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Short-sighted greed? Focusing on the future promotes reputation-based generosity

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Abstract

Long-term thinking and voluntary resource sharing are two distinctive traits of human nature. Across three experiments (N=1,082), I propose a causal connection: Sometimes people are generous *because* they think about the future. Participants were randomly assigned to either focus on the present or the future and then made specific decisions in hypothetical scenarios. In Study 1 (N=200), future-focused participants shared more money in a public dictator game than present-focused participants (+39%), and they were willing to donate more money to charity (+61%). Study 2 (N=410) replicated the positive effect of future-focus on dictator giving when the choice was framed as public (+36%), but found no such effect when the choice was framed as private. That is, focusing on the future made participants more generous only when others would know their identity. Study 3 was a high-powered and pre-registered replication of Study 1 (N=472), including a few extensions. Once again, future-focused participants gave more money to charity in a public donation scenario (+40%), and they were more likely to volunteer for the same charity (+17%). As predicted, the effect was mediated by reputational concern, indicating that future-orientation can make people more generous because it also makes them more attuned to the social consequences of their choices. Taken together, the results suggest that focusing on the future promotes *reputation-based generosity*. By stimulating voluntary resource sharing, a central function of human foresight might be to support cooperation in groups and society.

Keywords: future thinking, generosity, reputation, cooperation, morality

1 Introduction

The willingness to share is a critical ingredient in long-term cooperation and social life. It is therefore of great importance both for the individual and society to understand the psychology of human generosity. In the current investigation, I propose that the decision maker's time perspective plays a vital role in social decision-making, such that future-oriented thinking can promote higher levels of generosity.

Taking one step back, cooperation is a fundamental building block in optimal functioning — ranging from basic cell biology to modern society (Henrich & Henrich, 2007; Nowak & Highfield, 2011; Rand & Nowak, 2013). Indeed, cooperation might even be the ultimate foundation for morality (Krebs, 2008; Tomasello & Vaish, 2013; Curry, Mullins & Whitehouse, 2019). However, one central obstacle for successful cooperation is that it requires a certain willingness to forgo one's own resources. When people refuse to share or defect from the interests of the group, cooperation breaks down – often leaving most or all worse off. After initial acts of generosity, however, long-term cooperation may follow in self-reinforcing cycles. This makes the drivers of initial generosity a major concern in psychology and the social sciences.

In purely strategic terms, the problem with generosity is that the personal cost is immediate whereas the greater reward is often delayed or uncertain (Rand & Nowak, 2013). So why then, is human resource sharing so widespread? One reason might be that generosity tend to offer long-term rewards (Eriksson, Vartanova, Strimling & Simpson, 2018), and therefore, that thinking ahead might help people realize this possibility before acting. In the present investigation, I test the following proposition across three experiments (N=1,082): Sometimes people are generous *because* they think about the future.

1.1 The Power of Reputation

If future-oriented thinking promotes generosity, why might that be? An evolutionary and game-theoretic perspective suggests that the power of reputation might be an important part of the explanation, as it creates long-term incentives for voluntary resource sharing. Humans evolved to coop-

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Data and materials for all three studies are openly available: https://osf.io/y6mct/. The hypotheses and statistical analysis of Study 3 were pre-registered: https://aspredicted.org/q93ap.pdf.

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erate to a greater extent than other primates (Henrich & Henrich, 2007; Suddendorf, 2013; Tomasello, 2016), and typically secure survival and reproduction through social means (Baumeister, 2005; Sloman & Fernbach, 2017). Central to such a social strategy is to attract future cooperation partners by establishing a positive reputation, which can be achieved through generous actions in the present (Tomasello, 2016). By refusing to share, one's long-term prospects in the group and wider community has a good chance to be severely harmed (Apicella, Marlowe, Fowler & Christakis, 2012). In this way, reputational mechanisms create future rewards of pro-social behavior that typically exceeds the immediate cost (Trivers, 1971; Axelrod, 1984: Rand & Nowak, 2013).

By zooming in on the actual decision process, the testable hypothesis I propose here, is that merely *thinking* about the future consequences of one's choices promotes generosity.

1.2 Reputation as Delayed Reward

One reason to expect a connection between future-orientation and reputational concern is that the notion of "reputation" is inherently about the future. In essence, reputation is a delayed consequence of one's choices in the present — feeding forward in time to shape future interactions. Human consciousness can produce mental simulations of possible futures, which enables current decisions to be based on anticipated outcomes (Baumeister, Maranges & Sjåstad, 2018). To the extent that this future consists of reputational concerns, engaging in prospective thinking should increase the salience of the social rewards for acting generously, thereby promoting voluntary resource sharing.

Crucially, people have a strong desire to build and maintain a positive reputation to begin with. For instance, a recent study found a striking willingness to incur personal costs and emotional discomfort to prevent damaging reputational information from spreading to one's social network (Vonasch, Reynolds, Winegard & Baumeister, 2018). As part of the experiments, student participants were provided with false test feedback suggesting that they had clearly racist attitudes. When they were offered the possibility to place their hand in a bowl of disgusting worms or endure physical pain to prevent the dissemination of this information, 30% and 63% of the participants choose to do so, respectively. Moreover, the historical record is full of parallel examples of how people go to great lengths to protect their honor, "save face", participate in gun duels, or in other ways pay a high price to secure their future reputation.

Closer to the domain of generosity, there is a large literature showing a positive effect of mere observability on pro-social behavior (Bradley, Lawrence & Ferguson, 2018). In behavioral and experimental economics, so-called "end-game effects" are prevalent, in which the rate of selfish defection increases steeply in the last round of repeated interactions (Andreoni, 1988). This means that people tend to act more generously when their choices have possible long-term consequences, and less generously in the (rare) situations where no social consequences are possible (for a formal reputation model, see Camerer & Weigelt, 1988). Similarly, studies from social psychology have found that enabling the possibility of "gossip" leads to greater contributions to the group (Beersma & Van Kleef, 2011) and increased levels of generosity (Wu, Balliet & Van Lange, 2016), driven by greater reputational concern. Thus, there is a broad range of empirical evidence suggesting that the desire to maintain a positive reputation can promote generosity. However, no studies have investigated whether future-orientation can causally promote reputation-based generosity.

1.3 Future-Oriented Generosity: Suggestive Evidence

Causal evidence for a direct link between future-oriented thinking and generosity is lacking, but there are suggestive findings consistent with this idea. For instance, humans think much more about the future and share more resources with non-kin than any other species on the planet. Although most if not all other animals seem to live present-focused lives (Roberts, 2002; Suddendorf & Corballis, 2007), experience-sampling research has documented that people frequently engage in "mental time travel" to the past and future (Baumeister, Vohs & Oettingen, 2016). Specifically, a large proportion of human mental processes seems to be prospective and pragmatic, targeting what the person needs to do in the present to produce positive future outcomes (Schacter, Addis & Buckner, 2007; Chennu et al., 2013; Baumeister, Maranges & Sjåstad, 2018). Studies on fairness concerns and altruism show that people frequently share more than zero in economic games, even when there is no strategic benefit of doing so (Kahneman, Knetch & Thaler, 1986; Fehr & Schmidt, 2006; Cappelen & Tungodden, 2019). Hence, a possible basis for the psychological connection between future-orientation and generosity is that the human species is an extreme outlier on both.

More relevant to the present investigation, correlational research on individual differences has found that people with future-oriented traits ("CFC": Joireman, Shaffer, Balliet, & Strathman, 2012) tend to share more resources in social dilemmas than those who are not as focused on future consequences (Kortenkamp & Moore, 2006). Using an experimental design, a recent study found that making a dictator decision in advance of the actual implementation led to greater generosity than when decisions were made with immediate consequences (Kölle & Wenner, 2018). It is therefore plausible, but not necessarily so, that future-oriented thinking promotes generosity.

Some evidence from the field of comparative cognition suggests that even children behave more pro-socially when reputational concerns are made salient (Tomasello, 2016).

Engelmann, Herrmann and Tomasello (2012) found that 5-year-old children stole fewer resources and shared more with others when someone was watching than when the children were alone, whereas chimpanzees did not change their behavior in the presence of other chimpanzees. This finding suggests that children become more generous in social situations because they realize that future rewards (or punishments) is possible. Indeed, 5-year-old children shared more resources when an observer child could later reciprocate (vs. not), and when the observer child was an ingroup member (Engelmann, Over, Herrmann & Tomasello, 2013). Thus, the evidence suggests that pre-school children behave in accordance to reputational rewards, highlighting the proposed connection between future-mindedness and pro-sociality.

However, the role of conscious and deliberate consideration of the future is not addressed in any of the studies reviewed above. It is not clear whether the 5-year-old children actually thought about the future benefits of their social behavior, or if they acted on subconscious intuitions. Research from developmental psychology typically finds that children's future perspective is rather limited relative to that of adolescents and adults (e.g., Metcalfe & Mischel, 1999), likely due to delayed development of the brain's frontal-lobe. Moreover, adults who are future-oriented and pro-social by disposition (Kortenkamp & Moore, 2006) surely have the sufficient *capacity* to think ahead, but the cognitive process of this future-orientation could just as well consist of intuitive habits. Thus, although the connection between future thinking and generosity is plausible and consistent with suggestive findings, empirical evidence for a causal link is lacking.

1.4 Future-Oriented Competence — With or Without Comprehension?

To be sure, even if a behavioral pattern has been favored by natural selection for its advantageous long-term consequences, conscious awareness of these future consequences may or may not be part of the actual decision process. Indeed, what Dennett (2013; 2017) refers to as "competence without comprehension" is widespread in nature – that is, knowing what to do and how to do it, without understanding why or having an intentional purpose. For example, spiders spin their webs instinctually, with the beneficial long-term consequence of catching flies. Squirrels bury nuts for the winter, avoiding starvation in times of nutritional scarcity. Termites build advanced tunnel systems that protect against predators and hostile environments. However, neither spiders, squirrels, nor termites show any observable sign of planning or intentional foresight beyond fixed behavioral patterns, or at most, short-termed expectations into the near future.

Such examples of "competence without comprehension" (Dennett, 2013; 2017) suggest that human behavior that is beneficial in the long-term does not necessarily require conscious deliberation of these future outcomes (see also: Bear & Rand, 2016). When people make fast and intuitive decisions in anonymous one-shot economic games, for example, they seem to blindly rely on a reciprocity heuristic based on prior learning, even when there are no long-term benefits of cooperating (Rand, 2016). Moreover, a large-scale correlational study concluded that "generosity pays" in the long run, in the sense that generous individuals tend to earn more money and have more children than selfish individuals (Eriksson, Vartanova, Strimling, & Simpson, 2018). Thus, although generosity has clear long-term benefits and future-oriented individuals tend to share more resources than short-sighted individuals, it is not clear whether conscious deliberation about the future is necessary or even advantageous for pro-sociality to occur. To answer that question, experimental research on the role of future-orientation is needed.

1.5 The Present Investigation: Hypothesis and Experiment Design

Across three experiments, I explored the causal effect of focusing on the future (vs. the present) on participants' willingness to share resources in hypothetical decision scenarios. The general prediction was that focusing on the future would promote generosity.

All studies used between-subjects experimental designs, to manipulate whether participants focused on the immediate or long-term benefits of their choices. Study 1 examined the effect of future-focus versus present-focus on the willingness to share money in a dictator game (Kahneman, Knetsch & Thaler, 1986), and the willingness to share money with a top-rated charity organization. Both choices were framed as public, meaning that others would know the identity of the participant and how much money (if any) he or she would give. Study 2 again examined the effect of future-focus on resource sharing in the dictator game, but also manipulated whether the choice setting was framed as public or private (i.e., anonymous). This second manipulation tested whether future-orientation promotes generosity in general (including "pure" altruistic giving), or whether the effect is restricted to reputation-based generosity where choices are made in public.

Study 3 served as a high-powered and pre-registered replication of Study 1. Crucially, Study 3 included a new process measure of reputational concern to test the central hypothesis more directly — namely, that focusing on the future promotes *reputation-based generosity*. If intensified reputational concern is an important part of the explanation, then future-focused participants should report a corresponding thought pattern in relation to their choice — which should be positively correlated with the willingness to share. In addition to the charity donation measure used in Study 1, Study 3 also measured participants' willingness to volunteer for the same charity. This enabled a test of whether the

effect of future-focus on reputation-based generosity would generalize from donating money to donating time.

An alternative and competing hypothesis, predicted that future thinking would promote generosity regardless of reputational consequences. Indeed, construal level theory (Eyal, Liberman & Trope, 2008) contends that greater temporal distance (from the present) can lead to higher-level cognitive representations that promote moral behavior. However, this was not a guiding prediction when the final study was designed (see also: Gong & Medin, 2012).

1.6 Theoretical Model

Most theories in psychology are stated verbally, in which the central variables and testable predictions are only loosely defined — typically relying on metaphors or narrative illustrations of the general idea. Such an approach can be an excellent starting point for scientific inquiry (McGuire, 1997), but recent calls have argued for greater adoption of formal models and better theory specification to move the field forward. Ideally, this can generate novel insights into the mechanisms of social decision-making (Crockett, 2016), and improve the replicability and cumulative knowledge formation in psychological research (Muthukrishna & Henrich 2019). In the present investigation, I aspire to adhere to this recommendation.

To illustrate the underlying model of the central hypothesis in its simplest form, that focusing on the future will promote reputation-based generosity, the value function of the decision-maker can be stated formally as follows:

$$V = Give[A + (LT \times R) - C],$$

where V is the total subjective value derived from the choice, which the decision-maker seeks to maximize. Give is the amount shared or donated, A is an indicator variable of altruism (individual differences in the intrinsic pleasure of giving, regardless of long-term outcomes), and C is an indicator variable of the monetary cost. LT is an indicator variable for long-term thinking, and R is an indicator variable of reputational concern.

When provided with a fixed endowment ($100)[1], the amount given has a positive altruistic value (A) and a negative monetary value in the present (C). When the decision-maker do not consider long-term outcomes, the subjective value of giving is determined by the parameters A and C ($A - C$). In this case, the altruistic value of giving must exceed the monetary cost for any amount above zero to be shared, and a higher net-level of altruism leads to higher levels of giving. However, when the decision-maker thinks about the future *and* is concerned with the reputational consequences of his or her choice, giving provides additional positive value. In the current investigation, it is this specific part of the model ($LT \times R$) that is varied by the experimental manipulation.

Thus, the central prediction derived from this model is that decision-makers who focus on the future (vs. the present) will on average be willing to share more resources with others (H1), and that this effect will be driven by a stronger concern for maintaining a positive reputation (H2).

[1]The model can be applied to allocation decisions regarding other resources as well, such as time or effort.

2 Study 1

In an online experiment, Study 1 randomly assigned participants to engage in either future-focused or present-focused thinking. After the experimental manipulation, participants made two (unrelated) decisions concerning how they would distribute $100 between themselves and someone else. First, participants reported how much money they would share with an unknown recipient in a dictator game scenario. Second, they reported how much money they would share with a top-rated charity, Deworm the World Initiative.

Resembling the social nature of everyday life, both choices in Study 1 were described as public (i.e., others would know the participants' identity and the outcome of their decision). The primary purpose of Study 1 was to provide a preliminary test of the general hypothesis (H1), namely that adopting a long-term perspective would increase generosity, operationalized as the willingness to share economic resources with others.

2.1 Method

Participants. I recruited 200 American participants (94 female, age M=37.5) from Amazon's Mechanical Turk, for a brief online study of "attitudes and decisions" in exchange for $0.50.

Materials and procedure. Using a between-subjects design with two conditions, participants were randomly assigned to a future-focused or present-focused choice condition. Participants in the present condition were instructed to think about the immediate benefits of their choices, and to focus on what would be the best choices to make in the situation they were in "right now". Participants in the future condition were instructed to think about the future benefits of their choices, and to focus on what would be the best choices to make in the long run. To amplify the strength and clarity of the manipulation, participants were asked to demonstrate that they had read and understood the text by reformulating the instruction in their own words before they proceeded ("in about the same way as you would have explained it to a friend or a colleague").

A manipulation check assessed whether the experimental procedure was successful in altering participants' time perspective by asking, "What will be your main focus when

you respond to the following questions in this survey?", on a scale from 0 (the present) to 100 (the future).

Next, participants were presented with two hypothetical choice scenarios: A dictator game scenario and a donation scenario. In both cases, participants were asked to imagine that they were provided with $100, that the potential recipient was provided with $0, and that it was entirely up to them how much money (if any) they would give to the other person (dictator scenario) and to the Deworm the World Initiative (donation scenario). Dictator scenario: "Imagine yourself in a real-life situation in which you and another person are given one lottery ticket each, in which the winner gets $100 and the loser gets $0. As it turns out, you win the $100, which you can keep to yourself or give to the other person, all or any portion of it. Out of the $100, how much (if any) would you give to the other person?" Charity scenario: "Imagine yourself in a real-life situation in which you are given $100, which you can keep to yourself or give to the top-rated charity 'Deworm the World Initiative', all or any portion of it. Out of the $100, how much (if any) would you give to the Deworm the World Initiative?" In both choice scenarios, participants reported how much they would give and how much they would keep by typing in the specific amounts, adding up to a total of $100 for each choice.

The choice situation was described as public to all participants in both conditions. Dictator scenario: "In addition to the outcome of your decision, your full name and a picture of your face would be revealed to the other person." Donation scenario: "In addition to the outcome of your decision, your full name and a picture of your face would be published on a public website." After making their choices in the two scenarios and completing the survey, all participants were debriefed and thanked for their participation.

2.2 Results

Manipulation check. The manipulation of time perspective proved successful, supporting the internal validity of the experiment. An independent t-test confirmed that participants in the future condition intended to think much more about the future than participants in the present condition ($M_{\text{future}} = 98.22$, $SD = 5.71$ vs. $M_{\text{present}} = 11.22$, $SD = 25.95$, $p < .001$).

Public generosity in dictator choice. In line with the general hypothesis of future-oriented generosity, an independent t-test revealed that participants in the future condition were willing to give more money to the recipient in the dictator scenario than participants in the present condition ($M_{\text{future}} = 28.82$, $SD = 25.57$ vs. $M_{\text{present}} = 20.80$, $SD = 23.75$). The difference was statistically significant and the estimated effect size was moderate ($t(198) = 2.30$, $p = .023$, $d = .33$). The relative increase in dictator giving following future-focus (vs. present-focus) corresponds to +39%.

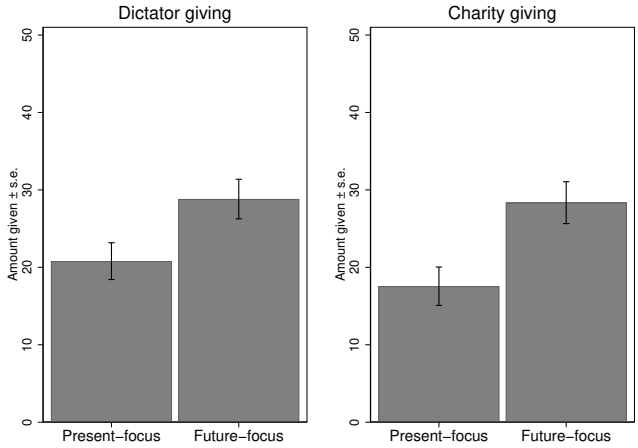

FIGURE 1: Experiment 1 (N=200): The left panel illustrates the mean amount given in a dictator game scenario for the present-focused and future-focused condition (maximum amount: $100). The right panel illustrates the mean amount given in a charity donation scenario for the present-focused and future-focused condition (maximum amount: $100). Error bars indicate standard error. Participants in the future-focused (vs. present-focused) condition were willing to give significantly more money to the recipient in the dictator game (+39%, $d = .33$, $p = .023$) and donate significantly more money to charity (+61%, $d = .42$, $p = .004$).

Public generosity in donation choice. Also in line with the general hypothesis, an independent t-test revealed that participants in the future condition were willing to donate more money to the Deworm the World Initiative than participants in the present condition ($M_{\text{future}} = 28.35$, $SD = 27.02$ vs. $M_{\text{present}} = 17.56$, $SD = 24.79$). The difference was statistically significant and the estimated effect size was moderate ($t(198) = 2.94$, $p = .004$, $d = .42$). The relative increase in donation giving following future-focus (vs. present-focus) corresponds to +61%.

2.3 Discussion

In line with the general hypothesis of future-oriented generosity, the results from Study 1 showed that focusing on the future led to higher levels of generosity in a public dictator game than focusing on the present. In addition, future-focused participants were willing to give more money to charity – suggesting that the effect is generalizable to a different domain of pro-social choice.

However, the investigation thus far cannot attest to the psychological mechanism – that is, *why* thinking about the future led to an increase in voluntary resource sharing. The central process hypothesis (H2), predicts that the pro-social effect of future-orientation should be driven by reputational concern. The alternative hypothesis predicts that focusing on the future should increase resource sharing broadly, regard-

less of reputational benefits. By using a 2x2 design where both time perspective and choice framing are manipulated between conditions, Study 2 provides a replication of the future-oriented generosity documented in Study 1, in addition to providing a first test of the competing explanations. By replicating the procedure from Study 1 and including reputational concern as a novel mediator variable, Study 3 was designed to offer an additional test of whether reputational concern can explain the positive effect of future-orientation on generosity.

3 Study 2

As in Study 1, the participants in Study 2 were instructed to either engage in future-focused or present-focused thinking when making their decisions in the following scenarios. Using the same dictator game scenario as in Study 1, the outcome measure was how much money out of $100 the participant would be willing to share with another person who received $0. Unlike Study 1, a second manipulation varied whether the choice situation was described as public or private (i.e., anonymous). Study 2 therefore employed a factorial 2x2 design with four conditions.

The central process hypothesis (H2), predicted future-focused generosity only when the choice situation was described as public, but not when the choice situation was described as private (i.e., not providing any reputational basis for resource sharing). The alternative hypothesis predicted that participants in the future condition would share more money in the dictator game scenario than participants in the present condition, regardless of choice context (private or public).

3.1 Method

Participants. I recruited 410 American participants (208 female, age *M*=38,5) from Amazon's Mechanical Turk, for a brief online study of "attitudes and decisions" in exchange for $0.50.

Materials and procedure. In a between-subjects 2x2 factorial design, participants were randomly assigned to a future-focused or present-focused condition to make a hypothetical dictator choice. The second manipulation varied whether the dictator choice was framed as either private or public. Thus, the experiment had four conditions and two manipulated independent variables; time perspective (future vs. present) and choice context (public vs. private).

As in Study 1, participants in the present condition were instructed to think about the immediate benefits of their choices, while participants in the future condition focused on which choices were better in the long run. Participants reformulated the instruction in their own words before proceeding. A manipulation check assessed whether the experimental procedure was successful in altering the time perspective of participants, and asked: "What do you think about right now?", on a scale from 0 (the present) to 100 (the future).

Unlike Study 1, the second experimental manipulation was whether this dictator scenario was described as public ("In addition to the outcome of your decision, your full name and a picture of your face would be revealed to the other person") or private ("Your identity would remain entirely anonymous, regardless of your choice").

Next, participants made a hypothetical decision in a dictator game scenario, which was the only dependent variable in this study. As in Study 1, participants were asked to imagine they received $100 after winning a lottery, that the other person received $0, and that it was entirely up to them how much money (if any) they would give to the other person. After making their choice and completing the survey, all participants were debriefed and thanked for their participation.

3.2 Results

Manipulation check. An independent *t*-test confirmed that participants in the future condition indeed thought much more about the future than participants in the present condition (M_{future} = 67.77, *SD* = 25.92 vs. M_{present} = 35.75, *SD* = 32.33, $p < .001$), indicating that the experimental manipulation was effective.

Generosity in dictator choice: Interaction analysis. A two-way ANOVA was conducted to examine the effect of time-orientation (future vs. present) and choice framing (public vs. private) on generosity in a dictator game scenario. The analysis revealed a statistically significant interaction between time-orientation and choice setting on how much money participants were willing to share with the recipient ($F(2, 406) = 4.445$, $p = .036$). To unpack this interaction, I conducted follow-up analyses of simple main effects.

Main effect: Public generosity in dictator choice. When the choice was framed as public, participants in the future condition were willing to give significantly more money (+36%) to the recipient than participants in the present condition (M_{future} = 27.67, *SD* = 25.23 vs. M_{present} = 20.34, *SD* = 22.91). The difference was statistically significant and the estimated effect size was moderate ($F(1, 203) = 4.74$, $p = .031$, partial $\eta^2 = .023$, $d = .31$).

Main effect: Private generosity in dictator choice. When the choice was framed as private, however, there were no significant difference between the two groups (M_{future} = 21.00, *SD* = 20.71 vs. M_{present} = 23.65, *SD* = 26.66, *F*(1,

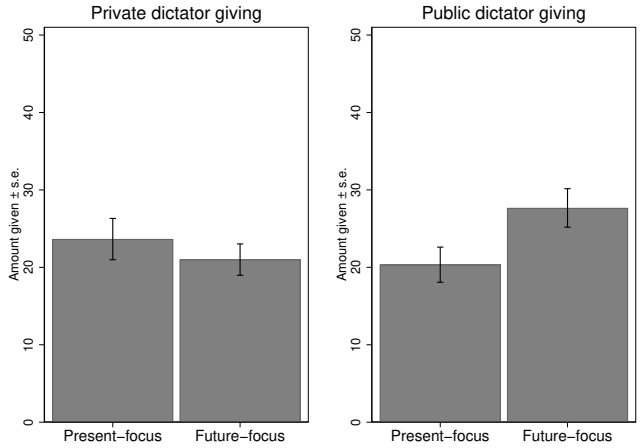

FIGURE 2: Experiment 2 (N=410): The figure illustrates the interaction between future-focus (vs. present-focus) and public (vs. private) choice framing in a dictator game scenario (maximum amount given: $100). Error bars indicate standard error. Focusing on the future led participants to share more money when the choice was framed as public (right panel: d = .31, p = .031), but not when it was framed as private/anonymous (left panel: d = −.11, p = .426).

203) = 0.64, $p = .426$, partial $\eta^2 = .003$, $d = .11$). If anything, participants in the future condition showed a non-significant tendency to share slightly *less* money than participants in the present condition (-13%).

3.3 Discussion

The results of Study 2 were in line with the central hypothesis of reputation-based generosity, which predicted that future-focus would increase public generosity without influencing private generosity. Thus, the alternative hypothesis predicting a positive effect of future-orientation on "pure" generosity was not supported. These findings fit the view that adopting a long-term perspective increase people's prosocial inclinations due to reputational concerns, in which public resource sharing is likely to provide a greater reward over time (either directly or indirectly) than would refusing to share with others. In other words, focusing on the future seems to promote reputation-based generosity rather than "pure" altruistic generosity. However, because Study 2 did not directly measure participants' reputational concerns, these conclusions cannot be drawn with certainty.

Study 3 therefore extended the investigation by examining whether the greater generosity of future-oriented participants can indeed be attributed to a greater concern for reputational consequences.

4 Study 3

Study 3 was a high-powered and pre-registered replication of Study 1 (PDF openly available: https://aspredicted.org/q93ap.pdf), in which the hypotheses and statistical analysis were specified in advance of the data collection. Beyond the inherent value of a large-scale replication (Sakaluk, 2016), Study 3 included two extensions. First and foremost, the main purpose of Study 3 was to examine reputational concern as a psychological mechanism in a mediator model. The previous two studies demonstrated that future-focused participants were more generous than present-focused participants, but Study 2 found that this was the case only in public scenarios, in which the choice was framed as observable. Although these findings suggest a reputational mechanism, the studies have so far not obtained any measure of the relevant thought process. In Study 3, all participants reported the degree to which they made their choices based on a social consideration of wanting to secure a good reputation.

In addition to the charity donation measure used in Study 1, the next extension was that Study 3 assessed participants' willingness to volunteer for the same charity as a second dependent variable. This enabled an assessment of whether the effect from the previous studies would generalize from donating money to donating time. Last, to establish generalizability across specific charities, both outcome measures in Study 3 used the Against Malaria Foundation as the recipient, rather than Deworm the World Initiative as in Study 1.

Once again, the general hypothesis (H1) predicted that future-focused participants would donate both more money and more time to a charity than present-focused participants. Crucially, the process hypothesis (H2) predicted that these effects would be statistically mediated by reputational concern. In essence, then, the theoretical prediction is that focusing on the future activates reputational motivation, which then promotes generosity.

4.1 Method

Participants. I recruited 500 American participants (244 female, age M=36,5) from Amazon's Mechanical Turk, for a brief online study of "cognition and decision-making" in exchange for $0.50.

Materials and procedure. As in Study 1, participants were randomly assigned to a future-focus or present-focus condition (between-subjects with two conditions). All participants read and rewrote the task instruction in their own words, before responding to a manipulation check that assessed their intended time perspective: "What will be your main focus in the remaining questions in this survey?" (0=*the present*, 10=*the future*).

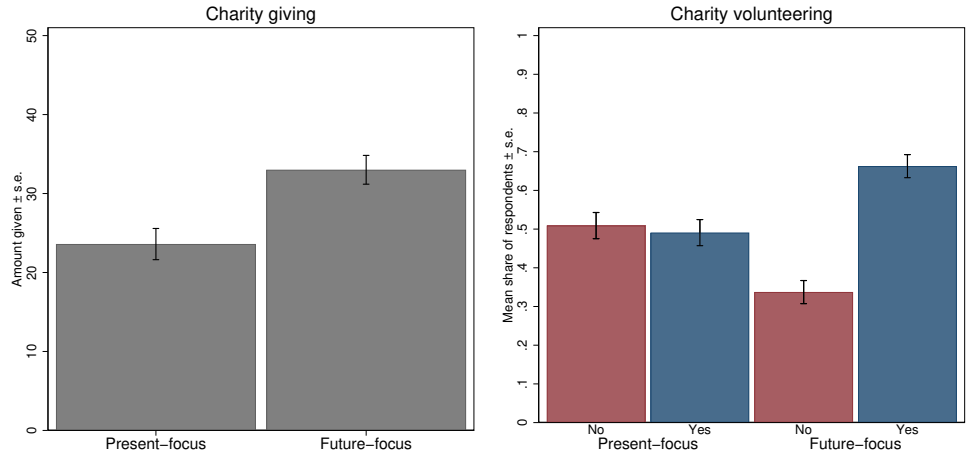

FIGURE 3: Experiment 3 (N=472): The left panel illustrates the mean amount given in a charity donation scenario for the present-focused and future-focused condition (maximum amount: $100). The right panel illustrates the proportion of participants in the present-focused and future-focused condition who were willing to volunteer for the same charity for an entire day (no/yes). Error bars indicate standard error. Participants in the future-focused (vs. present-focused) condition were willing to donate significantly more money to charity (+40%, d = .32, p = .001) and were significantly more likely to volunteer for the same charity (+17%, d = .35, p < .001).

In the first outcome measure, taken from Study 1, participants imagined that they were provided with $100, and that it was entirely up to them how much money (if any) they would donate to the Against Malaria Foundation ($0–$100). In the second and novel outcome measure, participants were asked whether they would be willing to spend an entire day volunteering on a nearby call center for the same charity, in which they made a dichotomous choice (yes/no). This scenario was described as follows: "Imagine yourself in a real-life situation in which you are asked to donate some of your time to the top-rated charity 'Against Malaria Foundation'. If so, you would volunteer for an entire working day on a call center, nearby where you live. If this was a real and committing choice: Would you be willing to donate one working day to the Against Malaria Foundation?" As the second outcome measure, all participants responded yes or no to this question.

As in Study 1, both choices in Study 3 were described as public for all participants. For charity giving: "In addition to the outcome of your decision, your full name and a picture of your face would be published on a public website". For charity volunteering: "In addition to the outcome of your decision, your full name and a picture of your face would be published in the local newspaper." This choice framing was included to provide a reputational basis for voluntary resource sharing.

To assess reputational concern more directly, a four-item measure of reputational concern was presented following each of the generosity decisions (adapted from: Beersma & Van Kleef, 2011; Wu, Balliet & Van Lange, 2016). On a response scale from 1 (*totally disagree*) to 7 (*totally agree*), participants rated their agreement with the following statements: "When making my choice, I thought about how others would think about me in the future"; "The fact that people would know about my decision played an important role in the choice I made"; "When I made my choice, I wanted to make sure that others would evaluate me positively"; "I did NOT consider what people would say about me during the task" (reversed). This measure was reliable (Cronbach's α: 0.91), which enabled a statistical test of the reputational process hypothesis. After making their choices in the two scenarios and reporting their degree of reputational concern directly following each choice, all participants were debriefed and thanked for their participation.

4.2 Results

Manipulation check. The manipulation check indicated that the task instruction was effective for 94.5% of the sample (N = 472 out of N = 500), meaning that participants in the future condition complied to the instruction and intended to focus on the future by reporting the number 6 or higher on a 0–10 scale, and that participants in the present condition intended to focus on the present by reporting the number 4 or lower on the same scale. In line with the preregistered analysis plan, the non-complying participants (N = 28) were excluded. Thus, a final sample of 472 participants were included in the data analysis (intended time perspective: M_{future} = 9.53, SD = 1.10 vs. M_{present} = .09, SD = .61, p < .001).

Power calculation. To ensure sufficient statistical power, the sample size of Study 3 per cell is more than 2.5 times that of Study 1 — which is a recommended benchmark for

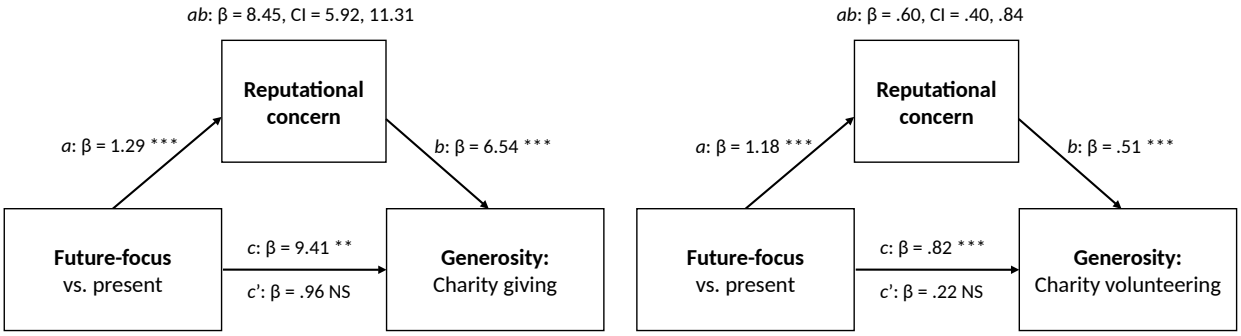

FIGURE 4: Experiment 3 (N=472): Participants in the future-focus condition expressed significantly higher reputational concern than participants in the present-focus condition. This elevated concern for securing a good reputation mediated the positive effect of future-focus on generosity (left diagram: charity giving; right diagram: charity volunteering).

high-powered replication studies (Simonsohn, 2015). A sensitivity analysis in G*power (Faul, Erdfelder, Lang & Buchner, 2007) showed that in a between-subjects design with two conditions, a sample of 472 participants provides 90% power to detect an effect size of $d = .30$ at the 5% significance level with a two-tailed test. This effect corresponds to 71.5% of the observed effect size in Study 1 ($d = .42$), which suggests that the current experiment had sufficient power to reject a smaller effect than the one originally observed.

Public generosity in charity giving. In line with the general hypothesis of future-oriented generosity, an independent *t*-test revealed that participants in the future condition were willing to donate more money to the Against Malaria Foundation than participants in the present condition ($M_{\text{future}} = 33.01$, $SD = 28.95$ vs. $M_{\text{present}} = 23.60$, $SD = 29.31$). The difference was statistically significant and the estimated effect size was moderate ($t(470) = 3.50$, $p = .001$, $d = .32$). The relative increase in donation giving following future-focus (vs. present-focus) corresponds to +40%.

Public generosity in charity volunteering. Also supporting the general hypothesis, a chi-square test revealed that participants in the future condition were more likely to volunteer for charity than participants in the present condition. Whereas 66.3% of participants in the future condition were willing to volunteer on a nearby call center for the Against Malaria Foundation, only 49.1% made the same choice in the present condition. The difference in proportions was statistically significant and the estimated effect size was moderate ($\chi 2(1, N = 472) = 14.26$, $p < .001$, $r = .17$, $d = .35$). This effect corresponds to a 17% increase in the likelihood of volunteering when focusing on the future as compared to the present.

For the effect on both outcome measures reported above, a non-registered robustness check found that the association between future-focus and generosity remained statistically significant and practically unchanged when controlling for age and gender (Charity giving: $p = .001$; Charity volunteering: $p < .001$).

Mediation analysis: Reputational concern. To test the pre-registered hypothesis regarding the reputational mechanism, I conducted a statistical mediation analysis in PROCESS (Hayes, 2017: Model 4). Future-focus (vs. present-focus) was included as the independent variable, reputational concern as the mediator variable, and generosity as the dependent variable. This was done separately for the two outcome measures, charity giving and willingness to volunteer.

The results showed that the positive effect of future-focus on generosity was indeed mediated by reputational concern (Charity giving: $ab = 8.45$; Charity volunteering: $ab = .60$), as a bias-corrected confidence interval based on 10,000 bootstrap samples did not include the value 0 for neither of the two outcome measures (Charity giving: CI = 5.92; 11.31; Charity volunteering: CI = .40, .84). For charity giving, focusing on the future led to higher levels of reputational concern ($M_{\text{future}} = 3.73$, $SD = 1.93$ vs. $M_{\text{present}} = 2.44$, $SD = 1.75$; $d = .70$, $a = 1.29$, $p < .001$), and higher reputational concern was associated with higher levels of generosity in the choice-based outcome measure ($b = 6.54$, $p <. 001$). For charity volunteering, a similar pattern was found: Focusing on the future led to higher reputational concern ($M_{\text{future}} = 3.67$, $SD = 1.96$ vs. $M_{\text{present}} = 2.49$, $SD = 1.80$; $d = .63$, $a = 1.18$, $p < .001$), and higher reputational concern was associated with higher willingness to volunteer ($b = .51$, $p < .001$).

When reputational concern was included as a mediator variable in the model, the direct effect of future-focus was no longer statistically significant (by far) for either of the two outcome measures (Charity giving: $c' = .96$, $p = .711$; Charity volunteering: $c' = .22$, $p = .308$). This suggests that a large proportion of the positive effect of future-orientation on generosity can be explained by a corresponding increase in the social concern for one's reputation.

4.3 Discussion

As in the previous studies, Study 3 found that participants who focused on the future were more generous than participants who focused on the present. This was true across two different outcome measures of public generosity: willingness to donate money to charity and willingness to donate one's time to the same charity (volunteering at a call center for an entire workday).

In addition to providing a high-powered replication of Study 1, Study 3 identified a psychological mechanism that motivated pro-social decision-making. Specifically, a process analysis showed that the positive effect of future-orientation on generosity was statistically mediated by elevated levels of reputational concern. Consistent with the theoretical model and the central hypothesis, this finding suggests that focusing on the future specifically promotes reputation-based generosity.

5 General Discussion

Across three experiments and a total of 1,082 participants, thinking about the future, as distinct from thinking about the present, was strongly connected to higher levels of generosity. After being randomly assigned to focus on the future rather than the present, people became significantly more willing to share resources with others. This pattern was found across different choice measures across the three studies, and was successfully replicated in a high-powered and pre-registered experiment (Study 3).

Specifically, future-focused generosity was found in a dictator game scenario (Study 1 and Study 2), and charity donation scenarios involving both money (Study 1 and 3) and time (Study 3). Participants who focused on the future were willing to share more money across different recipient categories than participants who focused on the present, and they were also more willing to volunteer for the same charity for an entire work day. Further supporting the generalizability of the effect, future-orientation predicted larger donations to two different charities, Deworm the World Initiative (Study 1) and Against Malaria Foundation (Study 3).

Turning to the psychological mechanism, a reputational explanation was supported by two different findings. In Study 2, there was a significant interaction between future-orientation and choice framing, in which future-orientation did not increase resource sharing when the choice was framed as private (i.e., anonymous). That is, future-orientation promoted generosity only when the choice was framed as public and observable to others, which offers reputational benefits of pro-social giving. This finding suggests that future-orientation can make people more generous because it also makes them more attuned to the social consequences of their choices. To provide a more direct test of this explanation, Study 3 assessed participants' reputation concerns following their decisions. Indeed, participants who thought about the future experienced elevated reputational concerns than did those thinking about the present, and these reputational concerns prompted greater generosity with their time and money. Seen as a whole, then, the three studies offer converging evidence for the central hypothesis in this investigation: Focusing on the future promotes *reputation-based generosity*.

5.1 Implications for Generosity and Cooperation

Given that cooperation is often a positive-sum game, in which the long-term rewards from mutual resource sharing is greater than the immediate costs (Nowak & Highfield, 2011; Rand & Nowak, 2013), one implication of the current findings is that selfishness can be understood as a form of "short-sightedness" or present bias in social decision-making. Correlational research using personality measures shows that future-oriented individuals tend to share more resources in social dilemmas than individuals who are less concerned with future consequences (Kortenkamp & Moore, 2006). The present investigation supported the causal direction of this pattern, demonstrating that those who were randomly assigned to a present-focused condition were less generous than participants in the future-focused condition. One interpretation of these findings is that thinking about the future can promote generosity by shifting one's attention from immediate costs to the *anticipated rewards* of pro-social behavior.

Ideally, adopting a future-oriented mindset might help individuals, groups, and perhaps even societies to become more successful by generating positive spirals of long-term cooperation. This suggests that psychologists and behavioral economists interested in the nature of generosity should not limit their analysis to social preferences or pro-social motivation. The present findings suggest they should also study the possible role of future-orientation, time preferences and self-control when attempting to explain and predict social behavior (Pinker, 2011).

It should be noted that the idealistic act of pure altruism in anonymous choice reached almost one-fifth or 20% of the total amount given in Study 2, which is much higher than what a perfectly selfish agent would do (i.e., give 0% and keep 100%). In line with anecdotal observations from everyday life as well as empirical research from psychology and behavioral economics (Kahneman, Knetch & Thaler, 1986; Fehr & Schmidt, 2006; Cappelen & Tungodden, 2019), this finding suggests that people derive some intrinsic pleasure or subjective value from sharing resources with others even when no strategic benefits are possible. However, this "intrinsic pleasure of giving" in anonymous choice was not influenced by focusing on the future.

Although resource sharing is a critical ingredient in cooperation, the present findings cannot speak directly to the empirical link between the two. A study by Peysakhovich, Nowak and Rand (2014) found evidence for a so-called "cooperative phenotype", in the sense that people's behavior across different economic games was highly correlated. Specifically, the inclination to help others seems to generalize across the dictator game, the trust game and the public goods game, reflecting a domain-general tendency that is relatively stable over time. Another study found that people who act generously in the dictator game also tend to cooperate in the public goods game, but not the converse (Capraro, Jordan & Rand, 2014). It is therefore a plausible hypothesis, but nonetheless an open question, whether the future-focused effect on generosity would generalize from the current investigation to cooperative behavior in other games and choice settings.

5.2 Implications for Future-Oriented Thinking ("Prospection")

Although people are systematically present-biased as compared to normative standards for rational decision-making, the human ability to think long-term is extraordinary in nature (for reviews, see Roberts, 2002; Suddendorf, 2013). The findings in this investigation demonstrate the potential value to such prospective cognition, while also illustrating the malleability or context-sensitivity of human time-orientation (Bulley, Henry & Suddendorf, 2016; Bulley et al., 2019). People are both able and willing to think about the future if the situation offers salient cues for it, such as reputational consequences or other reminders of long-term outcomes. The current findings suggest that when people look beyond the present situation, they may also become more willing to share resources with others.

As for the theoretical understanding of how and why people think about the future in the first place, the present findings fit a navigational theory of prospection (Seligman et al., 2013; Baumeister, Maranges & Sjåstad, 2018). Rather than focusing mostly on prediction of external events, people typically think ahead in strategic ways to navigate between different choice options, to figure out which specific behaviors they should enact to produce the desired outcome. That is, when people think ahead, they don't see the future as a straight path, but rather, they simulate it as a "matrix of maybe" in which multiple outcomes are possible (Baumeister, Maranges & Sjåstad, 2018). In support of this view, research using experience-sampling methods has found that people think much more about the future than the past, and that future-oriented thoughts consist primarily of planning and other strategic concerns (Baumeister, Vohs & Oettingen, 2016). Moreover, people perceive the future as more open, changeable and controllable than the past (Rothbart & Snyder, 1970; Helzer & Gilovich, 2012; Ferrante, Girotto, Stragà & Walsh, 2013).

The current investigation offers support to the idea of prospection-as-navigation. Focusing on the future increased reputation-based generosity, in which people shared resources in social situations that offered a strategic basis for doing so. Thus, one way to get what one wants and reach one's goals is to build a positive reputation by treating others with generosity and care. Thinking about the future before deciding seems to intensify this concern and facilitate pro-social decision-making.

5.3 Implications for Economic Behavior

The study findings suggest that part of the key to promote resource sharing might lie in developing interventions that effectively alter people's time-orientation toward the long-term future, especially when moral encouragement proves ineffective or when short-sighted greed undermines positive-sum cooperation.

Indeed, a recent large-scale study of 80,000 participants across 76 countries found that a substantial portion of country-level differences in wealth could be accounted for by individual differences in future-orientation (Falk et al., 2018). Countries with the most patient citizens also tend to be the best performing countries economically – even when statistically controlling for other relevant factors such as culture, institutions, and access to natural resources. But why is it that future-orientation is associated with better economic performance? Falk and colleagues (2018) found that future-orientation was associated with higher savings rates, education levels, and investment in research and development. The present studies suggest a psychological mechanism underlying these patterns: A tendency to focus on the future might lead to better economic performance because it intensifies the reputational motivation to create and share resources with one another.

5.4 Limitations

The present experiments used hypothetical scenarios to measure economic decision-making, asking people to indicate how much money they would be willing to share with others in an ostensible dictator game scenario and in two different charity donation scenarios. In a third donation scenario, participants made a hypothetical choice about whether they would volunteer for charity (yes/no). A recent study identified both similarities and differences in behavior and brain activity when comparing real versus hypothetical choices (Camerer & Mobbs, 2016), suggesting that hypothetical measures may provide an incomplete picture of actual decision-making.

On the other hand, a study by Ben-Ner, Kramer & Levy (2008) found that hypothetical and real (incentivized)

choices in the dictator game were highly correlated, leading the authors to conclude that the amount given was "remarkably similar" whether the transaction concerned real money or not. Similar findings have been reported in research on intertemporal choice and temporal discounting (Johnson & Bickel, 2002). These findings suggest that measures of hypothetical choice may be a "good enough" proxy for actual decisions in this type of experimental designs. Moreover, hypothetical choice has been a central source of data in judgment and decision research for decades (e.g. Kahneman & Tversky, 1979; Kahneman, Knetch & Thaler, 1986), under the assumption that they can elicit the heuristics or generalized strategies that people rely on in related choice environments. According to recent studies, the principles and effects derived from this type of decision research seems to replicate quite well also in incentivized experiments in behavioral economics (Camerer et al., 2018). Ideally, however, future research on the psychology of generosity could build on the present findings by supplementing measures of hypothetical choice with incentivized measures of real choice.

Regarding the statistical robustness of the results, there appears to be some meaningful differences between the three studies in the present investigation. The observed effect sizes were larger and the p-value were lower for charity giving (Studies 1 and 3) than dictator giving (Studies 1 and 2) as the outcome measure, suggesting that future-focused generosity might be a more robust phenomenon in the charity domain. Second, the evidence for the reputational mechanism was stronger in the mediation model in Study 3 than in the factorial design in Study 2. Specifically, the mediation effect was highly significant on both outcome measures of generosity in Study 3, whereas the interaction effect between time perspective (future vs. present) and choice framing (public vs. private) in Study 2 was closer to the 5% threshold for statistical significance. Given that statistical power is a function of both sample size per condition and the expected effect size, the most efficient way to build on the present findings in future research might be to extend the process approach from Study 3, relying on two experiment conditions and a self-reported measure of reputational concern as the mediator variable. Alternatively, or in addition, future studies might want to replicate the interaction effect from Study 2 in a large-scale, high-powered experiment in which such an effect can be detected or rejected with greater certainty (Simonsohn, 2015).

In that regard, I note that recent work has identified a reputation heuristic in social decision-making (Jordan & Rand, 2019), in which people punish others and express moral outrage as if they are observed even in situations that guarantee anonymity. By the same token, it is therefore possible that reputational motivation might produce an "overgeneralized" effect of future-focus on generosity in some anonymous choice situations, although such an effect was not observed in the current investigation.

A final limitation is that my experimental manipulations compared present and future, without any condition in which participants were not asked to take one perspective or the other. Thus, we do not know what they would do without instructions in a neutral baseline condition.

5.5 Future Directions

The present experiments suggest that focusing on the future, as opposed to the present, can lead people to consider reputation-based generosity as a rewarding long-term strategy. In future research, mapping out the possible interplay between future-orientation and social-economic (boundary) conditions could benefit from a closer examination.

For example, a study by Jachimowicz and colleagues (2017) demonstrated that although poverty is generally associated with short-sighted economic behavior, poor people in Bangladesh actually made long-term decisions once they thought they could trust their local communities. That is, increased community trust reduced future discounting. A similar connection has been identified between trait self-control and uncertainty, in which children became less willing to delay gratification (i.e., waiting for a greater reward in the future) when the experimenter did not appear to be trustworthy (Kidd, Palmeri, & Aslin, 2013).

The same could be the case for the psychology of generosity. If one's environment is unlikely to provide any reputational benefits from pro-sociality, thinking ahead might not promote resource sharing at all — for good reason. Indeed, the positive effect of future-orientation might be moderated by individuals' social context, such as safety, the general predictability of one's life situation, and trust for nearby social partners. If so, social security and individual future-orientation might be an especially powerful combination in promoting voluntary resource sharing and long-term cooperation. This possibility remains to be addressed empirically in future research.

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