usually) knowing about others' behavior in previous rounds. Thus, games involving repeated interaction (and feedback about own and/or others' prior behavior) provide an opportunity to reciprocate as well as to self-regulate one's impulse to behave in a selfish manner (to prevent that others will retaliate, creating a temporal conflict). We therefore tested whether traits related to conditional concern for others and/or self-regulation will show stronger relations with prosocial behavior in repeated interactions (with feedback) than in one-shot interactions.

### Behavior-Contingent Incentives

The use of behavior-contingent incentives versus hypothetical decisions is another potentially critical variation in the implementation of games (Baron, 2001; Camerer & Hogarth, 1999; Gneezy, Meier, & Rey-Biel, 2011) that may moderate the effect of personality traits on prosocial behavior. On the one hand, the relation between traits and prosocial behavior may be stronger if behavior is only hypothetical. Specifically, hypothetical decisions may be prone to the same type of socially desirable responding (e.g., Baron, 2001; Moshagen, Hilbig, & Musch, 2011; Thielmann, Heck, & Hilbig, 2016) as self-reports of (evaluative) personality traits (e.g., Dunning, Heath, & Suls, 2004; Robins & John, 1997; Sedikides, 1993). Thus, especially for evaluative traits, correlations might be inflated in hypothetical games. On the other hand, the relation between personality and prosocial behavior may be weaker in hypothetical games: Given that hypothetical behavior is costless, individuals may generally behave more prosocially to appear nice and/or to protect their positive self-image (Mazar, Amir, & Ariely, 2008; Ploner & Regner, 2013), and this tendency

Table 6  
Examples of Hypotheses Using the Decision Tree (Figure 3)

Trait	Game	Is the trait related to a broad affordance in the game?	Is the trait linked to EX and/or RE?	Is the trait linked to a subaffordance in the game?	Do the subaffordances afford opposing behaviors?	Is the broad affordance present to a relatively strong degree?	Prediction
Honesty-humility	DG	YES	YES	YES	NO	YES	++
	UG responder	NO	—	—	—	—	Ø
	TG trustor	YES	YES	YES	NO	NO	+
Inequality aversion	DG	YES	YES	YES	NO	YES	++
	UG responder	YES	YES	NO	—	—	Ø
	TG trustor	YES	YES	NO	—	—	Ø
Narcissism	DG	YES	YES	YES	NO	YES	--
	UG responder	YES	YES	YES	YES	—	Ø
	TG trustor	YES	YES	YES	NO	NO	—
Trust propensity	DG	NO	—	—	—	—	Ø
	UG responder	NO	—	—	—	—	Ø
	TG trustor	YES	NO	—	—	YES	++

Note. EX = exploitation affordance; RE = reciprocity affordance; DG = Dictator Game; TG = Trust Game; UG = Ultimatum Game. ++/- - = (relatively) strong positive/negative relation, +/- = (relatively) weak positive/negative relation, Ø = no relation.

may even be more pronounced in selfish individuals (Hilbig, Moshagen, & Zettler, 2015). However, evidence on the moderating role of incentives on the link between personality traits and prosocial behavior is mixed (Balliet et al., 2009; Ben-Ner, Kramer, & Levy, 2008; Lönnqvist, Verkasalo, & Walkowitz, 2011), thus calling for a large-scale meta-analytic test across traits and interdependent situations.

## Experimental Deception

Finally, we considered experimental deception as a potential moderator of the relation between personality and prosocial behavior in games. Deception is typically understood as the intentional and explicit misinformation of participants about a study's purpose or the experimental task and setup (e.g., Hertwig & Ortmann, 2008a, 2008b). In economic games, experimenters may, for instance, misinform individuals that they are interacting with a real other although they are actually interacting with a computer that follows a preprogrammed strategy. In (social) psychology, the use of deception appears to be common practice (Hertwig & Ortmann, 2008a, 2008b), whereas there is a proscription against deception in economics (Hertwig & Ortmann, 2001). Indeed, research suggests that deception can have unintended effects on individuals' behavior by triggering suspicion and second-guessing (Ortmann & Hertwig, 2002). Correspondingly, we tested whether deception to some extent suppresses the expression of personality in prosocial behavior.

## Method

The overall objectives and hypotheses as well as the inclusion criteria and analytic procedure were preregistered before any analyses were conducted.<sup>11</sup>

## Search for Studies

The search for eligible studies involved multiple steps (for a corresponding PRISMA flow diagram, see Figure S1 in the online

supplemental materials). First, we searched for studies on personality and prosocial behavior in resource allocation games. Therefore, in January 2018, we searched several scientific databases (i.e., Academic Search Premier, Business Source Premier, EconLit, PsycINFO, PsycARTICLES, Web of Science) as well as Google Scholar and ProQuest for relevant English-language articles, working papers, theses, and proceedings using the following search string: ("Dictator game" OR "Ultimatum game" OR "Trust game" OR "Investment game") AND ("Personality" OR "Trait"). Moreover, we searched the references of prior meta-analyses on personality and prosocial behavior for additional studies (Balliet et al., 2009; Balliet & Van Lange, 2013b; Kline et al., 2019; Pletzer et al., 2018; Zettler et al., in press; Zhao & Smillie, 2015). Overall, this resulted in 1,200 documents (after excluding duplicates).

Second, we screened all English-language documents included in the *Cooperation Databank* (Spadaro, Tiddi, Columbus, & Balliet, 2019) for relevant studies on personality and prosocial behavior in social dilemmas. This database comprises the entire history of research on human cooperation, and it is currently under development at the Amsterdam Cooperation Lab. Literature searches for

<sup>11</sup> The preregistration can be accessed via <https://osf.io/dbuk6/>. Although we derived our predictions based on the proposed theoretical framework, we acknowledge that this framework (including the four broad affordances) is not yet detailed in the preregistration. Moreover, in the process of data collection, we identified additional trait categories that are conceptually linked to the relevant affordances, but for which we did not specify predictions in the preregistration (e.g., morality, identity- and society-related attitudes). Based on our general theoretical approach, we specified hypotheses for these traits, too. Likewise, we refined the preregistered predictions that were based on the level of broad trait categories to conform with the features of the specific traits belonging to a category. Thus, some predictions detailed in the preregistration slightly differ from those presented here, and new predictions are added (see Table 5). For example, for all traits in the active prosociality category but social value orientation, we slightly adapted the predictions for certain games based on the specific conceptualizations and operationalizations of the traits. Nonetheless, all hypotheses were specified a priori, that is, before any analyses were conducted.



the Cooperation Databank had been conducted in September and October 2015 as well as in January 2018, including the following steps: (a) searching the PsycINFO, Web of Science, and Google Scholar databases as well as online university library repositories using the search string (“Public goods dilemma\*” OR “Public good\*” OR “Public good\* game\*” OR “Prisoner’s dilemma\*” OR “Voluntar\* contribut\* experiment\*” OR “Voluntary contribution mechanism” OR “Social dilemma” OR “Mixed-motive game\*” OR “Resource dilemma\*” OR “Matrix games” OR (“Cooperation” AND “Experiment”) OR “Common pool game” OR “Give-some dilemma” OR “Take-some dilemma” OR “Give-some game” OR “Take-some game”); and (b) checking the references of several published review articles and chapters, meta-analyses, and books on social dilemmas. Overall, these searches yielded 2,664 English-language documents (after excluding duplicates).

Next, we screened all 3,864 documents concerning their eligibility for the meta-analysis and identified 692 documents that reported one or multiple relevant studies<sup>12</sup> assessing at least one personality trait together with behavior in at least one of the six games considered here. However, for several of these studies, information on (some of) the zero-order correlations between personality traits and prosocial behavior was missing (e.g., because certain traits and/or trait measures were beyond the scope of interest in the current document or because only results from multiple regression analyses were reported). We therefore contacted 385 corresponding authors of 456 documents and asked for the missing effect sizes. If authors did not reply within four to six weeks, we sent a reminder (and usually a second one after another four to six weeks). Overall, 236 authors (61.2%) responded to our request, and 196 (50.9%) were able to provide the requested data for 312 studies in total.

Finally, in June 2018, we sent out several calls for (published and unpublished) data via the listservs of the Economic Science Association, the European Association for Decision Making, the European Association of Personality Psychology, the European Association of Social Psychology, the German Psychological Association, the International Conference on Social Dilemmas, and the Society for Judgment and Decision Making as well as via social-media postings (e.g., Twitter) and the website of the Amsterdam Cooperation Lab. Moreover, whenever contacting authors for missing data in a published document (see above), we asked them for additional published or unpublished data. Overall, this yielded another 94 eligible documents, 31 of which were published articles or working papers (which were not identified in one of the previous literature searches) and 63 of which were unpublished articles, theses, or raw data sets. Collection of data closed on November 30, 2018.

In sum, we identified 786 documents comprising 1,001 studies including data relevant for the current meta-analysis. However, for 191 studies, no useful data on the relation between personality and prosocial behavior was (made) available. Moreover, another 40 studies had to be excluded because they only considered traits for which there was insufficient data available across studies to perform meta-analysis (a list of all traits for which data was insufficient is provided in the additional materials on the OSF; <https://osf.io/dbuk6/>). Thus, the meta-analysis was based on a total number of 590 documents comprising 770 studies and 3,523 unique effect sizes involving  $N = 152,077$  participants.

## Inclusion Criteria

To be included in the meta-analysis, studies had to fulfill the following criteria:

1. At least one personality trait according to the definition from above (DeYoung, 2015) had to be assessed, using established multiple- or single-item scales, ad hoc created scales, or behavioral measures. We only excluded behavioral risk-taking measures (e.g., lottery-choice decisions; Holt & Laury, 2002) based on evidence showing that these measures “may capture states rather than a general and stable trait” (Frey, Pedroni, Mata, Rieskamp, & Hertwig, 2017, p. 8; see also Pedroni et al., 2017).
2. At least one of the following games (i.e., Dictator Game, Ultimatum Game, Trust Game, Prisoner’s Dilemma, Public Goods Game, Commons Dilemma) had to be used to measure prosocial behavior. We also included studies using slight variations of a relevant game if (and only if) the interdependent structure modeled was sufficiently similar to the standard game, in the sense that it involved the same (sub)affordances. For example, we excluded studies in which participants acted as second player in social dilemmas with sequential protocol and feedback (i.e., players choosing one after the other, with knowledge about the previous players’ choices) given the change in the interdependent structure (i.e., no dependence under uncertainty involved). We also excluded *team games* (Bornstein, 2003) in which groups interact with each other.
3. The game(s) had to involve a social interaction among humans, at least allegedly. That is, we only included studies in which participants interacted (or believed to interact) with another person rather than knowing that they interacted with a computer or robot.
4. Data had to be based on adult participants (aged 18 and above).
5. There had to be sufficient data available (either in the document/corresponding supplemental materials or provided upon request) to code the effect size(s).

## Coding of Effect Sizes

We used Pearson’s product-moment correlation coefficient  $r$  as the measure of effect size. Whenever effect sizes were reported in different metrics, we transformed them into  $r$  using appropriate conversion formulas (e.g., Borenstein, Hedges, Higgins, & Rothstein, 2011; Lakens, 2013). Moreover, whenever a study reported multiple effects contributing to the same meta-analytic effect size estimate (e.g., if a study assessed one and the same construct using two different measures, or if a study reported separate effects of a

<sup>12</sup> In the screening process, we took great care to identify potential sample overlap between studies due to data being used repeatedly in multiple documents. This led to the exclusion of 43 documents reporting the same data as another (included) document.



trait in two variants of the same game), we averaged these effects, taking into account the intercorrelation(s) of the to-be-averaged variables (Hunter & Schmidt, 2004). If these intercorrelations were not available, we conservatively assumed perfect redundancy. Likewise, when meta-analyzing effects across all games, we aggregated the corresponding effects in all studies assessing behavior in multiple games, conservatively assuming perfect convergence across the games. Overall, this procedure ensured that each independent sample contributed only once to a given meta-analytic effect size estimate. The R script for transformation and aggregation of effect sizes is available in the additional materials on the OSF (<https://osf.io/dbuk6/>).

To build (classes of) traits consisting of sufficiently equivalent constructs that can be meaningfully aggregated in the meta-analysis, we thoroughly reviewed the definitions and operationalizations of all constructs assessed in the single studies. Moreover, two experts in personality psychology independently reviewed our initial classification which we revised correspondingly based on their feedback. Table 2 summarizes the 51 traits we identified through this procedure; in the additional materials on the OSF (<https://osf.io/dbuk6/>) we further provide information on the measures each trait is composed of.

To aggregate effect sizes, we relied on random-effects psychometric meta-analysis with sample-size weights (Hunter & Schmidt, 2004). Whenever possible, we applied a correction for attenuation (Spearman, 1904) based on Cronbach's alpha estimate of internal consistency to account for unreliability of the trait measures. If Cronbach's alpha was not available or if effect sizes involved single item measures, we conservatively assumed perfect reliability, thus refraining from disattenuation. Moreover, no correction for attenuation was applied to effect sizes derived from latent variable models (e.g., structural equation models) given that such models inherently correct for measurement error. Effect sizes per study (disattenuated correlations) are provided in the additional materials (<https://osf.io/dbuk6/>).

### Coding of Study Characteristics

Coding of the data was conducted by the first author and the team of the *Cooperation Databank*. The latter (databank) coding was thoroughly checked by the first author to fit the coding of study characteristics for the current analysis. Nonetheless, we report Cohen's  $\kappa$  (Cohen, 1960; *irr* package in R; Gamer, Lemon, Fellows, & Singh, 2019) as index of interrater agreement for the key study characteristics, based on a subset of (social dilemma) studies included in the Cooperation Databank for which the corresponding information was available ( $131 \leq k \leq 216$ ). Importantly, interrater agreement was very high (Landis & Koch, 1977; McHugh, 2012) for all variables ( $.85 \leq \kappa \leq .99$ ). Table S1 in the online supplemental materials provides an overview of all variables coded. However, several of these variables were merely included for exploratory reasons, and they are therefore neglected in what follows.

**Game type.** The type of game to which an effect size referred was a key variable in our coding. For games with asymmetric player roles (Ultimatum and Trust Game), we further distinguished between the two roles (i.e., proposer vs. responder, trustor vs. trustee), and we treat these roles as different games in our analysis. Overall, all games were represented well in our analysis, compris-

ing 1,145 effects (32.5%) for social dilemmas, 796 effects (22.6%) for the Dictator Game, 432 effects (12.3%) for the Trust Game as trustor, 410 effects (11.6%) for the Ultimatum Game as responder, 380 effects (10.8%) for the Trust Game as trustee, and 360 effects (10.2%) for the Ultimatum Game as proposer.

**Conflict of interests.** We coded the degree of conflict of interests between players' payoffs in social dilemmas ( $\kappa = .89$  for the Prisoner's Dilemma,  $\kappa = .85$  for the Public Goods Game). One way to express conflict of interests is the  $K$  index (Rapoport & Chammah, 1965; Vlaev & Chater, 2006), which provides a measure of the relation between payoffs resulting from the possible combination of players' choices. Traditionally,  $K$  is used to describe conflict of interests in the Prisoner's Dilemma; however, it can also be applied to other social dilemmas such as the Public Goods Game<sup>13</sup>—which represents a  $N$ -player variant ( $N > 2$ ) of the two-player Prisoner's Dilemma. Formally,  $K = \frac{(R-P)}{(T-S)}$ , with  $R$  denoting the payoff for mutual cooperation (reward),  $P$  for mutual defection (punishment),  $T$  for unilateral defection (temptation), and  $S$  for unilateral cooperation (sucker). In games with continuous choice—in which players decide *how much* to contribute to a group account—cooperation means to contribute the maximum amount possible whereas defection means to contribute nothing. The  $K$  index ranges between 0 and 1, given that social dilemmas with conflicting interests are characterized by  $T > R > P > S$ . The higher  $K$  is, the lower is the relative gain from defection over cooperation (i.e.,  $T - R$  and  $P - S$ )—and thus the temptation to defect. In the studies considered in the meta-analysis, the mean level of  $K$  was  $M = 0.4$  ( $SD = 0.1$ ). We tested whether conflict of interests (as measured by  $K$ ) moderates the relation between personality and prosocial behavior in the Prisoner's Dilemma and the Public Goods Game.

**Repetition and feedback.** We coded whether a game involved one-shot interaction (i.e., the same players interact with each other only once) or repeated interaction (i.e., the same players interact with each other for several rounds;  $\kappa = .94$ ). Whenever a game involved repeated interaction, we further coded whether participants received feedback about others' behavior in previous rounds ( $\kappa = .88$ ). We investigated the potential moderation by repetition of interaction (with feedback) on the relation between personality and prosocial behavior in social dilemmas, given that repeated interaction has been restricted almost exclusively to these games (i.e., 93.9% of all instances of repeated interaction in our meta-analysis came from social dilemmas). Among those studies using social dilemmas, 244 (56.6%) implemented one-shot interaction whereas 138 (32.0%) implemented repeated interaction with feedback ( $Md = 18$  iterations;  $M = 28.4$ ,  $SD = 37.5$ ; for 49 studies, i.e., 11.4%, the status of repetition was unknown).

**Group size.** Games can be played in dyads or in groups (of variable size). We therefore coded the number of players interacting with each other in a game ( $\kappa = .99$ ). The majority of

<sup>13</sup> A more common way to express the degree of conflict of interests in the Public Goods Game is the marginal per-capita return (MPCR; Isaac, Walker, & Thomas, 1984), which refers to the ratio of the factor  $m$ , by which contributions to the group account are multiplied, to the group size  $N$  (i.e.,  $\frac{m}{N}$ ). In the current analysis, MPCR and  $K$  showed a strong positive correlation ( $r = .59$ ), reflecting that both are indicators of conflict of interests.

games involved dyads (77.7%; for 3.8% of games group size was unknown). In turn, interactions involving groups were almost exclusively implemented in social dilemmas. Group sizes in social dilemmas ranged up to 1,000, with a median of 4.

**Incentives.** We coded whether a game involved behavior-contingent incentives or hypothetical decisions ( $\kappa = .93$ ). Incentives could be provided to all participants for all decisions (full-payment incentive scheme), to all participants for some decisions (random-payment incentive scheme), to some participants for all decisions (random-lottery incentive scheme), or to some participants for some decisions (random-payment-and-lottery incentive scheme), and they could be of any type (including, e.g., small gifts, although most were monetary in nature). Games in which participants were only led to believe that they will receive behavior-contingent incentives but actually received a flat fee or no incentives at all were conservatively excluded from the moderation analyses. Overall, most of the games (72.2%) were implemented with behavior-contingent incentives; 16.2% were played truly hypothetically, and for 5.9% of games it was unknown whether incentives were provided.

**Experimental deception.** We coded whether a study involved deception ( $\kappa = .89$ ). Deception was defined as intentionally misinforming participants about any aspect of the game (e.g., the interaction partner, the payment). Importantly, a study was not considered to involve deception if certain information about the (background of the) study was withheld from participants (see, e.g., Hertwig & Ortmann, 2008a). Most studies (60.1%) did not involve deception; around one third (34.5%) involved deception, and for 5.3% it was unknown.

**Additional study characteristics.** To provide more detailed information on the studies included in the meta-analysis, we coded several additional variables for which we provide a summary in what follows: Females and males were almost equally represented in the samples, with 54.0% female participants. The average age of participants was 26.3 years ( $SD = 7.76$ ;  $Md = 23.0$ ). Studies came from 46 different countries, with the majority coming from the U.S. (33.4%), Germany (22.6%), the Netherlands (9.4%), and Great Britain (5.6%). Most of the studies collected data in the laboratory (72.8%) or on the Internet (20.5%); only a few studies collected data in the classroom (2.5%) or in the (lab in the) field (2.1%).

Year of publication of documents ranged from 1960 to 2019, with a median of 2014. This clearly shows the recent upsurge of interest in the study of individual differences in prosocial behavior. The majority of documents were journal articles (81.0%), followed by (published or unpublished) theses (7.0%), unpublished (raw) data sets (5.1%), and (published or unpublished) working papers (4.6%). In turn, demonstrating the success of our efforts to include as much unpublished data as possible, 54.8% of all effect sizes were unpublished at the time of data collection. Almost all effect sizes (92.6%) were (made) available as correlation coefficient  $r$ , thus requiring no transformation at all. Otherwise, most effects were available as standardized regression coefficient  $\beta$  (2.6%) or as standardized mean difference Cohen's  $d$  (1.8%). Finally, regarding the nature of trait measurement, almost all effects were based on self-reports of personality traits (95.9%).

## Results

### Analytic Strategy

All analyses were conducted using the *metafor* package (Viechtbauer, 2010) in R (R Core Team, 2018). We first estimated the disattenuated, zero-order correlations of all 51 traits with prosocial behavior aggregated across games as well as separately for each game, using random-effects meta-analysis with sample-size weights (Hunter & Schmidt, 2004). Moreover, we assessed the presence of heterogeneity in effect sizes (Cochran's  $Q$ ), the extent of between-study variance ( $T^2$ ), and the percentage of between-study variance that can be attributed to true heterogeneity ( $I^2$ ). To detect potential publication bias, we applied the rank correlation method (Begg & Mazumdar, 1994), Egger's regression test (Egger, Smith, Schneider, & Minder, 1997), and the trim-and-fill-method (Duval & Tweedie, 2000a, 2000b). However, reflecting that more than 50% of effect sizes included were unpublished, there was almost no evidence of publication bias: For only 11 of the 284 correlations estimated (i.e., 3.9%), publication bias was implied by more than a single indicator. Nonetheless, it should be noted that there was indeed some evidence that published effect sizes were larger than unpublished ones (i.e., for 8 of 43 traits we found a significant moderation by publication status). This generally supports the importance of considering unpublished data in meta-analyses to prevent systematic overestimation of effect sizes due to publication bias. We report all statistics from the publication bias tests in the online supplemental materials (Tables S18 and S19 and Figure S8).

To test whether the effects of certain traits on prosocial behavior vary as a function of relevant differences in the implementation of games, we performed moderation analyses using multivariate multilevel random-effects regression. Specifically, we predicted the disattenuated correlations observed for a trait or group of traits in certain games by the moderator in question (as fixed effect), specified control variables (as fixed effects), and a unique study identifier (as random effect). This allowed us to include multiple effects per study whenever the moderator was manipulated within a study and separate correlations were available for different levels of the moderator. To ensure sufficient data for the moderator analyses, we required effect sizes from at least 10 studies for which the level of the moderator was known. Moreover, there had to be some variation in the level of the moderator across studies. That is, we required availability of at least four studies with a certain level of the moderator for binary moderators (i.e., repeated interaction: yes vs. no; incentives: yes vs. no; deception: yes vs. no) and within a certain range for continuous moderators (i.e., relatively high vs. low conflict of interests;  $K < 0.4$  vs.  $K \geq 0.4$ ). For moderator analyses of game type, at least three effects (i.e.,  $k \geq 3$ ) had to be available for at least four games.

### Personality and Prosocial Behavior Across Games

First, we investigated the disattenuated, meta-analytic correlations of all traits with prosocial behavior aggregated across all games. Figure 4 summarizes the correlations and corresponding number of independent samples ( $k$ ); Table 7 provides more detailed information on the sample sizes ( $N$ ), standard errors ( $SE$ ) and 95% prediction intervals ( $PI$ ) of the disattenuated correlations,

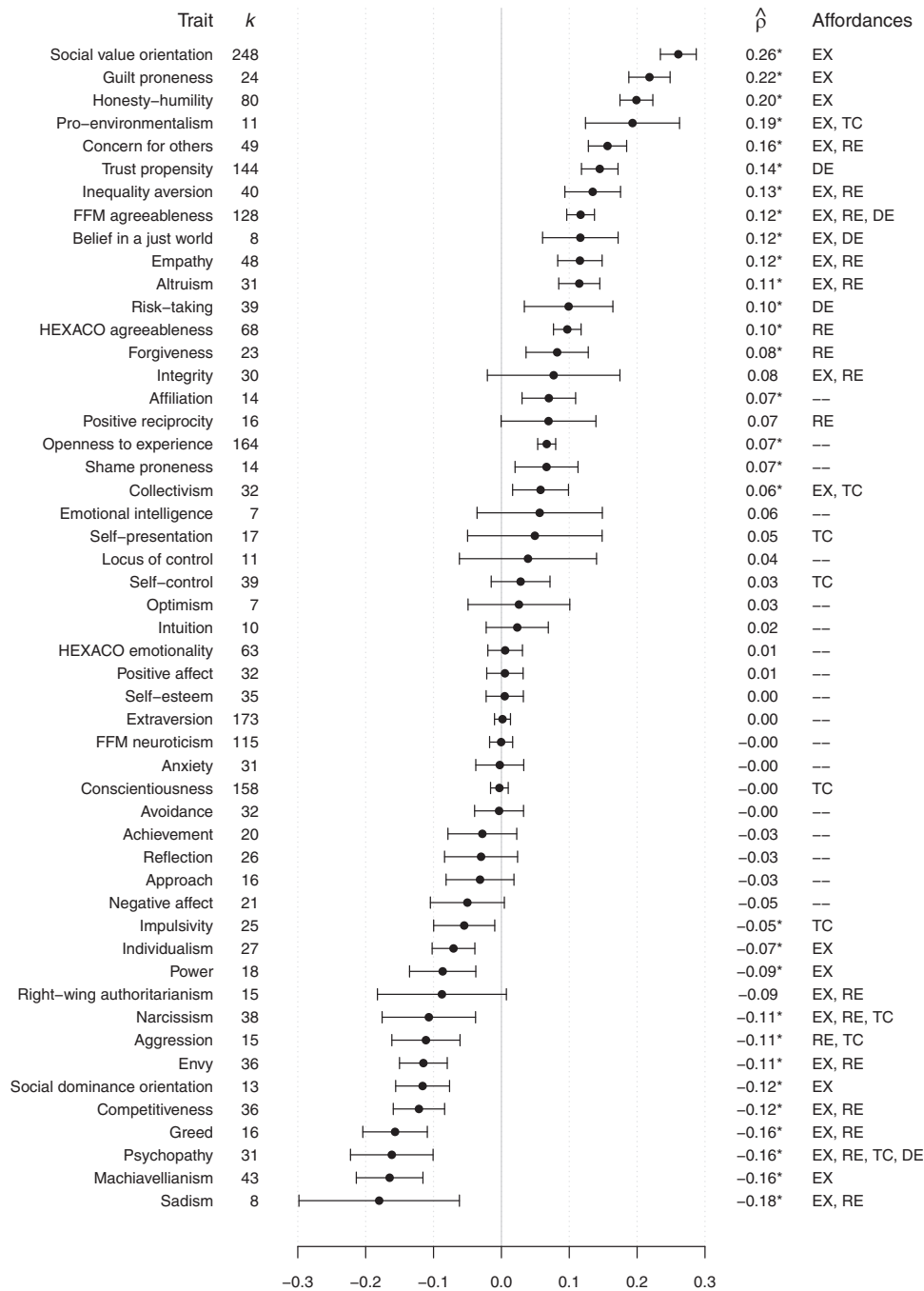


Figure 4. Meta-analytic correlations ( $\hat{\rho}$ ) for all traits with prosocial behavior aggregated across all games, with number of independent samples ( $k$ ) and broad affordances linked to the traits. Error bars indicate 95% CIs. FFM = Five Factor Model; DE = dependence; EX = exploitation; RE = reciprocity; TC = temporal conflict. \*  $p < .05$ .

exact  $p$  values, heterogeneity in effect sizes ( $Q$ ,  $T^2$ , and  $I^2$ ), and uncorrected (i.e., bare-bones) correlations ( $r$ ). As is apparent, the number of independent samples varied substantially across the traits, ranging from 7 samples for emotional intelligence as well as optimism to 248 samples for social value orientation. Likewise, there was variation in the correlations of the traits with prosocial

behavior, varying between  $\hat{\rho} = -.18$  (for sadism) to  $\hat{\rho} = .26$  (for social value orientation).

For each trait, we specified whether the trait is associated with one of the four broad affordances provided in interdependent situations (see Table 2 and Figure 4). This affordance-based account predicts that only those traits linked to any of the affordances

Table 7  
*Meta-Analysis of Correlations Between Personality Traits and Prosocial Behavior Across Games*

Trait	k	N	$\hat{\rho}$ (SE)	95% CI	95% PI	p	Q	$\tau^2$	$I^2$	r (SE)
Broad traits										
Agreeableness (FFM)	128	24,282	.12* (.01)	[.10, .14]	[.02, .21]	<.001	170.60*	.002	24.80	.10* (.01)
Agreeableness (HEXACO)	68	13,674	.10* (.01)	[.08, .12]	[.05, .15]	<.001	74.43	.001	8.57	.09* (.01)
Conscientiousness	158	31,919	-.01 (.01)	[-.02, .01]	[-.04, .03]	.658	165.30	.001	4.39	-.01 (.01)
Emotionality (HEXACO)	63	12,024	.01 (.01)	[-.02, .03]	[-.10, .11]	.670	87.04*	.003	27.44	.01 (.01)
Extraversion	173	32,753	.01 (.01)	[-.01, .01]	[-.01, .01]	.787	172.68	0	0	.01 (.01)
Honesty-humility (HEXACO)	80	16,903	.20* (.01)	[.17, .22]	[.08, .32]	<.001	130.15*	.004	38.35	.17* (.01)
Neuroticism (FFM)	115	22,713	-.00 (.01)	[-.02, .02]	[-.06, .06]	.963	132.71	.001	13.18	-.01 (.01)
Openness to experience	164	32,284	.07* (.01)	[.05, .08]	[.03, .10]	<.001	171.22	.001	4.19	.06* (.01)
Narrow traits										
Active prosociality										
Altruism	31	8,853	.11* (.02)	[.08, .14]	[.03, .20]	<.001	44.83*	.002	30.16	.11* (.01)
Concern for others	49	10,783	.16* (.01)	[.13, .18]	[.06, .25]	<.001	66.34*	.002	25.63	.14* (.01)
Empathy	48	9,252	.12* (.02)	[.08, .15]	[.01, .22]	<.001	68.46*	.003	29.17	.11* (.02)
Inequality aversion	40	5,584	.13* (.02)	[.09, .18]	[-.02, .29]	<.001	67.22*	.005	40.05	.13* (.02)
Pro-environmentalism	11	1,819	.19* (.04)	[.12, .26]	[.04, .35]	<.001	18.59*	.004	39.90	.18* (.03)
Social value orientation	248	42,779	.26* (.01)	[.23, .29]	[-.00, .53]	<.001	1,010.23*	.018	75.36	.26* (.01)
Reactive prosociality										
Forgiveness (vs. retaliation)	23	8,740	.08* (.02)	[.04, .13]	[-.05, .21]	<.001	51.07*	.004	53.38	.07* (.02)
Positive reciprocity	16	4,568	.07 (.04)	[-.00, .14]	[-.11, .25]	.051	44.50*	.007	61.76	.06 (.03)
Antisocial tendencies										
Aggression	15	3,358	-.11* (.03)	[-.16, -.06]	[-.22, .00]	<.001	22.94	.003	33.00	-.11* (.02)
Competitiveness	36	6,085	-.12* (.02)	[-.16, -.08]	[-.26, .02]	<.001	56.67*	.004	36.34	-.11* (.02)
Envy	36	4,729	-.11* (.02)	[-.15, -.08]	[-.20, -.03]	<.001	42.87	.002	15.78	-.11* (.02)
Greed	16	3,627	-.16* (.02)	[-.20, -.11]	[-.27, -.05]	<.001	23.95	.003	31.76	-.15 (.02)
Machiavellianism	43	6,858	-.16* (.03)	[-.21, -.12]	[-.34, .01]	<.001	89.34*	.008	50.67	-.16* (.02)
Narcissism	38	9,295	-.11* (.04)	[-.18, -.04]	[-.38, .17]	.002	189.05*	.019	79.28	-.10* (.03)
Psychopathy	31	5,381	-.16* (.03)	[-.22, -.10]	[-.35, .02]	<.001	68.53*	.008	52.63	-.15* (.03)
Sadism	8	2,651	-.18* (.06)	[-.30, -.06]	[-.42, .06]	.003	35.43*	.011	72.46	-.18* (.06)
Beliefs										
Belief in a just world	8	1,432	.12* (.03)	[.06, .17]	[.06, .17]	<.001	6.73*	0	0	.11* (.03)
Trust propensity	144	35,445	.14* (.01)	[.12, .17]	[-.04, .33]	<.001	411.28*	.009	64.74	.13* (.01)
Morality										
Guilt proneness	24	5,881	.22* (.02)	[.19, .25]	[.16, .27]	<.001	26.90	.001	10.64	.20* (.01)
Integrity	30	9,372	.08 (.05)	[-.02, .17]	[-.30, .46]	.122	312.83*	.035	90.09	.07 (.05)
Identity- and society-related attitudes										
Collectivism	32	5,928	.06* (.02)	[.02, .10]	[-.08, .19]	.006	49.23*	.004	34.67	.05* (.02)
Individualism	27	5,856	-.07* (.02)	[-.10, -.04]	[-.10, -.04]	<.001	25.38	0	0	-.06* (.01)
Power	18	4,315	-.09* (.02)	[-.14, -.04]	[-.21, .04]	<.001	30.19*	.003	38.96	-.08* (.02)
Right-wing authoritarianism	15	2,799	-.09 (.05)	[-.18, .01]	[-.35, .18]	.071	53.52*	.016	70.59	-.09 (.05)
Social dominance orientation	13	3,001	-.12* (.02)	[-.16, -.08]	[-.16, -.08]	<.001	9.32	0	0	-.11* (.02)

(table continues)

Table 7 (continued)

Trait	<i>k</i>	<i>N</i>	$\hat{\rho}$ ( <i>SE</i> )	95% CI	95% PI	<i>p</i>	<i>Q</i>	<i>T</i> <sup>2</sup>	<i>F</i> <sup>2</sup>	<i>r</i> ( <i>SE</i> )
Self-regulation										
Self-control	39	11,550	.03 (.02)	[−.01, .07]	[−.12, .18]	.200	99.56*	.006	59.59	.03 (.02)
Self-presentation	17	2,710	.05 (.05)	[−.05, .15]	[−.25, .35]	.330	64.87*	.021	72.86	.04 (.05)
Impulsivity	25	3,352	−.05* (.02)	[−.10, −.01]	[−.15, .04]	.017	29.73	.002	15.14	−.05* (.02)
Risk attitudes										
Risk-taking	39	8,616	.10* (.03)	[.03, .16]	[−.11, .31]	.003	124.37*	.010	66.82	.09* (.03)
Thinking style										
Intuition	10	3,333	.02 (.02)	[−.02, .07]	[−.05, .10]	.317	12.91	.001	19.46	.02 (.02)
Reflection	26	10,498	−.03 (.03)	[−.08, .02]	[−.19, .13]	.275	80.37*	.006	65.78	−.03 (.03)
Affect										
Anxiety	31	3,370	−.00 (.02)	[−.04, .03]	[−.04, .03]	.894	23.66	0	0	−.00 (.02)
Negative affect	21	2,216	−.05 (.03)	[−.10, .00]	[−.18, .08]	.071	28.31	.004	25.37	−.05 (.03)
Positive affect	32	6,471	.01 (.01)	[−.02, .03]	[−.02, .03]	.703	30.22	0	0	.01 (.01)
Shame proneness	14	3,105	.07* (.02)	[.02, .11]	[−.02, .16]	.005	18.00	.002	21.78	.06* (.02)
Motivation										
Achievement	20	2,731	−.03 (.03)	[−.08, .02]	[−.13, .07]	.278	23.99	.002	16.15	−.03 (.02)
Affiliation	14	3,251	.07* (.02)	[.03, .11]	[.02, .11]	<.001	14.32	0	1.89	.06* (.02)
Approach	16	1,814	−.03 (.03)	[−.08, .02]	[−.08, .02]	.217	15.36	0	0	−.03 (.02)
Avoidance	32	3,692	−.00 (.02)	[−.04, .03]	[−.04, .03]	.853	29.75	0	0	−.00 (.02)
Other										
Emotional intelligence	7	533	.06 (.05)	[−.04, .15]	[−.04, .15]	.231	2.37	0	0	.05 (.04)
Locus of control	11	1,683	.04 (.05)	[−.06, .14]	[−.19, .27]	.447	24.55*	.011	53.83	.03 (.04)
Optimism	7	843	.03 (.04)	[−.05, .10]	[−.05, .10]	.499	2.13	0	0	.02 (.03)
Self-esteem	35	5,992	.00 (.01)	[−.02, .03]	[−.02, .03]	.725	24.73	0	0	.00 (.01)

Note. *k* = number of independent samples; *N* = total sample size;  $\hat{\rho}$  = mean true-score correlation corrected for unreliability; *SE* = standard error; CI = confidence interval; PI = prediction interval; *Q* = Cochran's *Q* statistic; *T*<sup>2</sup> = between-study variance; *F*<sup>2</sup> = variation across samples attributable to true heterogeneity; *r* = mean (bare-bones) correlation; FFM = Five Factor Model.  
\* *p* < .05.



will have an association with prosocial behavior across the games (because—on the whole—the games include all four affordances and additional subaffordances). Strikingly, the pattern of correlations was largely in line with this prediction: Traits that were hypothesized to be expressed in the presence of any of the four broad affordances mostly showed stronger and statistically significant correlations with prosocial behavior than traits that were not hypothesized to be expressed in the presence of any of these affordances—with all of the latter traits yielding (close to) zero correlations (see Figure 4). In other words, whereas 30 of the 33 traits that are conceptually linked to at least one of the four affordances showed correlations of  $\hat{\rho} \geq .105$  (27 of which significantly differed from zero), this occurred for only 5 of the 18 traits that are not conceptually linked to any of these affordances (three of which significantly differed from zero).

The strongest correlations were apparent for traits associated with unconditional concern for others that were expected to be expressed when one can exploit others. Specifically, the three traits yielding the largest effects overall—social value orientation ( $\hat{\rho} = .26$ ), guilt proneness ( $\hat{\rho} = .22$ ), and honesty-humility ( $\hat{\rho} = .20$ )—are all exclusively linked to the exploitation affordance. However, it should be noted that the strong correlation for social value orientation is likely—at least to some extent—attributable to its measurement based on hypothetical, game-like distribution decisions (Murphy & Ackermann, 2014). Conversely, traits exclusively linked to self-regulation and the affordance of temporal conflict—self-presentation ( $\hat{\rho} = .05$ ), self-control ( $\hat{\rho} = .03$ ), conscientiousness ( $\hat{\rho} = -.003$ ), and impulsivity ( $\hat{\rho} = -.06$ )—all showed (close to) zero correlations with prosocial behavior across the games. Somewhat in between fell the traits (exclusively) linked to the affordances of reciprocity and dependence under uncertainty for which the strongest absolute correlations emerged for trust propensity ( $\hat{\rho} = .15$ ; dependence), followed by risk-taking ( $\hat{\rho} = .10$ ; dependence) and HEXACO agreeableness ( $\hat{\rho} = .10$ ; reciprocity). Overall, the findings thus imply that it is particularly the possibility to exploit that affords the expression of certain personality traits in prosocial behavior across interdependent situations.

### Personality and Prosocial Behavior Within Games

Depending on the specific interdependent structure modeled in each game—and corresponding (sub)affordances involved—we derived more refined predictions about which traits should relate to behavior in which games (Table 5). Thus, we next investigated whether the relations of traits to prosocial behavior within the games also followed the predicted pattern. This provides information on whether the fine-grained structural differences between games can be used to predict which traits relate to prosocial behavior in which situations. Here, we focus on 33 traits for which we can derive hypotheses on when (i.e., in which games) these traits should relate to prosocial behavior (see Table 5).

Table 8 shows the disattenuated, meta-analytic correlations for all trait-game combinations for which  $k \geq 3$  (for additional statistics as well as correlations of all 51 traits with behavior per game, including separate estimates for the three social dilemmas, see Tables S3–S11 and Figures S2–S7 in the online supplemental materials). Moreover, Table 8 summarizes the results from meta-analytic multilevel regression testing the moderation by game type. Specifically, we conducted an overall regression for each trait, testing whether correlations significantly differed across the games

by predicting the disattenuated correlations for a trait by (up to) five dummy variables coding the type of game (against the Dictator Game as baseline). Results are indicated by + and – superscripts in Table 8 as well as by the  $Q$  statistic; more detailed results for these analyses are provided in Table S12 in the online supplemental materials. In addition, for all traits for which correlations with behavior were hypothesized to systematically differ across the games based on the (sub)affordances involved (in the sense that correlations were expected to occur in some games, but not in others; Table 5), we used multilevel regression and tailored contrast or dummy coding to test whether correlations followed the predicted pattern. If we predicted no effect in at least one game and effects of different size (e.g., ++ vs. +) in the other games (e.g., for social value orientation), we used Helmert contrasts (see, e.g., Cohen, Cohen, West, & Aiken, 2003) to code the type of game: One variable specified the expected presence versus absence of an effect, without considering the relative strength of effects (e.g., +/+ = 0.5, no effect = –1); the other variable specified the relative strength of effects (e.g., + = –1, ++ = +1, no effect = 0). In turn, if we predicted effects in all games that should only differ in size (e.g., for FFM agreeableness), we used dummy coding (e.g., ++ = 1, + = 0). Overall, the coding variables allowed to specifically test the hypothesized pattern of correlations across games. Note that all regression weights were tested one-tailed given the directed hypotheses.

**Broad traits.** As is apparent in Table 8, the pattern of correlations was indeed in line with predictions for most traits. Among the broad traits, honesty-humility yielded a significant positive correlation with prosocial behavior in all games but the Ultimatum Game as responder ( $.09 \leq \hat{\rho} \leq .26$  vs.  $\hat{\rho} = .02$ ; see also Figure 5). Correspondingly, both contrast variables (one comparing the Ultimatum Game as responder with all other games and one comparing the Ultimatum Game as proposer and Trust Game as trustor with the Dictator Game, Trust Game as trustee, and social dilemmas) revealed the expected moderation by game type,  $B = .10$ ,  $p < .001$  and  $B = .07$ ,  $p < .001$ , respectively. For FFM agreeableness, the pattern was likewise largely in line with hypotheses, showing positive correlations with prosocial behavior in all games. However, correlations were weak overall ( $.07 \leq \hat{\rho} \leq .16$ ), and the moderation test did not support the expected rank order of correlations (Ultimatum Game as proposer < others),  $B = .04$ ,  $p = .074$ . A similar picture emerged for HEXACO agreeableness: Descriptively, results were in line with expectations, showing the largest correlation in the Ultimatum Game as responder ( $\hat{\rho} = .12$ ). However, differences in correlations were small ( $.06 \leq \hat{\rho} \leq .12$ ) and the moderation did not reach statistical significance. That is, correlations were not significantly stronger for games providing a possibility to reciprocate (i.e., Ultimatum Game as responder and Trust Game as trustee) versus other games,  $B = .01$ ,  $p = .179$ , and for the Ultimatum Game as responder versus the Trust Game as trustee,  $B = .01$ ,  $p = .364$ .

In the context of these broad traits, we also aimed to specifically test the prediction that HEXACO honesty-humility and agreeableness will show a more differentiated pattern of correlations across the games than FFM agreeableness. To this end, for each of these traits, we (a) calculated the proportion of variance ( $R^2$ ) explained by the type of game (i.e., five dummy variables, with the Dictator Game as baseline) and (b) compared the regression model including the game type variables as predictors against the null model including no predictor at all using likelihood ratio tests as well as

**Table 8**  
*Meta-Analytic Correlations ( $\hat{\rho}$ ) Between Traits and Prosocial Behavior Within Each Game, Including the Number of Independent Samples ( $k$ ; in Parentheses) and Results of Moderation Tests for Game Type*

Trait	Games						Test of predicted moderation by game type		
	DG	UG		UG responder	TG trustor	TG trustee		SDG	Q (df = 5)
		proposer							
Broad traits									
Conscientiousness	-.00 (68)	.02 (25)		.02 (25)	-.05* <sup>-</sup> (34)	.00 (31)	-.01 (57)	16.10*	(UG-A, UG-B) > others: B = .04*
FFM agreeableness	.16* (51)	.08* <sup>-</sup> (16)		.07* <sup>-</sup> (18)	.09* <sup>-</sup> (28)	.13* (28)	.07* <sup>-</sup> (47)	31.34*	UG-A < others: B = .04
HEXACO agreeableness	.11* (37)	.06* (14)		.12* (12)	.09* (12)	.11* (7)	.08* (22)	5.10	(UG-B, TG-B) > others: B = .01; UG-B > TG-B: B = .01
Honesty-humility	.26* (43)	.09* <sup>-</sup> (16)		.02 <sup>-</sup> (15)	.11* <sup>-</sup> (12)	.22* (7)	.18* <sup>-</sup> (27)	126.66*	UG-B < others: B = .10* <sup>-</sup> ; (DG, TG-B, SDG) > (UG-A, TG-A): B = .07*
Narrow traits									
Active prosociality									
Altruism	.14* (21)	.08* <sup>-</sup> (10)		.04 <sup>-</sup> (12)	.09* <sup>-</sup> (7)	.15* (6)	.14* (9)	31.69*	(UG-A, TG-A) < others: B = .04*
Concern for others	.15* (10)	.12* (4)		.07* (4)	.16* (7)	.17* (4)	.17* (38)	5.38	(UG-A, TG-A) < others: B = .01
Empathy	.15* (31)	.09* (7)		-.01 <sup>-</sup> (12)	.06* <sup>-</sup> (10)	.13* (4)	.08 <sup>-</sup> (9)	29.53*	(UG-A, TG-A) < others: B = .02
Inequality aversion	.22* (20)	.13* <sup>-</sup> (9)		.01 <sup>-</sup> (11)	.08* <sup>-</sup> (10)	.12* <sup>-</sup> (10)	.12* <sup>-</sup> (9)	54.08*	(DG, UG-A, TG-B) > others: B = .08* <sup>-</sup> ; (DG, TG-B) > UG-A: B = .03*
Pro-environmentalism	—	—		—	—	—	.19* (11)	—	—
Social value orientation	.32* (37)	.24* <sup>-</sup> (24)		-.03 <sup>-</sup> (25)	.27* <sup>-</sup> (15)	.40* (6)	.28* <sup>-</sup> (182)	226.37*	UG-B < others: B = .19* <sup>-</sup> ; (DG, TG-B, SDG) > (UG-A, TG-A): B = .04*
Reactive prosociality									
Forgiveness	.16* (10)	.04 <sup>-</sup> (9)		.09* (9)	.09* (10)	.13* (7)	.05* (11)	10.27	(UG-B, TG-B) > others: B = .01; UG-B > TG-B: B = -.01
Positive reciprocity	.08* (6)	.07* (5)		.06 (4)	.09 (6)	.10* (5)	.03 (9)	0.62	(UG-B, TG-B) vs. others: B = .001; UG-B > TG-B: B = -.01
Antisocial traits									
Aggression	—	—		-.08* (5)	—	—	-.15* (7)	—	—
Competitiveness	—	—		—	-.06 (4)	—	-.13* (33)	—	—
Envy	-.15* (11)	-.11* (3)		-.10* (7)	-.10* (12)	-.08* (10)	-.09* (10)	4.34	(UG-A, TG-A) > others: B = .01
Greed	-.15* (6)	—		—	—	—	-.16* (10)	—	—
Machiavellianism	-.20* (16)	-.04 <sup>+</sup> (6)		-.02 <sup>+</sup> (8)	-.16* (10)	-.20* (11)	-.16* (20)	19.57*	UG-B > others: B = .09* <sup>-</sup> ; (UG-A, TG-A) > (DG, TG-B, SDG): B = .02
Narcissism <sup>a</sup>	-.16* (12)	-.11* (5)		.00 <sup>+</sup> (8)	—	—	-.07 <sup>+</sup> (24)	16.09*	UG-B > others: B = .11* <sup>-</sup>
Psychopathy	-.19* (15)	-.05 (8)		-.04 <sup>+</sup> (12)	-.00 (3)	-.12 (3)	-.13* (17)	7.58	N/A
Sadism	—	—		—	—	—	-.04 (6)	—	—
Beliefs									
Belief in a just world	.14* (6)	—		—	—	—	—	—	—
Trust propensity	.13* (19)	.04 <sup>-</sup> (9)		.05* (9)	.16* (44)	.11* (27)	.15* (93)	38.59*	(UG-A (reversed), TG-A, SDG) > others: B = -.03; (TG-A, SDG) > UG-A (reversed): B = .06*
Morality									
Guilt proneness	—	—		—	.16* (3)	.22* (19)	.13 (3)	—	—

Table 8 (continued)

Trait	Games						Test of predicted moderation by game type
	DG	UG proposer	UG responder	TG trustor	TG trustee	SDG	
Integrity	.02 (13)	-.02 (3)	-.10 (3)	.12* (6)	.20* (10)	.14* (9)	3.55 (UG-A, TG-A) < others; $B = .03$
Identity- and society-related attitudes							
Collectivism	.11 (3)	—	—	—	—	.06* (32)	—
Individualism	—	—	—	—	—	-.08* (27)	—
Power <sup>a</sup>	-.16* (9)	-.16* (5)	-.08*+ (8)	—	—	-.02+ (7)	UG-B > others: $B = .05^*$ ; UG-A > (DG, SDG): $B = .02$
Right-wing authoritarianism	—	—	—	-.19* (5)	—	-.09 (13)	—
Social dominance orientation	-.18* (5)	-.13* (5)	-.03+ (4)	-.12* (3)	—	-.12* (10)	UG-B > others: $B = .08^*$ ; (UG-A, TG-A) > (DG, SDG): $B = .01$
Self-regulation							
Impulsivity	-.04 (9)	.01 (6)	-.05 (8)	-.00 (4)	-.06 (6)	-.04 (11)	(UG-A, UG-B) > others: $B = -.001$
Self-control	.02 (21)	-.02 (5)	.05+ (4)	.04 (9)	.00 (8)	.02 (24)	(UG-A, UG-B) > others: $B = .02$
Self-presentation	.04 (8)	-.14 (3)	.09 (3)	.05 (3)	.02 (3)	.04 (12)	(UG-A, UG-B) > others: $B = .01$
Risk attitudes							
Risk-taking <sup>a</sup>	.02 (3)	—	—	.11* (11)	.04 (4)	.11* (26)	(TG-A, SDG) > others: $B = .08^*$

Note. Meta-analytic correlations are only displayed in the table and considered in the moderation tests if  $k \geq 3$  for a given trait-game combination. Moderation tests of game type testing the predicted correlational pattern (Table 5) are only performed if (a) relations of a trait to behavior were predicted to differ across the games (otherwise “N/A”) and (b) correlations of a trait with behavior were available for at least four of the six games (otherwise “—”).  $B$  = regression coefficient for effect of game type (dummy or contrast variables; see main text for details) in multilevel regression model; DG = Dictator Game; SDG = social dilemma games; TG = Trust Game; TG-A = Trust Game as trustor; TG-B = Trust Game as trustee; UG = Ultimatum Game; UG-A = Ultimatum Game as proposer; UG-B = Ultimatum Game as responder.

<sup>a</sup>  $Q(df = 3)$  given that there was insufficient data for some games (as indicated by “—”).

\*  $p < .05$  (one-tailed for regression coefficients  $B$  of predicted moderation by game type).  
+ correlation is significantly larger ( $p < .05$ ) as compared to the Dictator Game (baseline); — correlation is significantly smaller ( $p < .05$ ) as compared to the Dictator Game (baseline). Results are based on meta-analytic regression analyses testing the overall effect of game type on trait-behavior relations (see  $Q$  statistic for overall effect of game type; see Table S12 in the online supplemental materials for details).

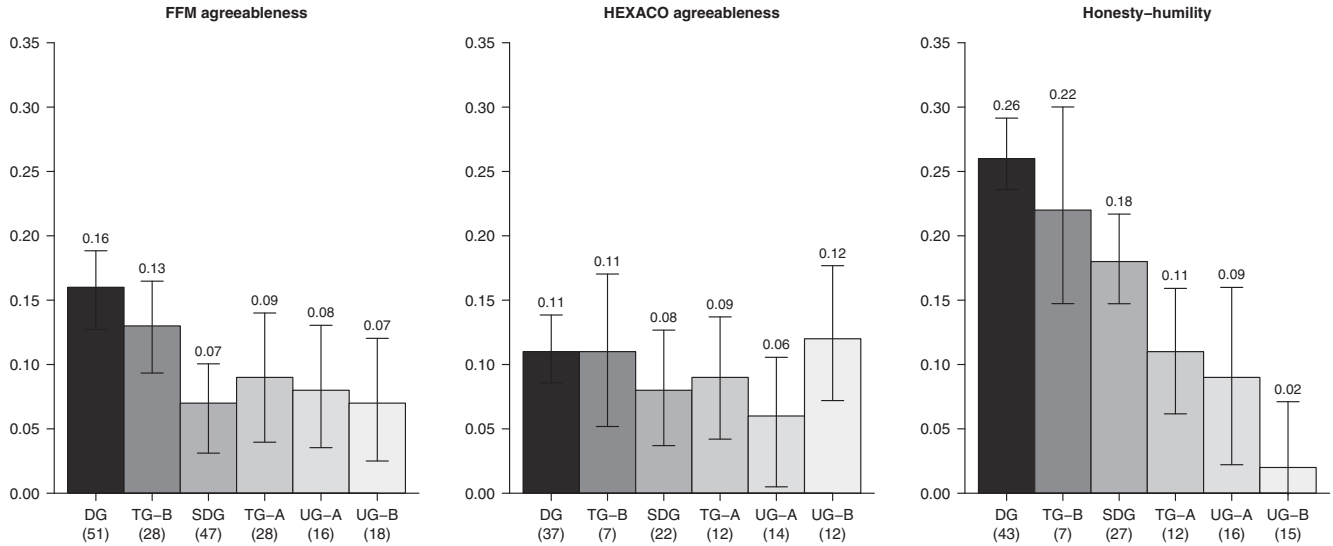


Figure 5. Meta-analytic correlations ( $\hat{\rho}$ ) of selected broad traits from the Five Factor Model (FFM) and the HEXACO model with prosocial behavior in different games. Error bars indicate 95% CIs. Number of independent samples ( $k$ ) are provided in parentheses. DG = Dictator Game; SDG = social dilemma games; TG-A = Trust Game as trustor; TG-B = Trust Game as trustee; UG-A = Ultimatum Game as proposer; UG-B = Ultimatum Game as responder.

differences in the Bayesian Information Criterion ( $\Delta\text{BIC}$ ), which we interpreted following Raftery (1995).<sup>14</sup> As follows from our hypothesis,  $R^2$  should be higher for the two HEXACO dimensions as compared with FFM agreeableness, and this should likewise be mirrored in the model comparisons. For honesty-humility, the type of game indeed explained a large portion of variance in effects ( $R^2 = 71.4\%$ ). Correspondingly, model comparisons provided very strong support in favor of the alternative model,  $\chi^2(5) = 116.59$ ,  $p < .001$ ,  $\Delta\text{BIC} = 92.65$ . For HEXACO agreeableness, however, there was no support for the predicted differences in effect sizes: Game type did not explain any variance in correlations ( $R^2 = 0.0\%$ ) and the model comparison provided very strong support in favor of the null model,  $\chi^2(5) = 5.21$ ,  $p = .391$ ,  $\Delta\text{BIC} = -18.01$ . Finally, for FFM agreeableness, we found positive support for the explanatory power of game type ( $R^2 = 31.9\%$ ),  $\chi^2(5) = 30.45$ ,  $p < .001$ ,  $\Delta\text{BIC} = 4.27$ . Overall, results thus supported our predictions for honesty-humility and FFM agreeableness, but not for HEXACO agreeableness, even though correlations followed the predicted rank order for all three traits (see Figure 5).

**Narrow traits.** Within the category of active prosociality, most traits followed the predicted pattern of correlations across games. For social value orientation, for example, the (descriptively) strongest correlations emerged in games providing a clear possibility to exploit (i.e., the Dictator Game, Trust Game as trustee, and social dilemmas;  $.28 \leq \hat{\rho} \leq .40$ ), followed by games providing a somewhat lower possibility to exploit (i.e., Ultimatum Game as proposer and Trust Game as trustor;  $\hat{\rho} = .27$  and  $\hat{\rho} = .24$ ), and it showed an essentially zero relation in the Ultimatum Game as responder ( $\hat{\rho} = -.03$ ) which provides no possibility to exploit. Correspondingly, both game type contrasts turned out significant in the moderation analysis,  $B = .19$ ,  $p < .001$  and  $B = .04$ ,  $p < .001$ . For inequality aversion, in turn, correlations were largest in those games that provide an opportunity to exploit and in which one can minimize

the difference between own and others' outcomes, yielding = .22 in the Dictator Game,  $\hat{\rho} = .13$  in the Ultimatum Game as proposer, and  $\hat{\rho} = .12$  in the Trust Game as trustee (as well as in social dilemmas). Correspondingly, moderation tests revealed that correlations were stronger in these games than in the others,  $B = .08$ ,  $p < .001$ , and they were also stronger in the Dictator Game and Trust Game as trustee (with a clear possibility to exploit) than in the Ultimatum Game as proposer,  $B = .03$ ,  $p = .018$ .

For traits within the category of reactive prosociality (i.e., forgiveness and positive reciprocity), by contrast, results did not support our predictions. Specifically, much like HEXACO agreeableness, we hypothesized these traits to yield the strongest (positive) effects in situations providing a possibility for reciprocity, and thus in the Ultimatum Game as responder and (albeit less so) in the Trust Game as trustee. However, moderation analyses showed no significant effects whatsoever (see Table 8).

The antisocial traits all displayed negative (or null) relations with prosocial behavior within games. Supporting the predicted correlational pattern, narcissism, for instance, showed small to medium-sized negative relations in all games (for which sufficient data were available;  $-.16 \leq \hat{\rho} \leq -.07$ ) except the Ultimatum Game as responder ( $\hat{\rho} = .00$ ). Although the Ultimatum Game as responder provides an opportunity to reciprocate, the two subaffordances linked to narcissism (i.e., max(own) and max(own -

<sup>14</sup> For the model comparisons, we relied on maximum likelihood estimation (ML) – rather than restricted maximum likelihood (REML), which we used for all other estimations—because estimates from REML are not readily comparable across models specifying different fixed effects. According to Raftery (1995, Table 6),  $\Delta\text{BIC} > 10$  provides very strong evidence for the alternative (less restrictive) model,  $6 < \Delta\text{BIC} \leq 10$  provides strong evidence,  $2 < \Delta\text{BIC} \leq 6$  provides positive evidence, and  $\Delta\text{BIC} \leq 2$  provides weak evidence.

other)) afford opposing (i.e., prosocial vs. selfish) behaviors in this game, which is why we did not expect narcissism to relate to behavior. For Machiavellianism, in turn—a trait that should be expressed when there is a possibility to exploit by increasing one's own outcome in absolute (i.e.,  $\max(\text{own})$ ) and/or relative (i.e.,  $\max(\text{own} - \text{other})$ ) terms—we found the weakest, close-to-zero relation in the Ultimatum Game as responder ( $\hat{\rho} = -.02$ ) in which there is no possibility to exploit,  $B = .09$ ,  $p < .001$ . However, in contrast to our predictions, the correlations with behavior in the Ultimatum Game as proposer ( $\hat{\rho} = -.04$ ) and the Trust Game as trustor ( $\hat{\rho} = -.16$ )—in which exploitation is possible to a relatively weaker degree—were not significantly smaller in size (i.e., less negative) than the correlations with behavior in the Dictator Game, the Trust Game as trustee, and social dilemmas ( $-.20 \leq \hat{\rho} \leq -.16$ ),  $B = .02$ ,  $p = .074$ . Finally, envy—a trait that should be expressed in the presence of exploitation and reciprocity and when one can increase the difference between own and others' outcomes (i.e.,  $\max(\text{own} - \text{other})$ )—showed negative relations of similar size across all games ( $-.15 \leq \hat{\rho} \leq -.08$ ), although we expected its link to be somewhat weaker in the Ultimatum Game as proposer and the Trust Game as trustor (given the weaker possibility for exploitation),  $B = .01$ ,  $p = .332$ .

We also tested whether traits linked to beliefs about others' prosociality (e.g., trust propensity, risk-taking) show stronger relations to prosocial behavior in games involving dependence under uncertainty, that is, in the Ultimatum Game as proposer, the Trust Game as trustor, and social dilemmas. For trust propensity, for instance, results indeed showed the descriptively strongest (positive) relations in the Trust Game as trustor ( $\hat{\rho} = .16$ ) and in social dilemmas ( $\hat{\rho} = .15$ ) in which positive beliefs about others' prosociality should drive prosocial behavior. However, there was no evidence for a (negative) link with proposer behavior in the Ultimatum Game ( $\hat{\rho} = .04$ ) in which positive beliefs about others' prosociality should drive selfish behavior. Also contrary to predictions, trust propensity had a positive relation with behavior in the Dictator Game ( $\hat{\rho} = .13$ ) and the Trust Game as trustee ( $\hat{\rho} = .11$ ), neither of which involves dependence under uncertainty because players have full power over the final outcome distribution. Correspondingly, moderation tests provided no support for a stronger effect of trust propensity in games involving dependence under uncertainty,  $B = -.03$ ,  $p = .99$ , although there was support for the expected difference in effects when comparing the Trust Game as trustee and social dilemmas with the Ultimatum Game as proposer,  $B = .06$ ,  $p < .001$ . For risk-taking, in turn, the pattern of correlations descriptively matched the predictions, showing the highest relations in the Trust Game as trustee and social dilemmas (both  $\hat{\rho} = .11$ ), but no relations in other games for which  $k \geq 3$  (Table 8), yielding the expected moderation by game type,  $B = .08$ ,  $p = .028$ .

### Additional Moderator Analyses

**Conflict of interests.** We tested whether conflict of interests in the Prisoner's Dilemma and the Public Goods Game moderates the relation between personality and prosocial behavior. This provides another test of our prediction that traits related to unconditional concern for others should be more or less relevant for prosocial behavior depending on how strongly a situation affords exploitation. In line with this reasoning, we focus on traits related

to unconditional concern for others (and to the social motives of altruism, social welfare, competitiveness, individualism, and/or spite, all of which may guide behavior in social dilemmas). We applied multivariate regression analyses predicting the disattenuated correlations observed for a given trait or group of traits (i.e., traits positively or negatively linked to unconditional concern for others) by the  $K$  index. In addition, we included group size (continuous), repetition of interaction (dummy-coded; 0 = one-shot, 1 = repeated), and incentives (dummy-coded; 0 = hypothetical, 1 = incentivized) as predictors in the regression model, all of which are design features that could be confounded with  $K$  (for intercorrelations of the design features, see Table 9). Moreover, when considering groups of traits, we included dummy variables coding the types of traits as predictors. In the following report of results, however, we will focus on the effect of  $K$ , which we tested one-tailed for traits positively linked to unconditional concern for others given our directed hypotheses.

First, we tested the moderation by  $K$  across all traits positively linked to unconditional concern for others (e.g., altruism, FFM agreeableness, social value orientation) and all traits negatively linked to this psychological process (e.g., envy, Machiavellianism, narcissism). As expected, for traits positively linked to unconditional concern for others, correlations were significantly stronger (i.e., more positive) when  $K$  was relatively small,  $B = -.21$ ,  $p < .001$  ( $k = 211$ ), that is, in high-conflict situations. Conversely, for traits negatively linked to unconditional concern for others, correlations were significantly stronger (i.e., more negative) when  $K$  was relatively large,  $B = -.36$ ,  $p = .021$  ( $k = 123$ ), that is, in low conflict situations. This pattern also occurred on the level of single traits. Figure 6 summarizes the results of the moderator analyses for those eight traits for which sufficient data were available, together with their zero-order correlations with prosocial behavior in high versus low conflict situations (i.e.,  $K < 0.4$  vs.  $K \geq 0.4$ , corresponding to the mean of  $K$ ). Table S13 in the online supplemental materials provides more detailed statistics of the moderation tests. As is apparent, moderation by  $K$  was significant for five of these traits, three of which are positively linked to unconditional concern for others (i.e., FFM agreeableness, honesty-humility, social value orientation) and two of which are negatively linked to unconditional concern for others (i.e., competitiveness, Machiavellianism). Moreover, to rule out that correlations are not generally affected by conflict of interests—meaning

Table 9  
*Intercorrelations of Design Features of the Games Included in the Multivariate Moderator Analyses*

Variable	Correlations			
	$K$ index	Repeated interaction	Feedback	Incentives
$K$ index				
Repeated interaction	-.13*			
Feedback	-.01	.62*		
Incentives	.05	.04	.16*	
Group size	-.03	-.05	.05	-.11

Note. Number of independent samples varied between  $174 \leq k \leq 322$ . Repeated interaction, feedback, and incentives are all dummy variables. \*  $p < .05$ .



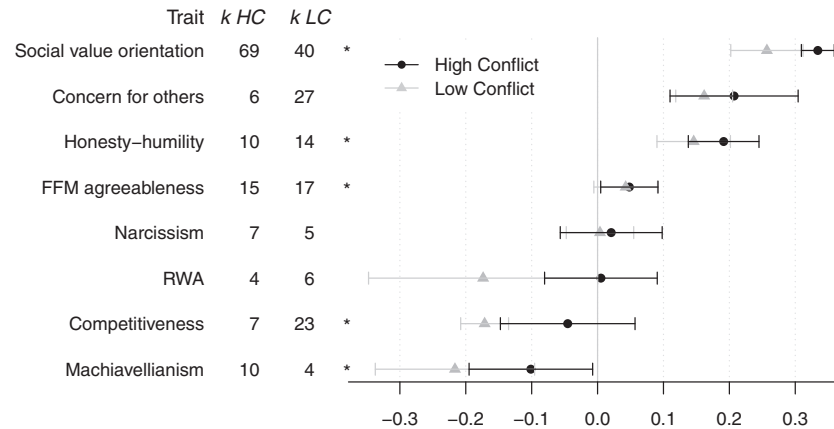


Figure 6. Meta-analytic correlations ( $\hat{r}$ ) between selected traits and prosocial behavior in the Prisoner's Dilemma and Public Goods Game, separated for games involving high conflict of interests (HC;  $K < 0.4$ ) and low conflict of interests (LC;  $K \geq 0.4$ ). Error bars indicate 95% CIs. \*  $p < .05$  (indicating a significant moderation by conflict of interests; one-tailed for traits positively linked to unconditional concern for others, i.e., social value orientation, concern for others, honesty-humility, and FFM agreeableness);  $k$  = number of independent samples underlying an effect size; FFM = Five Factor Model; RWA = right-wing authoritarianism.

that the effect of  $K$  may not be restricted to traits linked to unconditional concern for others—we also tested the moderation by  $K$  for other traits. Importantly, for none of these, there was evidence for a moderating effect of conflict of interests on their relation to prosocial behavior (see Table S13 in the online supplemental materials for details).

**Repetition of interaction.** We investigated whether repetition of interaction moderates the relation between personality and prosocial behavior. This provides another test of our prediction that traits related to conditional concern for others and/or to self-regulation should be more or less relevant for prosocial behavior depending on how strongly a situation involves the affordances of reciprocity or temporal conflict, respectively. Thus, we focus on traits linked to conditional concern for others (and to the social motives of altruism, social welfare, competitiveness, individualism, and/or spite, all of which may guide behavior in social dilemmas) and traits linked to self-regulation for which we hypothesized stronger effects in repeated games. Using multivariate regression analyses, we predicted the disattenuated correlations observed for a given trait or group of traits by repeated interaction (dummy-coded; 0 = one-shot interaction, 1 = repeated interaction and feedback), controlling for group size (continuous) and incentives (dummy-coded; 0 = hypothetical, 1 = incentivized).<sup>15</sup> Moreover, when considering groups of traits, we included dummy variables coding the specific types of traits as predictors. We tested the moderation effects of repeated interaction one-tailed given our directed hypotheses.

First, we tested the moderation by repetition of interaction across all traits linked to conditional concern for others (e.g., HEXACO agreeableness, forgiveness) and all traits linked to self-regulation (e.g., conscientiousness, impulsivity, self-control), reversing correlations for traits with negative links to these psychological processes. For neither group of traits, there was evidence for a moderation by repetition of interaction,  $B = .02$ ,  $p = .219$  (for traits linked to conditional concern for others;  $k = 220$ ) and  $B = -.00$ ,  $p > .999$  (for traits linked to self-regulation;  $k = 151$ ).

These results were also reflected on the level of specific traits. As is apparent in Figure 7, for only one trait for which sufficient data for the moderation tests were available (i.e., HEXACO agreeableness), there was a significant moderating effect of repeated interaction (see Table S14 in the online supplemental materials for details). That is, as expected, HEXACO agreeableness yielded a stronger relation with prosocial behavior in repeated as compared to one-shot games,  $B = .11$ ,  $p = .035$ . Of note, however, for most traits the number of effects and samples sizes were relatively small for repeated interaction (see Figure 7).

**Incentives.** We tested the influence of behavior-contingent incentives on the relation between personality and prosocial behavior. Therefore, we applied multivariate multilevel regression, predicting the disattenuated correlations observed for a given trait by incentives (dummy-coded; 0 = hypothetical, 1 = incentivized), controlling for the type of game (five dummy variables, with the Dictator Game as baseline), group size (continuous), and repetition of interaction (dummy-coded; 0 = one-shot, 1 = repeated). Analyses could be performed for 28 of the 51 traits for which sufficient data were available.

Figure 8 displays the correlations as a function of incentives (see Table S15 in the online supplemental materials for further details). Strikingly, for almost all traits, correlations were virtually identical for hypothetical and incentivized games. Correspondingly, moderation analyses yielded significant effects of incentives for three traits only, namely the Dark Triad traits, showing larger negative correlations in hypothetical games for Machiavellianism ( $B = .14$ ,  $p = .012$ ), narcissism ( $B = .14$ ,  $p = .024$ ), and psychopathy

<sup>15</sup> We did not control for conflict of interests given that we considered all social dilemmas in the analyses, including the Commons Dilemma for which  $K$  is not defined. Repeating the analyses with  $K$  as a predictor (excluding the Commons Dilemma) yielded similar results for most traits. For psychopathy, however, the moderation by repetition now became significant, showing a stronger (more negative) effect in repeated games,  $B = -.28$ ,  $p = .021$ .

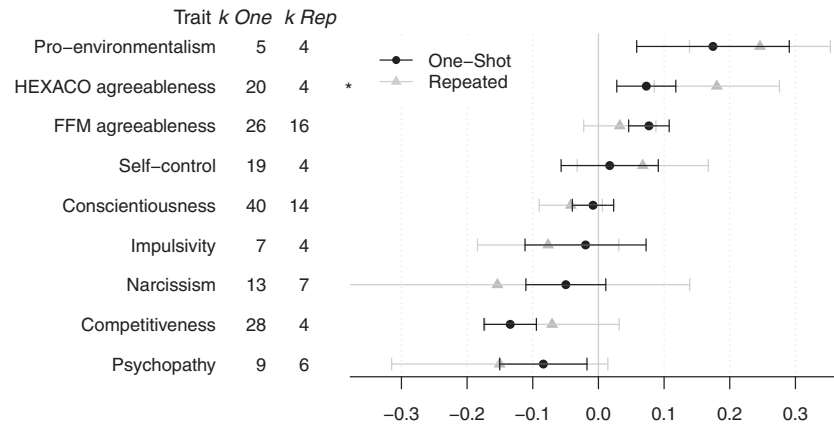


Figure 7. Meta-analytic correlations ( $\hat{r}$ ) between selected traits and prosocial behavior in social dilemma games, separated for one-shot (One) versus repeated (Rep) interaction. Error bars indicate 95% CIs. \*  $p < .05$  (indicating a significant moderation by repetition of interaction; one-tailed);  $k$  = number of independent samples underlying an effect size; FFM = Five Factor Model.

( $B = .12$ ,  $p = .001$ ). By contrast, for other traits that are also highly evaluative, such as altruism, honesty-humility, or social value orientation, there was no indication for a moderation by incentives (all  $p > .10$ ).

**Deception.** We tested the influence of experimental deception on the relation between personality and prosocial behavior. Therefore, we applied multivariate multilevel regression, predicting the disattenuated correlations observed for a given trait by deception (dummy-coded; 0 = no deception, 1 = deception), controlling for type of game (five dummy variables, with the Dictator Game as baseline), group size (continuous), repetition of interaction (dummy-coded; 0 = one-shot, 1 = repeated), and incentives (dummy-coded; 0 = hypothetical, 1 = incentivized).<sup>16</sup> Data for these analyses were sufficient for 36 of the 51 traits.

Figure 9 displays the correlations as a function of experimental deception (see Table S16 in the online supplemental materials for further details). As is apparent, results were mixed overall: For some traits, absolute correlations were (descriptively) smaller when a study involved deception whereas for others traits absolute correlations were (descriptively) larger. For even other traits, there was virtually no difference in correlations. Moderation tests yielded significant effects of deception for three traits, two of which showed larger effects under deception, namely affiliation,  $B = .10$ ,  $p = .011$ , and trust propensity,  $B = .07$ ,  $p = .044$ , and one of which showed a smaller effect under deception, namely altruism,  $B = -.09$ ,  $p = .006$ .

## Discussion

Although the study of individual differences in prosocial behavior has received great attention across scientific disciplines, there is a lack of empirical and theoretical integration about how (well) various personality traits can account for this interindividual variation. The current meta-analysis provides the first comprehensive summary of associations between 8 broad and 43 narrow personality traits with prosocial behavior in diverse interdependent situations as modeled in six of the most commonly studied economic games. The meta-analysis thereby offers a unique testbed to ad-

vance theory of individual differences in prosocial behavior. Specifically, we developed and tested a theoretical framework about (a) which traits relate (most strongly) to prosocial behavior across interdependent situations, and whether this pattern can be accounted for by broad affordances provided in these situations, and (b) how personality relates to prosocial behavior within interdependent situations, taking into account the (degree to which) these broad affordances (and more specific subaffordances) are provided. Moreover, the meta-analysis has theoretical implications for conceptualizations of trait prosociality, including a comparison of broad versus narrow traits and of the two most prominent models of basic personality structure (i.e., FFM vs. HEXACO). Further, we examined how structural differences within certain games (i.e., degree of conflict of interests, repetition of interaction) and variation of experimental methods (i.e., behavior-contingent incentives, deception) moderate the relation between personality and prosocial behavior.

## A Theoretical Framework of Individual Differences in Prosocial Behavior

We proposed an affordance-based account of individual differences in prosocial behavior, suggesting that the relation of personality to prosocial behavior can be explained by activation of certain traits in the presence of certain affordances. Specifically, based on integration of prior literature, we identified four broad situational affordances that may allow certain traits to become expressed in behavior across various interdependent situations: (a) a possibility for *exploitation*, allowing the expression of unconditional concern for others' welfare, (b) a possibility for *reciprocity*, allowing the expression of conditional concern for others' welfare, (c) a *temporal conflict* between short-term and long-term interests, allowing

<sup>16</sup> Although one might assume a negative correlation between the use of experimental deception and behavior-contingent incentives—given that psychologists seem to more commonly use deception in non-incentivized paradigms, whereas economists by default refrain from deception but use incentives (Hertwig & Ortmann, 2001)—the two variables were unrelated in the current analysis,  $r = .02$ ,  $p = .613$  ( $k = 639$ ).

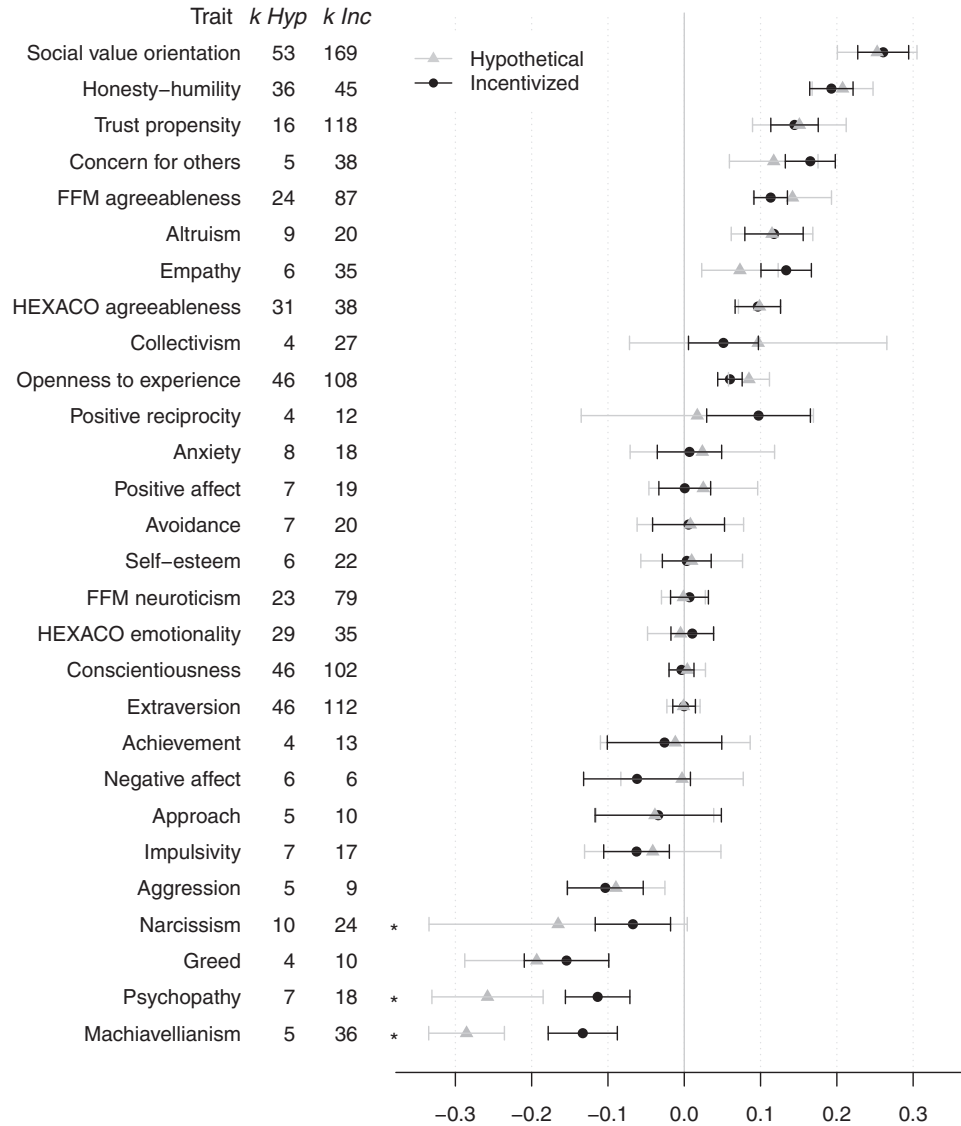


Figure 8. Meta-analytic correlations ( $\hat{r}$ ) between selected traits and prosocial behavior across all games, separated for games involving hypothetical (Hyp) and real incentives (Inc). Error bars indicate 95% CIs. \*  $p < .05$  (indicating a significant moderation by incentives);  $k$  = number of independent samples underlying an effect size; FFM = Five Factor Model.

the expression of self-regulation of immediate impulse gratification, and (d) *dependence under uncertainty*, allowing the expression of beliefs about others' prosociality. Moreover, we considered six additional subaffordances that may be provided in the presence of the exploitation and reciprocity affordances and that may allow basic social motives (e.g., altruism, fairness, individualism) to ultimately guide behavior.

To derive predictions about which traits should relate to prosocial behavior across and within situations, we first analyzed the structure of the games referring to Game Theory (von Neumann & Morgenstern, 1944) and Interdependence Theory (Kelley & Thibaut, 1978) to determine the (sub)affordances each game involves. Second, we analyzed the traits based on their conceptualizations and operationalizations to determine their links to the related

psychological processes and social motives, that is, *when* the traits should be activated to become expressed in behavior. Integrating these two perspectives provided specific hypotheses about which traits should relate to prosocial behavior in which game, and we tested these hypotheses in our meta-analysis.

**Four broad affordances for prosocial behavior.** At the broadest level, our framework predicts that traits that are conceptually linked to any of the four broad affordances proposed should relate to prosocial behavior across a variety of interdependent situations providing these affordances, whereas traits that are not linked to any of the affordances should essentially yield zero relations. Supporting this idea, the meta-analysis showed that traits linked to any of the four broad affordances mostly showed stronger relations to prosocial behavior across the games than traits not

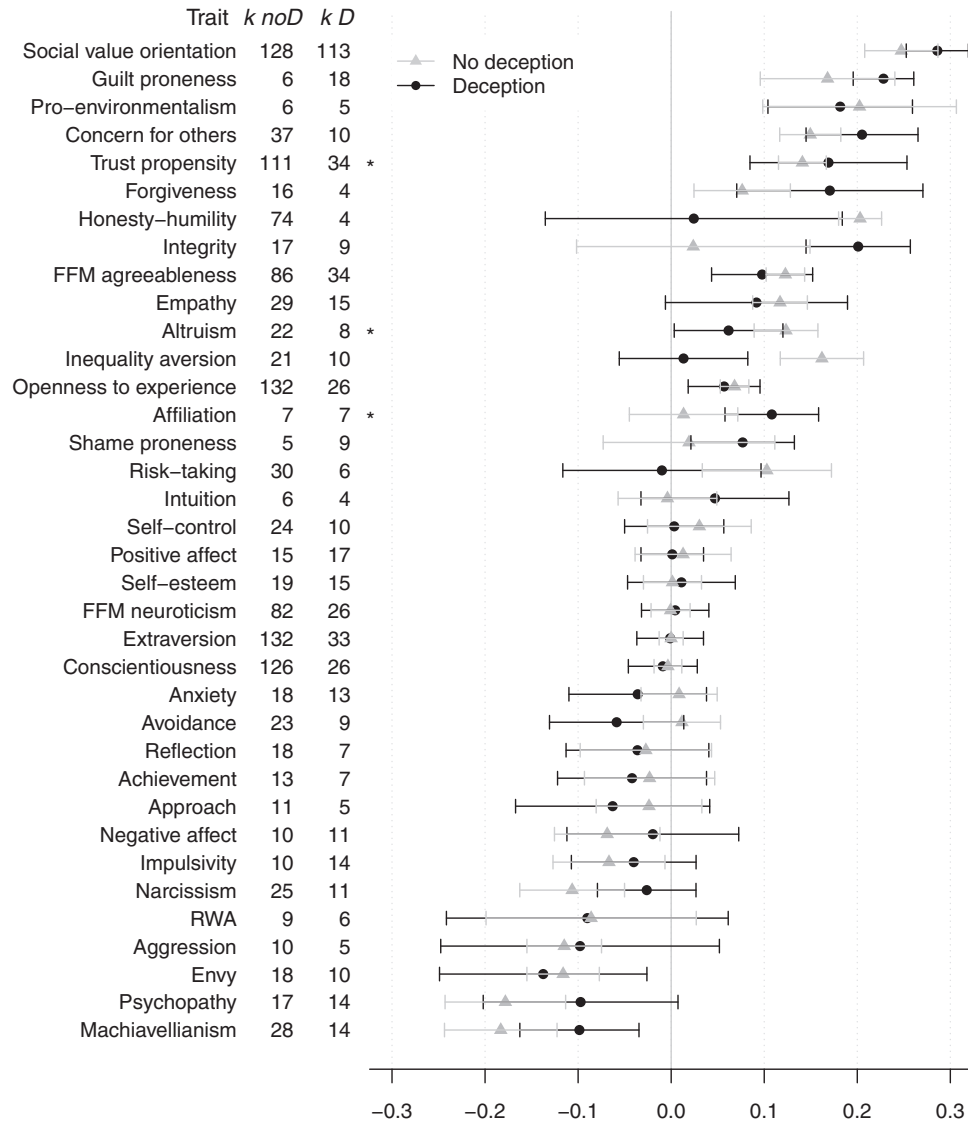


Figure 9. Meta-analytic correlations ( $\hat{\rho}$ ) between selected traits and prosocial behavior across all games, separated for studies involving no deception (noD) versus deception (D). Error bars indicate 95% CIs. \*  $p < .05$  (indicating a significant moderation by deception);  $k$  = number of independent samples underlying an effect size; FFM = Five Factor Model; RWA = right-wing authoritarianism.

linked to any of the affordances (see Figure 4). That is, whereas 81.8% of the traits that we predicted to be activated by at least one of the affordances showed significant correlations with prosocial behavior, this was the case for only 16.7% of traits that we did not predict to be activated by any of the affordances. The strongest correlations were apparent for traits linked to unconditional concern for others which may be expressed when one can exploit others: 9 of the 10 traits yielding the largest absolute correlations across games were linked to unconditional concern for others, and four of these uniquely so. Moderate correlations were, in turn, apparent for traits linked to conditional concern for others and to beliefs about others' prosociality, which may be expressed when reciprocity is possible or when there is dependence under uncertainty, respectively. Finally, correlations close to zero occurred for

traits linked to self-regulation, which may be expressed when there is a temporal conflict, meaning that short- and long-term interests are at odds.

Overall, these results demonstrate that situational affordances offer a useful approach to understand the relation between personality and prosocial behavior across various interdependent situations. Most consistent evidence in this regard emerged for the affordance of exploitation, whereas there was no evidence that a temporal conflict between short- and long-term interests represents a key affordance that can account for individual variation in prosocial behavior across interdependent situations. However, it should be noted that the games—and corresponding affordances—were not equally represented in our data. For example, the Dictator Game—which exclusively provides a possibility for exploita-

tion—was the second most applied game in the studies included in the meta-analysis. Thus, one may argue that the advantage of exploitation over the other affordances may be attributable to the fact that games involving this affordance (alone) were better represented in our analysis. To rule out this alternative explanation, we compared the pattern of correlations observed across all games with the pattern of correlations observed in social dilemmas in which all broad affordances are provided, at least when the game involves repeated interaction. Importantly, the rank order of correlations observed across all games was highly similar to the rank order of correlations observed in social dilemmas, Spearman's  $\rho = .96, p < .001$ . This clearly shows that the advantage of exploitation to account for the associations between personality and prosocial behavior across situations can be attributed to the unique importance of this affordance for the expression of personality in prosocial behavior.

**Affordances within situations.** Our framework further predicts that structural differences between interdependent situations—and corresponding variation in the (sub)affordances provided—can account for differences in the expression of certain traits in behavior across and within situations. That is, we derived and tested specific hypotheses about which traits should relate to prosocial behavior in which games (Table 5) and contingent on which structural features (i.e., conflict of interests, repetition of interaction). Support for the predicted pattern of correlations between games was found for several traits, namely altruism, conscientiousness, honesty-humility, inequality aversion, narcissism, risk-taking, and social value orientation; partial support was further found for Machiavellianism, power, social dominance orientation, and trust propensity (Table 8). For other traits, however, results provided no support for our predictions, either because differences in correlations between games were smaller than expected or because the observed pattern of correlations differed from predictions.

More detailed, most of the traits for which we found support for our predictions were conceptually linked to the exploitation affordance. That is, several traits (exclusively) related to unconditional concern for others (e.g., honesty-humility, social value orientation) showed significant positive relations with prosocial behavior whenever exploitation was possible in a situation, but no relation when it was not (i.e., in the Ultimatum Game as responder). This once again corroborates the unique importance of the exploitation affordance for the expression of personality in prosocial behavior, as also implied by our analyses of behavior across games. Moreover, results supported the hypothesized moderation by conflict of interests—reflecting differences in the degree to which exploitation is tempting—for several traits linked to unconditional concern for others: Traits positively linked to unconditional concern for others (e.g., social value orientation) yielded stronger (more positive) correlations with prosocial behavior when conflict of interests was high. By contrast, traits negatively linked to unconditional concern for others (e.g., Machiavellianism) yielded stronger (more negative) correlations with prosocial behavior when conflict of interests was low (see Figure 6). Overall, individuals with high unconditional concern for others were thus more likely to behave in a prosocial manner than those with low unconditional concern for others, even—and specifically—when the costs of prosocial behavior were high and the temptation to defect large. Conversely,

individuals with low unconditional concern for others were more likely to behave in a selfish manner than those with high unconditional concern for others, even—and specifically—when the costs of prosocial behavior were low and the temptation to defect small. This implies that individuals with high unconditional concern for others may want to create peace in hostile environments, whereas individuals with low unconditional concern for others may want to create discord in peaceful environments. Ultimately, these findings are well in line with recent notions that dark personality traits do not simply reflect the negative pole of bright personality traits, even though dark and bright traits are strongly related (e.g.,  $r = .80$  between honesty-humility and the dark core of personality; Moshagen et al., 2018).

For traits conceptually linked to the reciprocity affordance, in turn, game-specific analyses provided somewhat weaker support for the predicted pattern of trait-behavior relations. For example, forgiveness and positive reciprocity—both traits exclusively related to conditional concern for others—showed, unlike expected, similar correlations across all games. In fact, forgiveness showed its descriptively strongest relation to prosocial behavior in the Dictator Game, which does not provide an opportunity to reciprocate. Likewise, the hypothesized moderation by repetition of interaction was only supported for one trait linked to conditional concern for others, namely HEXACO agreeableness, which showed a stronger relation in repeated games as predicted. This finding is indeed in line with the idea that HEXACO agreeableness should be particularly predictive of forgiving (i.e., nonretaliatory) behavior in ongoing relationships (Ashton & Lee, 2007). In contrast, all other traits related to conditional concern for others yielded comparable relations in one-shot and repeated games (see Figure 7).

Similarly, traits related to beliefs about others' prosociality and the affordance of dependence under uncertainty provided mixed evidence in support of our predictions. Risk-taking, for instance, showed—as expected—positive relations with prosocial behavior whenever dependence under uncertainty was present in a situation (i.e., in the Trust Game as trustor and social dilemmas), but no relation when it was not. Trust propensity, however, yielded—besides the expected positive relations with behavior in the Trust Game as trustor and in social dilemmas—positive relations of about the same size in the Dictator Game and the Trust Game as trustee, both of which should not afford beliefs about others' prosociality to influence behavior.

Finally, for traits conceptually linked to the temporal conflict affordance, results once again failed to provide support for the importance of this affordance for the expression of personality in prosocial behavior. Specifically, correlations of traits (exclusively) linked to self-regulation (e.g., impulsivity, self-control) with prosocial behavior generally hovered around zero, and for most traits there was no difference in effect sizes depending on whether a situation involved temporal conflict or not. Only for conscientiousness, correlations followed the predicted pattern, although again yielding close-to-zero effects. Correspondingly, for none of the traits linked to self-regulation, we found the predicted moderation by repetition of interaction. Interestingly, however, recent evidence on the (low) replicability of the *spontaneous cooperation effect* (Rand, Greene, & Nowak, 2012; Rand, Peysakhovich, et al., 2014)—which proposes that humans are intuitive cooperators who only become more selfish through deliberation—has likewise



questioned that processes related to self-regulation (i.e., “thinking it through”) may influence prosocial behavior (Bouwmeester et al., 2017), which is why we also considered our analyses in this regard exploratory (see Footnote 9 and preregistration). Our finding that traits linked to self-regulation showed no consistent relation with prosocial behavior—both across situations and between situations, irrespective of whether temporal conflict was present or not—contributes to this recent research. However, it is plausible that self-regulation capacities will only be expressed in behavior by selfish individuals who have to suppress their immediate impulse to defect (Yamagishi et al., 2017). Prosocial individuals, by contrast, may not need to self-regulate their behavior because they should generally be willing to behave in a prosocial manner. Thus, traits linked to self-regulation might only take effect in interaction with individuals’ level of prosociality (e.g., their social value orientation), which may have simply been obscured in our analysis. Future research is needed to investigate this issue.

Importantly, some of the (game-specific) findings for traits related to unconditional and/or conditional concern for others can help understand *how*—that is, through which social motives—their relations to prosocial behavior may come about in the presence of specific subaffordances. For example, inequality aversion—a trait exclusively linked to the motive of fairness—showed stronger (positive) relations with prosocial behavior in games in which equality in outcomes can be achieved than in games in which it cannot. This implies that the motivation of inequality averse individuals to minimize differences between own and others’ outcomes underlies their willingness to behave in a prosocial manner. Similarly, narcissism—a trait linked to the motives of competitiveness and individualism—only showed negative relations with prosocial behavior in games in which both these motives drive selfish behavior, but not in the Ultimatum Game as responder in which these motives drive opposing behaviors. This suggests that the (negative) association between narcissism and prosocial behavior is attributable to the motivation of narcissistic individuals to (unconditionally and conditionally) increase own outcomes, both in absolute terms and relative to others.

However, it should be noted that for most traits included in our meta-analysis (that were related to unconditional and/or conditional concern for others), it was impossible to specifically test whether their links to the additional subaffordances (and corresponding social motives) can indeed account for their association with prosocial behavior. This is because several traits had conceptual links to multiple subaffordances and because (some of) the games included in the meta-analysis involve the same subaffordances (i.e., all games involve the subaffordances of max(other), min(own—other), and min(other), affording the motives of altruism, competitiveness, and spite, respectively). Thus, the consideration of the subaffordances had no incremental predictive value beyond the consideration of the four broad affordances for most traits (i.e., for 21 of the 27 relevant traits the predictions remained the same when neglecting the subaffordances). Future research is therefore needed to further and more specifically test the role of the subaffordances—and corresponding social motives—for the expression of personality in prosocial behavior as proposed in our framework. To this end, studies may exploit the well-defined structure of games to isolate certain social motives by tailored manipulations of the interdependent situation at hand (for em-

pirical examples, see Haesevoets et al., 2018; Hilbig et al., 2018; Zhao, Ferguson, & Smillie, 2016, 2017a). Another approach is to directly assess individuals’ motives for behavior (e.g., Colman & Stirk, 1998; Insko et al., 2013; Pfattheicher, Landhäußer, & Keller, 2014) and to test whether these self-reported motives mediate the link between traits and prosocial behavior. In this regard, future studies may also consider other psychological factors that can serve as mediators, such as cognitions (e.g., norms, justifications; Dunning, Anderson, Schlösser, Ehlebracht, & Fetchenhauer, 2014; Mellers, Hasel-huhn, Tetlock, Silva, & Isen, 2010) and emotions (e.g., anger, regret; Martinez & Zeelenberg, 2015; van der Schalk, Kuppens, Bruder, & Manstead, 2015).

By and large, our analysis of trait-behavior relations between and within games provided further support for our theoretical framework, particularly for the usefulness of considering situation-specific affordances to understand individual differences in prosocial behavior in certain situations. Most consistent evidence again emerged for traits linked to the exploitation affordance. Together with the findings for prosocial behavior across games, this implies that individuals can readily perceive situational cues to exploitation (e.g., high conflict of interests, high power) and correspondingly construe the situations they encounter. Indeed, research suggests that individuals can differentiate situations along the dimensions of conflict of interests and power (Gerpott et al., 2018) and that high levels of both of these dimensions have strong (negative) effects on prosocial behavior (e.g., Camerer, 2003; Sally, 1995; Suleiman, 1996; Vlaev & Chater, 2006). Future research should build on these findings to more directly test whether the high salience of exploitation-related cues in interdependent situations—and in subjective representations thereof—can indeed explain why traits linked to unconditional concern for others are most strongly expressed in these situations.

For other traits, however, the fine-grained differences between interdependent situations with regard to the (sub) affordances involved may not be fully represented in their relations to prosocial behavior. This may have several reasons: First, some games may render certain affordances more or less salient due to specific (structural) features (Betsch, Böhm, & Korn, 2013). For example, evidence suggests that for trustors in the Trust Game, beliefs about others’ trustworthiness as well as risk—both of which emphasize the dependence on others under uncertainty—are particularly salient (Dunning, Fetchenhauer, & Schlösser, 2012), and arguably more so than the possibility for exploitation. Second, the strength of associations of affordances with traits may differ within and across traits. That is, whereas a trait may be strongly activated in the presence of one affordance, it may only be weakly activated in the presence of another affordance—although being linked to both affordances. Finally, due to (conceptual and empirical) overlap between traits, a trait may be indirectly linked to other affordances than implied by its conceptualization and operationalization. For example, it has been shown that prosocial individuals (i.e., those high in unconditional concern for others) expect others to be prosocial as well, thus having more optimistic beliefs about their prosociality (e.g., Pletzer et al., 2018; Thielmann, Hilbig, & Zettler, 2018). The unexpected positive relations between trust propensity and prosocial behavior in the Dictator Game

and the Trust Game as trustee may thus result from the link of trust propensity to traits related to unconditional concern for others. Future research is needed to address these issues.

### Trait Concepts Accounting for Individual Differences in Prosocial Behavior

**Broad versus narrow traits.** According to the bandwidth-fidelity dilemma (Cronbach & Gleser, 1965; Ones & Viswesvaran, 1996), it has been argued that narrow (facet-level) traits may have higher predictive validity for related outcomes than broad (factor-level) traits because they specifically and homogeneously tap into certain constructs (e.g., Paunonen et al., 2003). In terms of our affordance-based framework, this implies that narrow traits may be specifically expressed in those interdependent situations involving the (sub)affordances the traits are conceptually linked to. Stated differently, particularly for narrow traits, there should be evidence for the predicted correlational patterns, and to-be-expected correlations should be larger than for broad traits. Indeed, several narrow traits showed correlations that followed the predicted rank order. Most prominently, social value orientation was positively related to prosocial behavior in all games except the Ultimatum Game as responder ( $\hat{\rho} = -.03$ ; otherwise  $.24 \leq \hat{\rho} \leq .40$ ; Table 8), reflecting that social value orientation should be exclusively expressed when one can exploit others. Moreover, social value orientation yielded the strongest relation (i.e.,  $\hat{\rho} = .26$ ) with prosocial behavior across games among all traits considered. However, we once more emphasize that social value orientation may not only correlate strongly with prosocial behavior due to shared content variance, but also because of shared method variance because of its assessment based on game-like paradigms.

Among the broad traits, the strongest relation with prosocial behavior across games was apparent for honesty-humility ( $\hat{\rho} = .20$ ; Figure 4), which indeed yielded the second largest correlation among all traits for which data was available for all games<sup>17</sup> and which also showed the predicted pattern of correlations between games. That is, much like social value orientation, honesty-humility was the strongest predictor of prosocial behavior among broad traits in all games but the Ultimatum Game as responder ( $\hat{\rho} = .02$ ; otherwise  $.09 \leq \hat{\rho} \leq .26$ ; Table 8). In this game, in turn, HEXACO agreeableness showed the strongest link among all (narrow and broad) traits considered in our analysis ( $\hat{\rho} = .12$ ).

Taken together, the meta-analysis shows that no single trait—neither a narrow trait, nor a broad trait—yielded meaningful relations ( $\hat{\rho} \geq .10$ ) with prosocial behavior in all games. This implies that no single trait can be expressed in prosocial behavior across all types of interdependent situations, even though several of the narrow traits are conceptualized so as to capture prosocial versus selfish tendencies *in general* (e.g., altruism, empathy, envy). As such, the findings demonstrate that the distinction between the affordances of exploitation and reciprocity is useful and should be captured in corresponding trait conceptualizations. Moreover, the meta-analysis shows that narrow traits may not generally outperform broad traits in predicting prosocial behavior. Indeed, narrow and broad traits alike can—and do—account for individual variation in prosocial behavior.

**Basic personality models.** As summarized previously, honesty-humility was the strongest predictor of prosocial behavior among broad traits in all games, except the Ultimatum Game as

responder in which HEXACO agreeableness yielded the strongest association among all traits (Table 8). The findings for honesty-humility were thus fully in line with its conceptualization in the HEXACO model (Ashton & Lee, 2007; De Vries et al., 2016), supporting that honesty-humility specifically captures individual differences in tendencies related to unconditional concern for others (i.e., nonexploitation). For HEXACO agreeableness, results likewise supported that this dimension captures individual differences in tendencies related to conditional concern for others (i.e., nonretaliation) better than any other dimension. However, differences in correlations across games were very weak (albeit following the predicted rank order), calling for additional evidence on the double dissociation of HEXACO agreeableness and honesty-humility (Hilbig, Thielmann, et al., 2016; Hilbig et al., 2013; Zhao & Smillie, 2015). A promising approach in this regard is to take the moderate intercorrelation between these dimensions (Moshagen, Thielmann, Hilbig, & Zettler, 2019) into account, which will likely result in a clearer dissociation (Zettler et al., *in press*). FFM agreeableness, in turn, yielded positive relations with prosocial behavior in all games ( $.07 \leq \hat{\rho} \leq .16$ ), thereby also supporting the conceptualization of this broad trait to capture individual differences in prosocial tendencies *in general* (Denissen & Penke, 2008). However, effects were relatively small in size (for four of the six games  $\hat{\rho} < .10$ ; Table 8) and indeed smaller than the corresponding relations observed for honesty-humility and HEXACO agreeableness.

Overall, the findings imply that the HEXACO model offers a particularly good representation of individual differences in prosociality in terms of broad trait taxonomies, and that this is attributable to the distinction between unconditional and conditional prosocial tendencies as captured in honesty-humility and agreeableness. Indeed, this essentially replicates the results for the narrow traits summarized above. Future research addressing individual differences in prosocial behavior from the perspective of basic personality models will thus profit from relying on the HEXACO model.

### Methodological Implications

**Role of incentives.** A critical design feature of games is whether behavior is real—in the sense that it incurs actual (e.g., monetary) consequences—or hypothetical. However, prior evidence on the role of incentives for the (strength of) relations between personality and prosocial behavior has been inconclusive (e.g., Balliet et al., 2009; Ben-Ner et al., 2008; Lönnqvist et al., 2011). Our meta-analysis showed that, if at all, effects of incentives on trait-behavior links are very small, even for highly evaluative traits. That is, for almost all traits, relations were similar in incentivized and hypothetical games. The only exception emerged for the Dark Triad traits (i.e., narcissism, Machiavellianism, and psychopathy), for which correlations were stronger (more negative) in hypothetical games (see Figure 8). This is in line with prior notions that high levels of these traits are particularly socially undesirable (Moshagen et al., 2018). Individuals may thus report

<sup>17</sup> Only guilt proneness additionally yielded a slightly stronger relation with prosocial behavior than honesty-humility (i.e.,  $\hat{\rho} = .22$ ). However, the correlation for guilt proneness was only based on a subset of games because of insufficient data for other games (Table 8).

lower levels on these traits due to socially desirable responding, and likewise behave socially desirable (prosocial) when behavior is hypothetical, but less so if real incentives are at stake. Overall, however, the findings imply that relations between personality and prosocial behavior can be validly studied in hypothetical games.

**Experimental deception.** Experimental deception is largely accepted in psychology, whereas it is not in economics (Hertwig & Ortmann, 2001). Indeed, deception may have unintended effects on participants' behavior because it may increase suspiciousness (e.g., Gerlach, Teodorescu, & Hertwig, 2019; Ortmann & Hertwig, 2002). Correspondingly, deception may also affect how personality is expressed in prosocial behavior, in the sense that trait-behavior relations may decrease under deception. In contrast to this reasoning, however, we found no evidence for systematic effects of deception on the link between personality and prosocial behavior (see Figure 9). Although these findings may lead one to conclude that deception does not influence the expression of personality in prosocial behavior, we consider such conclusions premature. Specifically, even though deception may not have immediate effects on trait-behavior relations, it may have adverse effects in the long run when participants learn that deception is common practice and adapt their behavior correspondingly.

**Size of correlations.** In general, the correlations between traits and prosocial behavior were maximally medium-sized and most of them were small (J. Cohen, 1988). However, typical (bare-bones) effects in social and personality psychology are actually small to medium-sized (i.e.,  $r \approx .20$ ; Gignac & Szodorai, 2016; Richard, Bond, & Stokes-Zoota, 2003). Moreover, it should be noted that most studies assessed behavior in single-trial one-shot games, and that correlations with behavior should be larger when behavior is assessed repeatedly in such one-shot situations (Fleeson, 2001). Correspondingly, it has been argued that "the relevance of the cumulation of small effects over time is particularly obvious for research on individual differences, such as . . . personality traits" (Funder & Ozer, 2019, p. 161). Even more importantly, the size (and range) of correlations differed across interdependent situations (see Figures S2–S7 in the online supplemental materials), being largest in the Dictator Game (i.e.,  $-.20 \leq \hat{\rho} \leq .32$ ) and the Trust Game as trustee (i.e.,  $-.20 \leq \hat{\rho} \leq .40$ ) and smallest in the Ultimatum Game as proposer (i.e.,  $-.16 \leq \hat{\rho} \leq .24$ ) and responder (i.e.,  $-.10 \leq \hat{\rho} \leq .12$ ). In fact, this pattern mirrors the situational strength of the games (Mischel, 1977; Monson, Hesley, & Chernick, 1982; Snyder & Ickes, 1985): The situations modeled in the Dictator Game and the Trust Game as trustee are comparably weak given that players have full power and do neither need to fear retaliation by the interaction partner, nor take any strategic considerations into account. Thus, behavior may largely be an expression of one's personality. In contrast, the situations modeled in the Ultimatum Game are much stronger: Whereas proposers have to consider that responders might reject a small (i.e., selfish) offer, responders have to consider that rejecting an offer is individually costly. Thus, behavior may be more an expression of strategic considerations than one's personality. We recommend researchers to take these systematic differences in the size of effects of personality on behavior across situations into account when designing their studies, as these have important implications for statistical power.

**Operationalizations of the traits.** Using different operationalizations to measure the same (latent) personality construct im-

plicitly suggests that all indicators (i.e., measurements) provide equivalent assessments. However, evidence suggests that this equivalence assumption does not necessarily hold, as different trait indicators of allegedly the same construct may have different predictive validity for certain outcomes (e.g., Hilbig, Moshagen, & Zettler, 2016; Miller, Gaughan, Maples, & Price, 2011; Muris et al., 2017; Parks-Leduc, Feldman, & Bardi, 2015; Thalmayer, Saucier, & Eigenhuis, 2011; Thielmann & Hilbig, 2019b). We therefore considered it important to also test for potential moderation by the inventory used to measure a trait. Specifically, for the 10 traits for which most data were available (i.e., the eight FFM and HEXACO traits, social value orientation, and trust propensity), we investigated whether their relations with prosocial behavior across games were moderated by the inventory used to measure the traits. Results are summarized in Table S17 in the online supplemental materials. Indeed, for one trait under scrutiny—FFM agreeableness—analyses yielded significant differences in effect sizes across inventories. Specifically, the correlation of FFM agreeableness with prosocial behavior was larger for the Big Five Aspects Scale (DeYoung, Quilty, & Peterson, 2007) than for any other scale (i.e.,  $\hat{\rho} = .21$  vs.  $.08 \leq \hat{\rho} \leq .12$ ). This replicates prior studies which likewise showed differences in the predictive validity of FFM agreeableness across indicators (e.g., Decuyper, De Pauw, De Fruyt, De Bolle, & De Clercq, 2009; Hilbig, Moshagen, et al., 2016; Miller et al., 2011; Sibley & Duckitt, 2008). In general, this further supports that the equivalence assumption of indicators sought to measure the same construct does not necessarily hold.

## Limitations and Directions for Future Research

Although the meta-analysis provides viable insights into the relation between personality and prosocial behavior, some limitations ought to be acknowledged. First, we exclusively focused on zero-order correlations. However, several traits included in our meta-analysis (most prominently those belonging to the same category; Table 2) are likely to show considerable interrelations. Thus, some traits may have simply yielded nonzero relations with prosocial behavior in (some) games because of their shared variance with other traits, and accounting for this shared variance might provide even clearer support for the proposed affordance-based account. More generally, considering the interrelations between traits will allow to specifically study the unique predictive validity of traits showing meaningful zero-order relations with prosocial behavior when other (related) traits are accounted for. The meta-analysis establishes which traits should be invited to such a comparison in future research.

Closely related, the meta-analysis is mute on the relative importance of personality versus situational variables for prosocial behavior given that we exclusively focused on the role of the person. It is thus unclear how much of the variance in prosocial behavior can be accounted for by the type of a trait versus the type of the interdependent situation at hand. Future research might extend the current analysis to provide further insights into the relative importance of the person and the situation for prosocial behavior. A promising approach may be individual-level meta-analysis (e.g., Steinberg et al., 1997; Stewart & Clarke, 1995), which can offer more fine-grained insights than our synthesis based on summary (effect size) data.



Another limitation of the meta-analysis is that interdependent situations providing a possibility to reciprocate were somewhat underrepresented, only counting the Ultimatum Game as responder, the Trust Game as trustee, and social dilemmas with repeated interaction. However, situations providing a possibility to reciprocate have actually received less attention in prior research. Moreover, we did not consider the type of behavior (i.e., selfish or prosocial) to which individuals reacted in situations providing a possibility to reciprocate; thus, we cannot distinguish between positive and negative reciprocal behavior in our analysis. Both these issues might potentially explain why traits (exclusively) linked to the affordance of reciprocity (e.g., HEXACO agreeableness, forgiveness, positive reciprocity) yielded relatively weak associations with prosocial behavior across situations. The meta-analysis calls for stronger consideration of situations providing opportunities for reciprocity in future studies. This also includes the need to focus more on repeated interactions to provide a deeper understanding of how the relation of personality to prosocial behavior may develop over the course of an ongoing interaction.

Closely related, for some traits data were insufficient to perform meta-analysis in some games (see Table 8), or even in general (see excluded traits in the additional materials on the OSF; <https://osf.io/dbuk6/>). These gaps, however, reflect that prior research has—at least implicitly—adopted the concept of affordances to some extent in studying the relation between traits and prosocial behavior. For example, dispositional greed has exclusively been studied in the Dictator Game and in social dilemmas in which exploitation is possible to a relatively strong degree. Similarly, trust propensity has mainly been considered in the Trust Game (and mostly so in the trustor role) and social dilemmas, in which beliefs about others' prosociality are relevant for behavior. However, a crucial step in testing a theoretical framework beyond establishing convergent relations is to test discrimination or dissociation, respectively, that is, whether relations are *not* observed when they are *not* to be expected (Campbell & Fiske, 1959; Teuber, 1955). Future research is thus needed to fill the gaps identified by our meta-analysis and to thereby provide further evidence on the proposed theoretical framework.

Finally, we focused on prosocial behavior in (a selection of) games—and corresponding interdependent situations. A crucial advantage of games is that they offer a theory-driven apparatus to measure *actual* behavior in a precise and parsimonious way (Murnighan & Wang, 2016). In this sense, we selected a set of games covering a variety of interdependent situations and involving the affordances relevant for prosocial behavior to different degrees. Thus, although the games may not reflect the entire breadth of interdependent situations in everyday social interactions, they arguably comprise a broad range of relevant situations. Nonetheless, future research may expand the study of (individual differences in) prosocial behavior to other interdependent situations, including real-life settings (Gneezy & Imas, 2017) and situations that more strongly differ on the proposed subaffordances than the games considered here. Importantly, our affordance-based framework provides a theoretical account for the understanding of prosocial behavior *in general*, not only in (a selection of) games. The framework can thus guide such future endeavors in providing a strong theoretical basis.

## Conclusion

Individual differences in prosocial behavior have consistently been documented over decades of research using economic games—and personality traits have been shown to account for such individual variation. The present meta-analysis offers an affordance-based theoretical framework that can illuminate *which*, *when*, and *how* personality traits relate to prosocial behavior across various interdependent situations. Specifically, the framework and meta-analysis identify a few situational affordances that form the basis for the expression of certain traits in prosocial behavior. In this regard, the meta-analysis also shows that no single trait is capable to account for individual variation in prosocial behavior across the variety of interdependent situations individuals may encounter in their everyday social interactions. Rather, individual differences in prosocial behavior are best viewed as a result of traits being expressed in response to certain situational features that influence the affordances involved in interdependent situations. In conclusion, research on individual differences in prosocial behavior—and corresponding trait conceptualizations—should consider the affordances provided in interdependent situations to allow for a complete understanding of how personality can shape the many aspects of human prosociality.

## References

References marked by an asterisk are included in the meta-analysis.

- Abele, S., Stasser, G., & Chartier, C. (2010). Conflict and coordination in the provision of public goods: A conceptual analysis of continuous and step-level games. *Personality and Social Psychology Review*, 14, 385–401. <http://dx.doi.org/10.1177/1088868310368535>
- \*Adres, E., Vashdi, D. R., & Zalmanovitch, Y. (2016). Globalization and the retreat of citizen participation in collective action: A challenge for public administration. *Public Administration Review*, 76, 142–152. <http://dx.doi.org/10.1111/puar.12424>
- Ainsworth, S. E., & Baumeister, R. F. (2013). Cooperation and fairness depend on self-regulation. *Behavioral and Brain Sciences*, 36, 79–80. <http://dx.doi.org/10.1017/S0140525X12000696>
- \*Alarcon, G. M., Lyons, J. B., & Christensen, J. C. (2016). The effect of propensity to trust and familiarity on perceptions of trustworthiness over time. *Personality and Individual Differences*, 94, 309–315. <http://dx.doi.org/10.1016/j.paid.2016.01.031>
- \*Alford, J. R., & Hibbing, J. R. (2007). Personal, interpersonal, and political temperaments. *Annals of the American Academy of Political and Social Science*, 614, 196–212. <http://dx.doi.org/10.1177/0002716207305621>
- \*Almakias, S., & Weiss, A. (2012). Ultimatum game behavior in light of attachment theory. *Journal of Economic Psychology*, 33, 515–526. <http://dx.doi.org/10.1016/j.joep.2011.12.012>
- Alston, M. (2015). Social work, climate change and global cooperation. *International Social Work*, 58, 355–363. <http://dx.doi.org/10.1177/0020872814556824>
- \*Al-Ubaydli, O., Jones, G., & Weel, J. (2016). Average player traits as predictors of cooperation in a repeated prisoner's dilemma. *Journal of Behavioral and Experimental Economics*, 64, 50–60. <http://dx.doi.org/10.1016/j.socec.2015.10.005>
- \*Amanatullah, E. T., Morris, M. W., & Curhan, J. R. (2008). Negotiators who give too much: Unmitigated communion, relational anxieties, and economic costs in distributive and integrative bargaining. *Journal of Personality and Social Psychology*, 95, 723–738. <http://dx.doi.org/10.1037/a0012612>

- \*Anania, E. (2015). *The role of perceived similarity in social dilemmas* (Unpublished doctoral dissertation). University of Delaware, Newark, DE.
- \*Anderl, C., Steil, R., Hahn, T., Hitzeroth, P., Reif, A., & Windmann, S. (2018). Reduced reciprocal giving in social anxiety - Evidence from the Trust Game. *Journal of Behavior Therapy and Experimental Psychiatry*, 59, 12–18. <http://dx.doi.org/10.1016/j.jbtep.2017.10.005>
- \*Andreoni, J., Koessler, A.-K., & Serra-Garcia, M. (2018). Who gives? The roles of empathy and impulsiveness. In K. Scharf & M. Tonin (Eds.), *The economics of philanthropy* (pp. 49–62). Cambridge, MA: MIT Press.
- \*Arechar, A. A., Kraft-Todd, G., & Rand, D. G. (2017). Turking overtime: How participant characteristics and behavior vary over time and day on Amazon Mechanical Turk. *Journal of the Economic Science Association*, 3, 1–11. <http://dx.doi.org/10.1007/s40881-017-0035-0>
- \*Artinger, F., Exadaktylos, F., Koppel, H., & Sääksvuori, L. (2014). In others' shoes: Do individual differences in empathy and theory of mind shape social preferences? *PLoS ONE*, 9, e92844. <http://dx.doi.org/10.1371/journal.pone.0092844>
- Ashton, M. C., & Lee, K. (2007). Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and Social Psychology Review*, 11, 150–166. <http://dx.doi.org/10.1177/1088868306294907>
- Ashton, M. C., & Lee, K. (2009). The HEXACO-60: A short measure of the major dimensions of personality. *Journal of Personality Assessment*, 91, 340–345. <http://dx.doi.org/10.1080/00223890902935878>
- Ashton, M. C., Lee, K., & de Vries, R. E. (2014). The HEXACO Honesty-Humility, Agreeableness, and Emotionality factors: A review of research and theory. *Personality and Social Psychology Review*, 18, 139–152. <http://dx.doi.org/10.1177/1088868314523838>
- Ashton, M. C., Lee, K., Perugini, M., Szarota, P., de Vries, R. E., Di Blas, L., . . . De Raad, B. (2004). A six-factor structure of personality-descriptive adjectives: Solutions from psycholexical studies in seven languages. *Journal of Personality and Social Psychology*, 86, 356–366. <http://dx.doi.org/10.1037/0022-3514.86.2.356>
- Ashton, M. C., Paunonen, S. V., & Lee, K. (2014). On the validity of narrow and broad personality traits: A response to Salgado, Moscoso, and Berges (2013). *Personality and Individual Differences*, 56, 24–28. <http://dx.doi.org/10.1016/j.paid.2013.08.019>
- \*Atilgan, H. (2017). *Framing perceptions of justice in a public goods dilemma* (Doctoral Dissertation). Retrieved from <https://scholarcommons.sc.edu/etd/4137>
- \*Atlas, S., & Putterman, L. (2011). Trust among the avatars: Playing trust games in a virtual world, with and without textual and visual cues. *Southern Economic Journal*, 38, 122–125. <http://dx.doi.org/10.4284/0038-4038-78.1.63>
- \*Au, W. T., Lu, S., Leung, H., Yam, P., & Fung, J. M. Y. (2012). Risk and prisoner's dilemma: A reinterpretation of Coombs' re-parameterization. *Journal of Behavioral Decision Making*, 25, 476–490. <http://dx.doi.org/10.1002/bdm.743>
- Axelrod, R., & Hamilton, W. D. (1981). The evolution of cooperation. *Science*, 211, 1390–1396. <http://dx.doi.org/10.1126/science.7466396>
- Back, M. D., Küfner, A. C. P., Dufner, M., Gerlach, T. M., Rauthmann, J. F., & Denissen, J. J. A. (2013). Narcissistic admiration and rivalry: Disentangling the bright and dark sides of narcissism. *Journal of Personality and Social Psychology*, 105, 1013–1037. <http://dx.doi.org/10.1037/a0034431>
- \*Baggio, M. C., & Benning, S. D. (2017). *The influence of psychopathic traits on scores and behavior in the prisoner's dilemma*. Unpublished manuscript, Department of Psychology, University of Nevada, Las Vegas, NV.
- \*Balliet, D. (2007). *A matter of time: Does the impact of social value orientation and self-efficacy on contributions to public goods depend on the temporal framing of the dilemma?* (Unpublished doctoral dissertation). Washington State University, Pullman, WA.
- \*Balliet, D., Li, N. P., & Joireman, J. (2011). Relating trait self-control and forgiveness within prosocials and proselves: Compensatory versus synergistic models. *Journal of Personality and Social Psychology*, 101, 1090–1105. <http://dx.doi.org/10.1037/a0024967>
- Balliet, D., Mulder, L. B., & Van Lange, P. A. M. (2011). Reward, punishment, and cooperation: A meta-analysis. *Psychological Bulletin*, 137, 594–615. <http://dx.doi.org/10.1037/a0023489>
- Balliet, D., Parks, C. D., & Joireman, J. A. (2009). Social value orientation and cooperation in social dilemmas: A meta-analysis. *Group Processes & Intergroup Relations*, 12, 533–547. <http://dx.doi.org/10.1177/1368430209105040>
- Balliet, D., Tybur, J. M., & Van Lange, P. A. M. (2017). Functional Interdependence Theory: An evolutionary account of social situations. *Personality and Social Psychology Review*, 21, 361–388. <http://dx.doi.org/10.1177/1088868316657965>
- \*Balliet, D., Tybur, J. M., Wu, J., Antonellis, C., & Van Lange, P. A. M. (2018). Political ideology, trust, and cooperation: In-group favoritism among republicans and democrats during a U.S. national election. *Journal of Conflict Resolution*, 62, 797–818. <http://dx.doi.org/10.1177/0022002716658694>
- Balliet, D., & Van Lange, P. A. M. (2013a). Trust, conflict, and cooperation: A meta-analysis. *Psychological Bulletin*, 139, 1090–1112. <http://dx.doi.org/10.1037/a0030939>
- Balliet, D., & Van Lange, P. A. M. (2013b). Trust, punishment, and cooperation across 18 societies: A meta-analysis. *Perspectives on Psychological Science*, 8, 363–379. <http://dx.doi.org/10.1177/1745691613488533>
- \*Barclay, P. (2004). Trustworthiness and competitive altruism can also solve the “tragedy of the commons”. *Evolution and Human Behavior*, 25, 209–220. <http://dx.doi.org/10.1016/j.evolhumbehav.2004.04.002>
- \*Barclay, P. (2006). Reputational benefits for altruistic punishment. *Evolution and Human Behavior*, 27, 325–344. <http://dx.doi.org/10.1016/j.evolhumbehav.2006.01.003>
- \*Barclay, P., & Barker, J. L. (2018). *Greener than thou: People who protect the environment are more cooperative, compete to be environmental, and benefit from reputation*. Manuscript submitted for publication.
- \*Barclay, P., & Willer, R. (2007). Partner choice creates competitive altruism in humans. *Proceedings Biological Sciences*, 274, 749–753. <http://dx.doi.org/10.1098/rspb.2006.0209>
- Bardsley, N. (2008). Dictator game giving: Altruism or artefact? *Experimental Economics*, 11, 122–133. <http://dx.doi.org/10.1007/s10683-007-9172-2>
- \*Barends, A., de Vries, R. E., & van Vugt, M. (2018). *Investigating the relations between economic games and Honesty-Humility*. Unpublished pilot study, Department of Experimental and Applied Psychology, Vrije Universiteit Amsterdam, Amsterdam, the Netherlands.
- \*Barends, A., de Vries, R. E., & van Vugt, M. (2019). Power influences the expression of Honesty-Humility: The power-exploitation affordances hypothesis. *Journal of Research in Personality*, 82, 103856. <http://dx.doi.org/10.1016/j.jrp.2019.103856>
- Baron, J. (2001). Purposes and methods [Peer commentary on “Experimental practices in economics: A methodological challenge for psychologists?” by R. Hertwig & A. Ortmann]. *Behavioral and Brain Sciences*, 24, 383–451. <http://dx.doi.org/10.1017/S0140525X01224145>
- \*Barraza, J. A., Alexander, V., Beavin, L. E., Terris, E. T., & Zak, P. J. (2015). The heart of the story: Peripheral physiology during narrative exposure predicts charitable giving. *Biological Psychology*, 105, 138–143. <http://dx.doi.org/10.1016/j.biopsycho.2015.01.008>
- \*Barraza, J. A., McCullough, M. E., Ahmadi, S., & Zak, P. J. (2011). Oxytocin infusion increases charitable donations regardless of monetary



- resources. *Hormones and Behavior*, 60, 148–151. <http://dx.doi.org/10.1016/j.yhbeh.2011.04.008>
- \*Barraza, J. A., & Zak, P. J. (2009). Empathy toward strangers triggers oxytocin release and subsequent generosity. In O. Vilarroya, S. Altran, A. Navarro, K. Ochsner, & A. Tobeña (Eds.), *Values, empathy, and fairness across social barriers* (Vol. 1167, pp. 182–189). New York: New York Academy of Sciences. <http://dx.doi.org/10.1111/j.1749-6632.2009.04504.x>
- \*Barrett, S., & Dannenberg, A. (2012). Climate negotiations under scientific uncertainty. *Proceedings of the National Academy of Sciences of the United States of America*, 109, 17372–17376. <http://dx.doi.org/10.1073/pnas.1208417109>
- \*Barrett, S., & Dannenberg, A. (2014). Sensitivity of collective action to uncertainty about climate tipping points. *Nature Climate Change*, 4, 36–39. <http://dx.doi.org/10.1038/nclimate2059>
- \*Barrett, S., & Dannenberg, A. (2016). An experimental investigation into “pledge and review” in climate negotiations. *Climatic Change*, 138, 339–351. <http://dx.doi.org/10.1007/s10584-016-1711-4>
- \*Barrett, S., & Dannenberg, A. (2017). Tipping versus cooperating to supply a public good. *Journal of the European Economic Association*, 15, 910–941. <http://dx.doi.org/10.1093/jea/ejw022>
- Batson, C. D., Bolen, M. H., Cross, J. A., & Neuringer-Benefiel, H. E. (1986). Where is the altruism in the altruistic personality? *Journal of Personality and Social Psychology*, 50, 212–220. <http://dx.doi.org/10.1037/0022-3514.50.1.212>
- Baumard, N., André, J.-B., & Sperber, D. (2013). A mutualistic approach to morality: The evolution of fairness by partner choice. *Behavioral and Brain Sciences*, 36, 59–78. <http://dx.doi.org/10.1017/S0140525X11002202>
- Baumeister, R. F., Vohs, K. D., & Funder, D. C. (2007). Psychology as the science of self-reports and finger movements: Whatever happened to actual behavior? *Perspectives on Psychological Science*, 2, 396–403. <http://dx.doi.org/10.1111/j.1745-6916.2007.00051.x>
- \*Baumert, A., & Maltese, S. (2011). *Justice sensitivity, information processing and behavior, Study 1*. Unpublished raw data, Department of Psychology, University of Koblenz-Landau, Landau, Germany.
- \*Baumert, A., & Maltese, S. (2012). *Justice sensitivity, information processing and behavior, Study 4*. Unpublished raw data, Department of Psychology, University of Koblenz-Landau, Landau, Germany.
- \*Baumert, A., & Maltese, S. (2013). *Justice sensitivity, information processing and behavior, Study 5*. Unpublished raw data, Department of Psychology, University of Koblenz-Landau, Landau, Germany.
- \*Baumert, A., Maltese, S., & Lischetzke, T. (2018). *A social-cognitive mechanism of change and development in dispositional sensitivity to injustice*. Unpublished manuscript, Max-Planck Institute for Research on Collective Goods, Bonn, Germany.
- \*Baumert, A., Schlösser, T. M., & Schmitt, M. (2014). Economic games: A performance-based assessment of fairness and altruism. *European Journal of Psychological Assessment*, 30, 178–192. <http://dx.doi.org/10.1027/1015-5759/a000183>
- \*Baumgartner, T., Fischbacher, U., Feierabend, A., Lutz, K., & Fehr, E. (2009). The neural circuitry of a broken promise. *Neuron*, 64, 756–770. <http://dx.doi.org/10.1016/j.neuron.2009.11.017>
- \*Baumgartner, T., Heinrichs, M., Vonlanthen, A., Fischbacher, U., & Fehr, E. (2008). Oxytocin shapes the neural circuitry of trust and trust adaptation in humans. *Neuron*, 58, 639–650. <http://dx.doi.org/10.1016/j.neuron.2008.04.009>
- \*Beadle, J. N., Paradiso, S., Kovach, C., Polgreen, L., Denburg, N. L., & Tranel, D. (2012). Effects of age-related differences in empathy on social economic decision-making. *International Psychogeriatrics*, 24, 822–833. <http://dx.doi.org/10.1017/S1041610211002547>
- \*Becchetti, L., Castriota, S., & Conzo, P. (2017). Disaster, aid, and preferences: The long-run impact of the Tsunami on giving in Sri Lanka. *World Development*, 94, 157–173. <http://dx.doi.org/10.1016/j.worlddev.2016.12.014>
- \*Becker, A., Deckers, T., Dohmen, T., Falk, A., & Kosse, F. (2012). The relationship between economic preferences and psychological personality measures. *Annual Review of Economics*, 4, 453–478. <http://dx.doi.org/10.1146/annurev-economics-080511-110922>
- Begg, C. B., & Mazumdar, M. (1994). Operating characteristics of a rank correlation test for publication bias. *Biometrics*, 50, 1088–1101. <http://dx.doi.org/10.2307/2533446>
- \*Bekkers, R. (2007). Measuring altruistic behavior in surveys: The all-or-nothing dictator game. *Survey Research Methods*, 1, 139–144.
- \*Bendahan, S., Zehnder, C., Pralong, F. P., & Antonakis, J. (2015). Leader corruption depends on power and testosterone. *The Leadership Quarterly*, 26, 101–122. <http://dx.doi.org/10.1016/j.leaqua.2014.07.010>
- \*Benjamin, D. J., Choi, J. J., & Fisher, G. (2016). Religious identity and economic behavior. *The Review of Economics and Statistics*, 98, 617–637. [http://dx.doi.org/10.1162/REST\\_a\\_00586](http://dx.doi.org/10.1162/REST_a_00586)
- \*Ben-Ner, A., & Halldorsson, F. (2010). Trusting and trustworthiness: What are they, how to measure them, and what affects them. *Journal of Economic Psychology*, 31, 64–79. <http://dx.doi.org/10.1016/j.joep.2009.10.001>
- \*Ben-Ner, A., & Kramer, A. (2011). Personality and altruism in the dictator game: Relationship to giving to kin, collaborators, competitors, and neutrals. *Personality and Individual Differences*, 51, 216–221. <http://dx.doi.org/10.1016/j.paid.2010.04.024>
- \*Ben-Ner, A., Kramer, A., & Levy, O. (2008). Economic and hypothetical dictator game experiments: Incentive effects at the individual level. *Journal of Socio-Economics*, 37, 1775–1784. <http://dx.doi.org/10.1016/j.socsc.2007.11.004>
- \*Ben-Ner, A., Putterman, L., Kong, F., & Magan, D. (2004). Reciprocity in a two-part dictator game. *Journal of Economic Behavior & Organization*, 53, 333–352. <http://dx.doi.org/10.1016/j.jebo.2002.12.001>
- \*Bentzen-Bilkvist, D., Migliano, A., & Vinicius, L. (2017). Behavioural phenotypes and the structure of human cognition. *Evolutionary Biology*, 44, 113–119. <http://dx.doi.org/10.1007/s11692-016-9399-y>
- \*Bereczkei, T., & Czibor, A. (2014). Personality and situational factors differently influence high Mach and low Mach persons’ decisions in a social dilemma game. *Personality and Individual Differences*, 64, 168–173. <http://dx.doi.org/10.1016/j.paid.2014.02.035>
- \*Bereczkei, T., Papp, P., Kincses, P., Bodrogi, B., Perlaki, G., Orsi, G., & Deak, A. (2015). The neural basis of the Machiavellians’ decision making in fair and unfair situations. *Brain and Cognition*, 98, 53–64. <http://dx.doi.org/10.1016/j.bandc.2015.05.006>
- Berg, J., Dickhaut, J., & McCabe, K. A. (1995). Trust, reciprocity, and social history. *Games and Economic Behavior*, 10, 122–142. <http://dx.doi.org/10.1006/game.1995.1027>
- \*Berg, J. M., Lilienfeld, S. O., & Waldman, I. D. (2013). Bargaining with the devil: Using economic decision-making tasks to examine the heterogeneity of psychopathic traits. *Journal of Research in Personality*, 47, 472–482. <http://dx.doi.org/10.1016/j.jrp.2013.04.003>
- \*Bergh, R., & Sidanius, J. (2018). *Dominance and selfishness: Differentiating domineering dispositions from socially dominant values*. Manuscript in preparation.
- \*Bergsieker, H. (2018). *Inducing trust in interracial relationships: Rewards of risky interdependence*. Manuscript in preparation.
- Berkowitz, N. H. (1968). Alternative measures of authoritarianism, response sets, and prediction in a two-person game. *The Journal of Social Psychology*, 74, 233–242. <http://dx.doi.org/10.1080/00224545.1968.9924850>
- \*Bernold, E., Gsottbauer, E., Ackermann, K. A., & Murphy, R. O. (2015). *Social framing and cooperation: The roles and interaction of preferences and beliefs*. SSRN Working Paper Series. <http://dx.doi.org/10.2139/ssrn.2557927>

- Berry, J. W., Worthington, E. L. J., Jr., O'Connor, L. E., Parrott, L., III, & Wade, N. G. (2005). Forgivingness, vengeful rumination, and affective traits. *Journal of Personality*, 73, 183–226. <http://dx.doi.org/10.1111/j.1467-6494.2004.00308.x>
- Betsch, C., Böhm, R., & Korn, L. (2013). Inviting free-riders or appealing to prosocial behavior? game-theoretical reflections on communicating herd immunity in vaccine advocacy. *Health Psychology*, 32, 978–985. <http://dx.doi.org/10.1037/a0031590>
- Bettencourt, B. A., Talley, A., Benjamin, A. J., & Valentine, J. (2006). Personality and aggressive behavior under provoking and neutral conditions: A meta-analytic review. *Psychological Bulletin*, 132, 751–777. <http://dx.doi.org/10.1037/0033-2909.132.5.751>
- \*Bieleke, M., Gollwitzer, P. M., Oettingen, G., & Fischbacher, U. (2017). Social value orientation moderates the effects of intuition versus reflection on responses to unfair ultimatum offers. *Journal of Behavioral Decision Making*, 30, 569–581. <http://dx.doi.org/10.1002/bdm.1975>
- \*Bischoff, I., & Ihtiyar, Ö. (2015). *Feedback and emotions in the trust game*. Joint Discussion Paper Series in Economics, No. 03-2015. Retrieved from <http://hdl.handle.net/10419/106479>
- Blanco, M., Engelmann, D., & Normann, H. T. (2011). A within-subject analysis of other-regarding preferences. *Games and Economic Behavior*, 72, 321–338. <http://dx.doi.org/10.1016/j.geb.2010.09.008>
- Bochner, S. (1994). Cross-cultural differences in the self concept: A test of Hofstede's individualism/collectivism distinction. *Journal of Cross-Cultural Psychology*, 25, 273–283. <http://dx.doi.org/10.1177/0022022194252007>
- \*Böckler, A., Sharifi, M., Kanske, P., Dziobek, I., & Singer, T. (2017). Social decision making in narcissism: Reduced generosity and increased retaliation are driven by alterations in perspective-taking and anger. *Personality and Individual Differences*, 104, 1–7. <http://dx.doi.org/10.1016/j.paid.2016.07.020>
- \*Böckler, A., Tusche, A., & Singer, T. (2016). The structure of human prosociality: Differentiating altruistically motivated, norm motivated, strategically motivated, and self-reported prosocial behavior. *Social Psychological and Personality Science*, 7, 530–541. <http://dx.doi.org/10.1177/1948550616639650>
- \*Böhm, R., & Theelen, M. M. P. (2016). Outcome valence and externality valence framing in public good dilemmas. *Journal of Economic Psychology*, 54, 151–163. <http://dx.doi.org/10.1016/j.joep.2016.04.003>
- \*Boone, C., De Brabander, B., & van Witteloostuijn, A. (1999). The impact of personality on behavior in five Prisoner's Dilemma games. *Journal of Economic Psychology*, 20, 343–377. [http://dx.doi.org/10.1016/S0167-4870\(99\)00012-4](http://dx.doi.org/10.1016/S0167-4870(99)00012-4)
- \*Boone, C., Declerck, C. H., & Kiyonari, T. (2010). Inducing cooperative behavior among proselves versus prosocials: The moderating role of incentives and trust. *Journal of Conflict Resolution*, 54, 799–824. <http://dx.doi.org/10.1177/0022002710372329>
- \*Boone, C., Declerck, C. H., & Suetens, S. (2008). Subtle social cues, explicit incentives and cooperation in social dilemmas. *Evolution and Human Behavior*, 29, 179–188. <http://dx.doi.org/10.1016/j.evolhumbehav.2007.12.005>
- Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2011). *Introduction to meta-analysis*. West Sussex, UK: Wiley.
- \*Borgolte, A. (2017). *Feedback processing in the Ultimatum Game in patients with social anxiety disorder and healthy controls* (Unpublished master's thesis). University of Münster, Münster, Germany.
- Bornstein, G. (2003). Intergroup conflict: Individual, group, and collective interests. *Personality and Social Psychology Review*, 7, 129–145. [http://dx.doi.org/10.1207/S15327957PSPR0702\\_129-145](http://dx.doi.org/10.1207/S15327957PSPR0702_129-145)
- \*Bosetti, V., Heugues, M., & Tavoni, A. (2017). Luring others into climate action: Coalition formation games with threshold and spillover effects. *Oxford Economic Papers*, 69, 410–431. <http://dx.doi.org/10.1093/oxep/gpx017>
- \*Bouma, J., Reyes-García, V., Huanca, T., & Arrazola, S. (2017). Understanding conditions for co-management: A framed field experiment amongst the Tsimane', Bolivia. *Ecological Economics*, 141, 32–42. <http://dx.doi.org/10.1016/j.ecolecon.2017.05.013>
- \*Bouwmeester, S., Verkoeijen, P. P. J. L., Aczel, B., Barbosa, F., Bègue, L., Brañas-Garza, P., . . . Wollbrant, C. E. (2017). Registered replication report: Rand, Greene, and Nowak (2012). *Perspectives on Psychological Science*, 12, 527–542. <http://dx.doi.org/10.1177/1745691617693624>
- \*Boyce-Jacino, C. M. (2017). *Making a little go a long way: Scarcity increases cooperation in an iterated prisoner's dilemma* (Master's thesis). Rutgers University, New Brunswick, NJ. <http://dx.doi.org/10.7282/T3XG9TJT>
- \*Bracht, J., & Regner, T. (2013). Moral emotions and partnership. *Journal of Economic Psychology*, 39, 313–326. <http://dx.doi.org/10.1016/j.joep.2013.09.007>
- \*Brañas-Garza, P., Espín, A. M., & Lenkei, B. (2016). BMI is not related to altruism, fairness, trust or reciprocity: Experimental evidence from the field and the lab. *Physiology & Behavior*, 156, 79–93. <http://dx.doi.org/10.1016/j.physbeh.2016.01.008>
- \*Brandstätter, H., & Güth, W. (2002). Personality in dictator and ultimatum games. *Central European Journal of Operations Research*, 10, 191–215.
- \*Brandstätter, H., & Königstein, M. (2001). Personality influences on ultimatum bargaining decisions. *European Journal of Personality*, 15, S53–S70. <http://dx.doi.org/10.1002/per.424>
- \*Brethel-Haurwitz, K. M., Stoycos, S. A., Cardinale, E. M., Huebner, B., & Marsh, A. A. (2016). Is costly punishment altruistic? Exploring rejection of unfair offers in the Ultimatum Game in real-world altruists. *Scientific Reports*, 6, 18974. <http://dx.doi.org/10.1038/srep18974>
- \*Brockner, J., De Cremer, D., van den Bos, K., & Chen, Y.-R. (2005). The influence of interdependent self-construal on procedural fairness effects. *Organizational Behavior and Human Decision Processes*, 96, 155–167. <http://dx.doi.org/10.1016/j.obhdp.2004.11.001>
- \*Brosig, J. (2002). Identifying cooperative behavior: Some experimental results in a prisoner's dilemma game. *Journal of Economic Behavior & Organization*, 47, 275–290. [http://dx.doi.org/10.1016/S0167-2681\(01\)00211-6](http://dx.doi.org/10.1016/S0167-2681(01)00211-6)
- \*Brucks, W. M., & Van Lange, P. A. M. (2007). When prosocials act like proselves in a commons dilemma. *Personality and Social Psychology Bulletin*, 33, 750–758. <http://dx.doi.org/10.1177/0146167206298569>
- \*Brüne, M., Tas, C., Wischniewski, J., Welpinghus, A., Heinisch, C., & Newen, A. (2012). Hypnotic ingroup-outgroup suggestion influences economic decision-making in an Ultimatum Game. *Consciousness and Cognition*, 21, 939–946. <http://dx.doi.org/10.1016/j.concog.2012.02.009>
- \*Brunell, A. B., Davis, M. S., Schley, D. R., Eng, A. L., van Dulmen, M. H. M., Wester, K. L., & Flannery, D. J. (2013). A new measure of interpersonal exploitativeness. *Frontiers in Psychology*, 4, 299. <http://dx.doi.org/10.3389/fpsyg.2013.00299>
- \*Bruntsch, R., & Wagner, L. (2015). *Personality, character strengths, and behavior in economic games*. Unpublished raw data, Department of Psychology, University of Zurich, Zurich, Switzerland.
- \*Buchan, N. R., Grimalda, G., Wilson, R., Brewer, M., Fatas, E., & Foddy, M. (2009). Globalization and human cooperation. *Proceedings of the National Academy of Sciences of the United States of America*, 106, 4138–4142. <http://dx.doi.org/10.1073/pnas.0809522106>
- \*Budesu, D. V., & Au, W. T. (2002). A model of sequential effects in common pool resource dilemmas. *Journal of Behavioral Decision Making*, 15, 37–63. <http://dx.doi.org/10.1002/bdm.402>
- \*Budesu, D. V., Au, W. T., & Chen, X.-P. (1997). Effects of protocol of play and social orientation on behavior in sequential resource dilemmas. *Organizational Behavior and Human Decision Processes*, 69, 179–193. <http://dx.doi.org/10.1006/obhd.1997.2684>
- \*Burks, S. V., Carpenter, J. P., Goette, L., & Rustichini, A. (2009). Cognitive skills affect economic preferences, strategic behavior, and job

- attachment. *Proceedings of the National Academy of Sciences of the United States of America*, 106, 7745–7750. <http://dx.doi.org/10.1073/pnas.0812360106>
- \*Burks, S. V., Carpenter, J. P., & Verhoogen, E. (2003). Playing both roles in the trust game. *Journal of Economic Behavior & Organization*, 51, 195–216. [http://dx.doi.org/10.1016/S0167-2681\(02\)00093-8](http://dx.doi.org/10.1016/S0167-2681(02)00093-8)
- \*Burns, J., & Keswell, M. (2015). Diversity and the provision of public goods: Experimental evidence from South Africa. *Journal of Economic Behavior & Organization*, 118, 110–122. <http://dx.doi.org/10.1016/j.jebo.2015.02.018>
- \*Buser, T., & Dreber, A. (2016). The flipside of comparative payment schemes. *Management Science*, 62, 2626–2638. <http://dx.doi.org/10.1287/mnsc.2015.2257>
- \*Cáceda, R., James, G. A., Gutman, D. A., & Kilts, C. D. (2015). Organization of intrinsic functional brain connectivity predicts decisions to reciprocate social behavior. *Behavioural Brain Research*, 292, 478–483. <http://dx.doi.org/10.1016/j.bbr.2015.07.008>
- \*Cáceda, R., Moskovciak, T., Prendes-Alvarez, S., Wojas, J., Engel, A., Wilker, S. H., . . . Stowe, Z. N. (2014). Gender-specific effects of depression and suicidal ideation in prosocial behaviors. *PLoS ONE*, 9, e108733. <http://dx.doi.org/10.1371/journal.pone.0108733>
- \*Calvillo, D. P., & Burgeno, J. N. (2015). Cognitive reflection predicts the acceptance of unfair ultimatum game offers. *Judgment and Decision Making*, 10, 332–341.
- Camerer, C. F. (2003). *Behavioral game theory: Experiments in strategic interaction*. New York, NY: Russell Sage Foundation.
- Camerer, C. F., & Hogarth, R. M. (1999). The effects of financial incentives in experiments: A review and capital-labor-production framework. *Journal of Risk and Uncertainty*, 19, 7–42. <http://dx.doi.org/10.1023/A:1007850605129>
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56, 81–105. <http://dx.doi.org/10.1037/h0046016>
- \*Campbell, W. K., Bonacci, A. M., Shelton, J., Exline, J. J., & Bushman, B. J. (2004). Psychological entitlement: Interpersonal consequences and validation of a self-report measure. *Journal of Personality Assessment*, 83, 29–45. [http://dx.doi.org/10.1207/s15327752jpa8301\\_04](http://dx.doi.org/10.1207/s15327752jpa8301_04)
- \*Campbell, W. K., Bush, C. P., Brunell, A. B., & Shelton, J. (2005). Understanding the social costs of narcissism: The case of the tragedy of the commons. *Personality and Social Psychology Bulletin*, 31, 1358–1368. <http://dx.doi.org/10.1177/0146167205274855>
- \*Campos-Mercade, P. (2018). *Helping behavior and group size: The volunteer's dilemma explains the bystander effect*. Manuscript submitted for publication.
- \*Campos-Vazquez, R. M., & Mejia, L. A. (2016). Does corruption affect cooperation? A laboratory experiment. *Latin American Economic Review*, 25, 5. <http://dx.doi.org/10.1007/s40503-016-0035-0>
- \*Candelo, N., Croson, R. T. A., & Li, S. X. (2017). Identity and social exclusion: An experiment with Hispanic immigrants in the U.S. *Experimental Economics*, 20, 460–480. <http://dx.doi.org/10.1007/s10683-016-9492-1>
- \*Cao, J., Galinsky, A. D., & Maddux, W. W. (2014). Does travel broaden the mind? Breadth of foreign experiences increases generalized trust. *Social Psychological and Personality Science*, 5, 517–525. <http://dx.doi.org/10.1177/1948550613514456>
- \*Capaldi, C. A., & Zelenski, J. M. (2016, May). *Can cognitive depletion lead to natural resource depletion? An initial investigation*. Poster presented at the 5th Annual Interdisciplinary Conference in Psychology, Ottawa, Ontario, Canada.
- \*Cappelen, A. W., Sørensen, E. Ø., & Tungodden, B. (2013). When do we lie? *Journal of Economic Behavior & Organization*, 93, 258–265. <http://dx.doi.org/10.1016/j.jebo.2013.03.037>
- \*Carbajal, J. M., Gamboa, J. L., Moore, J., Smith, F., Ann Eads, L., Clothier, J. L., & Cáceda, R. (2017). Response to unfairness across the suicide risk spectrum. *Psychiatry Research*, 258, 365–373. <http://dx.doi.org/10.1016/j.psychres.2017.08.071>
- Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality-social, clinical, and health psychology. *Psychological Bulletin*, 92, 111–135. <http://dx.doi.org/10.1037/0033-2909.92.1.111>
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS Scales. *Journal of Personality and Social Psychology*, 67, 319–333. <http://dx.doi.org/10.1037/0022-3514.67.2.319>
- Cattell, R. B., Eber, H. W., & Tatsuoaka, M. M. (1970). *Handbook for the Sixteen Personality Factor Questionnaire (16PF)*. Champaign, IL: Institute for Personality and Ability Testing.
- \*Celse, J., Nicolas, M., & Schilling, P. (2017). Are athletes more cooperative than nonathletes? A laboratory experiment. *Managerial & Decision Economics*, 38, 1248–1261. <http://dx.doi.org/10.1002/mde.2862>
- \*Chaudhuri, A., Li, Y., & Paichayontvijit, T. (2016). What's in a frame? Goal framing, trust and reciprocity. *Journal of Economic Psychology*, 57, 117–135. <http://dx.doi.org/10.1016/j.joep.2016.09.005>
- \*Chen, C.-C., Chiu, I.-M., Smith, J., & Yamada, T. (2013). Too smart to be selfish? Measures of cognitive ability, social preferences, and consistency. *Journal of Economic Behavior & Organization*, 90, 112–122. <http://dx.doi.org/10.1016/j.jebo.2013.03.032>
- \*Chen, X., Hackett, P. D., DeMarco, A. C., Feng, C., Stair, S., Haroon, E., . . . Rilling, J. K. (2016). Effects of oxytocin and vasopressin on the neural response to unreciprocated cooperation within brain regions involved in stress and anxiety in men and women. *Brain Imaging and Behavior*, 10, 581–593. <http://dx.doi.org/10.1007/s11682-015-9411-7>
- \*Chen, X.-P., & Bachrach, D. G. (2003). Tolerance of free-riding: The effects of defection size, defection pattern, and social orientation in a repeated public goods dilemma. *Organizational Behavior and Human Decision Processes*, 90, 139–147. [http://dx.doi.org/10.1016/S0749-5978\(02\)00511-3](http://dx.doi.org/10.1016/S0749-5978(02)00511-3)
- \*Chen, X.-P., Wasti, S. A., & Triandis, H. C. (2007). When does group norm or group identity predict cooperation in a public goods dilemma? The moderating effects of idiocentrism and allocentrism. *International Journal of Intercultural Relations*, 31, 259–276. <http://dx.doi.org/10.1016/j.ijintrel.2006.02.004>
- \*Cherry, T. L., McEvoy, D. M., & Sælen, H. (2017). Conditional cooperation and cultural worldviews. *Economics Letters*, 158, 51–53. <http://dx.doi.org/10.1016/j.econlet.2017.06.034>
- \*Chesney, T., Chuah, S.-H., Hoffmann, R., Hui, W., & Lerner, J. (2014). Skilled players cooperate less in multi-player games. *Journal of Gaming and Virtual Worlds*, 6, 21–31. [http://dx.doi.org/10.1386/jgvw.6.1.21\\_1](http://dx.doi.org/10.1386/jgvw.6.1.21_1)
- \*Christov-Moore, L. (2015). *Prosocial decision making: Brain-behavior relationships and neuromodulation* (Doctoral dissertation). University of California, Los Angeles, CA. Retrieved from <https://escholarship.org/uc/item/39x5t598>
- \*Chuah, S.-H., Hoffmann, R., Jones, M., & Williams, G. (2009). An economic anatomy of culture: Attitudes and behaviour in inter- and intra-national ultimatum game experiments. *Journal of Economic Psychology*, 30, 732–744. <http://dx.doi.org/10.1016/j.joep.2009.06.004>
- \*Chuah, S.-H., Hoffmann, R., Ramasamy, B., & Tan, J. H. W. (2014). Religion, ethnicity and cooperation: An experimental study. *Journal of Economic Psychology*, 45, 33–43. <http://dx.doi.org/10.1016/j.joep.2014.07.002>
- \*Ciardo, F., Ricciardelli, P., Lugli, L., Rubichi, S., & Iani, C. (2015). Eyes keep watch over you! Competition enhances joint attention in females. *Acta Psychologica*, 160, 170–177. <http://dx.doi.org/10.1016/j.actpsy.2015.07.013>
- \*Clark, C. B., Swails, J. A., Pontinen, H. M., Bowerman, S. E., Kriz, K. A., & Hendricks, P. S. (2017). A behavioral economic assessment of individualizing versus binding moral foundations. *Personality and Individ-*



- ual Differences, 112, 49–54. <http://dx.doi.org/10.1016/j.paid.2017.02.052>
- \*Clark, C. B., Thorne, C. B., Vann, J., & Cropsey, K. L. (2014). Five-factor personality and cooperative behavior. *North American Journal of Psychology*, 16, 481–494.
- Cloninger, C. R. (1987). A systematic method for clinical description and classification of personality variants. A proposal. *Archives of General Psychiatry*, 44, 573–588. <http://dx.doi.org/10.1001/archpsyc.1987.01800180093014>
- Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement*, 20, 37–46. <http://dx.doi.org/10.1177/001316446002000104>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (rev. ed.). Hillsdale, NJ: Erlbaum.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). New York, NY: Taylor & Francis Ltd. <http://dx.doi.org/10.4324/9780203774441>
- \*Cohen, T. R. (2018). *Trust game and personality among MBA students*. Unpublished raw data, Kellogg School of Management, Northwestern University, Evanston, IL.
- \*Cohen, T. R., Halevy, N., & Livingston, R. W. (2009). *Dictator game and personality*. Unpublished raw data.
- Cohen, T. R., Panter, A. T., & Turan, N. (2012). Guilt proneness and moral character. *Current Directions in Psychological Science*, 21, 355–359. <http://dx.doi.org/10.1177/0963721412454874>
- \*Collins, M. G., Juvina, I., & Gluck, K. A. (2016). Cognitive model of trust dynamics predicts human behavior within and between two games of strategic interaction with computerized confederate agents. *Frontiers in Psychology*, 7, 49. <http://dx.doi.org/10.3389/fpsyg.2016.00049>
- Colman, A. M., & Stirk, J. A. (1998). Stackelberg reasoning in mixed-motive games: An experimental investigation. *Journal of Economic Psychology*, 19, 279–293. [http://dx.doi.org/10.1016/S0167-4870\(98\)00008-7](http://dx.doi.org/10.1016/S0167-4870(98)00008-7)
- \*Corfman, K. P., & Lehmann, D. R. (1994). The prisoner's dilemma and the role of information in setting advertising budgets. *Journal of Advertising*, 23, 35–48. <http://dx.doi.org/10.1080/00913367.1994.10673440>
- \*Cornelissen, G., Dewitte, S., & Warlop, L. (2011). Are social value orientations expressed automatically? Decision making in the dictator game. *Personality and Social Psychology Bulletin*, 37, 1080–1090. <http://dx.doi.org/10.1177/0146167211405996>
- \*Corr, P. J., Hargreaves Heap, S. P., Seger, C. R., & Tsutsui, K. (2015). An experiment on individual 'parochial altruism' revealing no connection between individual 'altruism' and individual 'parochialism.' *Frontiers in Psychology*, 6, 1261. <http://dx.doi.org/10.3389/fpsyg.2015.01261>
- Costa, P. T., Jr., McCrae, R. R., & Dye, D. A. (1991). Facet scales for agreeableness and conscientiousness: A revision of the NEO Personality Inventory. *Personality and Individual Differences*, 12, 887–898. [http://dx.doi.org/10.1016/0191-8869\(91\)90177-D](http://dx.doi.org/10.1016/0191-8869(91)90177-D)
- Costa, P. T., Jr., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.
- Costa, P. T., Jr., Terracciano, A., & McCrae, R. R. (2001). Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology*, 81, 322–331. <http://dx.doi.org/10.1037/0022-3514.81.2.322>
- \*Côté, S., Decelles, K. A., McCarthy, J. M., Van Kleef, G. A., & Hideg, I. (2011). The Jekyll and Hyde of emotional intelligence: Emotion-regulation knowledge facilitates both prosocial and interpersonally deviant behavior. *Psychological Science*, 22, 1073–1080. <http://dx.doi.org/10.1177/0956797611416251>
- \*Cotterell, N., Eisenberger, R., & Speicher, H. (1992). Inhibiting effects of reciprocity wariness on interpersonal relationships. *Journal of Personality and Social Psychology*, 62, 658–668. <http://dx.doi.org/10.1037/0022-3514.62.4.658>
- \*Cox, C. A. (2015). Decomposing the effects of negative framing in linear public goods games. *Economics Letters*, 126, 63–65. <http://dx.doi.org/10.1016/j.econlet.2014.11.015>
- \*Cox, C. A., & Stoddard, B. (2015). Framing and feedback in social dilemmas with partners and strangers. *Games*, 6, 394–412. <http://dx.doi.org/10.3390/g6040394>
- \*Cox, C. A., & Stoddard, B. (2018). *Common-value public goods and informational social dilemmas*. Unpublished manuscript, Department of Economics, Virginia Commonwealth University, Richmond, VA.
- \*Cozzolino, P. J., Sheldon, K. M., Schachtman, T. R., & Meyers, L. S. (2009). Limited time perspective, values, and greed: Imagining a limited future reduces avarice in extrinsic people. *Journal of Research in Personality*, 43, 399–408. <http://dx.doi.org/10.1016/j.jrp.2009.01.008>
- \*Cress, U. (2005). Ambivalent effect of member portraits in virtual groups. *Journal of Computer Assisted Learning*, 21, 281–291. <http://dx.doi.org/10.1111/j.1365-2729.2005.00136.x>
- \*Crockett, M. J., Clark, L., Hauser, M. D., & Robbins, T. W. (2010). Serotonin selectively influences moral judgment and behavior through effects on harm aversion. *Proceedings of the National Academy of Sciences of the United States of America*, 107, 17433–17438. <http://dx.doi.org/10.1073/pnas.1009396107>
- \*Crockett, M. J., Clark, L., Lieberman, M. D., Tabibnia, G., & Robbins, T. W. (2010). Impulsive choice and altruistic punishment are correlated and increase in tandem with serotonin depletion. *Emotion*, 10, 855–862. <http://dx.doi.org/10.1037/a0019861>
- Cronbach, L. J., & Gleser, G. C. (1965). *Psychological tests and personnel decisions*. Oxford, UK: University of Illinois Press.
- \*Crone, D. L., & Levy, N. L. (2019). Are free will believers nicer people? (Four studies suggest not). *Social Psychological and Personality Science*, 10, 612–619. <http://dx.doi.org/10.1177/1948550618780732>
- \*Currie, J., Buruju, D., Perrin, J. S., Reid, I. C., Steele, J. D., & Feltovich, N. (2017). Schizophrenia illness severity is associated with reduced loss aversion. *Brain Research*, 1664, 9–16. <http://dx.doi.org/10.1016/j.brainres.2017.03.006>
- \*Curry, O., Chesters, M. J., & Viding, E. (2011). The psychopath's dilemma: The effects of psychopathic personality traits in one-shot games. *Personality and Individual Differences*, 50, 804–809. <http://dx.doi.org/10.1016/j.paid.2010.12.036>
- \*Curry, O. S., Price, M. E., & Price, J. G. (2008). Patience is a virtue: Cooperative people have lower discount rates. *Personality and Individual Differences*, 44, 780–785. <http://dx.doi.org/10.1016/j.paid.2007.09.023>
- \*Dalbert, C., & Umlauf, S. (2009). The role of the justice motive in economic decision making. *Journal of Economic Psychology*, 30, 172–180. <http://dx.doi.org/10.1016/j.joep.2008.07.006>
- \*Danvers, A. F., & Shiota, M. N. (2018). Dynamically engaged smiling predicts cooperation above and beyond average smiling levels. *Evolution and Human Behavior*, 39, 112–119. <http://dx.doi.org/10.1016/j.evolhumbehav.2017.10.007>
- \*Davis, D., Ivanov, A., & Korenok, O. (2016). Individual characteristics and behavior in repeated games: An experimental study. *Experimental Economics*, 19, 67–99. <http://dx.doi.org/10.1007/s10683-014-9427-7>
- Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, 44, 113–126. <http://dx.doi.org/10.1037/0022-3514.44.1.113>
- \*De Bruin, E. N. M., & Van Lange, P. A. M. (1999). The double meaning of a single act: Influences of the perceiver and the perceived on cooperative behaviour. *European Journal of Personality*, 13, 165–182. [http://dx.doi.org/10.1002/\(SICI\)1099-0984\(199905/06\)13:3<165::AID-PER322>3.0.CO;2-9](http://dx.doi.org/10.1002/(SICI)1099-0984(199905/06)13:3<165::AID-PER322>3.0.CO;2-9)

- \*DeCelles, K. A., DeRue, D. S., Margolis, J. D., & Ceranic, T. L. (2012). Does power corrupt or enable? When and why power facilitates self-interested behavior. *Journal of Applied Psychology*, 97, 681–689. <http://dx.doi.org/10.1037/a0026811>
- \*Declerck, C. H., Boone, C., & Kiyonari, T. (2014a). The effect of oxytocin on cooperation in a prisoner's dilemma depends on the social context and a person's social value orientation. *Social Cognitive and Affective Neuroscience*, 9, 802–809. <http://dx.doi.org/10.1093/scan/nst040>
- \*Declerck, C. H., Boone, C., & Kiyonari, T. (2014b). No place to hide: When shame causes proselves to cooperate. *The Journal of Social Psychology*, 154, 74–88. <http://dx.doi.org/10.1080/00224545.2013.855158>
- \*De Cremer, D. (2000). Leadership selection in social dilemmas—Not all prefer it: The moderating effect of social value orientation. *Group Dynamics*, 4, 330–337. <http://dx.doi.org/10.1037/1089-2699.4.4.330>
- \*De Cremer, D., & Dewitte, S. (2002). Effect of trust and accountability in mixed-motive situations. *The Journal of Social Psychology*, 142, 541–543. <http://dx.doi.org/10.1080/00224540209603917>
- \*De Cremer, D., Snyder, M., & Dewitte, S. (2001). "The less I trust, the less I contribute (or not)?" The effects of trust, accountability and self-monitoring in social dilemmas. *European Journal of Social Psychology*, 31, 93–107. <http://dx.doi.org/10.1002/ejsp.34>
- De Cremer, D., & Tyler, T. R. (2005). Am I respected or not?: Inclusion and reputation as issues in group membership. *Social Justice Research*, 18, 121–153. <http://dx.doi.org/10.1007/s11211-005-7366-3>
- \*De Cremer, D., & van Dijk, E. (2002). Reactions to group success and failure as a function of identification level: A test of the goal-transformation hypothesis in social dilemmas. *Journal of Experimental Social Psychology*, 38, 435–442. [http://dx.doi.org/10.1016/S0022-1031\(02\)00009-4](http://dx.doi.org/10.1016/S0022-1031(02)00009-4)
- \*De Cremer, D., Van Knippenberg, D., van Dijk, E., & Van Leeuwen, E. (2008). Cooperating if one's goals are collective-based: Social identification effects in social dilemmas as a function of goal transformation. *Journal of Applied Social Psychology*, 38, 1562–1579. <http://dx.doi.org/10.1111/j.1559-1816.2008.00359.x>
- \*De Cremer, D., & Van Lange, P. A. M. (2001). Why prosocials exhibit greater cooperation than proselves: The roles of social responsibility and reciprocity. *European Journal of Personality*, 15, 5–18. <http://dx.doi.org/10.1002/per.418>
- \*De Cremer, D., & Van Vugt, M. (1999). Social identification effects in social dilemmas: A transformation of motives. *European Journal of Social Psychology*, 29, 871–893. [http://dx.doi.org/10.1002/\(SICI\)1099-0992\(199911\)29:7<871::AID-EJSP962>3.0.CO;2-I](http://dx.doi.org/10.1002/(SICI)1099-0992(199911)29:7<871::AID-EJSP962>3.0.CO;2-I)
- Decuyper, M., De Pauw, S., De Fruyt, F., De Bolle, M., & De Clercq, B. J. (2009). A meta-analysis of psychopathy-, antisocial PD- and FFM associations. *European Journal of Personality*, 23, 531–565. <http://dx.doi.org/10.1002/per.729>
- \*De Dreu, C. K. W., & McCusker, C. (1997). Gain-loss frames and cooperation in two-person social dilemmas: A transformational analysis. *Journal of Personality and Social Psychology*, 72, 1093–1106. <http://dx.doi.org/10.1037/0022-3514.72.5.1093>
- \*de Groene, V. (2016). *Active and reactive cooperation in economic games, contextualized games and framing effects* (Unpublished master's thesis). Vrije Universiteit Amsterdam, Amsterdam, the Netherlands.
- \*de Heus, P., Hoogervorst, N., & van Dijk, E. (2010). Framing prisoners and chickens: Valence effects in the prisoner's dilemma and the chicken game. *Journal of Experimental Social Psychology*, 46, 736–742. <http://dx.doi.org/10.1016/j.jesp.2010.04.013>
- \*de Hooij, I. E., Breugelmans, S. M., & Zeelenberg, M. (2008). Not so ugly after all: When shame acts as a commitment device. *Journal of Personality and Social Psychology*, 95, 933–943. <http://dx.doi.org/10.1037/a0011991>
- \*de Hooij, I. E., Zeelenberg, M., & Breugelmans, S. M. (2007). Moral sentiments and cooperation: Differential influences of shame and guilt. *Cognition and Emotion*, 21, 1025–1042. <http://dx.doi.org/10.1080/02699930600980874>
- \*de Jong, G., & Veijer, J. (2014). Cooperative behavior in strategic decision making: Human capital and personality traits. In T. K. Das (Ed.), *Behavioral strategy: Emerging perspectives* (pp. 55–78). Charlotte, NC: IAP Information Age Publishing.
- \*de Kwaadsteniet, E. W., van Dijk, E., Wit, A., & de Cremer, D. (2006). Social dilemmas as strong versus weak situations: Social value orientations and tacit coordination under resource size uncertainty. *Journal of Experimental Social Psychology*, 42, 509–516. <http://dx.doi.org/10.1016/j.jesp.2005.06.004>
- \*de Kwaadsteniet, E. W., van Dijk, E., Wit, A., & De Cremer, D. (2008). "How many of us are there?": Group size uncertainty and social value orientations in common resource dilemmas. *Group Processes & Intergroup Relations*, 11, 387–399. <http://dx.doi.org/10.1177/1368430208090649>
- \*Demiral, E., & Mollerstrom, J. (2017). *Entitled women—but not men—make tougher strategic demands as proposers in the ultimatum game*. DIW Discussion Papers, No. 1708. <http://dx.doi.org/10.2139/ssrn.3090265>
- \*Demmer, K. (2017). *Zum Zusammenhang von Persönlichkeit und Vertrauen* [On the relationship between personality and trust] (Unpublished bachelor's thesis). University of Koblenz-Landau, Landau, Germany.
- Denissen, J. J. A., & Penke, L. (2008). Motivational individual reaction norms underlying the Five-Factor Model of personality: First steps towards a theory-based conceptual framework. *Journal of Research in Personality*, 42, 1285–1302. <http://dx.doi.org/10.1016/j.jrp.2008.04.002>
- \*de Oliveira, A. C. M., Croson, R. T. A., & Eckel, C. C. (2011). The giving type: Identifying donors. *Journal of Public Economics*, 95, 428–435. <http://dx.doi.org/10.1016/j.jpubeco.2010.11.012>
- \*Deutsch, M. (1960). Trust, trustworthiness, and the F scale. *The Journal of Abnormal and Social Psychology*, 61, 138–140. <http://dx.doi.org/10.1037/h0046501>
- De Vries, A., De Vries, R. E., & Born, M. P. (2011). Broad versus narrow traits: Conscientiousness and honesty-humility as predictors of academic criteria. *European Journal of Personality*, 25, 336–348. <http://dx.doi.org/10.1002/per.795>
- De Vries, R. E., Tybur, J. M., Pollet, T. V., & van Vugt, M. (2016). Evolution, situational affordances, and the HEXACO model of personality. *Evolution and Human Behavior*, 37, 407–421. <http://dx.doi.org/10.1016/j.evolhumbehav.2016.04.001>
- DeYoung, C. G. (2015). Cybernetic Big Five Theory. *Journal of Research in Personality*, 56, 33–58. <http://dx.doi.org/10.1016/j.jrp.2014.07.004>
- DeYoung, C. G., Quilty, L. C., & Peterson, J. B. (2007). Between facets and domains: 10 aspects of the Big Five. *Journal of Personality and Social Psychology*, 93, 880–896. <http://dx.doi.org/10.1037/0022-3514.93.5.880>
- Dickman, S. J. (1990). Functional and dysfunctional impulsivity: Personality and cognitive correlates. *Journal of Personality and Social Psychology*, 58, 95–102. <http://dx.doi.org/10.1037/0022-3514.58.1.95>
- \*Dijkstra, J. (2013). Put your money where your mouth is: Reciprocity, social preferences, trust and contributions to public goods. *Rationality and Society*, 25, 290–334. <http://dx.doi.org/10.1177/1043463113492305>
- \*Dijkstra, J., & Bakker, D. M. (2017). Relative power: Material and contextual elements of efficacy in social dilemmas. *Social Science Research*, 62, 255–271. <http://dx.doi.org/10.1016/j.ssresearch.2016.08.011>
- \*Dorrough, A., Glöckner, A., & Lee, B. (2017). Race for power in public good games with unequal, unstable punishment power. *Journal of Behavioral Decision Making*, 30, 582–609. <http://dx.doi.org/10.1002/bdm.1976>
- \*Drażkowski, D., Kaczmarek, L. D., & Kashdan, T. B. (2017). Gratitude pays: A weekly gratitude intervention influences monetary decisions, physiological responses, and emotional experiences during a trust-



- related social interaction. *Personality and Individual Differences*, 110, 148–153. <http://dx.doi.org/10.1016/j.paid.2017.01.043>
- \*Drouvelis, M., & Nosenzo, D. (2013). Group identity and leading-by-example. *Journal of Economic Psychology*, 39, 414–425. <http://dx.doi.org/10.1016/j.joep.2013.06.005>
- Duckitt, J., Bizumic, B., Krauss, S. W., & Heled, E. (2010). A tripartite approach to right-wing authoritarianism: The Authoritarianism-Conservatism-Traditionalism model. *Political Psychology*, 31, 685–715. <http://dx.doi.org/10.1111/j.1467-9221.2010.00781.x>
- \*Dunn, B. D., Makarova, D., Evans, D., & Clark, L. (2010). “I’m worth more than that”: Trait positivity predicts increased rejection of unfair financial offers. *PLoS ONE*, 5, e15095. <http://dx.doi.org/10.1371/journal.pone.0015095>
- Dunning, D., Anderson, J. E., Schlösser, T., Ehlebracht, D., & Fetchenhauer, D. (2014). Trust at zero acquaintance: More a matter of respect than expectation of reward. *Journal of Personality and Social Psychology*, 107, 122–141. <http://dx.doi.org/10.1037/a0036673>
- Dunning, D. A., Fetchenhauer, D., & Schlösser, T. M. (2012). Trust as a social and emotional act: Noneconomic considerations in trust behavior. *Journal of Economic Psychology*, 33, 686–694. <http://dx.doi.org/10.1016/j.joep.2011.09.005>
- Dunning, D., Heath, C., & Suls, J. M. (2004). Flawed self-assessment: Implications for health, education, and the workplace. *Psychological Science in the Public Interest*, 5, 69–106. <http://dx.doi.org/10.1111/j.1529-1006.2004.00018.x>
- Duval, S., & Tweedie, R. (2000a). A nonparametric “trim and fill” method of accounting for publication bias in meta-analysis. *Journal of the American Statistical Association*, 95, 89–98.
- Duval, S., & Tweedie, R. (2000b). Trim and fill: A simple funnel-plot-based method of testing and adjusting for publication bias in meta-analysis. *Biometrics*, 56, 455–463. <http://dx.doi.org/10.1111/j.0006-341X.2000.00455.x>
- \*Eckel, C. C., & Wilson, R. K. (2004). Is trust a risky decision? *Journal of Economic Behavior & Organization*, 55, 447–465. <http://dx.doi.org/10.1016/j.jebo.2003.11.003>
- \*Edele, A., Dziobek, I., & Keller, M. (2013). Explaining altruistic sharing in the dictator game: The role of affective empathy, cognitive empathy, and justice sensitivity. *Learning and Individual Differences*, 24, 96–102. <http://dx.doi.org/10.1016/j.lindif.2012.12.020>
- Egger, M., Smith, G. D., Schneider, M., & Minder, C. (1997). Bias in meta-analysis detected by a simple, graphical test. *British Medical Journal*, 315, 629–634. <http://dx.doi.org/10.1136/bmj.315.7109.629>
- Ehrlich, S., & Maestas, C. (2010). Risk orientation, risk exposure, and policy opinions: The case of free trade. *Political Psychology*, 31, 657–684. <http://dx.doi.org/10.1111/j.1467-9221.2010.00774.x>
- \*Emanuele, E., Brondino, N., Bertona, M., Re, S., & Geroldi, D. (2008). Relationship between platelet serotonin content and rejections of unfair offers in the ultimatum game. *Neuroscience Letters*, 437, 158–161. <http://dx.doi.org/10.1016/j.neulet.2008.04.006>
- \*Emonds, G., Declerck, C. H., Boone, C., Seurinck, R., & Achten, R. (2014). Establishing cooperation in a mixed-motive social dilemma. An fMRI study investigating the role of social value orientation and dispositional trust. *Social Neuroscience*, 9, 10–22. <http://dx.doi.org/10.1080/17470919.2013.858080>
- \*Emonds, G., Declerck, C. H., Boone, C., Vandervliet, E. J. M., & Parizel, P. M. (2011). Comparing the neural basis of decision making in social dilemmas of people with different social value orientations, a fMRI study. *Journal of Neuroscience, Psychology, and Economics*, 4, 11–24. <http://dx.doi.org/10.1037/a0020151>
- Engel, C. (2011). Dictator games: A meta study. *Experimental Economics*, 14, 583–610. <http://dx.doi.org/10.1007/s10683-011-9283-7>
- \*Engel, C. (2014). Social preferences can make imperfect sanctions work: Evidence from a public good experiment. *Journal of Economic Behavior & Organization*, 108, 343–353. <http://dx.doi.org/10.1016/j.jebo.2014.02.015>
- Engelmann, D., & Strobel, M. (2004). Inequality aversion, efficiency, and maximin preferences in simple distribution experiments. *The American Economic Review*, 94, 857–869. <http://dx.doi.org/10.1257/0002828042002741>
- \*Englmaier, F., & Leider, S. (2010). *Gift exchange in the lab-It is not (only) how much you give . . .*. CESifo Working Paper No. 2944. Retrieved from [https://www.ifo.de/DocDL/cesifo1\\_wp2944.pdf](https://www.ifo.de/DocDL/cesifo1_wp2944.pdf)
- \*Eriksson, K., Cownden, D., Ehn, M., & Strimling, P. (2014). “Altruistic” and “antisocial” punishers are one and the same. *Review of Behavioral Economics*, 1, 1–13. <http://dx.doi.org/10.1561/105.000000009>
- \*Eriksson, K., Strimling, P., Andersson, P. A., & Lindholm, T. (2017). Costly punishment in the ultimatum game evokes moral concern, in particular when framed as payoff reduction. *Journal of Experimental Social Psychology*, 69, 59–64. <http://dx.doi.org/10.1016/j.jesp.2016.09.004>
- \*Esteve, M., Urbig, D., van Witteloostuijn, A., & Boyne, G. (2016). Prosocial behavior and public service motivation. *Public Administration Review*, 76, 177–187. <http://dx.doi.org/10.1111/puar.12480>
- \*Estrada, S. (2016). *The impact of individual differences and community factors on altruistic behavior* (Senior essay submitted for distinction). Yale University, New Haven, CT.
- \*Etang, A., Fielding, D., & Knowles, S. (2011). Does trust extend beyond the village? Experimental trust and social distance in Cameroon. *Experimental Economics*, 14, 15–35. <http://dx.doi.org/10.1007/s10683-010-9255-3>
- \*Etang, A., Fielding, D., & Knowles, S. (2016). Who votes expressively, and why? Experimental evidence. *Bulletin of Economic Research*, 68, 105–116. <http://dx.doi.org/10.1111/boer.12033>
- \*Evans, A. M., Dillon, K. D., & Rand, D. G. (2015). Fast but not intuitive, slow but not reflective: Decision conflict drives reaction times in social dilemmas. *Journal of Experimental Psychology: General*, 144, 951–966. <http://dx.doi.org/10.1037/xge0000107>
- \*Evans, A. M., & Revelle, W. (2008). Survey and behavioral measurements of interpersonal trust. *Journal of Research in Personality*, 42, 1585–1593. <http://dx.doi.org/10.1016/j.jrp.2008.07.011>
- Eysenck, H. J., & Eysenck, S. B. (1975). *Manual of the Eysenck Personality Questionnaire*. London, UK: Hodder and Stoughton.
- Eysenck, S. B., Eysenck, H. J., & Barrett, P. (1985). A revised version of the Psychoticism scale. *Personality and Individual Differences*, 6, 21–29. [http://dx.doi.org/10.1016/0191-8869\(85\)90026-1](http://dx.doi.org/10.1016/0191-8869(85)90026-1)
- \*Fahr, R., & Irlenbusch, B. (2008). Identifying personality traits to enhance trust between organisations: An experimental approach. *Managerial & Decision Economics*, 29, 469–487. <http://dx.doi.org/10.1002/mde.1415>
- \*Fahrenfort, J. J., van Winden, F., Pelloux, B., Stallen, M., & Ridderinkhof, K. R. (2012). Neural correlates of dynamically evolving interpersonal ties predict prosocial behavior. *Frontiers in Neuroscience*, 6, 28. <http://dx.doi.org/10.3389/fnins.2012.00028>
- \*Fatfouta, R., Rentzsch, K., & Schröder-Abé, M. (2018). Narcissus oeconomicus: Facets of narcissism and socio-economic decision-making. *Journal of Research in Personality*, 75, 12–16. <http://dx.doi.org/10.1016/j.jrp.2018.05.002>
- Fehr, E., Fischbacher, U., & Gächter, S. (2002). Strong reciprocity, human cooperation, and the enforcement of social norms. *Human Nature - An Interdisciplinary Biological Perspective*, 13, 1–25. <http://dx.doi.org/10.1007/s12110-002-1012-7>
- \*Fehr, E., & Leibbrandt, A. (2011). A field study on cooperativeness and impatience in the tragedy of the commons. *Journal of Public Economics*, 95, 1144–1155. <http://dx.doi.org/10.1016/j.jpubeco.2011.05.013>
- Fehr, E., & Schmidt, K. M. (1999). A theory of fairness, competition, and cooperation. *The Quarterly Journal of Economics*, 114, 817–868. <http://dx.doi.org/10.1162/003353599556151>

- \*Feinberg, M., Willer, R., & Keltner, D. (2012). Flustered and faithful: Embarrassment as a signal of prosociality. *Journal of Personality and Social Psychology*, 102, 81–97. <http://dx.doi.org/10.1037/a0025403>
- \*Fermin, A. S. R., Sakagami, M., Kiyonari, T., Li, Y., Matsumoto, Y., & Yamagishi, T. (2016). Representation of economic preferences in the structure and function of the amygdala and prefrontal cortex. *Scientific Reports*, 6, 20982. <http://dx.doi.org/10.1038/srep20982>
- \*Fetchnauer, D., & Huang, X. (2004). Justice sensitivity and distributive decisions in experimental games. *Personality and Individual Differences*, 36, 1015–1029. [http://dx.doi.org/10.1016/S0191-8869\(03\)00197-1](http://dx.doi.org/10.1016/S0191-8869(03)00197-1)
- \*Feyer, R., Leopold-Wildburger, U., & Pickl, S. (2008). The influence of social values in cooperation. In J. Kalcsics & S. Nickel (Eds.), *Operations Research Proceedings 2007* (pp. 205–210). Berlin, Germany: Springer. [http://dx.doi.org/10.1007/978-3-540-77903-2\\_32](http://dx.doi.org/10.1007/978-3-540-77903-2_32)
- \*Fiedler, S., Glöckner, A., Nicklisch, A., & Dickert, S. (2013). Social value orientation and information search in social dilemmas: An eye-tracking analysis. *Organizational Behavior and Human Decision Processes*, 120, 272–284. <http://dx.doi.org/10.1016/j.obhdp.2012.07.002>
- \*Fielding, D., Knowles, S., & Robertson, K. (2018). Alcohol, generosity and empathy. *Journal of Behavioral and Experimental Economics*, 76, 28–39. <http://dx.doi.org/10.1016/j.socec.2018.07.005>
- \*Fietzer, A. W., Ponterotto, J. G., Jackson, M. A., & Bolgatz, J. (2016). Cultural adjustment and social justice behaviour: The role of individual differences in multicultural personality. *European Journal of Personality*, 30, 552–563. <http://dx.doi.org/10.1002/per.2081>
- \*Fiori, M., Lintas, A., Mesrobian, S., & Villa, A. E. P. (2013). Effect of emotion and personality on deviation from purely rational decision-making. In T. V. Guy, M. Karny, & D. Wolpert (Eds.), *Decision making and imperfection* (pp. 129–161). Berlin, Germany: Springer. [http://dx.doi.org/10.1007/978-3-642-36406-8\\_5](http://dx.doi.org/10.1007/978-3-642-36406-8_5)
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison Wesley.
- Fleeson, W. (2001). Toward a structure- and process-integrated view of personality: Traits as density distribution of states. *Journal of Personality and Social Psychology*, 80, 1011–1027. <http://dx.doi.org/10.1037/0022-3514.80.6.1011>
- \*Fochmann, M., & Kroll, E. B. (2016). The effects of rewards on tax compliance decisions. *Journal of Economic Psychology*, 52, 38–55. <http://dx.doi.org/10.1016/j.joep.2015.09.009>
- Forsythe, R., Horowitz, J. L., Savin, N. E., & Sefton, M. (1994). Fairness in simple bargaining experiments. *Games and Economic Behavior*, 6, 347–369. <http://dx.doi.org/10.1006/game.1994.1021>
- \*Foschi, R., & Lauriola, M. (2014). Does sociability predict civic involvement and political participation? *Journal of Personality and Social Psychology*, 106, 339–357. <http://dx.doi.org/10.1037/a0035331>
- \*Frackenhohl, G., Hillenbrand, A., & Kube, S. (2016). Leadership effectiveness and institutional frames. *Experimental Economics*, 19, 842–863. <http://dx.doi.org/10.1007/s10683-015-9470-z>
- Frazier, M. L., Johnson, P. D., & Fainshmidt, S. (2013). Development and validation of a propensity to trust scale. *Journal of Trust Research*, 3, 76–97. <http://dx.doi.org/10.1080/21515581.2013.820026>
- French, E. G., & Chadwick, I. (1956). Some characteristics of affiliation motivation. *The Journal of Abnormal and Social Psychology*, 52, 296–300. <http://dx.doi.org/10.1037/h0045251>
- Frey, R., Pedroni, A., Mata, R., Rieskamp, J., & Hertwig, R. (2017). Risk preference shares the psychometric structure of major psychological traits. *Science Advances*, 3, e1701381. <http://dx.doi.org/10.1126/sciadv.1701381>
- \*Friehe, T., & Schildberg-Hörisch, H. (2017). Self-control and crime revisited: Disentangling the effect of self-control on risk taking and antisocial behavior. *International Review of Law and Economics*, 49, 23–32. <http://dx.doi.org/10.1016/j.irl.2016.11.001>
- \*Fudenberg, D., Rand, D. G., & Dreber, A. (2012). Slow to anger and fast to forgive: Cooperation in an uncertain world. *The American Economic Review*, 102, 720–749. <http://dx.doi.org/10.1257/aer.102.2.720>
- \*Füllbrunn, S., & Neugebauer, T. (2013). Limited liability, moral hazard, and risk taking: A safety net game experiment. *Economic Inquiry*, 51, 1389–1403. <http://dx.doi.org/10.1111/j.1465-7295.2012.00464.x>
- Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science*, 2, 156–168. <http://dx.doi.org/10.1177/2515245919847202>
- \*Fung, J. M. Y., Au, W. T., Hu, W., & Shi, K. (2012). Effect of risk orientation on cooperation and decision process in public goods dilemma. *Group Processes & Intergroup Relations*, 15, 791–803. <http://dx.doi.org/10.1177/1368430212448443>
- \*Gächter, S., Herrmann, B., & Thöni, C. (2004). Trust, voluntary cooperation, and socio-economic background: Survey and experimental evidence. *Journal of Economic Behavior & Organization*, 55, 505–531. <http://dx.doi.org/10.1016/j.jebo.2003.11.006>
- \*Galizzi, M. M., & Navarro-Martinez, D. (2019). On the external validity of social preference games: A systematic lab-field study. *Management Science*, 65, 976–1002. <http://dx.doi.org/10.1287/mnsc.2017.2908>
- Gallo, P. S. J., Jr., & Winchell, J. D. (1970). Matrix indices, large rewards, and cooperative behavior in a Prisoner's Dilemma game. *The Journal of Social Psychology*, 81, 235–241. <http://dx.doi.org/10.1080/00224545.1970.9922445>
- \*Gallup, A. C., O'Brien, D. T., & Wilson, D. S. (2010). The relationship between adolescent peer aggression and responses to a sequential prisoner's dilemma game during college: An explorative study. *Journal of Social, Evolutionary, and Cultural Psychology*, 4, 277–289. <http://dx.doi.org/10.1037/h0099283>
- Gamer, M., Lemon, J., Fellows, I., & Singh, P. (2019). irr: Various coefficients of interrater reliability and agreement [Computer software]. Retrieved from <https://cran.r-project.org/package=irr>
- \*Garbarini, F., Boero, R., D'Agata, F., Bravo, G., Mosso, C., Cauda, F., . . . Sacco, K. (2014). Neural correlates of gender differences in reputation building. *PLoS ONE*, 9, e106285. <http://dx.doi.org/10.1371/journal.pone.0106285>
- \*Gargalianou, V., Urbig, D., & van Witteloostuijn, A. (2017). Cooperating or competing in three languages: Cultural accommodation or alienation? *Cross Cultural & Strategic Management*, 24, 167–191. <http://dx.doi.org/10.1108/CCSM-01-2016-0008>
- \*Gärting, T. (1999). Value priorities, social value orientations and cooperation in social dilemmas. *British Journal of Social Psychology*, 38, 397–408. <http://dx.doi.org/10.1348/014466699164239>
- \*Garrison, K. E., Tang, D., & Schmeichel, B. J. (2016). Embodying power: A preregistered replication and extension of the power pose effect. *Social Psychological and Personality Science*, 7, 623–630. <http://dx.doi.org/10.1177/1948550616652209>
- \*Geniole, S. N., Busseri, M. A., & McCormick, C. M. (2013). Testosterone dynamics and psychopathic personality traits independently predict antagonistic behavior towards the perceived loser of a competitive interaction. *Hormones and Behavior*, 64, 790–798. <http://dx.doi.org/10.1016/j.yhbeh.2013.09.005>
- \*Gerbas, M. E., & Prentice, D. A. (2013). The Self- and Other-Interest Inventory. *Journal of Personality and Social Psychology*, 105, 495–514. <http://dx.doi.org/10.1037/a0033483>
- Gerlach, P., Teodorescu, K., & Hertwig, R. (2019). The truth about lies: A meta-analysis on dishonest behavior. *Psychological Bulletin*, 145, 1–44. <http://dx.doi.org/10.1037/bul0000174>
- \*Gerpott, F. H., Balliet, D., Columbus, S., Molho, C., & de Vries, R. E. (2018). How do people think about interdependence? A multidimensional model of subjective outcome interdependence. *Journal of Personality and Social Psychology*, 115, 716–742. <http://dx.doi.org/10.1037/pspp0000166>

- \*Geukes, K., Breil, S. M., Hutteman, R., Nestler, S., Kűfner, A. C. P., & Back, M. D. (2019). Explaining the longitudinal interplay of personality and social relationships in the laboratory and in the field: The PILS and the CONNECT study. *PLoS ONE*, 14, e0210424. <http://dx.doi.org/10.1371/journal.pone.0210424>
- \*Giacomantonio, M., De Dreu, C. K. W., Shalvi, S., Sligte, D., & Leder, S. (2010). Psychological distance boosts value-behavior correspondence in ultimatum bargaining and integrative negotiation. *Journal of Experimental Social Psychology*, 46, 824–829. <http://dx.doi.org/10.1016/j.jesp.2010.05.001>
- \*Gianotti, L. R. R., Nash, K., Baumgartner, T., Dahinden, F. M., & Knoch, D. (2018). Neural signatures of different behavioral types in fairness norm compliance. *Scientific Reports*, 8, 10513. <http://dx.doi.org/10.1038/s41598-018-28853-5>
- Gibson, J. J. (1977). The theory of affordances. In R. Shaw & J. Bransford (Eds.), *Perceiving, acting, and knowing: Toward an ecological psychology* (pp. 67–82). Hillsdale, NJ: Erlbaum.
- Gidron, Y. (2013). Trait anxiety. In M. D. Gellman & J. R. Turner (Eds.), *Encyclopedia of Behavioral Medicine* (p. 1989). New York, NY: Springer.
- Gignac, G. E., & Szodorai, E. T. (2016). Effect size guidelines for individual differences researchers. *Personality and Individual Differences*, 102, 74–78. <http://dx.doi.org/10.1016/j.paid.2016.06.069>
- \*Gillespie, S. M., Mitchell, I. J., Johnson, I., Dawson, E., & Beech, A. R. (2013). Exaggerated intergroup bias in economical decision making games: Differential effects of primary and secondary psychopathic traits. *PLoS ONE*, 8, e69565. <http://dx.doi.org/10.1371/journal.pone.0069565>
- \*Girtz, R., Hill, J., & Owens, M. (2017). Risk preferences, responsibility, and self-monitoring in a Stag Hunt. *Journal of Behavioral and Experimental Economics*, 68, 53–61. <http://dx.doi.org/10.1016/j.socec.2017.03.004>
- \*Glaeser, E. L., Laibson, D. I., Scheinkman, J. A., & Soutter, C. L. (2000). Measuring trust. *The Quarterly Journal of Economics*, 115, 811–846. <http://dx.doi.org/10.1162/003355300554926>
- \*Glöckner, A., & Hilbig, B. E. (2012). Risk is relative: Risk aversion yields cooperation rather than defection in cooperation-friendly environments. *Psychonomic Bulletin & Review*, 19, 546–553. <http://dx.doi.org/10.3758/s13423-012-0224-z>
- Gnambis, T., Scharl, A., & Schroeders, U. (2018). The structure of the Rosenberg Self-Esteem Scale: A cross-cultural meta-analysis. *Zeitschrift für Psychologie mit Zeitschrift für Angewandte Psychologie*, 226, 14–29. <http://dx.doi.org/10.1027/2151-2604/a000317>
- Gneezy, U., & Imas, A. (2017). Lab in the field: Measuring preferences in the wild. In A. V. Banerjee & E. Duflo (Eds.), *Handbook of economic field experiments* (Vol. 1, pp. 439–464). Amsterdam, the Netherlands: Elsevier. <http://dx.doi.org/10.1016/bs.hefe.2016.08.003>
- Gneezy, U., Meier, S., & Rey-Biel, P. (2011). When and why incentives (don't) work to modify behavior. *The Journal of Economic Perspectives*, 25, 191–210. <http://dx.doi.org/10.1257/jep.25.4.191>
- Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment*, 4, 26–42. <http://dx.doi.org/10.1037/1040-3590.4.1.26>
- \*Gollwitzer, M., & Rothmund, T. (2011). What exactly are victim-sensitive persons sensitive to? *Journal of Research in Personality*, 45, 448–455. <http://dx.doi.org/10.1016/j.jrp.2011.05.003>
- \*Goltermann, J., Dorrrough, A., & Glöckner, A. (2018). *A dissection of the trust game—The role of risk, social value orientation and beliefs*. Manuscript in preparation.
- \*Gong, X., Xia, L.-X., Sun, Y., Guo, L., Carpenter, V. C., Fang, Y., & Chen, Y. (2017). Proposal allocation ratio as a moderator of interpersonal responsibility effects on hostile decision-making in the Ultimatum Game. *Frontiers in Psychology*, 8, 1959. <http://dx.doi.org/10.3389/fpsyg.2017.01959>
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B. J., Jr. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, 37, 504–528. [http://dx.doi.org/10.1016/S0092-6566\(03\)00046-1](http://dx.doi.org/10.1016/S0092-6566(03)00046-1)
- \*Gradin, V. B., Pérez, A., MacFarlane, J. A., Cavin, I., Waiter, G., Engelmann, J., . . . Steele, J. D. (2015). Abnormal brain responses to social fairness in depression: An fMRI study using the Ultimatum Game. *Psychological Medicine*, 45, 1241–1251. <http://dx.doi.org/10.1017/S0033291714002347>
- \*Gradin, V. B., Pérez, A., Macfarlane, J. A., Cavin, I., Waiter, G., Tone, E. B., . . . Steele, J. D. (2016). Neural correlates of social exchanges during the Prisoner's Dilemma game in depression. *Psychological Medicine*, 46, 1289–1300. <http://dx.doi.org/10.1017/S0033291715002834>
- \*Greccucci, A., Giorgetta, C., Brambilla, P., Zuanon, S., Perini, L., Balestrieri, M., . . . Sanfey, A. G. (2013). Anxious ultimatums: How anxiety disorders affect socioeconomic behaviour. *Cognition and Emotion*, 27, 230–244. <http://dx.doi.org/10.1080/02699931.2012.698982>
- Griesinger, D. W., & Livingston, J. W., Jr. (1973). Toward a model of interpersonal motivation in experimental games. *Behavioral Science*, 18, 173–188. <http://dx.doi.org/10.1002/bs.3830180305>
- Grina, J., Bergh, R., Akrami, N., & Sidanius, J. (2016). Political orientation and dominance: Are people on the political right more dominant? *Personality and Individual Differences*, 94, 113–117. <http://dx.doi.org/10.1016/j.paid.2016.01.015>
- \*Gross, J. (2018). *The influence of democratic and dictatorial leadership on public goods provisions*. Unpublished raw data, Department of Psychology, University of Leiden, Leiden, the Netherlands.
- \*Gross, J., Méder, Z. Z., Okamoto-Barth, S., & Riedl, A. (2016). Building the Leviathan—Voluntary centralisation of punishment power sustains cooperation in humans. *Scientific Reports*, 6, 20767. <http://dx.doi.org/10.1038/srep20767>
- \*Guilfoos, T., & Kurtz, K. J. (2017). Evaluating the role of personality trait information in social dilemmas. *Journal of Behavioral and Experimental Economics*, 68, 119–129. <http://dx.doi.org/10.1016/j.socec.2017.04.006>
- \*Gummerum, M., & Hanoch, Y. (2012). Altruism behind bars: Sharing, justice, perspective taking and empathy among inmates. *Social Justice Research*, 25, 61–78. <http://dx.doi.org/10.1007/s11211-012-0149-8>
- \*Gunnthorsdottir, A., McCabe, K. A., & Smith, V. (2002). Using the Machiavellianism instrument to predict trustworthiness in a bargaining game. *Journal of Economic Psychology*, 23, 49–66. [http://dx.doi.org/10.1016/S0167-4870\(01\)00067-8](http://dx.doi.org/10.1016/S0167-4870(01)00067-8)
- Gűth, W., Schmittberger, R., & Schwarze, B. (1982). An experimental analysis of ultimatum bargaining. *Journal of Economic Behavior & Organization*, 3, 367–388. [http://dx.doi.org/10.1016/0167-2681\(82\)90011-7](http://dx.doi.org/10.1016/0167-2681(82)90011-7)
- \*Guzmán, R. A., Harrison, R., Abarca, N., & Villena, M. G. (in press). A game-theoretic model of reciprocity and trust that incorporates personality traits. *Journal of Behavioral and Experimental Economics*.
- \*Haesevoets, T., Reinders Folmer, C., Bostyn, D. H., & Van Hiel, A. (2018). Behavioural consistency within the Prisoner's Dilemma Game: The role of personality and situation. *European Journal of Personality*, 32, 405–426. <http://dx.doi.org/10.1002/per.2158>
- \*Haesevoets, T., Reinders Folmer, C., & Van Hiel, A. (2015). Cooperation in mixed-motive games: The role of individual differences in selfish and social orientation. *European Journal of Personality*, 29, 445–458. <http://dx.doi.org/10.1002/per.1992>
- \*Haesevoets, T., Van Hiel, A., & Reinders Folmer, C. (2015). The underlying motives of different mixed-motive games. *European Journal of Personality*, 29, 580–584. <http://dx.doi.org/10.1002/per.2035>
- \*Halimatussadiyah, A., Resosudarmo, B. P., & Widyawati, D. (2017). Social capital to induce a contribution to environmental collective action: Results from a laboratory experiment in Indonesia. *International Journal of Environment and Sustainable Development*, 16, 397–414. <http://dx.doi.org/10.1504/IJESD.2017.087262>



- Hardin, G. (1968). The tragedy of the commons. The population problem has no technical solution; it requires a fundamental extension in morality. *Science*, 162, 1243–1248.
- \*Haring, K. S., Matsumoto, Y., & Watanabe, K. (2013). *How do people perceive and trust a lifelike robot*. Proceedings of the World Congress on Engineering and Computer Science 2013 Vol I, San Francisco, CA.
- \*Harrell, A., & Simpson, B. (2016). The dynamics of prosocial leadership: Power and influence in collective action groups. *Social Forces*, 94, 1283–1308. <http://dx.doi.org/10.1093/sf/sov110>
- \*Harth, N. S., & Regner, T. (2017). The spiral of distrust: (Non-) cooperation in a repeated trust game is predicted by anger and individual differences in negative reciprocity orientation. *International Journal of Psychology*, 52, 18–25. <http://dx.doi.org/10.1002/ijop.12257>
- \*Haruno, M., Kimura, M., & Frith, C. D. (2014). Activity in the nucleus accumbens and amygdala underlies individual differences in prosocial and individualistic economic choices. *Journal of Cognitive Neuroscience*, 26, 1861–1870. [http://dx.doi.org/10.1162/jocn\\_a\\_00589](http://dx.doi.org/10.1162/jocn_a_00589)
- \*Hasan, S. (2013). *Incorporating personality trait psychology into economic decision making models* (Master's thesis). Clemson University, Clemson, SC. Retrieved from [https://tigerprints.clemson.edu/all\\_theses/479](https://tigerprints.clemson.edu/all_theses/479)
- \*He, S., Offerman, T., & van de Ven, J. (2017). The sources of the communication gap. *Management Science*, 63, 2832–2846. <http://dx.doi.org/10.1287/mnsc.2016.2518>
- \*Heimburger, A. (2018). *Awe und prosoziales Verhalten: Der Zusammenhang von Awe und prosozialem Verhalten, mediert durch ein reduziertes Selbst* [Awe and prosocial behavior: The relation between awe and prosocial behavior mediated by a reduced self] (Unpublished master's thesis). University of Mannheim, Mannheim, Germany.
- Hendriks, A. a. J., Hofstee, W. K. B., & De Raad, B. (1999). The Five-Factor Personality Inventory (FFPI). *Personality and Individual Differences*, 27, 307–325. [http://dx.doi.org/10.1016/S0191-8869\(98\)00245-1](http://dx.doi.org/10.1016/S0191-8869(98)00245-1)
- \*Herne, K., Lappalainen, O., Setälä, M., & Ylisalo, J. (2018). *Trust is good, accountability is better: Evidence from a three-player trust game*. Manuscript submitted for publication.
- Hertwig, R., & Ortmann, A. (2001). Experimental practices in economics: A methodological challenge for psychologists? *Behavioral and Brain Sciences*, 24, 383–403. <http://dx.doi.org/10.1017/S0140525X01004149>
- Hertwig, R., & Ortmann, A. (2008a). Deception in experiments: Revisiting the arguments in its defense. *Ethics & Behavior*, 18, 59–92. <http://dx.doi.org/10.1080/10508420701712990>
- Hertwig, R., & Ortmann, A. (2008b). Deception in social psychological experiments: Two misconceptions and a research agenda. *Social Psychology Quarterly*, 71, 222–227. <http://dx.doi.org/10.1177/019027250807100304>
- \*Hilbig, B. E., Henninger, F., & Kieslich, P. J. (2012). *Personality and Dictator Game with earned endowment*. Unpublished raw data, University of Mannheim, Germany.
- \*Hilbig, B. E., Henninger, F., Kieslich, P. J., & Thielmann, I. (2014). *Personality and predictions about others' prosocial behavior*. Unpublished raw data, University of Mannheim, Germany.
- \*Hilbig, B. E., Kieslich, P. J., Henninger, F., Thielmann, I., & Zettler, I. (2018). Lead us (not) into temptation: Testing the motivational mechanisms linking Honesty-Humility to cooperation. *European Journal of Personality*, 32, 116–127. <http://dx.doi.org/10.1002/per.2149>
- Hilbig, B. E., Moshagen, M., & Zettler, I. (2015). Truth will out: Linking personality, morality, and honesty through indirect questioning. *Social Psychological and Personality Science*, 6, 140–147. <http://dx.doi.org/10.1177/1948550614553640>
- Hilbig, B. E., Moshagen, M., & Zettler, I. (2016). Prediction consistency: A test of the equivalence assumption across different indicators of the same construct. *European Journal of Personality*, 30, 637–647. <http://dx.doi.org/10.1002/per.2085>
- \*Hilbig, B. E., Thielmann, I., Hepp, J., Klein, S. A., & Zettler, I. (2015). From personality to altruistic behavior (and back): Evidence from a double-blind dictator game. *Journal of Research in Personality*, 55, 46–50. <http://dx.doi.org/10.1016/j.jrp.2014.12.004>
- \*Hilbig, B. E., Thielmann, I., Klein, S. A., & Henninger, F. (2016). The two faces of cooperation: On the unique role of HEXACO agreeableness for forgiveness versus retaliation. *Journal of Research in Personality*, 64, 69–78. <http://dx.doi.org/10.1016/j.jrp.2016.08.004>
- \*Hilbig, B. E., Thielmann, I., Wüthrich, J., & Zettler, I. (2015). From Honesty-Humility to fair behavior—Benevolence or a (blind) fairness norm? *Personality and Individual Differences*, 80, 91–95. <http://dx.doi.org/10.1016/j.paid.2015.02.017>
- \*Hilbig, B. E., & Zettler, I. (2009). Pillars of cooperation: Honesty-Humility, social value orientations, and economic behavior. *Journal of Research in Personality*, 43, 516–519. <http://dx.doi.org/10.1016/j.jrp.2009.01.003>
- \*Hilbig, B. E., Zettler, I., & Heydasch, T. (2012). Personality, punishment and public goods: Strategic shifts towards cooperation as a matter of dispositional Honesty-Humility. *European Journal of Personality*, 26, 245–254. <http://dx.doi.org/10.1002/per.830>
- \*Hilbig, B. E., Zettler, I., Leist, F., & Heydasch, T. (2013). It takes two: Honesty-Humility and Agreeableness differentially predict active versus reactive cooperation. *Personality and Individual Differences*, 54, 598–603. <http://dx.doi.org/10.1016/j.paid.2012.11.008>
- \*Hill, J. M. (2013). *Noncognitive determinants of economic outcomes and behaviors: An empirical and experimental analysis* (Doctoral dissertation). Middle Tennessee State University, Murfreesboro, TN. Retrieved from <http://jewelscholar.mtsu.edu/handle/mtsu/3673>
- \*Hillenbrand, A., & Verrina, E. (2018). *The differential effect of narratives*. MPI Collective Goods Discussion Paper, No. 2018/16. <http://dx.doi.org/10.2139/ssrn.3303744>
- \*Hirsh, J. B., & Peterson, J. B. (2009). Extraversion, neuroticism, and the Prisoner's Dilemma. *Personality and Individual Differences*, 46, 254–256. <http://dx.doi.org/10.1016/j.paid.2008.10.006>
- Ho, A. K., Sidanius, J., Kteily, N., Sheehy-Skeffington, J., Pratto, F., Henkel, K. E., . . . Stewart, A. L. (2015). The nature of social dominance orientation: Theorizing and measuring preferences for intergroup inequality using the new SDO<sub>7</sub> scale. *Journal of Personality and Social Psychology*, 109, 1003–1028. <http://dx.doi.org/10.1037/pspi0000033>
- \*Hoeft, L., & Mill, W. (2017). Selfish punishers: An experimental investigation of designated punishment behavior in public goods. *Economics Letters*, 157, 41–44. <http://dx.doi.org/10.1016/j.econlet.2017.05.022>
- \*Hofmann, W., & Baumeister, A. (2010). Immediate affect as a basis for intuitive moral judgement: An adaptation of the affect misattribution procedure. *Cognition and Emotion*, 24, 522–535. <http://dx.doi.org/10.1080/02699930902847193>
- Holmes, J. G. (2004). The benefits of abstract functional analysis in theory construction: The case of interdependence theory. *Personality and Social Psychology Review*, 8, 146–155. [http://dx.doi.org/10.1207/s15327957pspr0802\\_8](http://dx.doi.org/10.1207/s15327957pspr0802_8)
- Holt, C. A., & Laury, S. K. (2002). Risk aversion and incentive effects. *The American Economic Review*, 92, 1644–1655. <http://dx.doi.org/10.1257/000282802762024700>
- \*Hommelhoff, S., & Richter, D. (2017). Refuting the cliché of the distrustful manager. *European Management Journal*, 35, 164–173. <http://dx.doi.org/10.1016/j.emj.2016.06.007>
- \*Hou, Y., Zhao, L., Yao, Q., & Ding, L. (2016). Altered economic decision-making in abstinent heroin addicts: Evidence from the ultimatum game. *Neuroscience Letters*, 627, 148–154. <http://dx.doi.org/10.1016/j.neulet.2016.06.002>
- Houston, J. M., McIntire, S. A., Kinnie, J., & Terry, C. (2002). A factorial analysis of scales measuring competitiveness. *Educational and Psychological Measurement*, 62, 284–298. <http://dx.doi.org/10.1177/0013164402062002006>

- \*Hoyer, M., Bault, N., Loerakker, B., & van Winden, F. (2014). Destructive behavior in a fragile public good game. *Economics Letters*, 123, 295–299. <http://dx.doi.org/10.1016/j.econlet.2014.02.023>
- \*Huang, L., & Murnighan, J. K. (2010). What's in a name? Subliminally activating trusting behavior. *Organizational Behavior and Human Decision Processes*, 111, 62–70. <http://dx.doi.org/10.1016/j.obhdp.2009.10.002>
- \*Hugh-Jones, D., Ron, I., & Zultan, R. (2019). Humans reciprocate by discriminating against group peers. *Evolution and Human Behavior*, 40, 90–95. <http://dx.doi.org/10.1016/j.evolhumbehav.2018.08.005>
- \*Hulbert, L. G., Corrêa da Silva, M. L., & Adegboyega, G. (2001). Cooperation in social dilemmas and allocentrism: A social values approach. *European Journal of Social Psychology*, 31, 641–657. <http://dx.doi.org/10.1002/ejsp.53>
- \*Hulka, L. M., Eisenegger, C., Preller, K. H., Vonmoos, M., Jenni, D., Bendrick, K., . . . Quednow, B. B. (2014). Altered social and non-social decision-making in recreational and dependent cocaine users. *Psychological Medicine*, 44, 1015–1028. <http://dx.doi.org/10.1017/S0033291713001839>
- Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis: Correcting error and bias in research findings* (2nd ed.). Thousand Oaks, CA: Sage. <http://dx.doi.org/10.4135/9781412985031>
- \*Ibáñez, M. I., Sabater-Grande, G., Barrera-Tarazona, I., Mezquita, L., López-Ovejero, S., Villa, H., . . . Georgantzis, N. (2016). Take the money and run: Psychopathic behavior in the trust game. *Frontiers in Psychology*, 7, 1866. <http://dx.doi.org/10.3389/fpsyg.2016.01866>
- \*Ingerson, M.-C. (2014). *Integrity matters: Construction and validation of an instrument to assess ethical integrity as an attitude-like phenomenon* (Doctoral dissertation). Brigham Young University, Provo, UT. Retrieved from <https://scholarsarchive.byu.edu/etd/5491>
- Insko, C. A., Wildschut, T., & Cohen, T. R. (2013). Interindividual–intergroup discontinuity in the prisoner's dilemma game: How common fate, proximity, and similarity affect intergroup competition. *Organizational Behavior and Human Decision Processes*, 120, 168–180. <http://dx.doi.org/10.1016/j.obhdp.2012.07.004>
- \*Irlenbusch, B., & Ter Meer, J. (2013). Fooling the nice guys: Explaining receiver credulity in a public good game with lying and punishment. *Journal of Economic Behavior & Organization*, 93, 321–327. <http://dx.doi.org/10.1016/j.jebo.2013.03.023>
- \*Irwin, K., McGrimmon, T., & Simpson, B. (2008). Sympathy and social order. *Social Psychology Quarterly*, 71, 379–397. <http://dx.doi.org/10.1177/019027250807100406>
- Isaac, R. M., Walker, J. M., & Thomas, S. H. (1984). Divergent evidence on free riding: An experimental examination of possible explanations. *Public Choice*, 43, 113–149. <http://dx.doi.org/10.1007/BF00140829>
- \*Ishii, K., & Kurzban, R. (2008). Public goods games in Japan: Cultural and individual differences in reciprocity. *Human Nature*, 19, 138–156. <http://dx.doi.org/10.1007/s12110-008-9034-4>
- \*Jacquemet, N., Luchini, S., Malézieux, A., & Shogren, J. F. (2019). A psychometric investigation of the personality traits underlying individual tax morale. *The B.E. Journal of Economic Analysis and Policy*, 19(3). <http://dx.doi.org/10.1515/bejap-2018-0149>
- \*Janusch, N., & Motika, M. (2016). *Linear public goods game cross-sample comparisons*. Unpublished raw data, Department of Applied Statistics and Economics, University of Delaware, Newark, DE.
- \*Jerabeck, J. M., & Ferguson, C. J. (2013). The influence of solitary and cooperative violent video game play on aggressive and prosocial behavior. *Computers in Human Behavior*, 29, 2573–2578. <http://dx.doi.org/10.1016/j.chb.2013.06.034>
- \*Johansson-Stenman, O., Mahmud, M., & Martinsson, P. (2013). Trust, trust games and stated trust: Evidence from rural Bangladesh. *Journal of Economic Behavior & Organization*, 95, 286–298. <http://dx.doi.org/10.1016/j.jebo.2011.06.022>
- John, O. P., Donahue, E. M., & Kentle, R. L. (1991). *The Big Five Inventory: Versions 4a and 54*. Berkeley: Institute of Personality and Social Research, University of California, Berkeley.
- Johnson, J. A. (2014). Measuring thirty facets of the Five Factor Model with a 120-item public domain inventory: Development of the IPIP-NEO-120. *Journal of Research in Personality*, 51, 78–89. <http://dx.doi.org/10.1016/j.jrp.2014.05.003>
- \*Johnson, M. K., Rustichini, A., & MacDonald, A. W., III. (2009). Suspicious personality predicts behavior on a social decision-making task. *Personality and Individual Differences*, 47, 30–35. <http://dx.doi.org/10.1016/j.paid.2009.01.050>
- Johnson, N. D., & Mislin, A. A. (2011). Trust games: A meta-analysis. *Journal of Economic Psychology*, 32, 865–889. <http://dx.doi.org/10.1016/j.joep.2011.05.007>
- \*Johnston, L., Hawes, D. J., & Straiton, M. (2014). Psychopathic traits and social cooperation in the context of emotional feedback. *Psychiatry, Psychology and Law*, 21, 767–778. <http://dx.doi.org/10.1080/13218719.2014.893550>
- \*Joireman, J., Posey, D. C., Truelove, H. B., & Parks, C. D. (2009). The environmentalist who cried drought: Reactions to repeated warnings about depleting resources under conditions of uncertainty. *Journal of Environmental Psychology*, 29, 181–192. <http://dx.doi.org/10.1016/j.jenvp.2008.10.003>
- \*Jones, B. A., & Rachlin, H. (2009). Delay, probability, and social discounting in a public goods game. *Journal of the Experimental Analysis of Behavior*, 91, 61–73. <http://dx.doi.org/10.1901/jeab.2009.91-61>
- \*Josef, A. K., Richter, D., Samanez-Larkin, G. R., Wagner, G. G., Hertwig, R., & Mata, R. (2016). Stability and change in risk-taking propensity across the adult life span. *Journal of Personality and Social Psychology*, 111, 430–450. <http://dx.doi.org/10.1037/pspp0000090>
- \*Kagel, J., & McGee, P. (2014). Personality and cooperation in finitely repeated prisoner's dilemma games. *Economics Letters*, 124, 274–277. <http://dx.doi.org/10.1016/j.econlet.2014.05.034>
- \*Kaiser, F. G., & Byrka, K. (2011). Environmentalism as a trait: Gauging people's prosocial personality in terms of environmental engagement. *International Journal of Psychology*, 46, 71–79. <http://dx.doi.org/10.1080/00207594.2010.516830>
- \*Kaltwasser, L., Hildebrandt, A., Wilhelm, O., & Sommer, W. (2016). Behavioral and neuronal determinants of negative reciprocity in the ultimatum game. *Social Cognitive and Affective Neuroscience*, 11, 1608–1617. <http://dx.doi.org/10.1093/scan/nsw069>
- \*Kaltwasser, L., Hildebrandt, A., Wilhelm, O., & Sommer, W. (2017). On the relationship of emotional abilities and prosocial behavior. *Evolution and Human Behavior*, 38, 298–308. <http://dx.doi.org/10.1016/j.evolhumbehav.2016.10.011>
- \*Kamas, L., & Preston, A. (2019). *Empathy, gender, and prosocial behavior*. Unpublished manuscript, Department of Economics, Santa Clara University, Santa Clara, CA.
- \*Kamijo, Y., & Tamura, T. (2016). *Altruistic and risk preference of individuals and groups*. Working Papers SDES-2016–12, Kochi University of Technology, School of Economics and Management.
- \*Kammerer, W. D. (2012). *Developing public policy and law based solely on reciprocal cooperation equilibria is ill-founded: The implications of four psychological factors in a repeated prisoner's dilemma game* (Doctoral dissertation). Alliant International University, Alhambra, CA. Available from ProQuest Dissertations and Theses database.
- \*Kanagaretnam, K., Mestelman, S., Nainar, K., & Shehata, M. (2009). The impact of social value orientation and risk attitudes on trust and reciprocity. *Journal of Economic Psychology*, 30, 368–380. <http://dx.doi.org/10.1016/j.joep.2008.12.003>
- \*Karagonlar, G., & Kuhlman, D. M. (2013). The role of social value orientation in response to an unfair offer in the Ultimatum Game. *Organizational Behavior and Human Decision Processes*, 120, 228–239. <http://dx.doi.org/10.1016/j.obhdp.2012.07.006>



- \*Kassinove, H., Roth, D., Owens, S. G., & Fuller, J. R. (2002). Effects of trait anger and anger expression style on competitive attack responses in a wartime prisoner's dilemma game. *Aggressive Behavior*, 28, 117–125. <http://dx.doi.org/10.1002/ab.90013>
- \*Kato, T. A., Watabe, M., Tsuboi, S., Ishikawa, K., Hashiya, K., Monji, A., . . . Kanba, S. (2012). Minocycline modulates human social decision-making: Possible impact of microglia on personality-oriented social behaviors. *PLoS ONE*, 7, e40461. <http://dx.doi.org/10.1371/journal.pone.0040461>
- \*Keller, J., Mayo, R., Greifeneder, R., & Pfattheicher, S. (2015). Regulatory focus and generalized trust: The impact of prevention-focused self-regulation on trusting others. *Frontiers in Psychology*, 6, 254. <http://dx.doi.org/10.3389/fpsyg.2015.00254>
- \*Keller, J., & Pfattheicher, S. (2011). Vigilant self-regulation, cues of being watched and cooperativeness. *European Journal of Personality*, 25, 363–372. <http://dx.doi.org/10.1002/per.797>
- Kelley, H. H., Holmes, J. G., Kerr, N. L., Reis, H. T., Rusbult, C. E., & Van Lange, P. A. M. (2003). *An atlas of interpersonal situations*. New York, NY: Cambridge University Press. <http://dx.doi.org/10.1017/CBO9780511499845>
- Kelley, H. H., & Thibaut, J. W. (1978). *Interpersonal relations: A theory of interdependence*. New York, NY: Wiley.
- \*Kenan Institute for Ethics of the Duke University. (2012). *Measuring Morality Survey* [Dataset]. Retrieved from <https://kenan.ethics.duke.edu/attitudes/resources/measuring-morality/>
- \*Kerr, N. L., & Harris, S. E. (1996). Why do cooperators cooperate? Efficacy as a moderator of social motive effects. In W. B. G. Liebrand & D. M. Messick (Eds.), *Frontiers in social dilemmas research* (pp. 101–115). Berlin, Germany: Springer. [http://dx.doi.org/10.1007/978-3-642-85261-9\\_6](http://dx.doi.org/10.1007/978-3-642-85261-9_6)
- \*Kibbe. (2016). *Intrinsische Umweltmotivation - Selbstbestimmungstheorie und Campbell-Paradigma im Vergleich* [Intrinsic environmental motivation - A comparison of self-determination theory and Campbell paradigm] (Unpublished doctoral dissertation). Otto-von-Guericke-Universität Magdeburg, Magdeburg, Germany.
- \*Kieslich, P. J., & Hilbig, B. E. (2014). Cognitive conflict in social dilemmas: An analysis of response dynamics. *Judgment and Decision Making*, 9, 510–522.
- \*Kim, B. (2016). *Influential factors of trust decision* (Doctoral dissertation). Washington State University, WA. Retrieved from <http://hdl.handle.net/2376/12023>
- \*Kimmerle, J., Wodzicki, K., Jarodzka, H., & Cress, U. (2011). Value of information, behavioral guidelines, and social value orientation in an information-exchange dilemma. *Group Dynamics*, 15, 173–186. <http://dx.doi.org/10.1037/a0021467>
- \*Kinnunen, S. P., & Windmann, S. (2013). Dual-processing altruism. *Frontiers in Psychology*, 4, 193. <http://dx.doi.org/10.3389/fpsyg.2013.00193>
- \*Kistler, D., Thöni, C., & Welzel, C. (2017). Survey response and observed behavior: Emancipative and secular values predict prosocial behaviors. *Journal of Cross-Cultural Psychology*, 48, 461–489. <http://dx.doi.org/10.1177/0022022117696799>
- \*Kleine, F., Königstein, M., & Rozsnyói, B. (2014). Voluntary leadership in an experimental trust game. *Journal of Economic Behavior & Organization*, 108, 442–452. <http://dx.doi.org/10.1016/j.jebo.2014.02.008>
- \*Klimecki, O. M., Mayer, S. V., Jusyte, A., Scheeff, J., & Schönenberg, M. (2016). Empathy promotes altruistic behavior in economic interactions. *Scientific Reports*, 6, 31961. <http://dx.doi.org/10.1038/srep31961>
- Kline, R., Bankert, A., Levitan, L., & Kraft, P. (2019). Personality and prosocial behavior: A multilevel meta-analysis. *Political Science Research and Methods*, 7, 125–142.
- Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *The Quarterly Journal of Economics*, 112, 1251–1288. <http://dx.doi.org/10.1162/003355300555475>
- \*Kocher, M. G., Martinsson, P., Myrseth, K. O. R., & Wollbrant, C. E. (2017). Strong, bold, and kind: Self-control and cooperation in social dilemmas. *Experimental Economics*, 20, 44–69. <http://dx.doi.org/10.1007/s10683-015-9475-7>
- \*Kocher, M. G., & Matzat, D. (2016). Preferences over punishment and reward mechanisms in social dilemmas. *Journal of Institutional and Theoretical Economics*, 172, 163–194. <http://dx.doi.org/10.1628/093245616X14500948554072>
- \*Koenigs, M., Kruepke, M., & Newman, J. P. (2010). Economic decision-making in psychopathy: A comparison with ventromedial prefrontal lesion patients. *Neuropsychologia*, 48, 2198–2204. <http://dx.doi.org/10.1016/j.neuropsychologia.2010.04.012>
- \*Kong, D. T. (2018). Trust toward a group of strangers as a function of stereotype-based social identification. *Personality and Individual Differences*, 120, 265–270. <http://dx.doi.org/10.1016/j.paid.2017.03.031>
- Konstabel, K., Lönnqvist, J.-E., Walkowitz, G., Konstabel, K., & Verkasalo, M. (2012). The 'Short Five' (S5): Measuring personality traits using comprehensive single items. *European Journal of Personality*, 26, 13–29. <http://dx.doi.org/10.1002/per.813>
- \*Koole, S. L., Jager, W., van den Berg, A. E., Vlek, C. A. J., & Hofstee, W. K. B. (2001). On the social nature of personality: Effects of extra-version, agreeableness, and feedback about collective resource use on cooperation in a resource dilemma. *Personality and Social Psychology Bulletin*, 27, 289–301. <http://dx.doi.org/10.1177/0146167201273003>
- \*Kortenkamp, K. V., & Moore, C. F. (2006). Time, uncertainty, and individual differences in decisions to cooperate in resource dilemmas. *Personality and Social Psychology Bulletin*, 32, 603–615. <http://dx.doi.org/10.1177/0146167205284006>
- \*Kotani, K., Managi, S., & Tanaka, K. (2008). Further investigations of framing effects on cooperative choices in a provision point mechanism. *Economic Bulletin*, 3, 1–9.
- \*Kramer, R. M., McClintock, C. G., & Messick, D. M. (1986). Social values and cooperative response to a simulated resource conservation crisis. *Journal of Personality*, 54, 576–582. <http://dx.doi.org/10.1111/j.1467-6494.1986.tb00413.x>
- \*Kraus, M. W., & Callaghan, B. (2016). Social class and prosocial behavior: The moderating role of public versus private contexts. *Social Psychological and Personality Science*, 7, 769–777. <http://dx.doi.org/10.1177/1948550616659120>
- Krekels, G., & Pandelaere, M. (2015). Dispositional greed. *Personality and Individual Differences*, 74, 225–230. <http://dx.doi.org/10.1016/j.paid.2014.10.036>
- \*Kuhlman, D. M., & Marshello, A. F. (1975). Individual differences in game motivation as moderators of preprogrammed strategy effects in prisoner's dilemma. *Journal of Personality and Social Psychology*, 32, 922–931. <http://dx.doi.org/10.1037/0022-3514.32.5.922>
- \*Kuhlman, D. M., & Wimberley, D. L. (1976). Expectations of choice behavior held by cooperators, competitors, and individualists across four classes of experimental games. *Journal of Personality and Social Psychology*, 34, 69–81. <http://dx.doi.org/10.1037/0022-3514.34.1.69>
- \*Kurzban, R., & Houser, D. (2001). Individual differences in cooperation in a circular public goods game. *European Journal of Personality*, 15, S37–S52. <http://dx.doi.org/10.1002/per.420>
- \*Kuwabara, K., Vogt, S., Watabe, M., & Komiya, A. (2014). Trust, cohesion, and cooperation after early versus late trust violations in two-person exchange: The role of generalized trust in the United States and Japan. *Social Psychology Quarterly*, 77, 344–360. <http://dx.doi.org/10.1177/0190272514546757>
- \*Ladbury, J. L., & Hinsz, V. B. (2018). How the distribution of member expectations influences cooperation and competition in groups: A social relations model analysis of social dilemmas. *Personality and Social Psychology Bulletin*, 44, 1502–1518. <http://dx.doi.org/10.1177/0146167218771322>

- Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for t-tests and ANOVAs. *Frontiers in Psychology*, 4, 863. <http://dx.doi.org/10.3389/fpsyg.2013.00863>
- \*Lambert, B., Declerck, C. H., Emonds, G., & Boone, C. (2017). Trust as commodity: Social value orientation affects the neural substrates of learning to cooperate. *Social Cognitive and Affective Neuroscience*, 12, 609–617. <http://dx.doi.org/10.1093/scan/nsw170>
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33, 159–174. <http://dx.doi.org/10.2307/2529310>
- \*Lang, H., DeAngelo, G., & Bongard, M. (2018). Theory of Mind and general intelligence in dictator and ultimatum games. *Games*, 9, 16. <http://dx.doi.org/10.3390/g9020016>
- \*Lange, F. (2013). *Sweet delusions: Shedding new light on impulsiveness and self-control* (Unpublished master's thesis). Braunschweig University of Technology, Braunschweig, Germany.
- \*Lavallee, L. F., Sussman, R., Gifford, R., Iglesias, F., Gouveia, V., Kronisch, D., & Hine, D. W. (2018). *Long-term conservation orientation in commons dilemmas*. Unpublished manuscript.
- \*Lawn, E. C. R., Smillie, L. D., & Laham, S. M. (2016). *Personality, morality, and prosociality*. Unpublished raw data, Department of Economics, Santa Clara University, Santa Clara, CA.
- \*Lazić, A. (2016). *Pospješivanje saradljivosti u socijalnim dilemama* [Enhancing cooperativeness in social dilemmas] (Unpublished master's thesis). University of Belgrade, Belgrade, Serbia.
- Le, B. M., Impett, E. A., Lemay, E. P. J., Jr., Muise, A., & Tskhay, K. O. (2018). Communal motivation and well-being in interpersonal relationships: An integrative review and meta-analysis. *Psychological Bulletin*, 144, 1–25. <http://dx.doi.org/10.1037/bul0000133>
- Ledyard, J. O. (1995). Public goods: A survey of experimental research. In J. H. Kagel & A. E. Roth (Eds.), *The handbook of experimental economics* (pp. 111–194). Princeton, NJ: Princeton University Press.
- Lee, K., & Ashton, M. C. (2004). Psychometric Properties of the HEXACO Personality Inventory. *Multivariate Behavioral Research*, 39, 329–358. [http://dx.doi.org/10.1207/s15327906mbr3902\\_8](http://dx.doi.org/10.1207/s15327906mbr3902_8)
- Lee, K., & Ashton, M. C. (2018). Psychometric properties of the HEXACO-100. *Assessment*, 25, 543–556. <http://dx.doi.org/10.1177/1073191116659134>
- Lee, K., Ashton, M. C., Wiltshire, J., Bourdage, J. S., Visser, B. A., & Gallucci, A. (2013). Sex, power, and money: Prediction from the Dark Triad and Honesty–Humility. *European Journal of Personality*, 27, 169–184. <http://dx.doi.org/10.1002/per.1860>
- \*Lee, W. S., & Selart, M. (2015). How betrayal affects emotions and subsequent trust. *The Open Psychology Journal*, 8, 153–159. <http://dx.doi.org/10.2174/1874350101508010153>
- Lerner, M. J., & Miller, D. T. (1978). Just world research and the attribution process: Looking back and ahead. *Psychological Bulletin*, 85, 1030–1051. <http://dx.doi.org/10.1037/0033-2909.85.5.1030>
- \*Levati, M. V., Ploner, M., & Traub, S. (2011). Are conditional cooperators willing to forgo efficiency gains? Evidence from a public goods experiment. *New Zealand Economic Papers*, 45, 47–57. <http://dx.doi.org/10.1080/00779954.2011.556069>
- \*Levine, E. E., Bitterly, T. B., Cohen, T. R., & Schweitzer, M. E. (2018). Who is trustworthy? Predicting trustworthy intentions and behavior. *Journal of Personality and Social Psychology*, 115, 468–494. <http://dx.doi.org/10.1037/pspi0000136>
- \*Levine, S. L. (2016). *The unique effects of awe and nature on prosociality and interest* (Unpublished honour's thesis). Carleton University, Ottawa, Ontario, Canada.
- \*Li, C., Turmunkh, U., & Wakker, P. P. (2019). Trust as a decision under ambiguity. *Experimental Economics*, 22, 51–75. <http://dx.doi.org/10.1007/s10683-018-9582-3>
- \*Li, X., Zhu, P., Yu, Y., Zhang, J., & Zhang, Z. (2017). The effect of reciprocity disposition on giving and repaying reciprocity behavior. *Personality and Individual Differences*, 109, 201–206. <http://dx.doi.org/10.1016/j.paid.2017.01.007>
- \*Liebrand, W. B. G. (1984). The effect of social motives, communication and group size on behaviour in an N-person multi-stage mixed-motive game. *European Journal of Social Psychology*, 14, 239–264. <http://dx.doi.org/10.1002/ejsp.2420140302>
- Liebrand, W. B. G., & McClintock, C. G. (1988). The ring measure of social values: A computerized procedure for assessing individual differences in information processing and social value orientation. *European Journal of Personality*, 2, 217–230. <http://dx.doi.org/10.1002/per.2410020304>
- \*Liebrand, W. B. G., & Van Run, G. J. (1985). The effects of social motives on behavior in social dilemmas in two cultures. *Journal of Experimental Social Psychology*, 21, 86–102. [http://dx.doi.org/10.1016/0022-1031\(85\)90008-3](http://dx.doi.org/10.1016/0022-1031(85)90008-3)
- \*Liebrand, W. B. G., Wilke, H. A. M., Vogel, R., & Wolters, F. J. (1986). Value orientation and conformity: A study using three types of social dilemma games. *Journal of Conflict Resolution*, 30, 77–97. <http://dx.doi.org/10.1177/0022002786030001006>
- \*Liu, J., Rau, P.-L. P., & Wendler, N. (2015). Trust and online information-sharing in close relationships: A cross-cultural perspective. *Behaviour & Information Technology*, 34, 363–374. <http://dx.doi.org/10.1080/0144929X.2014.937458>
- \*Livingston, R. W., Cohen, T. R., & Halevy, N. (2010). *Empowering the wolf in sheep's clothing: Why people choose the wrong leaders*. Unpublished manuscript, Department of Economics, Santa Clara University, Santa Clara, CA.
- Lockwood, P., Jordan, C. H., & Kunda, Z. (2002). Motivation by positive or negative role models: Regulatory focus determines who will best inspire us. *Journal of Personality and Social Psychology*, 83, 854–864. <http://dx.doi.org/10.1037/0022-3514.83.4.854>
- \*Lohse, J. (2016). Smart or selfish—When smart guys finish nice. *Journal of Behavioral and Experimental Economics*, 64, 28–40. <http://dx.doi.org/10.1016/j.socec.2016.04.002>
- \*Lönnqvist, J.-E., Verkasalo, M., & Walkowitz, G. (2011). It pays to pay—Big Five personality influences on co-operative behaviour in an incentivized and hypothetical prisoner's dilemma game. *Personality and Individual Differences*, 50, 300–304. <http://dx.doi.org/10.1016/j.paid.2010.10.009>
- \*Loomis, D. K., Samuelson, C. D., & Sell, J. A. (1995). Effects of information and motivational orientation on harvest of a declining renewable resource. *Society & Natural Resources*, 8, 1–18. <http://dx.doi.org/10.1080/08941929509380895>
- \*Lotz, S., Schlösser, T., Cain, D. M., & Fetschenhauer, D. (2013). The (in)stability of social preferences: Using justice sensitivity to predict when altruism collapses. *Journal of Economic Behavior & Organization*, 93, 141–148. <http://dx.doi.org/10.1016/j.jebo.2013.07.012>
- \*Lovejoy, K., Catellier, J., Evans, C., Lohiser, A., & Chiu, I.-H. (2013). Exploring individuals' social value orientation and decisions in a Prisoner's Dilemma. *Communication & Science Journal*. Retrieved from <http://www.galileo.com/comSciJliterate/lovejoy13.pdf>
- \*Lozano, J. H. (2016). Personality and behavior in social dilemmas: Testing the situational strength hypothesis and the role of hypothetical versus real incentives. *Journal of Personality*, 84, 71–78. <http://dx.doi.org/10.1111/jopy.12139>
- \*Lozano, J. H. (2018). The situational strength hypothesis and the measurement of personality. *Social Psychological and Personality Science*, 9, 70–79. <http://dx.doi.org/10.1177/1948550617699256>
- \*Lu, S., Au, W. T., Jiang, F., Xie, X., & Yam, P. (2013). Cooperativeness and competitiveness as two distinct constructs: Validating the Cooperative and Competitive Personality Scale in a social dilemma context. *International Journal of Psychology*, 48, 1135–1147. <http://dx.doi.org/10.1080/00207594.2012.743666>

- \*Luccasen, R. A., III. (2012). Individual differences in contributions and crowding-out of a public good. *Scottish Journal of Political Economy*, 59, 419–441. <http://dx.doi.org/10.1111/j.1467-9485.2012.00587.x>
- Luce, R. D., & Raiffa, H. (1957). *Games and decisions: Introduction and critical survey*. New York, NY: Wiley.
- \*Luo, Y., Wu, T., Broster, L. S., Feng, C., Zhang, D., Gu, R., & Luo, Y.-J. (2014). The temporal course of the influence of anxiety on fairness considerations. *Psychophysiology*, 51, 834–842. <http://dx.doi.org/10.1111/psyp.12235>
- \*Luo, Y., Zhang, S., Tao, R., & Geng, H. (2016). The power of subliminal and supraliminal eye contact on social decision making: An individual-difference perspective. *Consciousness and Cognition*, 40, 131–140. <http://dx.doi.org/10.1016/j.concog.2016.01.001>
- \*Lyons, M. T., & Aitken, S. J. (2008). Machiavellianism in strangers affects cooperation. *Journal of Evolutionary Psychology*, 6, 173–185. <http://dx.doi.org/10.1556/JEP.6.2008.3.2>
- \*Ma, Y., Liu, Y., Rand, D. G., Heatherston, T. F., & Han, S. (2015). Opposing oxytocin effects on intergroup cooperative behavior in intuitive and reflective minds. *Neuropsychopharmacology*, 40, 2379–2387. <http://dx.doi.org/10.1038/npp.2015.87>
- \*MacDonald, A. P., Jr., Kessel, V. S., & Fuller, J. B. (1972). Self-disclosure and two kinds of trust. *Psychological Reports*, 30, 143–148. <http://dx.doi.org/10.2466/pr0.1972.30.1.143>
- \*Maggioni, M. A., Rossignoli, D., Beretta, S., & Balestri, S. (2018). Trust behind bars: Measuring change in inmates' prosocial preferences. *Journal of Economic Psychology*, 64, 89–104. <http://dx.doi.org/10.1016/j.joep.2017.12.003>
- \*Maier, L. J., Wunderli, M. D., Vonmoos, M., Römmelt, A. T., Baumgartner, M. R., Seifritz, E., . . . Quednow, B. B. (2015). Pharmacological cognitive enhancement in healthy individuals: A compensation for cognitive deficits or a question of personality? *PLoS ONE*, 10, e0129805. <http://dx.doi.org/10.1371/journal.pone.0129805>
- \*Maldonado, J. H., & Moreno-Sanchez, R. P. (2016). Exacerbating the tragedy of the commons: Private inefficient outcomes and peer effect in experimental games with fishing communities. *PLoS ONE*, 11, e0148403. <http://dx.doi.org/10.1371/journal.pone.0148403>
- \*Maltese, S., & Baumert, A. (2012a). *Justice sensitivity, information processing and behavior: Study 2*. Unpublished raw data, Department of Psychology, University of Koblenz-Landau, Landau, Germany.
- \*Maltese, S., & Baumert, A. (2012b). *Justice sensitivity, information processing and behavior: Study 3*. Unpublished raw data, Department of Psychology, University of Koblenz-Landau, Landau, Germany.
- \*Maltese, S., & Baumert, A. (2016). *Justice sensitivity, information processing and behavior: Study 6*. Unpublished raw data, Department of Psychology, University of Koblenz-Landau, Landau, Germany.
- \*Maltese, S., Baumert, A., Schmitt, M. J., & MacLeod, C. (2016). How victim sensitivity leads to uncooperative behavior via expectancies of injustice. *Frontiers in Psychology*, 6, 2059. <http://dx.doi.org/10.3389/fpsyg.2015.02059>
- \*Marcus, J. C. (2009). *Losses, gains, and asymmetry in the 1-shot prisoner's dilemma game* (Unpublished master's thesis). University of Illinois at Urbana-Champaign, Urbana, IL.
- \*Markowska-Przybyla, U., & Ramsey, D. M. (2016). The association between social capital and membership of organisations amongst polish students. *Economia e Sociologia*, 9, 305–321.
- \*Martin, J. M., Juvina, I., Lebiere, C., & Gonzalez, C. (2013). The effects of individual and context on aggression in repeated social interaction. *Applied Ergonomics*, 44, 710–718. <http://dx.doi.org/10.1016/j.apergo.2012.04.014>
- Martinez, L. F., & Zeelenberg, M. (2015). Trust me (or not): Regret and disappointment in experimental economic games. *Decision*, 2, 118–126. <http://dx.doi.org/10.1037/dec0000025>
- \*Martinsson, P., Myrseth, K. O. R., & Wollbrant, C. (2012). Reconciling pro-social vs. selfish behavior: On the role of self-control. *Judgment and Decision Making*, 7, 1–20.
- \*Martinsson, P., Myrseth, K. O. R., & Wollbrant, C. (2014). Social dilemmas: When self-control benefits cooperation. *Journal of Economic Psychology*, 45, 213–236. <http://dx.doi.org/10.1016/j.joep.2014.09.004>
- Marx, S. M., & Weber, E. U. (2012). Decision making under climate uncertainty: The power of understanding judgment and decision processes. In T. Dietz & D. Bidwell (Eds.), *Climate change in the Great Lakes region: Navigating an uncertain future* (pp. 99–128). East Lansing: Michigan State University Press.
- \*Matsumoto, Y., Yamagishi, T., Li, Y., & Kiyonari, T. (2016). Prosocial behavior increases with age across five economic games. *PLoS ONE*, 11, e0158671. <http://dx.doi.org/10.1371/journal.pone.0158671>
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *The Academy of Management Review*, 20, 709–734. <http://dx.doi.org/10.5465/amr.1995.9508080335>
- Mazar, N., Amir, O., & Ariely, D. (2008). The dishonesty of honest people: A theory of self-concept maintenance. *Journal of Marketing Research*, 45, 633–644. <http://dx.doi.org/10.1509/jmkr.45.6.633>
- McAbee, S. T., Oswald, F. L., & Connelly, B. S. (2014). Bifactor models of personality and college student performance: A broad versus narrow view. *European Journal of Personality*, 28, 604–619. <http://dx.doi.org/10.1002/per.1975>
- \*McAdams, C. J., Lohrenz, T., & Montague, P. R. (2015). Neural responses to kindness and malevolence differ in illness and recovery in women with anorexia nervosa. *Human Brain Mapping*, 36, 5207–5219. <http://dx.doi.org/10.1002/hbm.23005>
- \*McAuliffe, W. H. B., Forster, D. E., Pedersen, E. J., & McCullough, M. E. (2019). Does cooperation in the laboratory reflect the operation of a broad trait? *European Journal of Personality*, 33, 89–103. <http://dx.doi.org/10.1002/per.2180>
- McClintock, C. G. (1972). Social motivation: A set of propositions. *Behavioral Science*, 17, 438–454. <http://dx.doi.org/10.1002/bs.3830170505>
- \*McClintock, C. G., & Liebrand, W. B. G. (1988). Role of interdependence structure, individual value orientation, and another's strategy in social decision making: A transformational analysis. *Journal of Personality and Social Psychology*, 55, 396–409. <http://dx.doi.org/10.1037/0022-3514.55.3.396>
- \*McClure, M. J., Bartz, J. A., & Lydon, J. E. (2013). Uncovering and overcoming ambivalence: The role of chronic and contextually activated attachment in two-person social dilemmas. *Journal of Personality*, 81, 103–117. <http://dx.doi.org/10.1111/j.1467-6494.2012.00788.x>
- McCrae, R. R., & Costa, P. T., Jr. (1999). A five-factor theory of personality. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 139–153). New York, NY: Guilford Press.
- McCrae, R. R., & Costa, P. T., Jr. (2008). The five-factor theory of personality. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 159–181). New York, NY: Guilford Press.
- McCrae, R. R., & Costa, P. T., Jr. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology*, 52, 81–90. <http://dx.doi.org/10.1037/0022-3514.52.1.81>
- McHugh, M. L. (2012). Interrater reliability: The kappa statistic. *Biochemia Medica*, 22, 276–282. <http://dx.doi.org/10.11613/BM.2012.031>
- \*Mehta, P. H. (2007). *The endocrinology of personality, leadership, and economic decision making* (Doctoral dissertation). University of Texas, Austin, TX. Retrieved from <http://hdl.handle.net/2152/3519>
- \*Meier, S., Pierce, L., Vaccaro, A., & La Cara, B. (2016). Trust and in-group favoritism in a culture of crime. *Journal of Economic Behavior*



- & *Organization*, 132, 78–92. <http://dx.doi.org/10.1016/j.jebo.2016.09.005>
- \*Melamed, D., Simpson, B., & Harrell, A. (2017). Prosocial orientation alters network dynamics and fosters cooperation. *Scientific Reports*, 7, 357. <http://dx.doi.org/10.1038/s41598-017-00265-x>
- \*Meleady, R., Hothrow, T., & Crisp, R. J. (2013). Simulating social dilemmas: Promoting cooperative behavior through imagined group discussion. *Journal of Personality and Social Psychology*, 104, 839–853. <http://dx.doi.org/10.1037/a0031233>
- Mellers, B. A., Haselhorn, M. P., Tetlock, P. E., Silva, J. C., & Isen, A. M. (2010). Predicting behavior in economic games by looking through the eyes of the players. *Journal of Experimental Psychology: General*, 139, 743–755. <http://dx.doi.org/10.1037/a0020280>
- \*Mentel, A., & Žižar, P. (2015). Does HEXACO-60 personality test predict decisions in a dictator game? In P. Jedlička (Ed.), *Proceedings of the International Conference Hradec Economic Days 2015*. Gaudeamus, the University of Hradec Králové, Czech Republic.
- \*Mesrobian, S. K., Bader, M., Götte, L., Villa, A. E. P., & Lintas, A. (2015). Imperfect decision making and risk taking are affected by personality. In T. V. Guy, M. Kárný, & D. H. Wolpert (Eds.), *Decision making: Uncertainty, Imperfection, Deliberation and Scalability* (pp. 145–184). Cham, Switzerland: Springer International Publishing. [http://dx.doi.org/10.1007/978-3-319-15144-1\\_6](http://dx.doi.org/10.1007/978-3-319-15144-1_6)
- Messick, D. M., & McClintock, C. G. (1968). Motivational bases of choice in experimental games. *Journal of Experimental Social Psychology*, 4, 1–25. [http://dx.doi.org/10.1016/0022-1031\(68\)90046-2](http://dx.doi.org/10.1016/0022-1031(68)90046-2)
- \*Meyer, S. F. (2010). *Symmetry of reinforcement in social behavior* (Doctoral dissertation). University of California, San Diego, CA. Retrieved from <https://escholarship.org/uc/item/2f81050r>
- \*Mieth, L., Bell, R., & Buchner, A. (2016a). Cognitive load does not affect the behavioral and cognitive foundations of social cooperation. *Frontiers in Psychology*, 7, 1312. <http://dx.doi.org/10.3389/fpsyg.2016.01312>
- \*Mieth, L., Bell, R., & Buchner, A. (2016b). Facial likability and smiling enhance cooperation, but have no direct effect on moralistic punishment. *Experimental Psychology*, 63, 263–277. <http://dx.doi.org/10.1027/1618-3169/a000338>
- \*Mikolajczak, M., Gross, J. J., Lane, A., Corneille, O., de Timary, P., & Luminet, O. (2010). Oxytocin makes people trusting, not gullible. *Psychological Science*, 21, 1072–1074. <http://dx.doi.org/10.1177/0956797610377343>
- \*Mill, W., & Theelen, M. M. P. (2018). *Social value orientation and group size uncertainty in public good dilemmas*. SSRN Working Paper Series. <http://dx.doi.org/10.2139/ssrn.3193594>
- Miller, J. D., Gaughan, E. T., Maples, J., & Price, J. (2011). A comparison of Agreeableness scores from the Big Five Inventory and the NEO PI-R: Consequences for the study of narcissism and psychopathy. *Assessment*, 18, 335–339. <http://dx.doi.org/10.1177/1073191111411671>
- \*Miller, J. D., Lynam, D. R., Vize, C., Crowe, M., Sleep, C., Maples-Keller, J. L., . . . Campbell, W. K. (2018). Vulnerable narcissism is (mostly) a disorder of neuroticism. *Journal of Personality*, 86, 186–199. <http://dx.doi.org/10.1111/jopy.12303>
- Mischel, W. (1977). The interaction of person and situation. In D. Magnusson & N. S. Endler (Eds.), *Personality at the crossroads: Current issues in interactional psychology* (pp. 333–352). Hillsdale, NJ: Erlbaum.
- Mischel, W., & Shoda, Y. (1995). A cognitive-affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review*, 102, 246–268. <http://dx.doi.org/10.1037/0033-295X.102.2.246>
- \*Mischkowski, D., & Glöckner, A. (2016). Spontaneous cooperation for prosocials, but not for proselves: Social value orientation moderates spontaneous cooperation behavior. *Scientific Reports*, 6, 21555. <http://dx.doi.org/10.1038/srep21555>
- \*Mischkowski, D., Glöckner, A., & Lewisch, P. (2018). From spontaneous cooperation to spontaneous punishment—Distinguishing the underlying motives driving spontaneous behavior in first and second order public good games. *Organizational Behavior and Human Decision Processes*, 149, 59–72. <http://dx.doi.org/10.1016/j.obhdp.2018.07.001>
- \*Moisan, F., ten Brincke, R., Murphy, R. O., & Gonzalez, C. (2018). Not all Prisoner's Dilemma games are equal: Incentives, social preferences, and cooperation. *Decision*, 5, 306–322. <http://dx.doi.org/10.1037/dec0000079>
- \*Mokros, A., Menner, B., Eisenbarth, H., Alpers, G. W., Lange, K. W., & Osterheider, M. (2008). Diminished cooperativeness of psychopaths in a prisoner's dilemma game yields higher rewards. *Journal of Abnormal Psychology*, 117, 406–413. <http://dx.doi.org/10.1037/0021-843X.117.2.406>
- Monson, T. C., Hesley, J. W., & Chernick, L. (1982). Specifying when personality traits can and cannot predict behavior: An alternative to abandoning the attempt to predict single-act criteria. *Journal of Personality and Social Psychology*, 43, 385–399. <http://dx.doi.org/10.1037/0022-3514.43.2.385>
- Moshagen, M., Hilbig, B. E., & Musch, J. (2011). Defection in the dark? A randomized response investigation of cooperativeness in social dilemma games. *European Journal of Social Psychology*, 41, 638–644. <http://dx.doi.org/10.1002/ejsp.793>
- \*Moshagen, M., Hilbig, B. E., & Zettler, I. (2018). The dark core of personality. *Psychological Review*, 125, 656–688. <http://dx.doi.org/10.1037/rev0000111>
- Moshagen, M., Thielmann, I., Hilbig, B. E., & Zettler, I. (2019). Meta-analytic investigations of the HEXACO Personality Inventory(–Revised): Reliability generalization, self-observer agreement, intercorrelations, and relations to demographic variables. *Zeitschrift für Psychologie*, 227, 186–194. <http://dx.doi.org/10.1027/2151-2604/a000377>
- \*Mulder, L. B., van Dijk, E., & De Cremer, D. (2009). When sanctions that can be evaded still work: The role of trust in leaders. *Social Influence*, 4, 122–137. <http://dx.doi.org/10.1080/15534510802469156>
- \*Mulder, L. B., van Dijk, E., De Cremer, D., & Wilke, H. A. M. (2006). Undermining trust and cooperation: The paradox of sanctioning systems in social dilemmas. *Journal of Experimental Social Psychology*, 42, 147–162. <http://dx.doi.org/10.1016/j.jesp.2005.03.002>
- \*Müller, J., & Schwier, C. (2017). *Using personality questionnaires in experiments—Limits and potentials*. Munich Personal RePEc Archive Paper No. 78132. Retrieved from [https://mpra.ub.uni-muenchen.de/78132/1/MPPA\\_paper\\_78132.pdf](https://mpra.ub.uni-muenchen.de/78132/1/MPPA_paper_78132.pdf)
- \*Müller, S., & Moshagen, M. (2019). True virtue, self-presentation, or both?: A behavioral test of impression management and overclaiming. *Psychological Assessment*, 31, 181–191. <http://dx.doi.org/10.1037/pas0000657>
- Muris, P., Merckelbach, H., Otgaar, H., & Meijer, E. (2017). The malevolent side of human nature: A meta-analysis and critical review of the literature on the Dark Triad (Narcissism, Machiavellianism, and Psychopathy). *Perspectives on Psychological Science*, 12, 183–204. <http://dx.doi.org/10.1177/1745691616666070>
- Murnighan, J. K., & Wang, L. (2016). The social world as an experimental game. *Organizational Behavior and Human Decision Processes*, 136, 80–94. <http://dx.doi.org/10.1016/j.obhdp.2016.02.003>
- Murphy, R. O., & Ackermann, K. A. (2014). Social value orientation: Theoretical and measurement issues in the study of social preferences. *Personality and Social Psychology Review*, 18, 13–41. <http://dx.doi.org/10.1177/1088868313501745>
- Murphy, R. O., Ackermann, K. A., & Handgraaf, M. J. J. (2011). Measuring social value orientation. *Judgment and Decision Making*, 6, 771–781.
- Murray, S. L., & Holmes, J. G. (2009). The architecture of interdependent minds: A Motivation-management theory of mutual responsiveness.

- Psychological Review*, 116, 908–928. <http://dx.doi.org/10.1037/a0017015>
- \*Mussel, P., Göritz, A. S., & Hewig, J. (2013). Which choice is the rational one? An investigation of need for cognition in the Ultimatum Game. *Journal of Research in Personality*, 47, 588–591. <http://dx.doi.org/10.1016/j.jrp.2013.05.007>
- \*Mussel, P., & Hewig, J. (2016). The life and times of individuals scoring high and low on dispositional greed. *Journal of Research in Personality*, 64, 52–60. <http://dx.doi.org/10.1016/j.jrp.2016.07.002>
- \*Mussel, P., Rodrigues, J., Krumm, S., & Hewig, J. (2018). The convergent validity of five dispositional greed scales. *Personality and Individual Differences*, 131, 249–253. <http://dx.doi.org/10.1016/j.paid.2018.05.006>
- \*Muthukrishna, M., Francois, P., Pourahmadi, S., & Henrich, J. (2017). Corrupting cooperation and how anti-corruption strategies may backfire. *Nature Human Behaviour*, 1, 138–158. <http://dx.doi.org/10.1038/s41562-017-0138>
- \*Myrseth, K. O. R., Riener, G., & Wollbrant, C. E. (2015). Tangible temptation in the social dilemma: Cash, cooperation, and self-control. *Journal of Neuroscience, Psychology, and Economics*, 8, 61–77. <http://dx.doi.org/10.1037/npe0000035>
- \*Naef, M., & Schupp, J. (2009). *Can we trust the trust game? A comprehensive examination*. Royal Holloway University of London Discussion Paper Series 2009-5. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.799.9700&rep=rep1&type=pdf>
- Naef, M., & Schupp, J. (2009). *Measuring trust: Experiments and surveys in contrast and combination*. SOEPpaper No. 167. <http://dx.doi.org/10.2139/ssrn.1367375>
- \*Nehrlich, A. D., Gebauer, J. E., Sedikides, C., & Schoel, C. (2019). Agentic narcissism, communal narcissism, and prosociality. *Journal of Personality and Social Psychology*, 117, 142–165. <http://dx.doi.org/10.1037/pspp0000190>
- \*Nelissen, R. M. A., Dijk, A. J. M., & DeVries, N. K. (2007). How to turn a hawk into a dove and vice versa: Interactions between emotions and goals in a give-some dilemma game. *Journal of Experimental Social Psychology*, 43, 280–286. <http://dx.doi.org/10.1016/j.jesp.2006.01.009>
- \*Nelissen, R. M. A., van Someren, D. S. I., & Zeelenberg, M. (2009). Take it or leave it for something better? Responses to fair offers in ultimatum bargaining. *Journal of Experimental Social Psychology*, 45, 1227–1231. <http://dx.doi.org/10.1016/j.jesp.2009.06.004>
- \*Neufeld, S. L. (2012). *Self-conscious cooperation: Implications of a functional approach to emotions for behavior in social dilemmas* (Doctoral dissertation). Arizona State University, Tempe, AZ. Available from ProQuest Dissertations and Theses database.
- \*Ng, G. T. T., & Au, W. T. (2018). *From personality to indices: How personality and situation interact to influence cooperation in prisoner's dilemmas*. Unpublished raw data, Department of Psychology, The Chinese University of Hong Kong, Hong Kong.
- \*Nguyen, C. M., Koenigs, M., Yamada, T. H., Teo, S. H., Cavanaugh, J. E., Tranel, D., & Denburg, N. L. (2011). Trustworthiness and negative affect predict economic decision making. *Journal of Cognitive Psychology*, 23, 748–759. <http://dx.doi.org/10.1080/20445911.2011.575773>
- \*Nguyen, H.-H. D., Le, H., & Boles, T. (2010). Individualism-collectivism and co-operation: A cross-society and cross-level examination. *Negotiation and Conflict Management Research*, 3, 179–204. <http://dx.doi.org/10.1111/j.1750-4716.2010.00057.x>
- \*Nicolay, A. (2017). *Der Einfluss von Gier vs. Ehrlichkeit-Bescheidenheit auf ökonomisches Verhalten* [The influence of greed vs. Honesty-Humility on economic behavior] (Unpublished bachelor's thesis). University of Koblenz-Landau, Landau, Germany.
- \*Nishina, K., Takagishi, H., Inoue-Murayama, M., Takahashi, H., & Yamagishi, T. (2015). Polymorphism of the oxytocin receptor gene modulates behavioral and attitudinal trust among men but not women. *PLoS ONE*, 10, e0137089. <http://dx.doi.org/10.1371/journal.pone.0137089>
- \*Noll, T., Endrass, J., Scherrer, P., Rossegger, A., Urbaniok, F., & Mokros, A. (2012). A comparison of professional traders and psychopaths in a simulated non-zero sum game. *Catalyst: A Social Justice Forum*, 2, 1–13.
- \*Nosenzo, D., & Sefton, M. (2011). Endogenous move structure and voluntary provision of public goods: Theory and experiment. *Journal of Public Economic Theory*, 13, 721–754. <http://dx.doi.org/10.1111/j.1467-9779.2011.01518.x>
- \*Nosenzo, D., & Tufano, F. (2017). The effect of voluntary participation on cooperation. *Journal of Economic Behavior & Organization*, 142, 307–319. <http://dx.doi.org/10.1016/j.jebo.2017.07.009>
- Nowak, M. A. (2006). Five rules for the evolution of cooperation. *Science*, 314, 1560–1563. <http://dx.doi.org/10.1126/science.1133755>
- \*Nozaki, Y., & Koyasu, M. (2013). The relationship between trait emotional intelligence and interaction with ostracized others' retaliation. *PLoS ONE*, 8, e77579. <http://dx.doi.org/10.1371/journal.pone.0077579>
- \*Oda, R., Niwa, Y., Honma, A., & Hiraishi, K. (2011). An eye-like painting enhances the expectation of a good reputation. *Evolution and Human Behavior*, 32, 166–171. <http://dx.doi.org/10.1016/j.evolhumbehav.2010.11.002>
- \*Oechssler, J., Roider, A., & Schmitz, P. W. (2015). Cooling off in negotiations: Does it work? *Journal of Institutional and Theoretical Economics*, 171, 565–588. <http://dx.doi.org/10.1628/093245615X14307212950056>
- \*Offerman, T., Sonnemans, J., & Schram, A. (1996). Value orientations, expectations and voluntary contributions in public goods. *Economic Journal*, 106, 817–845. <http://dx.doi.org/10.2307/2235360>
- \*Ogawa, K., & Ida, T. (2015). Investigating donating behavior using hypothetical dictator game experiments. *Review of Social Economy*, 73, 176–195. <http://dx.doi.org/10.1080/00346764.2015.1035908>
- O'Meara, A., Davies, J., & Hammond, S. (2011). The psychometric properties and utility of the Short Sadistic Impulse Scale (SSIS). *Psychological Assessment*, 23, 523–531. <http://dx.doi.org/10.1037/a0022400>
- Ones, D. S., & Viswesvaran, C. (1996). Bandwidth-fidelity dilemma in personality measurement for personnel selection. *Journal of Organizational Behavior*, 17, 609–626. [http://dx.doi.org/10.1002/\(SICI\)1099-1379\(199611\)17:6<609::AID-JOB1828>3.0.CO;2-K](http://dx.doi.org/10.1002/(SICI)1099-1379(199611)17:6<609::AID-JOB1828>3.0.CO;2-K)
- Ortmann, A., & Hertwig, R. (2002). The costs of deception: Evidence from psychology. *Experimental Economics*, 5, 111–131. <http://dx.doi.org/10.1023/A:1020365204768>
- \*Osumi, T., Nakao, T., Kasuya, Y., Shinoda, J., Yamada, J., & Ohira, H. (2012). Amygdala dysfunction attenuates frustration-induced aggression in psychopathic individuals in a non-criminal population. *Journal of Affective Disorders*, 142, 331–338. <http://dx.doi.org/10.1016/j.jad.2012.05.012>
- \*Osumi, T., & Ohira, H. (2010). The positive side of psychopathy: Emotional detachment in psychopathy and rational decision-making in the ultimatum game. *Personality and Individual Differences*, 49, 451–456. <http://dx.doi.org/10.1016/j.paid.2010.04.016>
- \*Osumi, T., & Ohira, H. (2017). Selective fair behavior as a function of psychopathic traits in a subclinical population. *Frontiers in Psychology*, 8, 1604. <http://dx.doi.org/10.3389/fpsyg.2017.01604>
- \*Otto, P. E., & Bolle, F. (2015). Exploiting one's power with a guilty conscience: An experimental investigation of self-serving biases. *Journal of Economic Psychology*, 51, 79–89. <http://dx.doi.org/10.1016/j.joep.2015.08.005>
- Ozer, D. J., & Benet-Martínez, V. (2006). Personality and the prediction of consequential outcomes. *Annual Review of Psychology*, 57, 401–421. <http://dx.doi.org/10.1146/annurev.psych.57.102904.190127>
- Pacini, R., & Epstein, S. (1999). The relation of rational and experiential information processing styles to personality, basic beliefs, and the ratio-bias phenomenon. *Journal of Personality and Social Psychology*, 76, 972–987. <http://dx.doi.org/10.1037/0022-3514.76.6.972>



- \*Park, G. (2012). *A multilevel model of team cooperation: Disentangling the discontinuity effect* (Doctoral dissertation). Michigan State University, East Lansing, MI. <http://dx.doi.org/10.25335/M5JQ0SX1C>
- \*Parks, C. D. (1994). The predictive ability of social values in resource dilemmas and public goods games. *Personality and Social Psychology Bulletin*, 20, 431–438. <http://dx.doi.org/10.1177/0146167294204010>
- \*Parks, C. D., Henager, R. F., & Scamhorn, S. D. (1996). Trust and reactions to messages of intent in social dilemmas. *Journal of Conflict Resolution*, 40, 134–151. <http://dx.doi.org/10.1177/0022002796040001007>
- \*Parks, C. D., & Hulbert, L. G. (1995). High and low trusters' responses to fear in a payoff matrix. *Journal of Conflict Resolution*, 39, 718–730. <http://dx.doi.org/10.1177/0022002795039004006>
- Parks, C. D., Joireman, J., & Van Lange, P. A. M. (2013). Cooperation, trust, and antagonism: How public goods are promoted. *Psychological Science in the Public Interest*, 14, 119–165. <http://dx.doi.org/10.1177/1529100612474436>
- \*Parks, C. D., & Rumble, A. C. (2001). Elements of reciprocity and social value orientation. *Personality and Social Psychology Bulletin*, 27, 1301–1309. <http://dx.doi.org/10.1177/01461672012710006>
- \*Parks, C. D., Rumble, A. C., & Posey, D. C. (2002). The effects of envy on reciprocation in a social dilemma. *Personality and Social Psychology Bulletin*, 28, 509–520. <http://dx.doi.org/10.1177/0146167202287008>
- Parks-Leduc, L., Feldman, G., & Bardi, A. (2015). Personality traits and personal values: A meta-analysis. *Personality and Social Psychology Review*, 19, 3–29. <http://dx.doi.org/10.1177/1088868314538548>
- Paunonen, S. V., Haddock, G., Forsterling, F., & Keinonen, M. (2003). Broad versus narrow personality measures and the prediction of behaviour across cultures. *European Journal of Personality*, 17, 413–433. <http://dx.doi.org/10.1002/per.496>
- \*Pauwels, L., Declerck, H. C., & Boone, C. (2017). Watching eyes and living up to expectations: Unkind, not kind, eyes increase first mover cooperation in a sequential prisoner's dilemma. *Games*, 8, 20–33. <http://dx.doi.org/10.3390/g802020>
- \*Paz, V., Nicolaisen-Sobesky, E., Collado, E., Horta, S., Rey, C., Rivero, M., . . . Gradin, V. B. (2017). Effect of self-esteem on social interactions during the Ultimatum Game. *Psychiatry Research*, 252, 247–255. <http://dx.doi.org/10.1016/j.psychres.2016.12.063>
- \*Pearson, J. A. (2007). *Individual differences in the detection of masked emotional faces and prosocial behavior* (Doctoral dissertation). University of Massachusetts Boston, Boston, MA. Available from ProQuest Dissertations and Theses database.
- Pedroni, A., Frey, R., Bruhin, A., Dutilh, G., Hertwig, R., & Rieskamp, J. (2017). The risk elicitation puzzle. *Nature Human Behaviour*, 1, 803–809. <http://dx.doi.org/10.1038/s41562-017-0219-x>
- \*Perry, J. L., & Clough, P. J. (2017). Predicting cooperation in competitive conditions: The role of sportpersonship, moral competence, and emotional intelligence. *Psychology of Sport and Exercise*, 31, 88–92. <http://dx.doi.org/10.1016/j.psychsport.2017.04.008>
- \*Perugini, M., Gallucci, M., Presaghi, F., & Ercolani, A. P. (2003). The personal norm of reciprocity. *European Journal of Personality*, 17, 251–283. <http://dx.doi.org/10.1002/per.474>
- \*Perugini, M., Tan, J. H. W., & Zizzo, D. J. (2010). Which is the more predictable gender? Public good contribution and personality. *Economic Issues*, 15, 83–110.
- \*Peterburs, J. (2018). *Sex differences and evaluative conditioning in the ultimatum game*. Unpublished raw data, Institute of Medical Psychology and Systems Neuroscience, University of Münster, Münster, Germany.
- \*Peterburs, J., Voegler, R., Liepelt, R., Schulze, A., Wilhelm, S., Ocklenburg, S., & Straube, T. (2017). Processing of fair and unfair offers in the ultimatum game under social observation. *Scientific Reports*, 7, 44062. <http://dx.doi.org/10.1038/srep44062>
- Petrides, K. V., & Furnham, A. (2006). The role of trait emotional intelligence in a gender-specific model of organizational variables. *Journal of Applied Social Psychology*, 36, 552–569. <http://dx.doi.org/10.1111/j.0021-9029.2006.00019.x>
- \*Petrova, D. G. (2010). *Whom do you trust? Personality and previous behavior of the counterpart as determinants of trust and cooperation in a trust game* (Bachelor's thesis). Jacobs University Bremen, Bremen, Germany. <http://dx.doi.org/10.31237/osf.io/emnwd>
- \*Peysakhovich, A., Nowak, M. A., & Rand, D. G. (2014). Humans display a 'cooperative phenotype' that is domain general and temporally stable. *Nature Communications*, 5, 4939. <http://dx.doi.org/10.1038/ncomms5939>
- \*Peysakhovich, A., & Rand, D. G. (2016). Habits of virtue: Creating norms of cooperation and defection in the laboratory. *Management Science*, 62, 631–647. <http://dx.doi.org/10.1287/mnsc.2015.2168>
- \*Pfafftheicher, S., & Böhm, R. (2018). Honesty-humility under threat: Self-uncertainty destroys trust among the nice guys. *Journal of Personality and Social Psychology*, 114, 179–194. <http://dx.doi.org/10.1037/pspp0000144>
- \*Pfafftheicher, S., & Keller, J. (2013). Vigilant self-regulation and costly punishment in public goods situations. *European Journal of Personality*, 27, 346–354. <http://dx.doi.org/10.1002/per.1909>
- \*Pfafftheicher, S., Keller, J., & Knezevic, G. (2017). Sadism, the intuitive system, and antisocial punishment in the public goods game. *Personality and Social Psychology Bulletin*, 43, 337–346. <http://dx.doi.org/10.1177/0146167216684134>
- Pfafftheicher, S., Landhäußer, A., & Keller, J. (2014). Individual differences in antisocial punishment in public goods situations: The interplay of cortisol with testosterone and dominance. *Journal of Behavioral Decision Making*, 27, 340–348.
- \*Pfafftheicher, S., & Schindler, S. (2015). Understanding the dark side of costly punishment: The impact of individual differences in everyday sadism and existential threat. *European Journal of Personality*, 29, 498–505. <http://dx.doi.org/10.1002/per.2003>
- \*Piff, P. K., Kraus, M. W., Côté, S., Cheng, B. H., & Keltner, D. (2010). Having less, giving more: The influence of social class on prosocial behavior. *Journal of Personality and Social Psychology*, 99, 771–784. <http://dx.doi.org/10.1037/a0020092>
- \*Pinter, B., & Wildschut, T. (2012). Self-interest masquerading as ingroup beneficence: Altruistic rationalization and interindividual-intergroup discontinuity. *Small Group Research*, 43, 105–123. <http://dx.doi.org/10.1177/1046496411419016>
- Pletzer, J. L., Balliet, D., Joireman, J. A., Kuhlman, D. M., Voelpel, S. C., & Van Lange, P. A. M. (2018). Social value orientation, expectations, and cooperation in social dilemmas: A meta-analysis. *European Journal of Personality*, 32, 62–83. <http://dx.doi.org/10.1002/per.2139>
- \*Plieninger, H., Henninger, M., & Meiser, T. (2018). *An experimental comparison of the effect of different response formats on response styles*. Manuscript submitted for publication.
- Ploner, M., & Regner, T. (2013). Self-image and moral balancing: An experimental analysis. *Journal of Economic Behavior & Organization*, 93, 374–383. <http://dx.doi.org/10.1016/j.jebo.2013.03.030>
- Podsakoff, P. M., Ahearne, M., & MacKenzie, S. B. (1997). Organizational citizenship behavior and the quantity and quality of work group performance. *Journal of Applied Psychology*, 82, 262–270. <http://dx.doi.org/10.1037/0021-9010.82.2.262>
- \*Ponsi, G., Panasiti, M. S., Aglioti, S. M., & Liuzza, M. T. (2017). Right-wing authoritarianism and stereotype-driven expectations interact in shaping intergroup trust in one-shot vs multiple-round social interactions. *PLoS ONE*, 12, e0190142. <http://dx.doi.org/10.1371/journal.pone.0190142>
- Poppe, M., & Utens, L. (1986). Effects of greed and fear of being gypped in a social dilemma situation with changing pool size. *Journal of Economic Psychology*, 7, 61–73. [http://dx.doi.org/10.1016/0167-4870\(86\)90012-7](http://dx.doi.org/10.1016/0167-4870(86)90012-7)
- \*Pothos, E. M., Perry, G., Corr, P. J., Matthew, M. R., & Busemeyer, J. R. (2011). Understanding cooperation in the prisoner's dilemma game.

- Personality and Individual Differences*, 51, 210–215. <http://dx.doi.org/10.1016/j.paid.2010.05.002>
- \*Probst, T. M., Carnevale, P. J., & Triandis, H. C. (1999). Cultural values in intergroup and single-group social dilemmas. *Organizational Behavior and Human Decision Processes*, 77, 171–191. <http://dx.doi.org/10.1006/obhd.1999.2822>
- Pruitt, D. G., & Kimmel, M. J. (1977). Twenty years of experimental gaming: Critique, synthesis, and suggestions for the future. *Annual Review of Psychology*, 28, 363–392. <http://dx.doi.org/10.1146/annurev.ps.28.020177.002051>
- \*Quednow, B. B., Hulka, L. M., Preller, K. H., Baumgartner, M. R., Eisenegger, C., & Vonmoos, M. (2017). Stable self-serving personality traits in recreational and dependent cocaine users. *PLoS ONE*, 12, e0172853. <http://dx.doi.org/10.1371/journal.pone.0172853>
- \*Radell, M. L., Sanchez, R., Weinflash, N., & Myers, C. E. (2016). The personality trait of behavioral inhibition modulates perceptions of moral character and performance during the trust game: Behavioral results and computational modeling. *PeerJ*, 4, e1631. <http://dx.doi.org/10.7717/peerj.1631>
- \*Räderscheidt, S. (2016). *Effects of victim sensitivity on uncooperative behaviour mediated by expectations of injustice* (Unpublished bachelor's thesis). University of Koblenz-Landau, Germany.
- \*Radke, S., Brazil, I. A., Scheper, I., Bulten, B. H., & de Bruijn, E. R. A. (2013). Unfair offers, unfair offenders? Fairness considerations in incarcerated individuals with and without psychopathy. *Frontiers in Human Neuroscience*, 7, 406. <http://dx.doi.org/10.3389/fnhum.2013.00406>
- \*Radke, S., Güroğlu, B., & de Bruijn, E. R. A. (2012). There's something about a fair split: Intentionality moderates context-based fairness considerations in social decision-making. *PLoS ONE*, 7, e31491. <http://dx.doi.org/10.1371/journal.pone.0031491>
- Raftery, A. E. (1995). Bayesian model selection in social research. *Sociological Methodology*, 25, 111–163. <http://dx.doi.org/10.2307/271063>
- Rammstedt, B., & John, O. P. (2005). Kurzversion des Big Five Inventory (BFI-K): Entwicklung und Validierung eines ökonomischen Inventars zur Erfassung der fünf Faktoren der Persönlichkeit [Short version of the Big Five Inventory (BFI-K): Development and validation of an economic inventory for assessment of the five factors of personality]. *Diagnostica*, 51, 195–206. <http://dx.doi.org/10.1026/0012-1924.51.4.195>
- \*Rand, D. G., Greene, J. D., & Nowak, M. A. (2012). Spontaneous giving and calculated greed. *Nature*, 489, 427–430. <http://dx.doi.org/10.1038/nature11467>
- \*Rand, D. G., & Kraft-Todd, G. T. (2014). Reflection does not undermine self-interested prosociality. *Frontiers in Behavioral Neuroscience*, 8, 300. <http://dx.doi.org/10.3389/fnbeh.2014.00300>
- Rand, D. G., Peysakhovich, A., Kraft-Todd, G. T., Newman, G. E., Wurzbacher, O., Nowak, M. A., & Greene, J. D. (2014). Social heuristics shape intuitive cooperation. *Nature Communications*, 5, 3677. <http://dx.doi.org/10.1038/ncomms4677>
- Rapoport, A., & Chammah, A. M. (1965). *Prisoner's dilemma: A study in conflict and cooperation*. Ann Arbor: University of Michigan Press. <http://dx.doi.org/10.3998/mpub.20269>
- \*Rau, R., Nikoleizig, L., & Krause, S. (2018). *Effects of interpersonal attraction on cooperation and group performance*. Unpublished raw data, Department of Psychology, University of Leipzig, Leipzig, Germany.
- Rauthmann, J. F., Gallardo-Pujol, D., Guillaume, E. M., Todd, E., Nave, C. S., Sherman, R. A., . . . Funder, D. C. (2014). The Situational Eight DIAMONDS: A taxonomy of major dimensions of situation characteristics. *Journal of Personality and Social Psychology*, 107, 677–718. <http://dx.doi.org/10.1037/a0037250>
- R Core Team. (2018). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from <http://www.r-project.org/>
- \*Rêgo, G. G., Campanhã, C., do Egito, J. H. T., & Boggio, P. S. (2017). Taking it easy when playing ultimatum game with a Down syndrome proposer: Effects on behavior and medial frontal negativity. *Social Neuroscience*, 12, 530–540. <http://dx.doi.org/10.1080/17470919.2016.1195772>
- \*Reinders Folmer, C., & Van Lange, P. A. M. (2007). Why promises and threats need each other. *European Journal of Social Psychology*, 37, 1016–1031. <http://dx.doi.org/10.1002/ejsp.414>
- Reis, H. T. (2008). Reinvigorating the concept of situation in social psychology. *Personality and Social Psychology Review*, 12, 311–329. <http://dx.doi.org/10.1177/1088868308321721>
- Richard, F. D., Bond, C. F. J., Jr., & Stokes-Zoota, J. J. (2003). One hundred years of social psychology quantitatively described. *Review of General Psychology*, 7, 331–363. <http://dx.doi.org/10.1037/1089-2680.7.4.331>
- \*Rieger, M., & Mata, R. (2015). On the generality of age differences in social and nonsocial decision making. *The Journals of Gerontology Series B, Psychological Sciences and Social Sciences*, 70, 200–214. <http://dx.doi.org/10.1093/geronb/gbt088>
- \*Riepl, K., Mussel, P., Osinsky, R., & Hewig, J. (2016). Influences of state and trait affect on behavior, feedback-related negativity, and P3b in the Ultimatum Game. *PLoS ONE*, 11, e0146358. <http://dx.doi.org/10.1371/journal.pone.0146358>
- \*Rilling, J. K., Glenn, A. L., Jairam, M. R., Pagnoni, G., Goldsmith, D. R., Elfenbein, H. A., & Lilienfeld, S. O. (2007). Neural correlates of social cooperation and non-cooperation as a function of psychopathy. *Biological Psychiatry*, 61, 1260–1271. <http://dx.doi.org/10.1016/j.biopsych.2006.07.021>
- Roberts, B. W. (2009). Back to the future: Personality and Assessment and personality development. *Journal of Research in Personality*, 43, 137–145. <http://dx.doi.org/10.1016/j.jrp.2008.12.015>
- \*Roberts, S. C., Vakirtzis, A., Kristjánsdóttir, L., & Havlíček, J. (2013). Who punishes? Personality traits predict individual variation in punitive sentiment. *Evolutionary Psychology*, 11, 186–200. <http://dx.doi.org/10.1177/147470491301100117>
- Robins, R. W., & John, O. P. (1997). The quest for self-insight: Theory and research on accuracy and bias in self-perception. In R. Hogan, J. A. Johnson, & S. R. Briggs (Eds.), *Handbook of personality psychology* (pp. 649–679). San Diego, CA: Academic Press. <http://dx.doi.org/10.1016/B978-012134645-4/50026-3>
- \*Roch, S. G., & Samuelson, C. D. (1997). Effects of environmental uncertainty and social value orientation in resource dilemmas. *Organizational Behavior and Human Decision Processes*, 70, 221–235. <http://dx.doi.org/10.1006/obhd.1997.2707>
- \*Rodebaugh, T. L., Heimberg, R. G., Taylor, K. P., & Lenze, E. J. (2016). Clarifying the behavioral economics of social anxiety disorder: Effects of interpersonal problems and symptom severity on generosity. *Clinical Psychological Science*, 4, 107–121. <http://dx.doi.org/10.1177/2167702615578128>
- \*Rodebaugh, T. L., Klein, S. R., Yarkoni, T., & Langer, J. K. (2011). Measuring social anxiety related interpersonal constraint with the flexible iterated prisoner's dilemma. *Journal of Anxiety Disorders*, 25, 427–436. <http://dx.doi.org/10.1016/j.janxdis.2010.11.006>
- \*Rodebaugh, T. L., Shumaker, E. A., Levinson, C. A., Fernandez, K. C., Langer, J. K., Lim, M. H., & Yarkoni, T. (2013). Interpersonal constraint conferred by generalized social anxiety disorder is evident on a behavioral economics task. *Journal of Abnormal Psychology*, 122, 39–44. <http://dx.doi.org/10.1037/a0030975>
- \*Rodebaugh, T. L., Tonge, N. A., Weisman, J. S., Lim, M. H., Fernandez, K. C., & Bogdan, R. (2017). The behavioral economics of social anxiety disorder reveal a robust effect for interpersonal traits. *Behaviour Research and Therapy*, 95, 139–147. <http://dx.doi.org/10.1016/j.brat.2017.06.003>

- \*Rodrigues, J., Ulrich, N., & Hewig, J. (2015). A neural signature of fairness in altruism: A game of theta? *Social Neuroscience*, 10, 192–205. <http://dx.doi.org/10.1080/17470919.2014.977401>
- \*Rodrigues, J., Ulrich, N., Mussel, P., Carlo, G., & Hewig, J. (2017). Measuring prosocial tendencies in Germany: Sources of validity and reliability of the revised prosocial tendency measure. *Frontiers in Psychology*, 8, 2119. <http://dx.doi.org/10.3389/fpsyg.2017.02119>
- \*Rosen, J., & Haaga, D. A. F. (1998). Facilitating cooperation in a social dilemma: A persuasion approach. *The Journal of Psychology: Interdisciplinary and Applied*, 132, 143–153. <http://dx.doi.org/10.1080/00223989809599155>
- Rosenberg, M. (1956). Misanthropy and political ideology. *American Sociological Review*, 21, 690–695. <http://dx.doi.org/10.2307/2088419>
- \*Rosenbusch, H., Evans, A. M., & Zeelenberg, M. (2018). *Trust and Twitter*. Manuscript in preparation.
- \*Rotella, A. M. (2015). *The influence of observation on cooperative decision making* (Unpublished master's thesis). The University of Guelph, Guelph, Canada.
- \*Rotella, A. M., Sparks, A. M., Mishra, S., & Barclay, P. (2018). *Individual differences in the "watching eyes" effect and real cues of observation*. Unpublished raw data.
- Rothbart, M. K., Ahadi, S. A., & Evans, D. E. (2000). Temperament and personality: Origins and outcomes. *Journal of Personality and Social Psychology*, 78, 122–135. <http://dx.doi.org/10.1037/0022-3514.78.1.122>
- \*Rothmund, T., Gollwitzer, M., Bender, J., & Klimmt, C. (2015). Short- and long-term effects of video game violence on interpersonal trust. *Media Psychology*, 18, 106–133. <http://dx.doi.org/10.1080/15213269.2013.841526>
- \*Rothmund, T., Gollwitzer, M., & Klimmt, C. (2011). Of virtual victims and victimized virtues: Differential effects of experienced aggression in video games on social cooperation. *Personality and Social Psychology Bulletin*, 37, 107–119. <http://dx.doi.org/10.1177/0146167210391103>
- Rotter, J. B. (1967). A new scale for the measurement of interpersonal trust. *Journal of Personality*, 35, 651–665. <http://dx.doi.org/10.1111/j.1467-6494.1967.tb01454.x>
- Rotter, J. B. (1990). Internal versus external control of reinforcement: A case history of a variable. *American Psychologist*, 45, 489–493. <http://dx.doi.org/10.1037/0003-066X.45.4.489>
- \*Ruch, W., Brunsch, R., & Wagner, L. (2017). The role of character traits in economic games. *Personality and Individual Differences*, 108, 186–190. <http://dx.doi.org/10.1016/j.paid.2016.12.007>
- Rusbult, C. E., & Van Lange, P. A. M. (2003). Interdependence, interaction, and relationships. *Annual Review of Psychology*, 54, 351–375. <http://dx.doi.org/10.1146/annurev.psych.54.101601.145059>
- Rusbult, C. E., & Van Lange, P. A. M. (2008). Why we need interdependence theory. *Social and Personality Psychology Compass*, 2, 2049–2070. <http://dx.doi.org/10.1111/j.1751-9004.2008.00147.x>
- \*Sagiv, L., Sverdlik, N., & Schwarz, N. (2011). To compete or to cooperate? Values' impact on perception and action in social dilemma games. *European Journal of Social Psychology*, 41, 64–77. <http://dx.doi.org/10.1002/ejsp.729>
- \*Sakalaki, M., & Fousiani, K. (2012). Social embeddedness and economic opportunism: A game situation. *Psychological Reports*, 110, 955–962. <http://dx.doi.org/10.2466/21.02.09.17.PR0.110.3.955-962>
- \*Sakalaki, M., & Sotiriou, P. (2012). Pro-self orientation and preference for deceitful strategies: Social value orientation, dispositional and behavioral correlates of economic opportunism. *Studia Psychologica*, 54, 157–165.
- Sally, D. (1995). Conversation and cooperation in social dilemmas: A meta-analysis of experiments from 1958 to 1992. *Rationality and Society*, 7, 58–92. <http://dx.doi.org/10.1177/1043463195007001004>
- Samuelson, P. A. (1954). The pure theory of public expenditure. *The Review of Economics and Statistics*, 36, 387–389. <http://dx.doi.org/10.2307/1925895>
- \*Sandoval, E. B., Brandstetter, J., Obaid, M., & Bartneck, C. (2016). Reciprocity in human-robot interaction: A quantitative approach through the Prisoner's Dilemma and the Ultimatum Game. *International Journal of Social Robotics*, 8, 303–317. <http://dx.doi.org/10.1007/s12369-015-0323-x>
- \*Saslow, L. R., John, O. P., Piff, P. K., Willer, R., Wong, E., Impett, E. A., . . . Saturn, S. R. (2013). The social significance of spirituality: New perspectives on the compassion–altruism relationship. *Psychology of Religion and Spirituality*, 5, 201–218. <http://dx.doi.org/10.1037/a0031870>
- \*Sattler, D. N., & Kerr, N. L. (1991). Might versus morality explored: Motivational and cognitive bases for social motives. *Journal of Personality and Social Psychology*, 60, 756–765. <http://dx.doi.org/10.1037/0022-3514.60.5.756>
- Saucier, G. (1994). Mini-markers: A brief version of Goldberg's unipolar big-five markers. *Journal of Personality Assessment*, 63, 506–516. [http://dx.doi.org/10.1207/s15327752jpa6303\\_8](http://dx.doi.org/10.1207/s15327752jpa6303_8)
- Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology*, 4, 219–247. <http://dx.doi.org/10.1037/0278-6133.4.3.219>
- \*Scheres, A., & Sanfey, A. G. (2006). Individual differences in decision making: Drive and Reward Responsiveness affect strategic bargaining in economic games. *Behavioral and Brain Functions*, 2, 35. <http://dx.doi.org/10.1186/1744-9081-2-35>
- \*Schild, C., Jünger, J., & Zettler, I. (2019). Linking men's voice pitch to actual and perceived trustworthiness across domains. *Behavioral Ecology*. Advance online publication. <http://dx.doi.org/10.1093/beheco/arz173>
- \*Schindler, S., & Thielmann, I. (2017). *The interplay between mortality salience and Honesty-Humility on prosocial behavior*. Unpublished raw data, Department of Psychology, University of Kassel, Kassel, Germany.
- Schlenker, B. R. (2008). Integrity and character: Implications of principled expedient ethical ideologies. *Journal of Social and Clinical Psychology*, 27, 1078–1125. <http://dx.doi.org/10.1521/jscp.2008.27.10.1078>
- \*Schlenker, B. R., Helm, B., & Tedeschi, J. T. (1973). The effects of personality and situational variables on behavioral trust. *Journal of Personality and Social Psychology*, 25, 419–427. <http://dx.doi.org/10.1037/h0034088>
- \*Schlösser, T., Berger, S., & Fetchenhauer, D. (2018). Justice sensitivity and cooperation dynamics in repeated public good games. *Social Justice Research*, 31, 1–22. <http://dx.doi.org/10.1007/s11211-017-0300-7>
- Schmitt, M., Baumert, A., Gollwitzer, M., & Maes, J. (2010). The Justice Sensitivity Inventory: Factorial validity, location in the personality facet space, demographic pattern, and normative data. *Social Justice Research*, 23, 211–238. <http://dx.doi.org/10.1007/s11211-010-0115-2>
- \*Schmitt, P., Shupp, R., Swope, K., & Mayer, J. (2008). Pre-commitment and personality: Behavioral explanations in ultimatum games. *Journal of Economic Behavior & Organization*, 66, 597–605. <http://dx.doi.org/10.1016/j.jebo.2006.08.002>
- \*Schönbrodt, F. D., & Gerstenberg, F. X. R. (2012). An IRT analysis of motive questionnaires: The Unified Motive Scales. *Journal of Research in Personality*, 46, 725–742. <http://dx.doi.org/10.1016/j.jrp.2012.08.010>
- \*Schug, J. (2018). *Trust and expectations of reciprocity*. Unpublished raw data, Department of Psychology, The College of William and Mary, Williamsburg, VA.
- \*Schug, J., Matsumoto, D., Horita, Y., Yamagishi, T., & Bonnet, K. (2010). Emotional expressivity as a signal of cooperation. *Evolution and Human Behavior*, 31, 87–94. <http://dx.doi.org/10.1016/j.evolhumbehav.2009.09.006>
- Schultz, P. W., Shriver, C., Tabanico, J. J., & Khazian, A. M. (2004). Implicit connections with nature. *Journal of Environmental Psychology*, 24, 31–42. [http://dx.doi.org/10.1016/S0272-4944\(03\)00022-7](http://dx.doi.org/10.1016/S0272-4944(03)00022-7)



- \*Schwab, B. (2017). *Projection bias and self-image concerns in charitable giving* (Master's thesis). Humboldt University of Berlin, Berlin, Germany. Retrieved from <https://www.drstatow.de/tests/persoenlichkeitstest/>
- Sedikides, C. (1993). Assessment, enhancement, and verification determinants of the self-evaluation process. *Journal of Personality and Social Psychology*, 65, 317–338. <http://dx.doi.org/10.1037/0022-3514.65.2.317>
- \*Settgast, A. H. (2018). *Einfluss der Umwelteinstellung auf individuelles Klimaschutz- und Klimaanpassungsverhalten in einem Öffentliche-Güter-Spiel* [Influence of environmental attitude on individual climate protection and climate adaptation behavior in a public good game] (Unpublished master's thesis). Otto-von-Guericke Universität Magdeburg, Magdeburg, Germany.
- \*Seuntjens, T. G., Zeelenberg, M., van de Ven, N., & Breugelmans, S. M. (2015). Dispositional greed. *Journal of Personality and Social Psychology*, 108, 917–933. <http://dx.doi.org/10.1037/pspp0000031>
- \*Sheldon, K. M. (1999). Learning the lessons of tit-for-tat: Even competitors can get the message. *Journal of Personality and Social Psychology*, 77, 1245–1253. <http://dx.doi.org/10.1037/0022-3514.77.6.1245>
- \*Sherman, R. (1967). Individual attitude toward risk and choice between prisoner's dilemma games. *The Journal of Psychology: Interdisciplinary and Applied*, 66, 291–298. <http://dx.doi.org/10.1080/00223980.1967.10544908>
- Sibley, C. G., & Duckitt, J. (2008). Personality and prejudice: A meta-analysis and theoretical review. *Personality and Social Psychology Review*, 12, 248–279. <http://dx.doi.org/10.1177/1088868308319226>
- \*Siegert, J. (2017). *Ich vertraue dir, weil man mir vertrauen kann: Eine Untersuchung des Einflusses von sozialer Projektion auf den Zusammenhang zwischen dem HEXACO Faktor Honesty-Humility und Vertrauen* [I trust you because you can trust me: An investigation of the influence of social projection on the relation between HEXACO Honesty-Humility and trust] (Unpublished bachelor's thesis). University of Koblenz-Landau, Landau, Germany.
- \*Simpson, B. (2004). Social values, subjective transformations, and cooperation in social dilemmas. *Social Psychology Quarterly*, 67, 385–395. <http://dx.doi.org/10.1177/019027250406700404>
- \*Simpson, B., & Aksoy, O. (2017). Cumulative advantage in collective action groups: How competition for group members alters the provision of public goods. *Social Science Research*, 66, 1–21. <http://dx.doi.org/10.1016/j.ssresearch.2017.03.001>
- \*Singh, P. (1997). *Human behavior in dictator games* (Doctoral dissertation). University of Minnesota, Minneapolis, MN. Available from ProQuest Dissertations and Theses database.
- \*Skatova, A., & Ferguson, E. (2013). Individual differences in behavioural inhibition explain free riding in public good games when punishment is expected but not implemented. *Behavioral and Brain Functions*, 9, 3. <http://dx.doi.org/10.1186/1744-9081-9-3>
- \*Skatova, A., Spence, A., Leygue, C., & Ferguson, E. (2017). Guilty repair sustains cooperation, angry retaliation destroys it. *Scientific Reports*, 7, 46709. <http://dx.doi.org/10.1038/srep46709>
- \*Smeesters, D., Warlop, L., Van Avermaet, E., Corneille, O., & Yzerbyt, V. (2003). Do not prime hawks with doves: The interplay of construct activation and consistency of social value orientation on cooperative behavior. *Journal of Personality and Social Psychology*, 84, 972–987. <http://dx.doi.org/10.1037/0022-3514.84.5.972>
- \*Smeesters, D., Warlop, L., Yzerbyt, V., Corneille, O., & Van Avermaet, E. (2003). *About prisoners and dictators: The role of other-self focus, social value orientation, and stereotype primes in shaping cooperative behavior* (DTEW Research Report 0317). K. U. Leuven - Departement toegepaste economische wetenschappen.
- \*Smeesters, D., Yzerbyt, V. Y., Corneille, O., & Warlop, L. (2009). When do primes prime? The moderating role of the self-concept in individuals' susceptibility to priming effects on social behavior. *Journal of Experimental Social Psychology*, 45, 211–216. <http://dx.doi.org/10.1016/j.jesp.2008.09.002>
- \*Smith, J. (2012). The endogenous nature of the measurement of social preferences. *Mind & Society*, 11, 235–256. <http://dx.doi.org/10.1007/s11299-012-0110-4>
- \*Smith, J. (2016). *Three essays on the origins and consequences of public service motives* (Doctoral dissertation). Syracuse University, Syracuse, NY. Retrieved from <https://surface.syr.edu/etd/642>
- \*Smith, J. M., & Bell, P. A. (1992). Environmental concern and cooperative-competitive behavior in a simulated commons dilemma. *The Journal of Social Psychology*, 132, 461–468. <http://dx.doi.org/10.1080/00224545.1992.9924725>
- \*Smith, K. B., Larimer, C. W., Littvay, L., & Hibbing, J. R. (2007). Evolutionary theory and political leadership: Why certain people do not trust decision makers. *The Journal of Politics*, 69, 285–299. <http://dx.doi.org/10.1111/j.1468-2508.2007.00532.x>
- Smith, R. H., Parrott, W. G., Diener, E. F., Hoyle, R. H., & Kim, S. H. (1999). Dispositional envy. *Personality and Social Psychology Bulletin*, 25, 1007–1020. <http://dx.doi.org/10.1177/01461672992511008>
- Snyder, M. (1974). Self-monitoring of expressive behavior. *Journal of Personality and Social Psychology*, 30, 526–537. <http://dx.doi.org/10.1037/h0037039>
- Snyder, M., & Ickes, W. (1985). Personality and social behavior. In G. Lindzey & E. Aronson (Eds.), *Handbook of social psychology* (3rd ed., pp. 883–947). New York, NY: Random House.
- \*Sofianos, A. (2016). *Individual and group characteristics and their economic implications* (Doctoral dissertation). University of Warwick, Coventry, England. Retrieved from <http://wrap.warwick.ac.uk/87647/>
- \*Sonnemans, J., Schram, A., & Offerman, T. (1998). Public good provision and public bad prevention: The effect of framing. *Journal of Economic Behavior & Organization*, 34, 143–161. [http://dx.doi.org/10.1016/S0167-2681\(97\)00042-5](http://dx.doi.org/10.1016/S0167-2681(97)00042-5)
- \*Sonnemans, J., van Dijk, F., & van Winden, F. (2006). On the dynamics of social ties structures in groups. *Journal of Economic Psychology*, 27, 187–204. <http://dx.doi.org/10.1016/j.joep.2005.08.004>
- \*Spadaro, G. (2018). *The institutional roots of interpersonal trust: The role of institutions in promoting trust toward strangers* (Unpublished doctoral dissertation). Vrije Universiteit Amsterdam, Amsterdam, the Netherlands.
- Spadaro, G., Tiddi, I., Columbus, S., & Balliet, D. (2019). *Cooperation databank (CoDa): An ontology representing the annotated history of research on human cooperation*. Manuscript in preparation.
- Spearman, C. (1904). The proof and measurement of association between two things. *The American Journal of Psychology*, 15, 72–101. <http://dx.doi.org/10.2307/1412159>
- \*Spitzer, M., Fischbacher, U., Herrnberger, B., Grön, G., & Fehr, E. (2007). The neural signature of social norm compliance. *Neuron*, 56, 185–196. <http://dx.doi.org/10.1016/j.neuron.2007.09.011>
- Stanton, K., & Watson, D. (2014). Positive and negative affective dysfunction in psychopathology. *Social and Personality Psychology Compass*, 8, 555–567. <http://dx.doi.org/10.1111/spc3.12132>
- \*Stavrova, O., & Schlösser, T. M. (2015). Solidarity and social justice: Effect of individual differences in justice sensitivity on solidarity behaviour. *European Journal of Personality*, 29, 2–16. <http://dx.doi.org/10.1002/per.1981>
- Steel, P., Schmidt, J., Bosco, F., & Uggerslev, K. (2019). The effects of personality on job satisfaction and life satisfaction: A meta-analytic investigation accounting for bandwidth-fidelity and commensurability. *Human Relations*, 72, 217–247. <http://dx.doi.org/10.1177/0018726718771465>
- \*Steidle, A., Hanke, E.-V., & Werth, L. (2013). In the dark we cooperate: The situated nature of procedural embodiment. *Social Cognition*, 31, 275–300. <http://dx.doi.org/10.1521/soco.2013.31.2.275>
- Steinberg, K. K., Smith, S. J., Stroup, D. F., Olkin, I., Lee, N. C., Williamson, G. D., & Thacker, S. B. (1997). Comparison of effect estimates from a meta-analysis of summary data from published studies



- and from a meta-analysis using individual patient data for ovarian cancer studies. *American Journal of Epidemiology*, 145, 917–925. <http://dx.doi.org/10.1093/oxfordjournals.aje.a009051>
- Stewart, L. A., & Clarke, M. J., & the Cochrane Working Group. (1995). Practical methodology of meta-analyses (overviews) using updated individual patient data. *Statistics in Medicine*, 14, 2057–2079. <http://dx.doi.org/10.1002/sim.4780141902>
- \*Stivers, A. W. (2016). *More for me or more for you? The effect of power and resource asymmetry on cooperation* (Unpublished doctoral dissertation). University of Delaware, Newark, DE.
- \*Stockard, J., Van de Kragt, A. J., & Dodge, P. J. (1988). Gender roles and behavior in social dilemmas: Are there sex differences in cooperation and in its justification? *Social Psychology Quarterly*, 51, 154–163. <http://dx.doi.org/10.2307/2786837>
- Stoffregen, T. A. (2004). Breadth and limits of the affordance concept. *Ecological Psychology*, 16, 79–85. [http://dx.doi.org/10.1207/s15326969eco1601\\_11](http://dx.doi.org/10.1207/s15326969eco1601_11)
- \*Stouten, J., De Cremer, D., & van Dijk, E. (2005). All is well that ends well, at least for proselves: Emotional reactions to equality violation as a function of social value orientation. *European Journal of Social Psychology*, 35, 767–783. <http://dx.doi.org/10.1002/ejsp.276>
- \*Stouten, J., De Cremer, D., & van Dijk, E. (2009a). Behavioral (in)tolerance of equality violation in social dilemmas: When trust affects contribution decisions after violations of equality. *Group Processes & Intergroup Relations*, 12, 517–531. <http://dx.doi.org/10.1177/1368430209105048>
- \*Stouten, J., De Cremer, D., & van Dijk, E. (2009b). When being disadvantaged grows into vengeance: The effects of asymmetry of interest and social rejection in social dilemmas. *European Journal of Social Psychology*, 39, 526–539. <http://dx.doi.org/10.1002/ejsp.556>
- Suleiman, R. (1996). Expectations and fairness in a modified ultimatum game. *Journal of Economic Psychology*, 17, 531–554. [http://dx.doi.org/10.1016/S0167-4870\(96\)00029-3](http://dx.doi.org/10.1016/S0167-4870(96)00029-3)
- \*Surbey, M. K. (2011). Adaptive significance of low levels of self-deception and cooperation in depression. *Evolution and Human Behavior*, 32, 29–40. <http://dx.doi.org/10.1016/j.evolhumbehav.2010.08.009>
- \*Sussman, R., Lavalley, L. F., & Gifford, R. (2016). Pro-environmental values matter in competitive but not cooperative commons dilemmas. *The Journal of Social Psychology*, 156, 43–55. <http://dx.doi.org/10.1080/00224545.2015.1052362>
- \*Swope, K. J., Cadigan, J., Schmitt, P. M., & Shupp, R. (2008). Personality preferences in laboratory economics experiments. *The Journal of Socio-Economics*, 37, 998–1009. <http://dx.doi.org/10.1016/j.socrec.2006.12.065>
- \*Sziijártó, L., Kocsor, F., & Bereczkei, T. (2018). Machiavellian individuals' reciprocation tends to be smaller in a Trust Game. *Human Ethology Bulletin*, 33, 39–48. <http://dx.doi.org/10.22330/heh/331/039-048>
- \*Takahashi, H., Takano, H., Camerer, C. F., Ideno, T., Okubo, S., Matsui, H., . . . Suhara, T. (2012). Honesty mediates the relationship between serotonin and reaction to unfairness. *Proceedings of the National Academy of Sciences of the United States of America*, 109, 4281–4284. <http://dx.doi.org/10.1073/pnas.1118687109>
- \*Tane, K., & Takezawa, M. (2011). Perception of human face does not induce cooperation in darkness. *Letters on Evolutionary Behavioral Science*, 2, 24–27. <http://dx.doi.org/10.5178/lebs.2011.15>
- \*Tanghe, J., Wisse, B., & van der Flier, H. (2010). The role of group member affect in the relationship between trust and cooperation. *British Journal of Management*, 21, 359–374.
- Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, 72, 271–324. <http://dx.doi.org/10.1111/j.0022-3506.2004.00263.x>
- \*Tappin, B. M., & McKay, R. T. (2019). Investigating the relationship between self-perceived moral superiority and moral behavior using economic games. *Social Psychological and Personality Science*, 10, 135–143. <http://dx.doi.org/10.1177/1948550617750736>
- \*Tazelaar, M. J. A., Van Lange, P. A. M., & Ouwerkerk, J. W. (2004). How to cope with “noise” in social dilemmas: The benefits of communication. *Journal of Personality and Social Psychology*, 87, 845–859. <http://dx.doi.org/10.1037/0022-3514.87.6.845>
- Teuber, H.-L. (1955). Physiological psychology. *Annual Review of Psychology*, 6, 267–296. <http://dx.doi.org/10.1146/annurev.ps.06.020155.001411>
- Thalmayer, A. G., Saucier, G., & Eigenhuis, A. (2011). Comparative validity of brief to medium-length Big Five and Big Six personality questionnaires. *Psychological Assessment*, 23, 995–1009. <http://dx.doi.org/10.1037/a0024165>
- Thibaut, J. W., & Kelley, H. H. (1959). *The social psychology of groups*. Piscataway, NJ: Transaction Publishers.
- Thielmann, I., Böhm, R., & Hilbig, B. E. (2015). Different games for different motives: Comment on Haesevoets, Folmer, and Van Hiel (2015). *European Journal of Personality*, 29, 506–508. <http://dx.doi.org/10.1002/per.2007>
- Thielmann, I., Heck, D. W., & Hilbig, B. E. (2016). Anonymity and incentives: An investigation of techniques to reduce socially desirable responding in the Trust Game. *Judgment and Decision Making*, 11, 527–536.
- \*Thielmann, I., & Hilbig, B. E. (2014). Trust in me, trust in you: A social projection account of the link between personality, cooperativeness, and trustworthiness expectations. *Journal of Research in Personality*, 50, 61–65. <http://dx.doi.org/10.1016/j.jrp.2014.03.006>
- \*Thielmann, I., & Hilbig, B. E. (2015a). *On the effect of framing on the link between personality and cooperation*. Unpublished raw data, Department of Psychology, University of Koblenz-Landau, Landau, Germany.
- \*Thielmann, I., & Hilbig, B. E. (2015b). The traits one can trust: Dissecting reciprocity and kindness as determinants of trustworthy behavior. *Personality and Social Psychology Bulletin*, 41, 1523–1536. <http://dx.doi.org/10.1177/0146167215600530>
- Thielmann, I., & Hilbig, B. E. (2015c). Trust: An integrative review from a person-situation perspective. *Review of General Psychology*, 19, 249–277. <http://dx.doi.org/10.1037/gpr0000046>
- \*Thielmann, I., & Hilbig, B. E. (2017). Should versus want: On the relative contribution of injunctive norms and preferences on trust decisions. *Journal of Behavioral Decision Making*, 30, 446–452. <http://dx.doi.org/10.1002/bdm.1962>
- \*Thielmann, I., & Hilbig, B. E. (2019a). No gain without pain: The psychological costs of dishonesty. *Journal of Economic Psychology*, 71, 126–137. <http://dx.doi.org/10.1016/j.joep.2018.06.001>
- Thielmann, I., & Hilbig, B. E. (2019b). Nomological consistency: A comprehensive test of the equivalence of different trait indicators for the same constructs. *Journal of Personality*, 87, 715–730. <http://dx.doi.org/10.1111/jopy.12428>
- \*Thielmann, I., Hilbig, B. E., & Niedtfield, I. (2014). Willing to give but not to forgive: Borderline personality features and cooperative behavior. *Journal of Personality Disorders*, 28, 778–795. [http://dx.doi.org/10.1521/pedi\\_2014\\_28\\_135](http://dx.doi.org/10.1521/pedi_2014_28_135)
- Thielmann, I., Hilbig, B. E., & Zettler, I. (2018). Seeing me, seeing you: Testing competing accounts of assumed similarity in personality judgments. *Journal of Personality and Social Psychology*. Advance online publication. <http://dx.doi.org/10.1037/pspp0000222>
- \*Thielmann, I., Hilbig, B. E., Zettler, I., & Moshagen, M. (2017). On measuring the sixth basic personality dimension: A comparison between HEXACO Honesty-Humility and Big Six Honesty-Propriety. *Assessment*, 24, 1024–1036. <http://dx.doi.org/10.1177/1073191116638411>
- \*Thielmann, I., Zimmermann, J., Leising, D., & Hilbig, B. E. (2017). Seeing is knowing: On the predictive accuracy of self- and informant reports for prosocial and moral behaviours. *European Journal of Personality*, 31, 404–418. <http://dx.doi.org/10.1002/per.2112>

- \*Thompson, K., King, K., Nahmias, E., Fani, N., Kvaran, T., Tone, E. B., & Turner, J. A. (2019). Social feedback modulates neural response associated with cognitive bias in individuals expressing anxious symptoms. *Chronic Stress*. Advance online publication. <http://dx.doi.org/10.1177/2470547019848648>
- Thompson, T., Altmann, R., & Davidson, J. (2004). Shame-proneness and achievement behaviour. *Personality and Individual Differences*, 36, 613–627. [http://dx.doi.org/10.1016/S0191-8869\(03\)00121-1](http://dx.doi.org/10.1016/S0191-8869(03)00121-1)
- \*Thöni, C., Tyran, J.-R., & Wengström, E. (2012). Microfoundations of social capital. *Journal of Public Economics*, 96, 635–643. <http://dx.doi.org/10.1016/j.jpubeco.2012.04.003>
- \*Thoron, S., & Guerci, E. (2016). *Gender effect and psychological traits analysis in a double sequential dictator game*. Proceedings of the 7th International Conference of the French Association of Experimental Economics, Cergy-Pontoise, France.
- \*Thulin, E. W., & Bicchieri, C. (2016). I'm so angry I could help you: Moral outrage as a driver of victim compensation. *Social Philosophy & Policy*, 32, 146–160. <http://dx.doi.org/10.1017/S0265052516000145>
- \*Timilsina, R. R., Kotani, K., & Kamijo, Y. (2017). Sustainability of common pool resources. *PLoS ONE*, 12, e0170981. <http://dx.doi.org/10.1371/journal.pone.0170981>
- \*Trautmann, S. T., van de Kuilen, G., & Zeckhauser, R. J. (2013). Social class and (un)ethical behavior: A framework, with evidence from a large population sample. *Perspectives on Psychological Science*, 8, 487–497. <http://dx.doi.org/10.1177/1745691613491272>
- \*Tremayne, K. (2009). *Social value orientation and contextual cues influence cooperation and trustworthiness* (Doctoral dissertation). University of Western Sydney, Penrith City, Australia. Retrieved from <http://handle.uws.edu.au:8081/1959.7/487763>
- Trivers, R. L. (1971). The evolution of reciprocal altruism. *The Quarterly Review of Biology*, 46, 35–57. <http://dx.doi.org/10.1086/406755>
- Tupes, E. C., & Christal, R. E. (1992). Recurrent personality factors based on trait ratings. *Journal of Personality*, 60, 225–251. <http://dx.doi.org/10.1111/j.1467-6494.1992.tb00973.x>
- \*Uejio, C. K., & Wrightsman, L. S. (1967). Ethnic-group differences in the relationship of trusting attitudes to cooperative behavior. *Psychological Reports*, 20, 563–571. <http://dx.doi.org/10.2466/pr0.1967.20.2.563>
- \*Urbig, D., Terjesen, S., Procher, V., Muehlfeld, K., & van Witteloostuijn, A. (2016). Come on and take a free ride: Contributing to public goods in native and foreign language settings. *Academy of Management Learning & Education*, 15, 268–286. <http://dx.doi.org/10.5465/amle.2014.0338>
- \*Utz, S. (2004a). Self-activation is a two-edged sword: The effects of I primes on cooperation. *Journal of Experimental Social Psychology*, 40, 769–776. <http://dx.doi.org/10.1016/j.jesp.2004.03.001>
- \*Utz, S. (2004b). Self-construct and cooperation: Is the interdependent self more cooperative than the independent self? *Self and Identity*, 3, 177–190. <http://dx.doi.org/10.1080/13576500440000001>
- \*Utz, S., Muscanell, N., & Göritz, A. S. (2014). Give, match, or take: A new personality construct predicts resource and information sharing. *Personality and Individual Differences*, 70, 11–16. <http://dx.doi.org/10.1016/j.paid.2014.06.011>
- \*Utz, S., Ouwerkerk, J. W., & Van Lange, P. A. M. (2004). What is smart in a social dilemma? Differential effects of priming competence on cooperation. *European Journal of Social Psychology*, 34, 317–332. <http://dx.doi.org/10.1002/ejsp.200>
- \*Uziel, L., & Hefetz, U. (2014). The selfish side of self-control. *European Journal of Personality*, 28, 449–458. <http://dx.doi.org/10.1002/per.1972>
- \*van den Berg, S. (2017). *Nimm's oder lass es: Der Einfluss von Verträglichkeit auf Entscheidungen im 2-Personen & 3-Personen Ultimatumspiel* [Take it or leave it: The influence of agreeableness on decisions in 2-person and 3-person Ultimatum Game] (Unpublished bachelor's thesis). University of Koblenz-Landau, Landau, Germany.
- \*Van den Bergh, B., Dewitte, S., & De Cremer, D. (2006). Are prosocials unique in their egalitarianism? The pursuit of equality in outcomes among individualists. *Personality and Social Psychology Bulletin*, 32, 1219–1231. <http://dx.doi.org/10.1177/0146167206289346>
- \*van den Bos, W., van Dijk, E., Westenberg, M., Rombouts, S. A. R. B., & Crone, E. A. (2009). What motivates repayment? Neural correlates of reciprocity in the Trust Game. *Social Cognitive and Affective Neuroscience*, 4, 294–304. <http://dx.doi.org/10.1093/scan/nsp009>
- \*van den Hof, N., Evans, A. M., & Toma, C. (2018). *Framing and personality effects on trust and reciprocity*. Retrieved from <http://arno.uvt.nl/show.cgi?fid=135325>
- \*van der Schalk, J., Bruder, M., & Manstead, A. (2012). Regulating emotion in the context of interpersonal decisions: The role of anticipated pride and regret. *Frontiers in Psychology*, 3, 513. <http://dx.doi.org/10.3389/fpsyg.2012.00513>
- \*van der Schalk, J., Kuppens, T., Bruder, M., & Manstead, A. S. R. (2015). The social power of regret: The effect of social appraisal and anticipated emotions on fair and unfair allocations in resource dilemmas. *Journal of Experimental Psychology: General*, 144, 151–157. <http://dx.doi.org/10.1037/xge0000036>
- \*van Dijk, E., De Cremer, D., & Handgraaf, M. J. J. (2004). Social value orientations and the strategic use of fairness in ultimatum bargaining. *Journal of Experimental Social Psychology*, 40, 697–707. <http://dx.doi.org/10.1016/j.jesp.2004.03.002>
- \*van Dijk, E., de Kwaadsteniet, E. W., & De Cremer, D. (2009). Tacit coordination in social dilemmas: The importance of having a common understanding. *Journal of Personality and Social Psychology*, 96, 665–678. <http://dx.doi.org/10.1037/a0012976>
- \*van Dijk, F., Sonnemans, J., & van Winden, F. (2002). Social ties in a public good experiment. *Journal of Public Economics*, 85, 275–299. [http://dx.doi.org/10.1016/S0047-2727\(01\)00090-1](http://dx.doi.org/10.1016/S0047-2727(01)00090-1)
- van Kampen, D. (2012). The 5-Dimensional Personality Test (5DPT): Relationships with two lexically based instruments and the validation of the absorption scale. *Journal of Personality Assessment*, 94, 92–101. <http://dx.doi.org/10.1080/00223891.2011.627966>
- \*Van Lange, P. A. M. (1992). Confidence in expectations: A test of the triangle hypothesis. *European Journal of Personality*, 6, 371–379. <http://dx.doi.org/10.1002/per.2410060505>
- Van Lange, P. A. M. (1999). The pursuit of joint outcomes and equality in outcomes: An integrative model of social value orientation. *Journal of Personality and Social Psychology*, 77, 337–349. <http://dx.doi.org/10.1037/0022-3514.77.2.337>
- Van Lange, P. A. M. (2000). Beyond self-interest: A set of propositions relevant to interpersonal orientations. *European Review of Social Psychology*, 11, 297–331. <http://dx.doi.org/10.1080/14792772043000068>
- Van Lange, P. A. M., Joireman, J. A., Parks, C. D., & Van Dijk, E. (2013). The psychology of social dilemmas: A review. *Organizational Behavior and Human Decision Processes*, 120, 125–141. <http://dx.doi.org/10.1016/j.obhdp.2012.11.003>
- \*Van Lange, P. A. M., & Kuhlman, D. M. (1994). Social value orientations and impressions of partner's honesty and intelligence: A test of the might versus morality effect. *Journal of Personality and Social Psychology*, 67, 126–141. <http://dx.doi.org/10.1037/0022-3514.67.1.126>
- \*Van Lange, P. A. M., & Liebrand, W. B. G. (1989). On perceiving morality and potency: Social values and the effects of person perception in a give-some dilemma. *European Journal of Personality*, 3, 209–225. <http://dx.doi.org/10.1002/per.2410030306>
- \*Van Lange, P. A. M., & Liebrand, W. B. G. (1991a). The influence of other's morality and own social value orientation on cooperation in the Netherlands and the USA. *International Journal of Psychology*, 26, 429–449. <http://dx.doi.org/10.1080/00207599108247133>
- \*Van Lange, P. A. M., & Liebrand, W. B. G. (1991b). Social value orientation and intelligence: A test of the Goal Prescribes Rationality Principle. *European Journal of Social Psychology*, 21, 273–292. <http://dx.doi.org/10.1002/ejsp.2420210402>

- Van Lange, P. A. M., Otten, W., De Bruin, E. M., & Joireman, J. A. (1997). Development of prosocial, individualistic, and competitive orientations: Theory and preliminary evidence. *Journal of Personality and Social Psychology*, 73, 733–746. <http://dx.doi.org/10.1037/0022-3514.73.4.733>
- Van Lange, P. A. M., Vinkhuyzen, A. A. E., & Posthuma, D. (2014). Genetic influences are virtually absent for trust. *PLoS ONE*, 9, e93880. <http://dx.doi.org/10.1371/journal.pone.0093880>
- \*Van Lange, P. A. M., & Visser, K. (1999). Locomotion in social dilemmas: How people adapt to cooperative, tit-for-tat, and noncooperative partners. *Journal of Personality and Social Psychology*, 77, 762–773. <http://dx.doi.org/10.1037/0022-3514.77.4.762>
- \*Velez, J. A. (2015). Extending the theory of Bounded Generalized Reciprocity: An explanation of the social benefits of cooperative video game play. *Computers in Human Behavior*, 48, 481–491. <http://dx.doi.org/10.1016/j.chb.2015.02.015>
- Viechtbauer, W. (2010). Conducting meta-analyses in R with the metafor package. *Journal of Statistical Software*, 36, 1–48. <http://dx.doi.org/10.18637/jss.v036.i03>
- \*Vieira, J. B., Almeida, P. R., Ferreira-Santos, F., Barbosa, F., Marques-Teixeira, J., & Marsh, A. A. (2014). Distinct neural activation patterns underlie economic decisions in high and low psychopathy scorers. *Social Cognitive and Affective Neuroscience*, 9, 1099–1107. <http://dx.doi.org/10.1093/scan/nst093>
- \*Visser, M. S., & Roelofs, M. R. (2011). Heterogeneous preferences for altruism: Gender and personality, social status, giving and taking. *Experimental Economics*, 14, 490–506. <http://dx.doi.org/10.1007/s10683-011-9278-4>
- Vlaev, I., & Chater, N. (2006). Game relativity: How context influences strategic decision making. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 32, 131–149. <http://dx.doi.org/10.1037/0278-7393.32.1.131>
- \*Volk, S., Thöni, C., & Ruigrok, W. (2011). Personality, personal values and cooperation preferences in public goods games: A longitudinal study. *Personality and Individual Differences*, 50, 810–815. <http://dx.doi.org/10.1016/j.paid.2011.01.001>
- \*Vollan, B., Landmann, A., Zhou, Y., Hu, B., & Herrmann-Pillath, C. (2017). Cooperation and authoritarian values: An experimental study in China. *European Economic Review*, 93, 90–105. <http://dx.doi.org/10.1016/j.euroecorev.2017.01.007>
- \*von Dawans, B., Fischbacher, U., Kirschbaum, C., Fehr, E., & Heinrichs, M. (2012). The social dimension of stress reactivity: Acute stress increases prosocial behavior in humans. *Psychological Science*, 23, 651–660. <http://dx.doi.org/10.1177/0956797611431576>
- von Neumann, J., & Morgenstern, O. (1944). *Theory of games and economic behavior*. Princeton, NJ: Princeton University Press.
- \*Wagner, J. A. (1995). Studies of individualism-collectivism: Effects on cooperation in groups. *Academy of Management Journal*, 38, 152–172.
- \*Waldemayer, K. E. (2012). *College dating couples' use of conflict management during a prisoner's dilemma task: An exploratory study* (Doctoral dissertation). University of Montana, Missoula, MT. Retrieved from <https://scholarworks.umt.edu/etd/207>
- \*Walkowitz, G. (2018). *On the validity of cost-saving randomization methods in Dictator-Game experiments: A systematic test*. MPRA Paper No. 84270. Retrieved from <https://mpra.ub.uni-muenchen.de/84270/>
- \*Wang, Y., Jing, Y., Zhang, Z., Lin, C., & Valadez, E. A. (2017). How dispositional social risk-seeking promotes trusting strangers: Evidence based on brain potentials and neural oscillations. *Journal of Experimental Psychology: General*, 146, 1150–1163. <http://dx.doi.org/10.1037/xge0000328>
- \*Weber, J. M., & Murnighan, J. K. (2008). Suckers or saviors? Consistent contributors in social dilemmas. *Journal of Personality and Social Psychology*, 95, 1340–1353. <http://dx.doi.org/10.1037/a0012454>
- \*Wei, Z., Zhao, Z., & Zheng, Y. (2016). Moderating effects of social value orientation on the effect of social influence in prosocial decisions. *Frontiers in Psychology*, 7, 952. <http://dx.doi.org/10.3389/fpsyg.2016.00952>
- Weiner, I. B., & Greene, R. L. (2017). *Handbook of personality assessment* (2nd ed.). Hoboken, NJ: Wiley.
- \*Weisel, O., & Zultan, R. (2016). Social motives in intergroup conflict: Group identity and perceived target of threat. *European Economic Review*, 90, 122–133. <http://dx.doi.org/10.1016/j.euroecorev.2016.01.004>
- \*Weitzel, U., Urbig, D., Desai, S., Sanders, M., & Acs, Z. (2010). The good, the bad, and the talented: Entrepreneurial talent and selfish behavior. *Journal of Economic Behavior & Organization*, 76, 64–81. <http://dx.doi.org/10.1016/j.jebo.2010.02.013>
- \*Wesslein, A.-K., & Thielmann, I. (2017). *Does touch affect trust behavior?* Unpublished raw data.
- \*Whitt, S., & Wilson, R. K. (2007). Public goods in the field: Katrina evacuees in Houston. *Southern Economic Journal*, 74, 377–387.
- Wilson, W., Chun, N., & Kayatani, M. (1965). Projection, attraction, and strategy choices in intergroup competition. *Journal of Personality and Social Psychology*, 2, 432–435. <http://dx.doi.org/10.1037/h0022287>
- Wilson, W., & Robinson, C. U. A. (1968). Selective intergroup bias in both authoritarians and non-authoritarians after playing a modified Prisoner's Dilemma game. *Perceptual and Motor Skills*, 27, 1051–1058. <http://dx.doi.org/10.2466/pms.1968.27.3f.1051>
- \*Winter, F. (2014). Fairness norms can explain the emergence of specific cooperation norms in the battle of the Prisoner's Dilemma. *The Journal of Mathematical Sociology*, 38, 302–320. <http://dx.doi.org/10.1080/0022250X.2014.897948>
- \*Wischniewski, J., & Brüne, M. (2011). Moral reasoning in schizophrenia: An explorative study into economic decision making. *Cognitive Neuropsychiatry*, 16, 348–363. <http://dx.doi.org/10.1080/13546805.2010.539919>
- \*Witt, E. A. (2011). *Examining associations between maladaptive personality traits, competition, and fairness in economic decision-making games* (Doctoral dissertation). Michigan State University, East Lansing, MI. <http://dx.doi.org/10.25335/M5B40J>
- \*Wood, D., Pilisuk, M., & Uren, E. (1973). The martyr's personality: An experimental investigation. *Journal of Personality and Social Psychology*, 25, 177–186. <http://dx.doi.org/10.1037/h0033969>
- Wrightman, L. S., Jr. (1964). Measurement of philosophies of human nature. *Psychological Reports*, 14, 743–751. <http://dx.doi.org/10.2466/pr0.1964.14.3.743>
- \*Wu, J., Balliet, D., & Kou, Y. (2013). *Social value orientation, emotion, and cooperation in social dilemmas*. Unpublished manuscript, Department of Psychology, Beijing Normal University, Beijing, China.
- \*Wu, J., Balliet, D., Tybur, J. M., Arai, S., Van Lange, P. A. M., & Yamagishi, T. (2017). Life history strategy and human cooperation in economic games. *Evolution and Human Behavior*, 38, 496–505. <http://dx.doi.org/10.1016/j.evolhumbehav.2017.03.002>
- \*Wu, J., Balliet, D., & Van Lange, P. A. M. (2016). Gossip versus punishment: The efficiency of reputation to promote and maintain cooperation. *Scientific Reports*, 6, 23919. <http://dx.doi.org/10.1038/srep23919>
- \*Wu, T., Luo, Y., Broster, L. S., Gu, R., & Luo, Y. J. (2013). The impact of anxiety on social decision-making: Behavioral and electrodermal findings. *Social Neuroscience*, 8, 11–21. <http://dx.doi.org/10.1080/17470919.2012.694372>
- \*Wunderli, M. D., Vonmoos, M., Treichler, L., Zeller, C., Dziobek, I., Kraemer, T., . . . Quednow, B. B. (2018). Social cognition and interaction in chronic users of 3,4-methylenedioxymethamphetamine (MDMA, 'Ecstasy'). *International Journal of Neuropsychopharmacology*, 21, 333–344. <http://dx.doi.org/10.1093/ijnp/pyx098>
- \*Yakovleva, M. (2009). *Trust as a social act: An experimental study* (Doctoral dissertation). Stevens Institute of Technology, Hoboken, NJ. Available from ProQuest Dissertations and Theses database.



- Yamagishi, T. (1986). The provision of a sanctioning system as a public good. *Journal of Personality and Social Psychology*, 51, 110–116. <http://dx.doi.org/10.1037/0022-3514.51.1.110>
- Yamagishi, T. (1988). The provision of a sanctioning system in the United States and Japan. *Social Psychology Quarterly*, 51, 265–271. <http://dx.doi.org/10.2307/2786924>
- \*Yamagishi, T., Akutsu, S., Cho, K., Inoue, Y., Li, Y., & Matsumoto, Y. (2015). Two-component model of general trust: Predicting behavioral trust from attitudinal trust. *Social Cognition*, 33, 436–458. <http://dx.doi.org/10.1521/soco.2015.33.5.436>
- \*Yamagishi, T., Horita, Y., Mifune, N., Hashimoto, H., Li, Y., Shinada, M., . . . Simunovic, D. (2012). Rejection of unfair offers in the ultimatum game is no evidence of strong reciprocity. *Proceedings of the National Academy of Sciences of the United States of America*, 109, 20364–20368. <http://dx.doi.org/10.1073/pnas.1212126109>
- \*Yamagishi, T., & Kakiuchi, R. (2000). It takes venturing into a tiger's cave to steal a baby tiger: Experiments on the development of trust relationships. In J. Weesie & W. Raub (Eds.), *The management of durable relations: Theoretical models and empirical studies of households and organizations*. Amsterdam, the Netherlands: Thela Thesis.
- \*Yamagishi, T., Li, Y., Takagishi, H., Matsumoto, Y., & Kiyonari, T. (2014). In search of Homo economicus. *Psychological Science*, 25, 1699–1711. <http://dx.doi.org/10.1177/0956797614538065>
- \*Yamagishi, T., Matsumoto, Y., Kiyonari, T., Takagishi, H., Li, Y., Kanai, R., & Sakagami, M. (2017). Response time in economic games reflects different types of decision conflict for prosocial and proself individuals. *Proceedings of the National Academy of Sciences of the United States of America*, 114, 6394–6399. <http://dx.doi.org/10.1073/pnas.1608877114>
- \*Yamagishi, T., & Mifune, N. (2009). Social exchange and solidarity: In-group love or out-group hate? *Evolution and Human Behavior*, 30, 229–237. <http://dx.doi.org/10.1016/j.evolhumbehav.2009.02.004>
- \*Yamagishi, T., Mifune, N., Li, Y., Shinada, M., Hashimoto, H., Horita, Y., . . . Simunovic, D. (2013). Is behavioral pro-sociality game-specific? Pro-social preference and expectations of pro-sociality. *Organizational Behavior and Human Decision Processes*, 120, 260–271. <http://dx.doi.org/10.1016/j.obhdp.2012.06.002>
- \*Yamagishi, T., & Sato, K. (1986). Motivational bases of the public goods problem. *Journal of Personality and Social Psychology*, 50, 67–73. <http://dx.doi.org/10.1037/0022-3514.50.1.67>
- Yamagishi, T., & Yamagishi, M. (1994). Trust and commitment in the United States and Japan. *Motivation and Emotion*, 18, 129–166. <http://dx.doi.org/10.1007/BF02249397>
- Yamaguchi, S., Kuhlman, D. M., & Sugimori, S. (1995). Personality correlates of allocentric tendencies in individualist and collectivist cultures. *Journal of Cross-Cultural Psychology*, 26, 658–672. <http://dx.doi.org/10.1177/002202219502600609>
- \*Yang, X., Li, T., & Zheng, Y. (2013). Understanding cooperation in a single-trial Prisoner's Dilemma game: Interactions among three conditions. *Social Behavior and Personality*, 41, 721–729. <http://dx.doi.org/10.2224/sbp.2013.41.5.721>
- \*Yang, Z., Sedikides, C., Gu, R., Luo, Y. L. L., Wang, Y., Yang, Y., . . . Cai, H. (2018). Communal narcissism: Social decisions and neurophysiological reactions. *Journal of Research in Personality*, 76, 64–73. <http://dx.doi.org/10.1016/j.jrp.2018.07.003>
- \*Yao, S., Zhao, W., Cheng, R., Geng, Y., Luo, L., & Kendrick, K. M. (2014). Oxytocin makes females, but not males, less forgiving following betrayal of trust. *International Journal of Neuropsychopharmacology*, 17, 1785–1792. <http://dx.doi.org/10.1017/S146114571400090X>
- \*Yost-Dubrow, R., & Dunham, Y. (2018). Evidence for a relationship between trait gratitude and prosocial behaviour. *Cognition and Emotion*, 32, 397–403. <http://dx.doi.org/10.1080/02699931.2017.1289153>
- \*Zelenski, J. M., Dopko, R. L., & Capaldi, C. A. (2015). Cooperation is in our nature: Nature exposure may promote cooperative and environmentally sustainable behavior. *Journal of Environmental Psychology*, 42, 24–31. <http://dx.doi.org/10.1016/j.jenvp.2015.01.005>
- Zelmer, J. (2003). Linear public goods experiments: A meta-analysis. *Experimental Economics*, 6, 299–310. <http://dx.doi.org/10.1023/A:1026277420119>
- \*Zettler, I., Hilbig, B. E., & Heydasch, T. (2013). Two sides of one coin: Honesty-Humility and situational factors mutually shape social dilemma decision making. *Journal of Research in Personality*, 47, 286–295. <http://dx.doi.org/10.1016/j.jrp.2013.01.012>
- Zettler, I., Thielmann, I., Hilbig, B. E., & Moshagen, M. (in press). The nomological net of the HEXACO model of personality: A large-scale meta-analytic investigation. *Perspectives on Psychological Science*.
- \*Zhao, K., Ferguson, E., & Smillie, L. D. (2016). Prosocial personality traits differentially predict egalitarianism, generosity, and reciprocity in economic games. *Frontiers in Psychology*, 7, 1137. <http://dx.doi.org/10.3389/fpsyg.2016.01137>
- \*Zhao, K., Ferguson, E., & Smillie, L. D. (2017a). Individual differences in good manners rather than compassion predict fair allocations of wealth in the dictator game. *Journal of Personality*, 85, 244–256. <http://dx.doi.org/10.1111/jopy.12237>
- \*Zhao, K., Ferguson, E., & Smillie, L. D. (2017b). Politeness and compassion differentially predict adherence to fairness norms and interventions to norm violations in economic games. *Scientific Reports*, 7, 3415. <http://dx.doi.org/10.1038/s41598-017-02952-1>
- \*Zhao, K., Ferguson, E., & Smillie, L. D. (2017c). When fair is not equal: Compassion and politeness predict allocations of wealth under different norms of equity and need. *Social Psychological and Personality Science*, 8, 847–857. <http://dx.doi.org/10.1177/1948550616683018>
- \*Zhao, K., Kashima, Y., & Smillie, D. L. (2018). From windfall sharing to property ownership: Prosocial personality traits in giving and taking dictator games. *Games*, 9, 30. <http://dx.doi.org/10.3390/g9020030>
- Zhao, K., & Smillie, L. D. (2015). The role of interpersonal traits in social decision making: Exploring sources of behavioral heterogeneity in economic games. *Personality and Social Psychology Review*, 19, 277–302. <http://dx.doi.org/10.1177/1088868314553709>
- \*Zhou, C., Wu, M. S., Han, B., & Lin, C. (2014). *Connecting awe with virtues: Evidence from beneficiary sensitivity and consumption behaviors*. Proceedings of the American Society of Business and Behavioral Sciences (Vol. 21, pp. 731–738), Las Vegas, NV.
- \*Zitek, E. M., & Jordan, A. H. (2019). Psychological entitlement predicts failure to follow instructions. *Social Psychological and Personality Science*, 10, 172–180. <http://dx.doi.org/10.1177/1948550617729885>
- Zuckerman, M., Kuhlman, D. M., Joireman, J., Teta, P., & Kraft, M. (1993). A comparison of three structural models for personality: The Big Three, the Big Five, and the Alternative Five. *Journal of Personality and Social Psychology*, 65, 757–768. <http://dx.doi.org/10.1037/0022-3514.65.4.757>

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