UNIVERSITY OF CALIFORNIA,
IRVINE

The Begetting of Greed and Generosity: Examining the Social Cognitive Mechanisms of Generalized Reciprocity

DISSERTATION

submitted in partial satisfaction of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

in Psychological Science

by

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Dissertation Committee:
Professor Chuansheng Chen, Chair
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2. Ye, B., Wu, D., Wang, P., **Im, H.,** Liu, M., Wang, X., & Yang, Q. (2021). COVID-19 Stressors and Poor Sleep Quality: The Mediating Role of Rumination and the Moderating Role of Emotion Regulation Strategies. International Journal of Behavioral Medicine. https://doi.org/10.1007/s12529-021-10026-w
3. **Im, H.** & Shane, J. (2021). Causal Beliefs for Socioeconomic Status Attainment Scale: Development and Validation. *The Journal of Social Psychology, online first*. https://doi.org/10.1080/00224545.2021.1948811
4. **Im, H.,** Ahn, C.†, Wang, *P.*, & Chen, C.S. (In Press). An Early Examination: Psychological, Health, and Economic Correlates and Determinants of Social Distancing Amidst COVID-19. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2021.589579
5. Hu, Y.*, Ye, B.*, & **Im, H.*** (2021). Hope and Post-stress growth during COVID-19 pandemic: The mediating role of perceived stress and the moderating role of empathy. *Personality and Individual Differences,* 178, 110831. https://doi.org/10.1016/j.paid.2021.110831

6. Wang, Q., Wei, S., **Im, H.,** et al. (2021). Neuroanatomical and functional substrates of the greed personality trait. *Brain Structure and Function, online first*. https://doi.org/10.1007/s00429-021-02240-9

7. Ye, B., Zeng, Y., **Im, H.,** Liu, M., Wang, X., & Yang, Q. (2021). The relationship between fear of COVID-19 and online aggressive behavior: A moderated mediation model. *Frontiers in Psychology.* https://doi.org/10.3389/fpsyg.2021.589615

8. **Im, H.,** Shao, J., & Chen, C.S. (2020). The Emotional Sponge: Perceived Reasons for Emotionally Laborious Sessions and Coping Strategies of Peer Writing Tutors. *The Writing Center Journal,* 38(1), 203-230. https://www.jstor.org/stable/27031268
    a. *Nominated for the International Writing Centers Association Fall 2021 Outstanding Article Award*

9. Ye, B.*, Zhou, X.*, **Im, H.***, Liu, M., Wang, X. Q., & Yang, Q. (2020). Epidemic Rumination and Resilience on College Students' Depressive Symptoms During the COVID-19 Pandemic: The Mediating Role of Fatigue. *Frontiers in Public Health*, 8. https://doi.org/10.3389/fpubh.2020.560983

10. Ye, B., Wu, D., **Im, H.,** Liu, M., Wang, X., & Yang, Q. (2020). Stressors of COVID-19 and stress consequences: The mediating role of rumination and the moderating role of psychological support. *Children and Youth Services Review,* 118(105466). https://doi.org/10.1016/j.childyouth.2020.105466

11. **Im, H.,** & Chen, C. (2020). Cultural dimensions as correlates of favoritism and the mediating role of trust. *Cross Cultural & Strategic Management*, 27(3), 417–445. https://doi.org/10.1108/CCSM-09-2019-0165

Under Review / Revise & Resubmit

1. **Im, H.** & Chen, C.S. (Revise & Resubmit at *Journal of Behavioral Decision Making*). From Saving to Losing: A Cross-National Examination of Disease Risk Framing and its Cultural Correlates. https://doi.org/10.31234/osf.io/4tnz2

2. **Im, H.** (*Revise & Resubmit at Journal of Personnel Psychology*). Come Work with Us: Inclusivity, Performance, Employee Engagement, and Job Satisfaction Promote Employer Recommendation.

3. Ye, B., Fan, N., **Im, H.,** Liu, M., Wang, X., & Yang, Q. (*Revise & Resubmit at Journal of Family and Child Studies*). Profiles of Childhood Psychological Abuse and Neglect among Chinese College Students and Their Problematic Online Behaviors. https://doi.org/10.31234/osf.io/95qd3

4. Ye, B.*, Fan, N.*, **Im, H.*,** Liu, M., Wang, X., & Yang, Q. (*Revise & Resubmit at Journal of American College Health*). Family cohesion and trust: the mediating role of psychological stress responses of COVID-19 and the moderating role of stress mindset.

5. **Im, H.** & Chen, C.S. (Under Review). Social Distancing Around the Globe: Cultural Correlates of Reduced Mobility. https://doi.org/10.31234/osf.io/b2s37

6. **Im, H.**, Wang, *P.*, & Chen, C.S. (Under Review). The Partisan Mask: Political and Cultural Correlates of Mask Adherence During COVID-19.

7. Ye, B.*, Zhao, S.*, **Im, H.*,** Gan, L., Liu, M., Wang, X., & Yang, Q. (Under Review). COVID-19 risk concerns inhibit intentions to travel: Roles of tourism valuation and safety orientation.

8. Ye, B.*, Hu, J.*, **Im, H.*,** Liu, M., Wang, X., & Yang, Q. (Under Review). Family Cohesion, Sense of Security, and Sleep Disturbances During COVID-19: The Mediating Role of Perceived Stress.

9. Ye, B.*, Zhao, S.*, **Im, H.*,** Zeng, Y., Liu, M., Wang, X., & Yang, Q. (Under Review). Perceived uncertainty of COVID-19 facilitates online shopping intention among Chinese college students: a moderated mediation model

10. Zhao, S.*, Ye, B.*, **Im, H.*,** Zeng, Y., & Chen, Z. (Under Review). Intolerance of Uncertainty & Online Impulse Buying: Mediating Effects of COVID-19 Worry and Self-Control.

Presentations

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2. **Im, H.,** & Chen, C.S. (2021, February). *To save or not to save? A cross-national examination of disease risk management and its cultural correlates.* Presentation given at the 2021 SPSP Annual Convention, Online.
3. Ahn, C.† & **Im, H.** (2020, May). *Favorable Appraisal of In-Group Wrongdoing Associated with Lower Whistleblowing Intention*. Presentation given at UCI Psych Science Post-Bacc Research Conference, University of California, Irvine, CA.
4. **Im, H.** & Chen, C.S. (2019, November). *When In-group Favoritism Seems Right: A Multi-Dimensional Approach to Understanding Situational Favoritism*. Poster presented at the School of Social Ecology Preview Day, University of California, Irvine, CA.
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6. **Im, H.** (2019, May). *When Favoritism Seems Right: The Cultural and Moral Drivers of Situational Favoritism.* Presentation given at the Psychological Science Colloquium, University of California, Irvine, CA.
7. **Im, H.**, Kim, C., & Chen, C.S. (2019, February). *The Role of Familism in Business Corruption: A Cross-National Examination*. Poster presented at the 2019 SPSP Annual Convention, Portland, OR.
8. **Im, H.,** Lee, J.H.*, & Chin, W.C.* (2017, April). *Emotional Labor: Implications of Emotional Investment in Peer-Learning Environments*. Poster presented at Symposium of Teaching & Learning, Seattle, WA.
9. Vincent, J., **Im, H.**, & Buck, S.L. (2016, October). *Independence of brown induction and brightness induction*. Poster presented at The Optical Society of America 2016 Fall Vision Meeting, Rochester, NY. https://doi.org/10.1167/17.7.52
10. DeLawyer, T., Buck, S.L., **Im, H.***, & Smith, C.* (2015, July). *Dichoptic Perception of Brown*. Poster presented at International Colour Vision Society, Tohoku University, Sendai, Japan.

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	SPR 21	• Cultural Psychology (P179S)
	SPR 20	• Naturalistic Field Research (SE194W), 6.30/7
	WIN 10	• Social Animal (P104S), 5.91/7
	FALL 19	• Health Psychology (P103H), 5.83/7
	SUM 19	• Psychology Fundamentals (P7A/P9C), 5.33/7
	SPR 19	• Attachment Relationship (P127D), 6.09/7
	WIN 19	• Positive Psychology (P184S), 6.16/7
	FALL 18	• Work and Family (P121D), 6.21/7
	SUM 18	• Lifespan Developmental Psychology (P101D), 5.93/7
	SPR 18	• Positive Psychology (P184S), 6.00/7
	WIN 18	• Clinical Psychology (P150C), 5.81/7
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2019 Graduate Panel Member | School of Social Ecology, UC Irvine

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2018 – Present Graduate Affiliate | Society for Personality and Social Psychology
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Ad hoc reviewer, Sultan Qaboos University Medical Journal
Ad hoc reviewer, International Journal of Mental Health and Addiction
Ad hoc reviewer, International Journal of General Medicine
Ad hoc reviewer, Risk Management and Healthcare Policy
Ad hoc reviewer, Journal of Pain Research
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Project: Causal Beliefs of Social Mobility as Antecedents of Noblesse Oblige

2020 **Undergraduate Research Opportunity Program (94932s1),** $500
Project: When is Ingroup Favoritism Right?

2020 **Undergraduate Research Opportunity Program (14249s1),** $550
Project: Paying Forward Negativity

2020 **Undergraduate Research Opportunity Program (02700s1),** $550
Project: Whistleblowing Intentions and Motivations: Friends vs Strangers

2020 **Undergraduate Research Opportunity Program (91521s1),** $550
Project: Distributive vs. Retributive Justice: Which is Fairer?

2020 **Undergraduate Research Opportunity Program (24042s1),** $500
Project: Mental Health of Undocumented Immigrants

Mentored Students' Presentations

1. Thomas, M., Lee, L., Ahn, C., Im, H., & Chen, C.S. (2021, May). Is it normal to pay it forward? Examining the roles of norms in generalized reciprocity. Presentation to be given at the 2021 UCI UROP Annual Symposium, Online.
2. Thomas, M., Dominguez, L., Widjaja, A., Ahn, C., Im, H., & Chen, C.S. (2021, May). Paying forward what you perceive: Examining the role of causal attributions in generalized reciprocity. Presentation to be given at the 2021 UCI UROP Annual Symposium, Online.
3. Widjaja, A., Stekkinger, R., Ahn, C., Im, H., & Chen, C.S. (2021, May). Who should be socially responsible? Examining the roles of upward social mobility pathways. Presentation to be given at the 2021 UCI UROP Annual Symposium, Online.
4. Dominguez, L., Stekkinger, R., Ahn, C., Im, H., & Chen, C.S. (2021, May). When is favoritism a good choice? Examining the roles of culture and preferred employee qualities. Presentation to be given at the 2021 UCI UROP Annual Symposium, Online.
5. Dominguez, L., Thomas, M., Lee, L., Ahn, C., Im, H., & Chen, C.S. (2021, May). Blowing the whistle for different reasons: Concerns of whistleblowers and bystanders. Presentation to be given at the 2021 UCI UROP Annual Symposium, Online.
6. Stekkinger, R., Thomas, M., Ahn, C., Im, H., & Chen, C.S. (2021, May). What, when, why? Comparison of distributive and retributive justice in fairness appraisal. Presentation to be given at the 2021 UCI UROP Annual Symposium, Online.

ABSTRACT OF THE DISSERTATION

The Begetting of Greed and Generosity:

Examining the Social Cognitive Mechanisms of Generalized Reciprocity

by

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Doctor of Philosophy in Psychological Science

University of California, Irvine, 2021

Professor Chuansheng Chen, Chair

In the absence of the ability to directly reciprocate greed or generosity, individuals are often disposed to exact similar treatment onto unrelated, third-party others. This concept of *generalized reciprocity* (i.e., *pay-it-forward*) has widely captivated the public's interest but has escaped the enthusiasm of the academic community. In this dissertation, 9 experiments utilized a repeated dictator game with changing partners design to systematically investigate the mechanisms underlying this phenomenon. In Study 1, participants (i.e., college students) were randomly assigned to receive either $0 (Greed), $5 (Equity), or $10 (Generosity) out of $10 from a supposed other and were given the option to pass on any amount of $10 onto another, unrelated individual. Results showed that those who experienced greed tended to pay the greed forward and this was mediated by attribution of greed (e.g., "the other person is greedy") but not negative affect. Study 2 replicated Study 1 and further found that participants (i.e., college students) used the experience of their initial treatment to infer the average amount people in general paid forward, which subsequently informed their own decisions. Studies 3-9 utilized a 2 × 2 between-

subjects experimental design to examine the efficacy of interventions targeting greed attribution and norm beliefs. An intervention targeting perceived intentionality showed greatest promise in promoting positive generalized reciprocity (Studies 5 & 8) while interventions descriptive norm appeals appeared to only work on naïve participants (Studies 6 & 9). Interventions targeting perceived locus of control (Studies 3 & 4) and injunctive norm appeals (Study 7) showed little to no promise for influencing generalized reciprocity. A non-systematic mini meta-analysis (Study 10) of 16 studies across three papers revealed the generalized reciprocity effect to be large and pervasive. Additional implications are discussed.

INTRODUCTION

Dissertation Overview

When one is a beneficiary of generosity, it is common courtesy to reciprocate that kindness in one way or another back to the benefactor. However, what about the cases in which the benefactor does not wish to be on the receiving end of that reciprocity? Or instances where the beneficiary may not know the benefactor? In such cases, the common alternative is to *pay the kindness forward*. The phrase, *pay-it-forward,* used to denote the process by which one repays a transactional loan to a third-party beneficiary in place of reciprocating the loan back to the original benefactor, achieved widespread pop culture prominence following Catherine Ryan Hyde's 1999 novel, *Pay It Forward*. In recent years, the phenomenon has received notable traction across online communities, after chains of 'pay-it-forward' movements surfaced on social media and mainstream news outlets, such as when more than 750 strangers participated in a 'pay-it-forward' chain at a local Starbucks (CNN, 2014). These anecdotal accounts add to the growing body of evidence that people appear inclined to pay positivity forward when they, themselves, have been the beneficiaries of such acts.

The scholarly community has been no stranger to the behavioral phenomenon. Early ethnographic studies in anthropology and sociology documented numerous accounts of parties paying forward resources and have typically studied it under the moniker of *generalized reciprocity* or *generalized exchange* (Bearman, 1997; Uehara, 1990). Scholars rekindled their interest in generalized reciprocity in the past two decades and the topic has since been empirically studied across multiple disciplines, including organizational behavior (Baker & Bulkley, 2014; Deckop et al., 2003), evolutionary biology (Barta et al., 2011; Rankin & Taborsky, 2009; Rutte & Taborsky, 2007; van Doorn & Taborsky, 2012), psychology (Gray et

al., 2014; Leimgruber et al., 2014; Pressman et al., 2015; Strang et al., 2016), behavioral economics (Cardella et al., 2019; Nowak & Sigmund, 2005), and neuroscience (Hu et al., 2018; Y. Wu et al., 2015). The increase in interest is not without good reason; not only is generalized reciprocity a pervasive behavioral phenomenon, several studies have provided evidence of the benefits of paying it forward, such as in promoting positive work-to-family spillover (Carlson et al., 2011), improving individual well-being (Pressman et al., 2015), and increasing academic motivation (Rivai & Yusri, 2018).

As much as generalized reciprocity may spread positivity, however, there is fertile ground for the spread of negativity. Indeed, early studies on displaced aggression (i.e., aggression directed toward third parties in absence of ability to directly retaliate against the antagonist) reflect the rudimentary nature of spreading negativity (e.g., Marcus-Newhall et al., 2000). Displacement of aggression, rudeness, and negativity has been a common topic of inquiry in the management literature (e.g., Francis et al., 2015; Gallus et al., 2014; Rosen et al., 2016) and recent controlled behavioral studies have supported the evidence of negative generalized reciprocity (Cardella et al., 2019; Gray et al., 2014; Leimgruber et al., 2014; Strang et al., 2016). However, these prior studies have often been limited in their investigations of generalized reciprocity in its purest form (e.g., experience *A* begets behavior *A*) by instead examining a spillover effect (e.g., experience *A* begets behavior *B*; Y. Wu et al., 2015) or only investigating potential mediating factors in isolation of competing mediators (e.g., Cardella et al., 2019; Gray et al., 2014).

The current dissertation first provides a comprehensive overview of literature relevant to the program of research presented. The theoretical foundation of the proposed research includes discussions and overviews of different families of reciprocity (e.g., direct, indirect, generalized)

building on prior studies on generalized reciprocity (e.g., Cardella et al., 2019; Gray et al., 2014; Hu et al., 2018; Leimgruber et al., 2014; Sun et al., 2020), theories of causal attribution (e.g., Foulk et al., 2016; van Lange et al., 1990; Weiner, 1985), and social influences of norm learning (e.g., Eckel et al., 2011; Krupka & Weber, 2013; Raihani & McAuliffe, 2014). In doing so, I focus on the discussion of the manifestation of generalized reciprocity in both controlled lab settings and within the field. I lastly acknowledge and consult the rich body of literature on prosocial behavior (e.g., religiosity, empathy, justice sensitivity, etc.) to discuss the possible moderators in the propensity to engage in generalized reciprocity. With this review of literature, I propose a comprehensive model of generalized reciprocity in Study 1. I then use the findings in Study 2 to correct the model of generalized reciprocity and identify two key mechanisms of causal attribution and norm learning. Six additional experimental studies are then presented to examine possible interventions that may promote positive generalized reciprocity and mitigate negative generalized reciprocity. Lastly, the mini meta-analysis (Study 10) compiled findings from all nine dissertation studies in addition to methodologically similar studies from Gray et al. (2014) and Sun et al. (2020) to estimate the generalized reciprocity effect.

The Social Workings of Reciprocity

You scratch my back, I scratch yours.

Claw me and I will claw thee.

Propriety, or courtesy, suggests reciprocity (禮尚往來).

Reciprocity, the practice of mutual exchange for one good or service for another of equal objective or subjective value, is such a rudimentary principle of social capital that numerous idioms and proverbs litter our daily linguistic syntax. Indeed, phrases like *quid pro quo*, *tit-for-tat*, and *give-and-take* reflect the architectural nature of reciprocity in maintaining and designing a cooperative social network (Diekmann, 2004). Reciprocity painting the constitutions of cooperative social exchange is further evidenced in its early development among humans (Caulfield, 1995; Chernyak et al., 2019; Groep et al., 2020; Hamlin et al., 2011; Leimgruber, 2018; Meristo & Surian, 2013) and even among social animals (e.g., rats, dogs) with limited cognitive capabilities (Freidin et al., 2017; Rutte & Taborsky, 2008).

The process of direct exchange is a simple one; when Person *A* provides a service to Person *B*, an unconditional state of fairness is established (i.e., one party benefited from another's cost). Person B reestablishes conditional fairness (i.e., no party benefited more than the other) by reciprocating the service received with one of objective or subjective equivalence (Diekmann, 2004). However, the exchange between persons need not be subjected to contracted obligations of reciprocation in cases where said exchange was initiated under the sole discretion of a single party. Such are deemed *reciprocal exchanges* (Molm, 2010). In contrast, in *negotiated exchanges*, the involved parties would bilaterally determine the appropriate rates of exchange (Molm, 2010). In the inability of establishing the latter, however, reciprocating like treatments

have famously been documented to yield the highest payoffs and promote cooperation in repeated exchanges (Axelrod, 1986; Axelrod & Dion, 1988; J. Wu & Axelrod, 1995).

Despite its rudimentary nature, however, the cognitive mechanisms guiding the motions of social reciprocity remain complex and elusive to the studies of social behavior. The sustainability of reciprocity in maintaining and promoting social capital is partly guided by its constituents' level of internalized social norms (Bó, 2006; Fehr & Fischbacher, 2004; Kerr et al., 1997; Lindbeck, 1995), particularly so when reciprocity is not strictly enforced by an external referee (J. Wu & Axelrod, 1995). That is, as humans develop tendencies and dispositions for reciprocity in early development (Chernyak et al., 2019; Hamlin et al., 2011; Leimgruber, 2018), and subsequently internalize norms of reciprocity (Putnam, 2000), individuals also show tendency to conform to their doctrines of reciprocal behavior, whether that be in consideration to appropriately compensate helping behavior or take punitive action against hurting behavior (Perugini et al., 2003). Nonetheless, even when such norms are not present for shepherding cooperation, a social network seeking cooperation fosters the development of a norm of reciprocity (Diekmann, 2004). Thus, reciprocity comprises a basic component of human behavior and explains humans' ability to extend cooperation and trust to even unknown others (Berg et al., 1995).

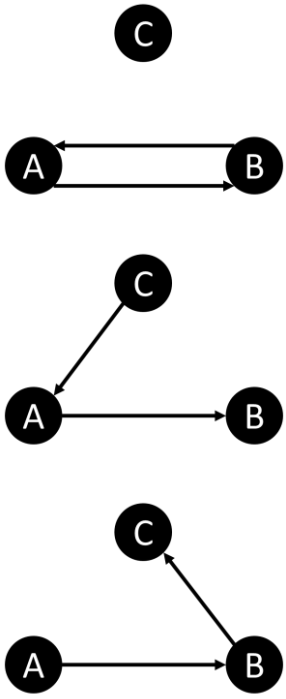
This form of *direct reciprocity*, however, comprises of only one of several different types in the domain that reciprocity operates under. In the absence of the ability to directly reciprocate actions toward the original benefactor or antagonist, individuals will seek alternative pathways to equalize the unconditional state of fairness (Molm, 2010; Molm et al., 2007). Indeed, two other large families of reciprocity capture the ways in which reciprocity manifests in such social exchanges, including *indirect reciprocity* and *generalized reciprocity.* Compared to its sister

counterpart of direct reciprocity, both indirect and generalized reciprocity remain even more elusive to different influencing mechanisms.

Families of Reciprocity: Indirect Reciprocity

Figure 1

Illustration of Direct, Indirect, and Generalized Reciprocity



A. Direct Reciprocity
A helps B. B returns the favor to A. C plays no part.

B. Indirect Reciprocity
A helps B. C observes A helping B. A gains reputation as helpful. C helps A as reward.

C. Generalized Reciprocity
A helps B. B does not return favor to A, but forwards reciprocation to C.

Note: Adapted from Nowak and Sigmund (2005) and Baker and Bulkley (2014)

Indirect reciprocity encompasses a larger family of reciprocal behavior in which the original benefactor or antagonist is not reciprocated by the respective beneficiary or victim, but rather by a third-party constituent. Indirect reciprocity entails that one garners *reputation* as either a helpful or harmful individual (Nowak & Sigmund, 2005), which in turn, serves to influence third-party observers' judgments or behaviors toward them (Baker & Bulkley, 2014; Romano et al., 2017). Compared to direct reciprocity, whereby *A* acts on *B* and *B* returns the act to *A* with no input from *C* (Figure 1A), indirect reciprocity necessitates the involvement of the

third-party member *C* (Figure 1B). In indirect reciprocity, *C* observes *A* helping *B* and subsequently rewards *A* for said behavior (or in the case of *A* harming *B*, *C* takes punitive action against *A*). In this regard, indirect reciprocity may be viewed as a strategic maneuver to gain reputation in the hopes that one would benefit from future interactions with third parties (Baker & Bulkley, 2014; Molm et al., 2007), particularly among those with whom cooperation is expected (Romano et al., 2017; Yamagishi et al., 1999; Yamagishi & Kiyonari, 2000).

Strategies for indirect reciprocity can be useful for social environments in which repeated interactions with known others are expected and normal (Baker & Bulkley, 2014). Further, cooperation amongst involved constituents may be maintained and promoted even in the absence of direct punitive action merely by withholding assistance for those who choose to defect from the norm of reciprocity (Ohtsuki et al., 2009). Indeed, in a study of professional designers, Hargadon and Sutton (1997) documented the evident importance of reputation in navigating future social exchanges:

> *"People realize that the way to be respected and to get ahead is to be out there… so there's a benefit for spreading your knowledge and your skills around because you get to be seen by more people and so you become more desirable." (p. 743)*

Across both organizations and societies, scholars have posited that complex forms of reciprocity build trust and solidarity among its constituents and create social capital (Molm, 2010; Molm et al., 2007).

Families of Reciprocity: Generalized Reciprocity

> *"Nothing is so contagious as example; and we never do any great good or evil which does not produce its like." – Francois de La Rochefoucauld*

Generalized reciprocity (Hamilton & Taborsky, 2005; Pfeiffer et al., 2005; Rutte & Taborsky, 2007), also called *paying it forward* (Gray et al., 2014; Leimgruber et al., 2014), *upstream indirect reciprocity* (Nowak & Roch, 2007), or *third-party reciprocity* (Baker & Dutton, 2017), operates on a simpler principle that one ought to help another when they have also been the recipient of help (Deckop et al., 2003). Unlike direct reciprocity, in which benefits accrue from direct, interpersonal exchange, generalized reciprocity, similar to indirect reciprocity, operates with third-party exchanges (Baker & Bulkley, 2014). The fundamental differentiation from direct and indirect reciprocity, however, is that the endowed social obligation to reciprocate remains with the beneficiary (compared to a third-party member as in the case of indirect reciprocity) and the target of said obligation is toward a new recipient (rather than the original benefactor as in the case of direct reciprocity). In other words, generalized reciprocity is more often, although not exclusively, situated in accounts of one-off encounters where the latter step of reciprocal direct or indirect exchange is either not possible or viable.

Specifically, in both cases of direct and indirect reciprocity, *A*'s treatment to *B* ultimately returns to *A*, whether directly from *B* (Figure 1A) or from a third-party *C* (Figure 1B). However, in generalized reciprocity, it is assumed that either *B* cannot reciprocate to *A* or that *A* is unwilling to receive any reciprocal benefit (Figure 1C). Thus, *A* first instigates a costly action for the benefit of *B* (Abell & Reyniers, 2000; Horita et al., 2016) and *B*, unable to directly reciprocate to *A*, alternatively forwards whatever treatment they received onto a third-party member *C*, a presumably unrelated individual from the original transaction of unconditional fairness between *A* and *B*. *C* may then continue this trend by paying forward the treatment to another unknown individual, say *D*, and so forth, until the chain is ultimately broken by a defector or other external prying force. Thus, the traditional model of social exchange, operated

by agents acting as both the benefactor and beneficiary in repeated interactions, fall short of capturing the psychological mechanisms of paying treatments forwards.

The prototypical examples of generalized reciprocity in mainstream culture are anecdotal cases of pay-it-forward chains at fast food drive-thru lanes. Recent events of fast food pay-it-forward movements drew the behavioral phenomenon from relative obscurity into the limelight of mainstream media through widespread news coverage of chains longer than 750 customers at Starbucks (CNN, 2014) and nearly 1,000 customers at Dairy Queen (DeSantis, 2020). Drive-thru lanes represent a unique system of social interaction in that the constant unidirectional movement of consumers prevent the evolution of indirect reciprocity. That is, customers are not situated in a manner that readily allows for bilateral communication or negotiations of exchanges between benefactors, beneficiaries, or neighboring observers. Although pay-it-forward chains at drive-thru lanes provide an example of common and emblematic cases of generalized reciprocity in mainstream culture, other real-world social environments are often not structured in strictly unidirectional channels of reciprocity. Nonetheless, generalized reciprocity manifests across a myriad of situations and contexts, as is to be discussed later in the dissertation. The peculiarity of generalized reciprocity, however, stems from the kind of benefits that are elicited from the phenomenon.

The Evolutionary Basis of Generalized Reciprocity

Numerous evolutionary studies have documented that generalized reciprocity yields several benefits beyond its direct and indirect counterparts by promoting group cooperation (Hamilton & Taborsky, 2005; Putnam, 2000) in heterogeneous interactions with changing partners (Chiong & Kirley, 2015; van Doorn & Taborsky, 2012; Voelkl, 2015). Under certain environmental conditions, such as small group structures (Pfeiffer et al., 2005) or high cost of

defection (Hamilton & Taborsky, 2005), generalized reciprocity can more strongly promote cooperation than direct and indirect reciprocity (Stanca, 2009; cf., Ben-Ner et al., 2004).

Generalized reciprocity is also made possible due to its lightweight burden on cognitive processes. Both direct and indirect reciprocity require the storage of information pertaining to whom one is indebted to or cognitive processing of the likelihood that one's reciprocal altruism will be rewarded by neighboring parties (Rankin & Taborsky, 2009). By contrast, generalized reciprocity can be conditionally activated on the simple premise that one has previously received help and does not require remembrance of whom the original benefactor was (Barta et al., 2011; Gfrerer & Taborsky, 2017; Pfeiffer et al., 2005; Rankin & Taborsky, 2009). By virtue of the cognitive simplicity, the behavioral phenomenon has been documented among social animals or humans with limited cognitive processing abilities, such as a rats (Rutte & Taborsky, 2007, 2008; Schmid et al., 2017; cf., Schweinfurth et al., 2019), dogs (Gfrerer & Taborsky, 2017), capuchin monkeys (Leimgruber et al., 2014), and children as young as 4-years old (Beeler-Duden & Vaish, 2020).

Scholars have argued that this simple process may be driven from the behavior's reliance on internal states. For instance, Barta et al. (2011) posited that one's current state variable (e.g., affective state) is influenced by their last interaction which, in turn, influences their subsequent behavior. Further, contextual or situational ambiguity may be partly disentangled by consulting one's experiences as cues for norms of reciprocity (Barta et al., 2010), providing useful information about the costs of defection and benefits of cooperation (Stojkoski et al., 2018, 2019). Prior literature in social behavioral sciences has documented evidence of engaging in potentially costly prosocial behaviors toward anonymous others when one experiences incidental emotions, such as gratitude (Bartlett & DeSteno, 2006) or empathy (Allsop et al., 2002), akin to

what one may expect in cases of unconditional prosocial behavior (Schmid et al., 2017). In other words, generalized reciprocity is beneficial in its ability to instigate prosocial behaviors even when its members may not be predisposed to doing so. For instance, individuals who played multiplayer video games with helpful teammates extended their generosity to outgroup members whom were not expected to reciprocate (Velez, 2015) and prior experience of help predicted employees' tendency to pay it forward even after controlling for antecedents of organizational citizenship behavior (Deckop et al., 2003).

The pervasiveness of generalized reciprocity is exemplified in its propensity to manifest across numerous scenarios and situations despite the strategy being seemingly unwonted from a strictly economic perspective (Abell & Reyniers, 2000). For instance, several studies have documented cases where people 'pay it forward' by helping stranded motorists (Baker, 2012), engaging in a network of kidney exchanges (Roth et al., 2004), donating human milk (Olsson et al., 2020), mentoring junior physicians (Steinert & Macdonald, 2015), lending a phone to others in need (Allsop et al., 2002), and aiding fellow employees (Deckop et al., 2003). Across these cases, studies have documented a diverse range of reasons underlying one's decisions to generally reciprocate, such as social-responsibility (Steinert & Macdonald, 2015), response to calls for aid (Olsson et al., 2020), empathic concern (Allsop et al., 2002), and ego-protection by restoring a sense of self-competence (Alvarez & Leeuwen, 2015). In other words, humans have the ability to trigger a cascade of good-will (Chiang & Takahashi, 2011; Pressman et al., 2015) and do so for reasons beyond strictly incidental emotions.

Catching Behavior Like the Flu: A Case of Behavioral Contagion

Despite the interest garnered around generalized reciprocity, however, a disproportionate number of studies has primarily focused on how *prosocial behaviors* are paid forward. Indeed,

the behavioral phenomenon of paying forward treatments is not strictly limited to generosity. Rather, a collection of recent evidence has shed light on the contagiousness of greed (Cardella et al., 2019; Gray et al., 2014; Hu et al., 2018; Leimgruber et al., 2014; Sun et al., 2020). Whether greed spreads through the same mechanisms as generosity is unclear and warrants further examination given its ubiquitous nature in human interaction. The best representation of the manifestation of both positive and negative social influence, however, comes from the body of literature examining *behavioral contagion*.

The idea that behavior is contagious and one behavior can incite similar actions on proximal others has long been studied by social psychologists (Gino et al., 2009; Polansky et al., 2016; Wheeler, 1966). Behavioral contagion, however, encompasses a broader range of effects including both behaviors instigated via experiences (i.e., generalized reciprocity) as well as observations (i.e., social modeling) (Polansky et al., 2016; Rosenhan & White, 1967; Wheeler, 1966). Recent literature examining behavioral contagion found it to be a robust and pervasive phenomenon (Fowler & Christakis, 2010) with experiences yielding stronger contagion effects than observations (Tsvetkova & Macy, 2015, 2014).

Behavioral contagion prompted by personal experiences hold numerous implications for social interactions. Best represented in the management and organizational behavior literature, generalized reciprocity has been found to manifest within (Constant et al., 1996; Gino et al., 2009; Hargadon & Sutton, 1997) as well as between organizations (Das & Teng, 2002). Although much of the seminal works have centered their attention on promoting a social network of cooperators (Baker & Dutton, 2017; Wenger et al., 2002), a contingent of studies imply that as much as organizations and social networks may foster cooperation, they also provide fertile ground for antisocial behaviors to spread.

The Antisocial Flu: Behavioral Contagion of Incivility and Aggression

"Geez, you guys don't have to be dicks about it, all right?"

"Yeah, neither did the guys before us, but you know what? They were."

- Rick and Morty, season 4 episode 5.

In the cynical sci-fi cartoon show *Rick and Morty*, episode Rattlestar Ricklactica, Rick Sanchez and Morty Smith, the anti-heroes of the show, meet alternative timeline versions of themselves who treat them badly, justifying their actions on how they, themselves, were treated just as badly by another set of alternative timeline versions of themselves. Despite being comedically depicted, the show demonstrated an important psychological phenomenon—*negative generalized reciprocity* or *antisocial behavioral contagion*. Both constructs may be construed as a conceptual sister to *displaced aggression* (Marcus-Newhall et al., 2000). As noted by Marcus-Newhall et al. (2000),

> "In a commonly used anecdote to illustrate displaced aggression, a man is berated by his boss but does not retaliate because he fears losing his job. Hours later, when he arrives home to the greeting barks of his dog he responds by kicking it." (*p*. 670).

Adults who were victim to both real world and cyber aggression were also likely to 'kick the digital dog' by engaging in cyber aggression half a year later, controlling for relevant antecedents of aggression (Wright & Li, 2012). In generalized reciprocity, the common obstacle in directly retaliating can induce similar displaced aggression and negative conduct. For instance, well embedded in the management and organizational behavior literature are cases of displaced incivility in workplaces where inherent hierarchical power inequalities between employees and supervisors establish a similar unidirectional (albeit vertical) chain of generalized reciprocity comparable to that of fast-food drive thru lanes. That is, because power inequalities typically

make it difficult for employees to directly retaliate against their superiors, antisocial behavioral contagion may run rampant with the availability and close proximity of potential victims.

Across numerous studies, employees who were subjected to forms of workplace incivility (e.g., rudeness) were more likely to also engage in similar behaviors in future interactions (Andersson & Pearson, 1999; Foulk et al., 2016; Francis et al., 2015; Gallus et al., 2014; Porath & Erez, 2007; Rosen et al., 2016; Torkelson et al., 2016; Woolum et al., 2017). For instance, employees who experienced abusive behaviors from supervisors showed similar tendencies toward colleagues (Bai et al., 2021) and those who received uncivil emails were more likely to also write uncivil emails themselves (Francis et al., 2015). Accordingly, the largest instigator of workplace incivility between coworkers was found to be one's own experienced incivility (Torkelson et al., 2016). However, negative generalized reciprocity and antisocial behavioral contagion's consequences extend beyond one's micro-interactions. Employees subjected to these experiences not only show less willingness to help others but also report poorer task performance, lower creative output (Porath & Erez, 2007, 2009), decreased situational wellbeing (Nicholson & Griffin, 2015), and prolonged negative affective state persisting beyond one's work period (Zhou et al., 2015). Expectedly, negative work outcomes can spillover into one's family (Hoobler & Brass, 2006; Liu et al., 2015) and fellow coworkers (Andersson & Pearson, 1999; Bai et al., 2021; Francis et al., 2015). Thus, antisocial behavioral contagion imposes burdens to both the affected individuals as well as innocent others.

Rosen et al. (2016) had argued that experiencing incivility diminishes one's self-control via consumption of cognitive resources thereby readily disposing individuals to instigate incivility themselves, echoing findings that generalized reciprocity may more readily manifest than direct and indirect reciprocity by function of its simple, lightweight cognitive requisites. As

commonly shown in the case of displaced aggression (Marcus-Newhall et al., 2000), individuals experiencing incivility at work may find themselves in the turbulent spiral of spreading incivility. This is particularly the case as prior evidence has generally shown that antisocial behavior can be more contagious in its social influence than its prosocial counterpart (Dimant, 2019; Gray et al., 2014). By this account, positive generalized reciprocity operates on the principle of 'help someone else if helped by someone' while negative generalized reciprocity operates on the principle of 'hurt someone else if hurt by someone'. Compared to its positive counterpart, however, only a select few studies have experimentally examined this contentious side of human behavior in controlled, decontextualized settings (Cardella et al., 2019; Gray et al., 2014; Hu et al., 2018; Leimgruber et al., 2014). In a series of studies, Gray et al. (2014) confirmed that individuals engage in negative generalized reciprocity when they were the recipients of an unfair allocation of goods or resources, even in decontextualized economic games. Based on prior findings on both positive and negative generalized reciprocity, the following hypothesis is given:

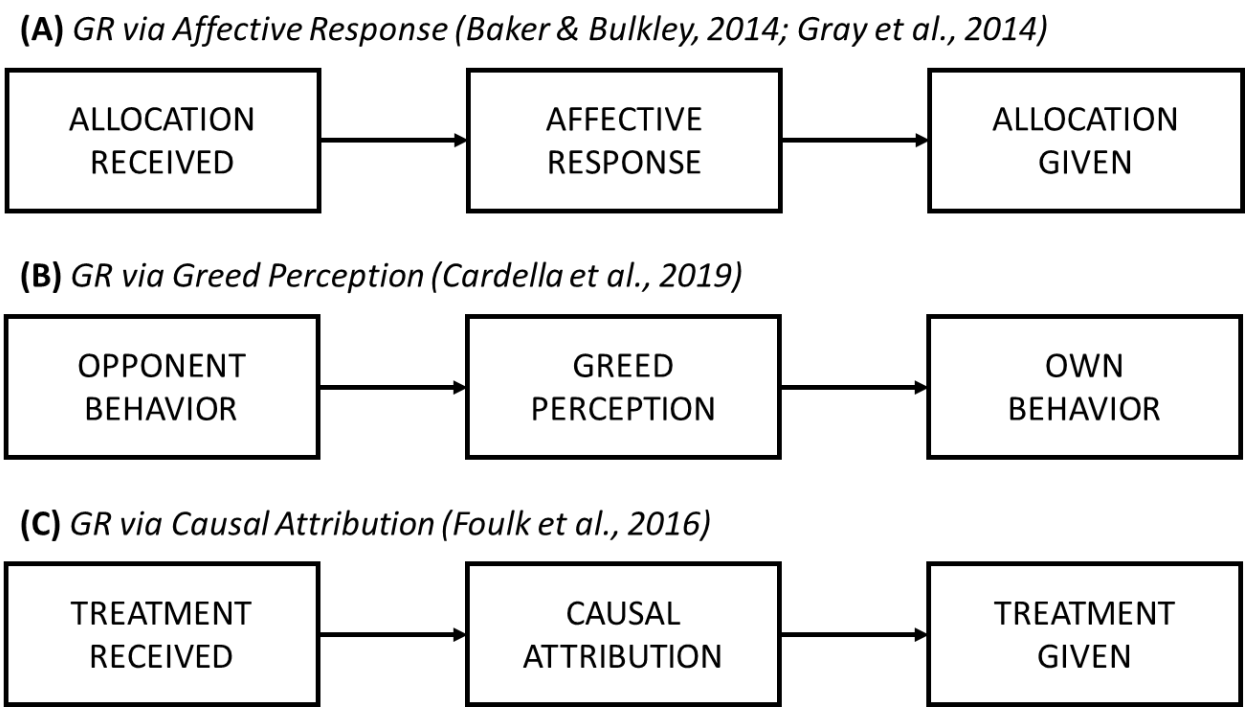
Hypothesis 1: Experience of negative (positive) treatment is paid forward in negative (positive) generalized reciprocity.

Nonetheless, as discussed previously, humans likely incorporate more complex cognitive processes in the rudimentary strategy of *give what you get* where one simply relies on the nature of the treatment received to inform the magnitude of treatment to be forwarded (Leimgruber et al., 2014). Recent evidence suggests that *what you get* may be up to subjective interpretation among humans. For instance, in recent studies of generalized reciprocity utilizing economic allocation games, the inability for one to attribute greedy treatment to ill-intent effectively negated the onset of negative generalized reciprocity (Hu et al., 2018; Sun et al., 2020). By contrast, when attribution of greed can be made, then negative generalized reciprocity flourishes.

The Gears of Generalized Reciprocity: Affective Valence

Figure 2

Previously Proposed Mechanisms of Generalized Reciprocity

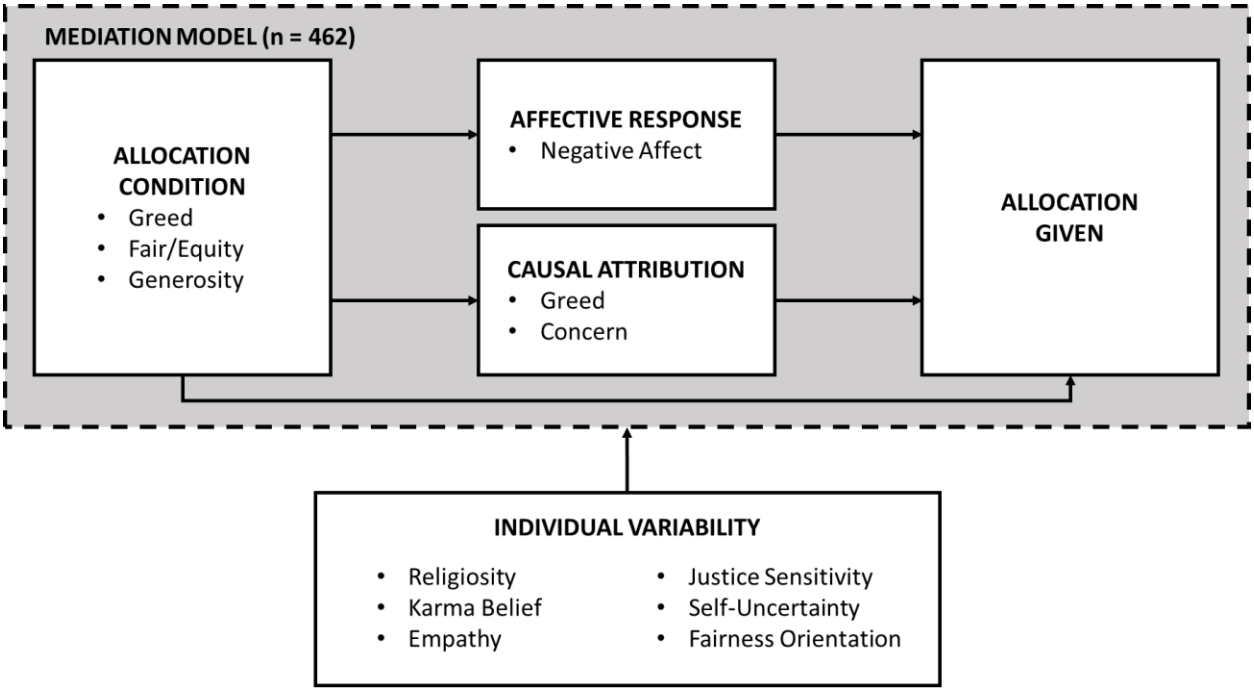


From evolutionary (Nowak & Roch, 2007) to social behavioral studies (Baker & Bulkley, 2014; Berkowitz & Daniels, 1964; Gray et al., 2014), the most commonly proposed catalyst for generalized reciprocity is affective response. Specifically, scholars have posited that the situation (i.e., treatment received) influences the individual by inducing the feeling of *gratitude,* which in turn motivates positive generalized reciprocity (Figure 2A) (Baker & Bulkley, 2014; Beeler-Duden & Vaish, 2020; Chang et al., 2012). In other words, positive feelings of gratitude (Chang et al., 2012; Pressman et al., 2015) can promote prosocial acts toward unrelated third parties (Shiraki & Igarashi, 2018) by broadening one's perspective towards others, leading individuals to associate strangers and the benefactor in similar social categories. For instance, Obeng et al. (2019) found that shoppers who had positive experiences with retailers were more likely to

generally reciprocate their gratitude by increasing the amount they donated at checkout compared to other shoppers. Positive feelings, in turn, can foster perceptions of social relationships, and strengthen one's involvement in their social networks to attenuate threats to cohesion (Molm et al., 2007).

Figure 3

Proposed Affective-Attribution Model for Generalized Reciprocity



The contrary was recently found for negative generalized reciprocity; being subjected to negativity conjures both an objective and subjective tension that individuals are motivated to relieve through negative reciprocity (Harth & Regner, 2017; Y. Wu et al., 2015). Negative affect stemming from being victimized may in turn encourage paying the negativity forward (Gray et al., 2014; Leimgruber et al., 2014) as a form of maladaptive coping strategy (Marcus-Newhall et al., 2000). Findings from Gray et al. (2014) further lent credence to prior documented cases affect-driven contagion by showing that experimentally inducing positive affect through simple interventions (e.g., viewing funny comics) attenuated negative generalized reciprocity. Thus, the

following hypotheses are given to reflect the new proposed conceptual model of generalized reciprocity (Figure 3):

Hypothesis 2a: Experience of negative treatment is positively related to feelings of negative affect.

Hypothesis 2b: Negative affect partially mediates the effect of experience on subsequent engagement in negative generalized reciprocity.

However, a purely affective state and incidental emotions proposition fails to adequately explain the neurological activation in regions associated with fairness processing and other-oriented cognition (Hu et al., 2018; Y. Wu et al., 2015). Rather, subjective interpretations and attributions of causality in the treatment received may be another key mediating mechanism in generalized reciprocity.

The Gears of Generalized Reciprocity: Perceptions and Causal Attributions

In contrast to affective response, however, where the main premise of its mediating effect lies on the contingency that the environment (i.e., others' behavior) affects the individual (i.e., affect), recent studies have implied the opposite as well. Specifically, Cardella and colleagues (2019) examined whether the perception of greed instigated greed contagion (Figure 2B). Although their studies found evidence of greed contagion, and greed perception correlated strongly with opponents' behaviors, greed perception yielded no significant effect on negative generalized reciprocity. However, their research paradigm utilized the common pool resource dilemma in which outcomes are contingent on strategic bilateral decisions, compared to the unilaterally determined outcomes of generalized reciprocity as discussed prior. As individuals brand those who defect from prescribed norms of engagement as greedy (Cardella et al., 2019; Chan, 2014; Hiel et al., 2008; Hine & Gifford, 1996; van Lange et al., 1990; Wilke, 1991), and

subsequent behaviors are receptive to causal attributions made toward others' behavioral intentions (Samuelson, 1991), a unilateral downstream chain of generalized reciprocity in its purest form may accordingly be influenced by causal attributions.

Findings from the management and organizational behavior fields partly support this proposition. People evaluate events and experiences by not only its consequences, but also the underlying intentions behind the act (Foulk et al., 2016; Zhou et al., 2015). Indeed, experiences of workplace rudeness were found to activate employees' semantic concepts of rudeness, not only making them more sensitive to instances of rudeness but also to more infer others' behaviors with rude intentions (Foulk et al., 2016; Woolum et al., 2017). Hence, actions that are construed as having been more internally driven (e.g., greed from selfishness) compared to externally motivated (e.g., greed from financial need) ought to elicit a stronger reciprocity response (Chernyak et al., 2019; Deci et al., 1999; Stanca, 2009; Stanca et al., 2007) (Figure 2B; Foulk et al., 2016). For instance, eliminating the possibility to attribute greed (e.g., offers given by computers vs. people) (Sun et al., 2020) and interventions that reappraised intentions of work incivility negated contagion effects (Schilpzand et al., 2016).

Although studies situated in workplace environments provide ample richness in leveraging theoretical propositions with practical application, these same studies are nonetheless bogged down by latent confounds of preexisting organizational cultural norms or climate that may influence the ways in which generalized reciprocity manifests (e.g., Gallus et al., 2014). In a study of employee emailing behavior, the lack of accompanying contextual communication cues (e.g., vocal tone, body language, etc.) that could have otherwise led to attributing the uncivil emails received to external reasons resulted in greater displacement of incivility in one's own emails (Francis et al., 2015). In further decontextualized economic games (e.g., ultimatum

game), participants who are subjected to unfairness when a clear alternative for distributive fairness was viable were more likely to reject ultimatum offers (Falk et al., 2003; Nelson, 2002). However, participants were overwhelmingly likely to accept even highly unequal offers if a fairer alternative was not available (Nelson, 2002). Thus, in the absence of peripheral social contextual cues, individuals are strongly motivated to rely on available experimental stimuli to infer causal attribution (Guala & Mittone, 2010). In the case of the current paradigm of unilateral downstream of generalized reciprocity absent of social context, the primary cue to infer causality of good- or ill-will is the consequence itself (Falk & Fischbacher, 2006). Hence, in contrast to affective response (i.e., environment influencing individual), causal attribution may be contingent upon how the individual interprets their environment (i.e., recipient perceives benefactor as generous). Accordingly, participants who experience negative treatment ought to attribute the treatment to ill-will, thereby establishing the indirect pathway with which one engages in negative generalized reciprocity toward an unknown other. Thus, the following hypotheses are given to reflect the new proposed conceptual model (Figure 3):

Hypothesis 3a: Experience of negative treatment is positively related to causal perception of greed.

Hypothesis 3b: Causal perception of greed partially mediates the effect of experience on subsequent engagement in negative generalized reciprocity.

Consideration of Individual Differences in Generalized Reciprocity

For several decades, there have been calls for studies to examine the interactions between the individual and the situation (Bem & Funder, 1978) particularly in studying the mechanisms underlying behavior (Baumeister et al., 2007; Funder, 2006, 2009). This push followed the polemic academic war over the topic of *Person vs. Situation* unintentionally caused by Mischel

(1968) and fueled by contingents who advocated for only one component of the original message (Mischel, 2009; B. W. Roberts, 2009). Indeed, Mischel (1973, 2009) originally asserted, "that we need to examine what situations are psychologically meaningful for different individuals and types, and how they may be mentally represented and function in the expressions of social behavior and in the organization and activation of the underlying personality system" (*p*. 284). Despite admirable efforts over the years to rectify personality psychology's lost valor in the field (Ahadi & Diener, 1989; Funder & Ozer, 1983; Nisbett, 1980; Richard et al., 2003; Rosenthal & Rubin, 1982) and advocate for Mischel's (1968) original message to examine personality and situation in tandem, studies examining the interaction between individual traits and situations have remained scant. Thus, the reality that individual variables may differentially influence the ways in which the mechanisms of generalized reciprocity operate warrants a deeper dive regarding generalized reciprocity (Sherman et al., 2010, 2012).

Researchers in social psychology and behavioral economics have extensively investigated individual variability in both prosocial and antisocial behavior in the past few decades. Individuals are likely to acquire values conducive to antisocial or prosocial behavior throughout their lifespan. In other words, the intricate network of personal experiences and individual values may predispose some to engage in prosocial or antisocial behavior more often even in the absence of stimuli immediately preceding one's actions. However, whether the same factors that induce individual variability in prosocial and antisocial behavior also produce similar effects in generalized reciprocity require further investigation.

Generalized reciprocity has benefited from several studies investigating the situational factors that trigger the effect (Dimant, 2019). However, little is known about the individual differences in one's tendency to engage in generalized reciprocity (Ogunlade, 1979). Although

the use of decontextualized economic games ought to conceptually partial out the latent effects of individual variability in generalized reciprocity, an empirical confirmation is warranted. Individual differences in prosocial behavior may also provide further insight into the variation in human cooperation not readily captured by classical theories of kin selection or reciprocal altruism (Fehr & Gächter, 2002). Nonetheless, due to the dearth of prior theoretical roots in individual variability in generalized reciprocity, I consult the rich library of studies that have previously investigated antecedents of prosocial and antisocial behavior in the following sections. I offer necessarily brief discussions of relevant constructs that were included as exploratory measures of individual values, traits, and beliefs that may moderate the process of generalized reciprocity.

Religion & Prosocial Behavior

Numerous studies in the past two decades have contributed to a rich body of literature tying together religion and prosocial behavior (Day, 2017; Duhaime, 2015; Hardy & Carlo, 2005; Shariff, 2015; Shariff et al., 2016; Shariff & Norenzayan, 2007). Religion and its related concepts have been argued to provide fertile grounds for endorsing cooperation among unrelated others (Willard, 2018) which has allowed for the development of tight knit congregations of similar constituents in adaptive and successful social groups (Norenzayan et al., 2016; Norenzayan & Shariff, 2008). Religion may also override otherwise salient and pervasive tendencies for ethnic favoritism, opening doors for cooperation across groups (Willard, 2018). In particular, Oviedo (2016) has maintained that religion and prosociality are a complex, intertwined set of concepts that cyclically promote one another via moral attitudes (Ward & King, 2018). Indeed, a large majority of religious bodies across the world explicitly endorse some form of altruism in its doctrine, encouraging its followers to remain faithful to its cause

(Norenzayan & Shariff, 2008). As such, religious individuals have tended to not only self-report greater levels of altruism but also have been perceived in a similar manner by their peers (Saroglou et al., 2005).

Such tendencies are not without evidence; in several subsequent studies, religiosity has been shown to be a strong, direct predictor of prosocial behavior (Saroglou et al., 2005) even after accounting for several mediating and confounding factors such as dispositional prosocial values (Hardy & Carlo, 2005) and emotions of love (Van Cappellen et al., 2016). In naturalistic studies of religiosity, shopkeepers' prosocial behaviors increased when religion was made salient via audio cues (Duhaime, 2015) and religious followers showed greater sharing intentions on religious days (Pazhoohi et al., 2017; Van Cappellen et al., 2016). Cross-nationally, religion has also been positively related to prosocial behaviors such as helping strangers (Guo et al., 2020). In experimental settings, individuals primed with religious cues showed increased monetary allocations to unknown others in economic games (Shariff & Norenzayan, 2007; Willard, 2018), cheated less (Shariff & Norenzayan, 2011), and donated more (Xygalatas et al., 2016).

However, religion is not without fault; although several studies have highlighted general links associating religion and prosociality together (Shariff et al., 2016; Shariff & Norenzayan, 2007), recent evidence has challenged the strength of religiosity in its general association to prosociality (Gomes & McCullough, 2015; Shariff, 2015). Shariff (2015) proposed that religion-motivated prosocial behaviors are likely to be bounded by the situation in question, suggesting that religion's effects on generic prosociality is limited. Further, the beneficial effects of religiosity are, as one may expect, tenuous at best for nonreligious individuals (Shariff et al., 2016; Shariff & Norenzayan, 2007; White, Kelly, et al., 2019). Nonetheless, the rich body of literature documenting effects of religion and religiosity on participants' economic allocation

(Shariff & Norenzayan, 2007; Willard, 2018; cf. Gomes & McCullough, 2015) and donation behavior (Van Cappellen et al., 2016; Xygalatas et al., 2016; cf. Guo et al., 2020) warranted an empirical examination as an alternative mechanism.

With respect to the current study, although links between religiosity and generalized reciprocity have not been tested or established, those who receive unfair treatment may be motivated to refrain from displaced retaliation toward unrelated others as may be prescribed in altruism scriptures of their religious doctrine (Norenzayan et al., 2016; Norenzayan & Shariff, 2008; Ward & King, 2018). In contrast, individuals who are subjected to generous treatment may be primed by cues of kindness and altruism norms that may promote prosocial reciprocation (Hardy & Carlo, 2005). That is, compared to non-religious others, individuals high on religiosity may be particularly protected against negative generalized reciprocity and motivated to engage in positive generalized reciprocity.

Karma & Prosocial Behavior

Although the effects of religiosity are limited to those who espouse such beliefs (Shariff et al., 2016; Shariff & Norenzayan, 2007; White, Kelly, et al., 2019), many social values commonly endorsed in mainstream culture today were derived from traditional religious values. One of which, is the concept of *karma*—the belief that one's future outcomes are presupposed by the degree of goodwill, or lack thereof, in their past actions (Banerjee & Bloom, 2017). The idea that past and future outcomes are intertwined has traditionally been discussed through the idea of rebirth in several religious circles (e.g., Hinduism, Buddhism), in which one's actions and deeds in one life will determine the prosperity or misfortune in a future life. However, more modern interpretations in mainstream culture have extended the term to refer to the idea that one's actions will either be met with prosperity or misfortune sometime later in the same life.

Regardless of the temporal sequence for karma, however, its supernatural abilities to punish violators of moral norms and reward adherents to altruism has been posited to endorse cooperation in groups and discourage defection from norms (White et al., 2017).

Due to its message of delayed naturalistic reward for one's good deeds, and close relation to its sister construct of religiosity, karmic beliefs have been proposed to enable prosocial behaviors (White & Norenzayan, 2019a). Several experimental studies have provided support for this proposition (cf. Berniūnas et al., 2020) showing that individuals, when primed with karmic beliefs, engage in greater prosocial behavior (Converse et al., 2012; Kulow & Kramer, 2016; White & Norenzayan, 2019b). Further, individuals primed with karmic belief were more likely to restrain themselves in the overconsumption of consumer goods (Chen et al., 2019), act more fairly (White, Kelly, et al., 2019), endorse prosocial norms (Willard et al., 2020), and take financial risks out of belief that their past good deeds will bear luck (Borenstein & Irmak, 2019). Even among those who may not find themselves aligned with any particular religious doctrine, aspects of karmic belief may be naturally endorsed as a function of moral development (Banerjee & Bloom, 2017).

With respect to generalized reciprocity and the current study, individuals high on karmic beliefs may be less prone to pay forward negativity under the belief that such actions will subsequently be met with punishment. That is, even when subjected to unfair treatment, individuals whom endorse high karmic beliefs may be motivated to positively generalize their reciprocity trusting that they will reap the benefits of their goodwill in the near future (Borenstein & Irmak, 2019; White, Kelly, et al., 2019). This contrasts with those who do not share such beliefs and operate under no externalized expectations of supernatural norm policing.

Thus, belief in karmic justice may moderate the generalized reciprocity process by mitigating negative generalized reciprocity and promoting positive generalized reciprocity.

Trait Empathy & Prosocial Behavior

Empathy is the "emotional state triggered by another's emotional state or situation, in which one feels what the other feels or would normally be expected to feel in [their] situation" (Hoffman, 2010, *p*. 440). Eisenberg and Miller (1987) proposed that individuals will feel compelled to come to the aid of others when they observe victims' actual distress levels, which in turn, facilitate their own empathic distress (Hoffman, 2010). That is, the degree of sympathetic response to victims' ails, as well as concern for others (Stiff et al., 1988), explains why individuals may engage in altruistic behaviors (Eisenberg & Fabes, 1990; Hoffman, 2010; Knafo & Israel, 2012; Paciello et al., 2013; Spinrad & Eisenberg, 2014). Indeed, empathy can promote altruism by fostering the prosocial values that underpin moral behaviors (Paciello et al., 2013) and triggering moral outrage against unfairness treatment (Batson et al., 2007).

Expectedly, the link between empathy and prosocial behavior (Eisenberg & Fabes, 1991; Hoffman, 2010; Knafo & Israel, 2012; Spinrad & Eisenberg, 2014) has garnered interest among scholars who have sought to empirically support the notion across both experimental (Batson et al., 2007; Berry et al., 2018; Edele et al., 2013) and naturalistic settings (Bethlehem et al., 2016). In experimental studies with interpersonal interactions with others, empathy was a positive precursor to individuals allocating more money in economic games (Edele et al., 2013), prosocial responsiveness to other players (Berry et al., 2018), and helpfulness to others (W. Roberts & Strayer, 1996). Individuals subjected to stories that induce empathic responses were also more likely to engage in prosocial behavior and greater reactivity to and accurate perception of cues of distress, such as fearful expressions (D. R. Johnson, 2012).

In a naturalistic setting, individuals with higher empathic dispositional traits were more likely to assist an individual who had appeared to have fallen off their bicycle (Bethlehem et al., 2016). Further, individuals who practiced compassion-related meditation were less prone to experience negative affect when subjected to unfair treatment, and subsequently were less likely to retaliate against their transgressors (McCall et al., 2014). Compared to non-meditators, these individuals were more motivated to reinforce norms of fair treatment and restore equity among those involved (McCall et al., 2014). Physiological measurements of empathic concern and response to cues of distress (Sze et al., 2012) suggest that empathic individuals may also be motivated to engage in altruism and prosocial behavior as a means to maintain a positive psychological and physiological homeostatic state (Telle & Pfister, 2016).

In generalized reciprocity, individuals with greater trait empathy may be more protected against negative generalized reciprocity compared to their low empathic counterparts. As empathy can facilitate perspective taking and enhance both harm aversion and prosocial values to guide moral judgment and behavior (Crockett et al., 2010), empathic individuals subjected to negativity may be more cued towards the experience of unfairness. That is, compared to individuals with low empathic concern, highly empathic individuals may be less likely to forward greed from being motivated to not subject others to the same type of negative treatment they, themselves, experienced.

Justice Sensitivity & Prosocial Behavior

An individual's sensitivity to injustice has been purported to have several implications for prosocial behavior. Schmitt and colleagues (Schmitt, 1996; Schmitt et al., 1995) argued that individuals may differentially experience injustice cognitively, emotionally, and behaviorally. Specifically, individuals typically vary in sensitivity to being subjected to injustice, observing

injustice, and being the perpetrator of injustice (Baumert et al., 2011, 2014; Baumert & Schmitt, 2016; Schmitt et al., 2010). Those highly sensitive to injustice, compared to those who are more justice-numb, show more behavioral reactivity to experiences of injustice and are more motivated to seek paths to rectify said injustice (Baumert & Schmitt, 2016; Schmitt, 1996; Schmitt et al., 1995). Accordingly, individuals can be differentially motivated to restore injustice depending on the perspective taken (Baumert & Schmitt, 2016).

Individuals are quick to recognize that meritocratic winnings constitute *due justice* beyond *equitable fairness* (Hoff, 2010). For instance, participants in economic games displayed greater generosity towards those who were construed as having *deserved* the treatment than strictly following a distributive norm of pure equality (Rodriguez-Lara & Moreno-Garrido, 2012; Schurter & Wilson, 2009). Nonetheless, in cases where no meritocratic information is available to frame one's perceptions of just deserts, justice sensitivity has been associated with adherence to equity norms (Edele et al., 2013; Fetchenhauer & Huang, 2004) and cooperation among players even in the absence of external punishments (Schlösser et al., 2018). On the contrary, individuals highly sensitive to being the victim of injustice are prone to disregard norms of equality (Fetchenhauer & Huang, 2004) and engage in self-centered behaviors (Gollwitzer et al., 2005, 2009).

As experiences of injustice can diminish one's internal regulatory abilities (Strang et al., 2016), justice sensitivity to being a victim and its associated effects on motivating antisocial behavior (Baumert & Schmitt, 2016; Edele et al., 2013) is likely to be compounded by feelings of social exclusion. Across several studies, when individuals were subjected to feelings of social exclusion, such as being told that no one wished to work with them, they tended to show lower inclination towards self-regulation (Baumeister et al., 2005), reported greater emotional

numbness (i.e., apathy) towards others' pain (DeWall & Baumeister, 2006), and were less inclined to act prosocially (Twenge et al., 2007). Not only are socially excluded people less likely to be prosocial and cooperative (Twenge et al., 2007), social exclusion has numerous negative ramifications evidenced by antisocial and hostile behaviors (Twenge et al., 2001) as well as greater identification with extremist groups (Renström et al., 2020).

If, in the absence of contextual information, individuals highly oriented towards justice for others and averse towards inequity seek to adhere to norms for equality and cooperation (Edele et al., 2013; Fetchenhauer & Huang, 2004; Schlösser et al., 2018), these same individuals may be strongly motivated to pay forward at least the equitable amount (in the case of experiencing greed) or as much as they have received (in the case of experiencing generosity). On the other hand, much like how individuals who have been helped seek out positive generalized reciprocity to mitigate the psychological threat of having received such help (Alvarez & Leeuwen, 2015), individuals highly sensitive to being victimized may be more prone to generalize their retaliation (Marcus-Newhall et al., 2000), motivating an inflated attribution and affective reactance, in effort to rectify their experience of injustice (Baumert & Schmitt, 2016; Fetchenhauer & Huang, 2004).

Self-Uncertainty, Perceived Significance, & Prosocial Behavior

Similar to social exclusion (Baumeister et al., 2005; Renström et al., 2020; Twenge et al., 2001, 2007), feelings and perceptions of social insignificance can strongly promote radicalization of one's behaviors as a pathway for rectifying the injustice experienced (Hogg, 2012; Hogg et al., 2013; Hogg & Blaylock, 2011; van den Bos, 2018, 2020). That is, subjection to unfair treatment pushes individuals past the threshold of system acceptance to endorsement of alternative social systems that better resonate with one's own worldviews of prescribed justice

(Bal & van den Bos, 2017). When challenged, not only do individuals become more radicalized in their endorsement of socially deviant schools of thought (Kruglanski et al., 2014, 2015; van den Bos, 2020) and seek punitive measures (Twenge et al., 2001), they also become more uncertain about their place and belonging in the world (Hohman et al., 2017).

Self-uncertainty, the state of being unsure of one's identity and belonging in the world (Hogg, 2012, 2014; Hogg & Blaylock, 2011), is unnerving and unsettling for many. People are generally motivated to minimize uncertainties about the world and themselves (Hogg, 2012) through various methods, such as identifying with groups or finding solace among similar others (Hogg, 2014; Hogg et al., 2010). Indeed, experimentally inducing self-uncertainty led people to psychologically distance themselves from others whom they deemed different (van den Bos et al., 2007). Membership in groups with which one may identify with not only provides relief from uncertainty-laden distress but also prescribes behavioral norms for one to follow (Hogg, 2014). That is, associating oneself with a group with prescriptive norms reduces self-uncertainty via adherence to manners deemed acceptable by the immediate social group. However, this voluntary self-excursion from alleged deviant others poses several repercussions.

Even as a member of a group, self-uncertainty may rise if one is neglected (Hohman et al., 2017). Further, joining selective, narrow social circles and reinforcing one's viewpoints through consensual agreement with one another only serves to evolve one's convictions to absolute truths (Hogg et al., 2013; van den Bos et al., 2005). Those high on self-uncertainty tend to show less trust towards unknown others and subsequently show lower prosocial behaviors (Pfattheicher & Böhm, 2018). In contrast, people more comfortable with approaching ambiguity are more willing to be prosocial even at their own expense (Vives & FeldmanHall, 2018). Once

the uncertainty and ambiguity is mitigated, the obstacles toward prosociality are removed (Vives & FeldmanHall, 2018).

With respect to the current study, individuals experiencing negative treatments may perceive the act as having threatened one's sense of value and significance, thereby promoting antisocial behaviors as a means of displaced aggression (Marcus-Newhall et al., 2000). In contrast, those who are treated well may infer the act as reaffirming one's significance, thereby promoting prosocial behaviors. Thus, individuals high on self-uncertainty, compared to those who may be more certain of themselves and their place in society, may be more prone to exhibit exacerbated generalized reciprocity for both negative and positive treatments.

Fairness Orientation & Prosocial Behavior

Inferences about distributive fairness come intuitively to many (Cappelen et al., 2016). People's gravitation towards distributive fairness has been a popular topic of inquiry among scholars amid the increasingly failing rhetoric that humans operate as purely self-interested entities (Güth & Huck, 1997). Subjection to unfairness commonly elicits anger on part of the victim, and in some cases, motivate them to take punitive action even at the cost to themselves (Pillutla & Murnighan, 1996). This is best illustrated in studies utilizing ultimatum games in which participants were more likely to reject unfair offers if the opposing player's alternative proposal was a fairer (vs. unfairer) offer (Falk et al., 2003). In a similar manner, Nelson (2002) showed that when ultimatum offers were artificially capped at $4 out of $20, the vast majority of participants accepted the offer even when the allocation itself was a violation of distributive fairness. In other words, across both cases, participants took into consideration the opposing player's alleged intentions behind their offer. For instance, Nelson (2002) suggests that when an offer is capped at $4 and the offer is for $4, then participants will infer the offer as having been

the most generous possible *under the current circumstances* and perceive the gesture made by the other player as having been a fair one. Thus, across both the findings of Falk et al. (2003) and Nelson (2002), there is consistent evidence that individuals are naturally sensitive to conditional fairness.

Beyond external forces guiding fair behavior, one's propensity to diverge from purely self-interested behavior also stem from personal rules and self-regulations (Bolton et al., 1998). For instance, individual disposition for fairness (Schier et al., 2016) and personality traits akin to social politeness both showed greater tendency to allocate more resources to another player (Zhao et al., 2017). However, one's fairness orientation is limited in the extent to which it can promote *generosity*. A recent analysis of dispositional orientation toward fairness found evidence that individuals prescribe to norms of distributive equity rather than pure generosity (Im & Chen, *in prep*). That is, prior findings that have pegged fairness considerations for altruism in anonymous dictator games fall short of explaining *generosity* in the sense of being *more than fair*. In segmenting participants into three categories of 1) greedy givers (<$5 / $10), 2) equitable givers ($5 / $10), or 3) generous givers (>$5 / $10), the authors showed that self-reported level of fairness orientation was strongest among equitable givers and equal across both greedy and generous givers. Accordingly, fairness orientation was positively related to greater giving tendencies in examining only greedy and equitable givers while contrastingly negatively related to greater giving in examining equitable and generous givers. Thus, fairness orientation does not appear to promote generosity or altruism but rather regresses individuals toward the distributive equity of an even-split. In other words, highly fair individuals neither act greedily nor generously even when said options are available (Im & Chen, *in prep*). Thus, with respect to the current generalized reciprocity paradigm, we may suspect that compared to those with lower fairness

orientations, individuals high on fairness orientation should exhibit lower propensity to engage in both negative and positive generalized reciprocity.

Study 1: The Roles of Causal Attribution and Affect in Paying it Forward

The current study utilizes the repeated dictator game with changing partners measurement (Gray et al., 2014; Hu et al., 2018; Sun et al., 2020) to investigate the proposed conceptual model of generalized reciprocity incorporating both affective response and causal attribution as mediating mechanisms (Figure 3). The decision to utilize this repeated dictator game paradigm was twofold. First, using dictator games maintains methodological consistency with prior studies while allowing for controlled examination of participants' propensity to generally reciprocate like behavior. This is in response to the conceptual rationalization that generalized reciprocity measures utilizing different economic allocation games (e.g., Cardella et al., 2019; Y. Wu et al., 2015) may allow for the intrusion of extraneous, confounding effects of differential strategies across the economic games. Second, the dictator game, being one of the simplest economic allocation measurements, allows for disentangling and simplifying participants' decisional processes from latent contextual confounds (Camerer, 2011) that may otherwise be present in organizational (Baker & Bulkley, 2014; Deckop et al., 2003) or social settings (Allsop et al., 2002; Pressman et al., 2015). In other words, by utilizing a context-ambiguous scenario, participants are less likely to be influenced by perceptions or construals of prior social norms that dictate behavior in otherwise familiar settings (Krupka & Weber, 2013). Study 1 examined the effects of being treated with greed, equity, or generosity on one's tendency to pay treatments forward. Building on the current body of literature on the role of affective response in generalized reciprocity, this study also examined the role of causal attribution of greed and generosity as additional mediating factors.

Method

Procedures

Participants were given an adjusted version of the standard dictator game in which they were given both the receiver and giver task. Participants were initially given the following instructions:

> *You have been chosen as a **receiver** in this economic decision-making task. The participant before you has been chosen as a **giver** and received $10.*
>
> *This participant was told that the $10 was theirs to keep but could divide up the money between themselves and you to receive.*

After a short delay, participants were randomly assigned to one of three conditions, 1) greed, 2) equity, or 3) generosity. Participants were given the following statement:

> *The participant before you decided to give you $[X] out of the $10 they received.*
>
> *This means **you get $[X]** and **they keep $[10 – X]**.*

Participants were told that they received either $0 (greed), $5 (equity), or $10 (generosity). Participants then completed the short PANAS scale (Thompson, 2007) and completed the causal attribution subscales measuring attribution of *greed* and *concern* for the other player's actions (van Lange et al., 1990). Participants were then told that they would now be given the chance to be the giver in the economic task:

> *Now you have a chance to be the **giver** in this economic decision-making task. You are given $10. The $10 is yours to keep. The next future participant will now receive any amount of money that you decide to transfer to them. It is up to you to determine how to divide up the money you and the next participant will receive.*
>
> *How much of your $10 would you like to transfer to the next participant?*

After making the allocation, participants were then asked to assess the fairness of the monetary allocation they received and the amount they paid forward.

Participants

A total of 462 college students (Mean age ± SD = 20.810 ± 3.139, 85.9% female) attending a large university participated in this study for extra credit. The sample was ethnically diverse (15.2% White, 22.8% East Asian, 30.8% Latino/Hispanic, 10% Southeast Asian).

Measures

Several measures were collected from participants to examine potential individual characteristics that may moderate the effect of generalized reciprocity. Variables with multiple factors were aggregated into single scores for two reasons: 1) the purpose of the current examination was to test broad concepts (e.g., Empathy) compared to isolating the test to specific, targeted components of said broad concept (e.g., Perspective-taking), and 2) to prevent multicollinearity issues from regressing the outcome onto predictors with problematic correlations. All variables were initially examined to ensure that subfactors, if any, yielded strong correlations and were not independent constructs. Measures that deviated from their original scales in wording or factor structuring were factor analyzed to ensure adequate measurement fit.

Demographics. Participants provided information regarding their age, gender, ethnicity, and parental educational attainment. Age was calculated as the reported age in years. Gender was measured as either being female, male, or other (e.g., gender nonconforming). Participants' socioeconomic status was measured via proxy of their parental educational attainment. Parental education attainment was calculated as the average of the highest level of education completed by the participant's reported mother and/or father figures (1 = *less than high school*, 2 = *high*

school/GED, 3 = *some college*, 4 = *2-year college degree [Associate's]*, 5 = *4-year college degree [Bachelor's]*, 6 = *Master's degree*, 7 = *Professional degree [e.g., M.D., J.D.]*, and 8 = *Doctoral degree [e.g., Ph.D.]*). If information for one parent was missing, the single-parent score was used.

Affective State. To capture participants' positive and negative affective state, participants completed the short form version of the Positive and Negative Affect Schedule (PANAS; Thompson, 2007). This scale also contained an additional measurement of participants' anger, following prior methodological decisions by Gray et al. (2014). In total, participants completed 5 items measuring positive affect (e.g., "Alert," "Attentive," "Inspired," $\omega = 0.822$) and 6 items measuring negative affect (e.g., "Angry," "Upset," "Hostile," $\omega = 0.871$).

Greed Attribution. To measure participants' greed attributions about the allocation they received, participants were asked to briefly think and write about the reason why the other person may have given them the allocation that they did. Once they completed this step, participants completed the Causal Attribution of Choice Behavior scale (van Lange et al., 1990) in which they reported the extent to which they believed the other individual's actions were determined by 1) Concern for Others (5 items reverse-coded, e.g., "the person wants to give chances to others as well," $\omega = 0.958$) and 2) Greed (7 items, e.g., "the person wants to earn as much as possible," $\omega = 0.969$). The scale yielded an acceptable fit, $\chi^2(53) = 413.187$, CFI = 0.951, TLI = 0.939, SRMR = 0.037, RMSEA = 0.121, 90% CI [0.111, 0.132]. All items were rated on a 5-point Likert scale ranging from 1 (*Disagree*) to 5 (*Agree*).

Fairness Perception. Following methodological procedures by Gray et al. (2014), participants were asked to also rate the fairness of the allocation they received (i.e., "How fair was [the other participant's] decision to give you this amount?"). In addition, participants rated

the fairness of the amount they paid forward (i.e., "You decided to give $X out of $10 to the next participant. How fair do you think your choice was?"). Both items were rated on a 5-point Likert scale ranging from 1 (*Much less than fair*), 3 (*Fair*), to 5 (*Much more than fair*).

Alternative Mechanism Measures

Religiosity. Participant religiosity was measured via an 8-item scale for general religiosity. Religion-general adjusted items were taken from the Religiosity scale (McDaniel & Burnett, 1990) and Christian Religious Guidance scale (Joseph & DiDuca, 2007). The Religiosity scale items (e.g., "I am very religious") were measured on a 9-point Likert scale (1 = *Completely Disagree*, 9 = *Completely Agree*) while the Religious Guidance scale items (e.g., "I try to follow the laws laid down in religious scriptures") were measured on a 5-point Likert scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*). The items measured on a 9-point Likert scale were rescaled to be within 1-5. The religiosity-general items provided good reliability ($\omega = 0.939$) and acceptable overall fit $\chi^2(19) = 141.349$, CFI = 0.961, TLI = 0.943, RMSEA = 0.118, 90% CI [0.100, 0.137], SRMR = 0.035.

Karmic Justice. Participants' belief in karma was measured via the 5-item Karmic Justice subscale of the Belief in Karma Questionnaire (White, Norenzayan, et al., 2019). Due to its relevance to karmic justice within a single lifetime, only the karmic justice subscale was given to participants (e.g., "When people experience good fortune, they have brought it upon themselves by previous behavior in their life"). All items were measured on a 5-point Likert scale (1 = *Strongly disagree,* 5 = *Strongly agree*), $\omega = 0.808$.

Self-Uncertainty. Participants' self-uncertainty was measured via the 7-item Self-uncertainty Measure (Rast et al., 2012, 2013). The self-uncertainty scale items (e.g., "I am

uncertain about my place in the world") were measured on a 5-point Likert scale (1 = *Strongly Disagree,* 5 = *Strongly Agree),* ω = 0.932.

Empathy. Participants' level of empathy was measured via the Empathic Concern and Perspective-Taking subscales from the Interpersonal Reactivity Index (Davis, 1980, 1983). The items for the two subfactors of empathic concern (7 items, e.g., "I often have tender, concerned feelings for people less fortunate than me") and perspective-taking (7 items, e.g., "When I'm upset at someone, I usually try to 'put myself in his shoes' for a while") were measured on a 5-point Likert scale (1 = *Does not describe me well,* 5 = *Describes me very well*), ω = 0.849.

Fairness Orientation. Participants' fairness orientation was measured via the Fairness subdomain of the Moral Foundations Questionnaire (Graham et al., 2011). The fairness measure consisted of 6 items in which participants indicated the extent to which they considered the given statements important in their determination of right and wrong (e.g., "Whether or not some people were treated differently than others). All items were measured on a 6-point Likert scale (0 = *Not at all relevant,* 5 = *Extremely relevant*), ω = 0.790.

Justice Sensitivity. Participants' justice sensitivity was measured via the Justice Sensitivity Inventory (Schmitt et al., 2010). The inventory consisted of three subfactors that were examined separately: 1) victim sensitivity (ω = 0.885, e.g., "I cannot easily bear it when others profit unilaterally from me"), 2) observer sensitivity (ω = 0.903, e.g., "It bothers me when someone gets something they don't deserve"), and 3) advantage sensitivity (ω = 0.912, e.g., "I feel guilty when I receive better treatment than others"). All items were measured on a 6-point Likert scale (0 = *Not at all,* 5 = *Exactly*).

Results

Table 1

Study 1; Descriptive statistics and Means/Frequency comparisons

	Greed (G)	Equity (E)	Generosity (*P*)	ANOVA			
Variable	**M ± SD**	**M ± SD**	**M ± SD**	***F***	***df***	***p***	**Pairwise**
Demographic							
Age	21.08 ± 3.654	20.46 ± 2.685	20.87 ± 2.974	1.634	299.414	0.197	
Gender*	0.884	0.850	0.856	-	-	-	
SES	3.343 ± 1.834	3.4424 ± 1.715	3.232 ± 1.589	0.516	300.544	0.597	
Mechanisms							
PANAS Negative	1.873 ± 0.876	1.337 ± 0.691	1.571 ± 0.680	17.907	303.076	< .001	G > *P* > E
Greed Attribute	3.823 ± 0.891	1.604 ± 0.651	1.711 ± 0.701	358.574	301.424	< .001	G > *P* & E
Outcomes							
Allocation	4.665 ± 2.130	5.571 ± 2.026	7.765 ± 2.771	60.490	300.949	< .001	*P* > E > G
Fairness (Other)	2.581 ± 1.156	3.468 ± 0.909	3.595 ± 1.264	35.993	299.455	< .001	*P* & E > G
Fairness (Self)	3.297 ± 0.927	3.364 ± 0.935	3.425 ± 0.958	0.711	305.859	0.492	

*Note: Games-Howell post-hoc comparisons shown; all pairwise comparisons significant at $p < 0.05$; non-significant pairwise comparisons not shown; *Gender percentages are given as the proportion of females*

To first ensure that the participants did not significantly differ in demographic variables across the randomly assigned three conditions, a one-way Welch's ANOVA test with Games-Howell unequal variance assumed pairwise comparison was used (Table 1). As expected, participants in the three groups did not differ in age or SES. Further, there were no significant differences in gender composition across conditions ($\chi^2(4) = 1.741$, $p = 0.783$).

Table 2

Study 1; Correlations between study variables

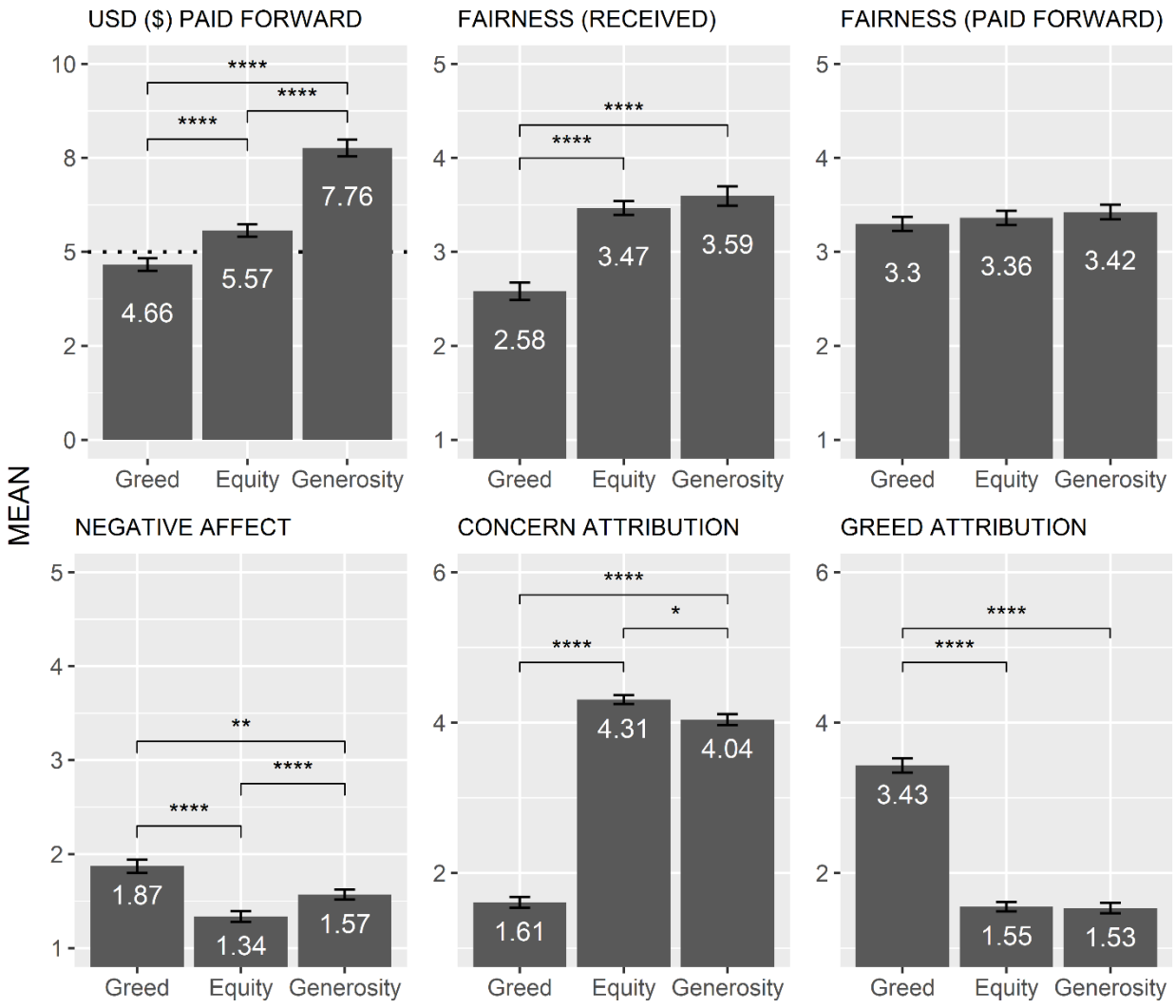
Variable	M ± SD	1	2	3	4	5
1. Allocation	5.994 ± 2.665	—				
2. Greed Con.	-	-0.354***	—			
3. Gener Con.	-	0.466***	-0.501***	—		
4. Neg. Affect	1.588 ± 0.775	-0.077	0.253***	-0.021	—	
5. Greed Att.	2.388 ± 1.275	-0.388***	0.805***	-0.374***	0.357***	—

*Note: *** p < 0.001; biserial correlations shown for greed and generosity conditions; Greed Con. = Greed condition, Gener Con. = Generosity condition, Neg. Affect = Negative affect, Greed Att. = Greed attribution*

As expected, monetary allocation was significantly lower in the greed condition than others while higher in the generosity condition (Table 2), supporting the presence of behavioral contagion effects. Those in the greed condition also reported higher negative affect and showed greater propensity to attribute more greed for the other's behaviors. Those in the generosity condition reported the opposite trend for attributing greed to behaviors but to a much smaller effect. The monetary allocation paid forward was negatively related to greed attribution. However, negative affect was not significantly related to monetary allocation paid forward.

Figure 4

Study 1; Means comparisons between conditions



Note: Dotted line at y = 5 indicates even split of monetary allocation; standard errors shown; * $p < 0.05$, ** $p < 0.01$, **** $p < 0.001$

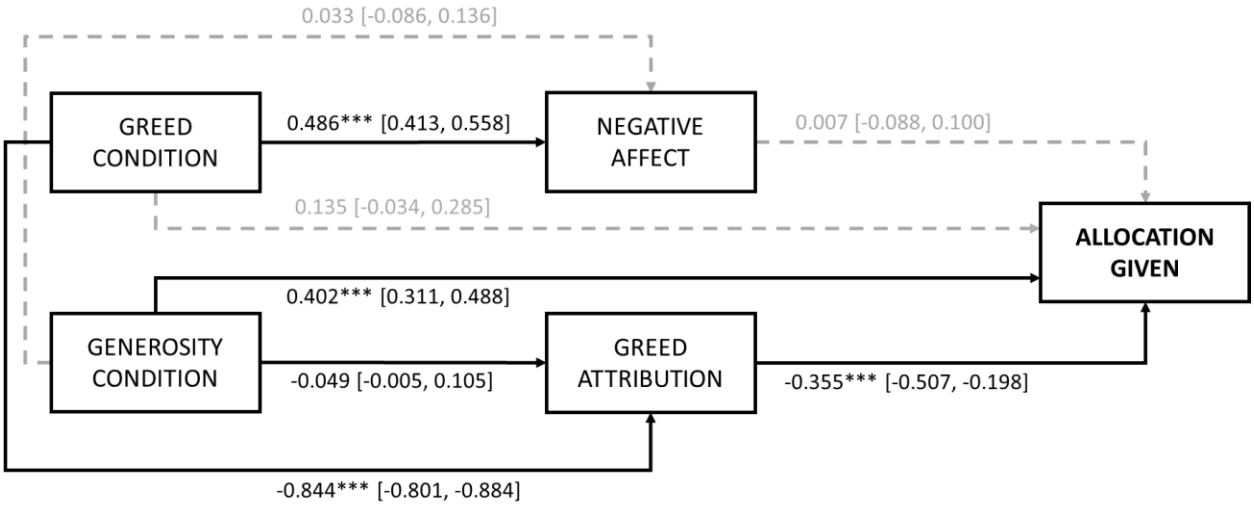
Consistent with expected results, participants in the generosity condition paid forward the most amount of money, followed by the equity condition, and then by the greed condition (Figure 4). The amount paid forward in each of the three conditions were then examined for deviation from the hypothetical *even split* of $5. Participants in the greed condition only marginally allocated less money than the assumed even split (i.e., $5), $t(154) = 1.958$, $p = 0.052$, 95% CI [-0.673, 0.003]. In contrast, participants in both the equity ($t(153) = 3.468$, $p < 0.001$, 95% CI [0.248, 0.894]) and

generosity conditions ($t(152) = 12.342$, $p < 0.001$, 95% CI [2.322, 3.208]) significantly paid forward more than the even split. There was no significant difference in appraisal of fairness in the allocation they received between the generosity and equity condition ($p = 0.838$). However, those in the greed condition reported the allocation they received as being more unfair than those in both the generosity and equity condition (p both < 0.001). Despite the differences in the amount paid forward across the conditions, there was no difference between the conditions in the fairness appraisal of it (p from 0.459 to 0.838).

In line with the appraisal of the fairness in the allocation participants received, those in the greed condition reported significantly greater negative affect than those in the generosity ($p = 0.003$) and equity condition ($p < 0.001$). Surprisingly, those in the generosity condition reported greater negative affect than those in the equity condition ($p = 0.003$). Participants in the greed condition also reported greater attribution of greed for the allocation they received than those in the equity or generosity conditions (both $p < 0.001$). Participants in the equity and generosity conditions, however, did not differ ($p = 0.982$). Participants in the equity condition reported greater attribution of concern for others for the allocation they received than those in the generosity ($p = 0.015$) and greed conditions ($p < 0.001$). Those in the generosity condition reported greater attribution of concern for others than in the greed condition ($p < 0.001$).

Figure 5

Mediation model results for generalized reciprocity



Note: Standardized coefficients and confidence intervals shown; non-significant paths are denoted in gray

To test the proposed multi-mediation model, partial least-squares structural equation modeling (PLS-SEM) with 1,000 bootstrap sampling was used (Figure 5). Due to lack of maximum likelihood estimation in PLS-SEM, missing data were handled using k-nearest neighbor (KNN) imputation using the 10 nearest neighbors with weighted averaging. The relation between the greed condition on amount paid forward was fully mediated by greed attribution (β = -0.302, [-0.435, -0.168], $p < 0.000$) but was not mediated by negative affect (β = 0.004, [-0.042, 0.049], $p = 0.887$). The effect of generosity condition on amount paid forward was not mediated by any of greed attribution (β = -0.021, [-0.044, 0.001], $p = 0.066$) or negative affect (β = -0.001, [-0.008, 0.006], $p = 0.851$). However, the direct effect between generosity condition and the amount paid forward was significant ($p < 0.001$).

Table 3

Study 1; Mediation of negative affect by discrete emotion

		95% Confidence Interval			
Discrete Emotion	**Estimate**	**Lower**	**Upper**	***p***	**% Mediated**

Greed					
Upset	0.112	-0.157	0.360	0.372	0.134
Hostile	-0.059	-0.210	0.082	0.414	-0.065
Ashamed	0.022	-0.019	0.084	0.324	0.021
Nervous	0.003	-0.030	0.039	0.890	0.001
Afraid	0.006	-0.040	0.064	0.770	0.004
Angry*	0.119	-0.100	0.367	0.302	0.138
Generosity					
Upset	0.024	-0.038	0.096	0.414	0.010
Hostile	0.005	-0.020	0.040	0.720	0.001
Ashamed	0.087	-0.042	0.239	0.196	0.037
Nervous	0.009	-0.100	0.119	0.874	0.003
Afraid	0.005	-0.031	0.050	0.844	0.001
Angry*	0.004	-0.024	0.040	0.790	0.001

Note: *added negative discrete emotion following Gray et al. (2014)

To examine the robustness of the lack of mediation via negative affect, each discrete emotion was analyzed separately using linear regression model-based mediation (Table 3). None of the six discrete negative emotions significantly mediated the effect of condition on the allocation paid forward, including anger.

Table 4

Study 1; Greed Attribution's Indirect Effect Controlling for Individual Differences

	1-SD		**Mean**		**1+SD**	
Ind. Variable	***β***	***p***	***β***	***p***	***β***	***p***
Religiosity						
Greed	**-0.297**	**0.003**	**-0.274**	**< .001**	**-0.251**	**0.001**
Generosity	-0.025	0.136	-0.011	0.293	0.004	0.804
Karmic Justice						
Greed	**-0.282**	**0.002**	**-0.282**	**< .001**	**-0.281**	**0.007**
Generosity	-0.014	0.333	-0.012	0.241	-0.010	0.477
Empathy						
Greed	**-0.180**	**0.035**	**-0.235**	**< .001**	**-0.296**	**0.002**
Generosity	-0.008	0.550	-0.005	0.528	-0.001	0.916
Fairness						
Greed	**-0.206**	**0.023**	**-0.264**	**< .001**	**-0.323**	**< .001**
Generosity	-0.020	0.176	-0.010	0.258	0.006	0.659
Self-Uncertainty						
Greed	**-0.269**	**0.003**	**-0.290**	**< .001**	**-0.304**	**< .001**
Generosity	-0.018	0.224	-0.011	0.312	-0.004	0.785
JS Self						

Greed	**-0.355**	**< .001**	**-0.290**	**< .001**	**-0.214**	**0.014**
Generosity	-0.032	0.086	-0.012	0.262	0.001	0.937
JS Else						
Greed	**-0.268**	**0.001**	**-0.255**	**< .001**	**-0.231**	**0.028**
Generosity	-0.026	0.171	-0.009	0.333	0.004	0.670
JS Advantage						
Greed	**-0.249**	**0.012**	**-0.249**	**< .001**	**-0.247**	**0.003**
Generosity	-0.028	0.081	-0.007	0.413	0.016	0.308

Note: significant indirect effect in **bold.**

To examine the robustness of the mediating paths controlling for individual variability, a series of moderated mediation analyses were conducted using generalized linear modeling with 1,000 bootstrap resampling. Across all measures of individual traits and values, the mediating effect of greed attribution remained robust for those receiving greedy treatment and was not significant for those receiving generous treatment (Table 4). Justice sensitivity for self (p from 0.157 to 0.802), belief in karmic justice (p from 0.166 to 0.985), religiosity (p from 0.063 to 0.973), and fairness orientation (p from 0.093 to 0.802) showed no significant moderation at any of the direct or indirect paths of the proposed model (Figure 3). Both justice sensitivity for others ($\beta = 0.091$, $p = 0.016$) and trait empathy significantly interacted with the greed condition ($\beta = 0.090$, $p = 0.008$) in the path toward greed attribution. Justice sensitivity for advantageousness, however, significantly interacted with the generosity condition ($\beta = -0.075$, $p = 0.015$) in the path toward greed attribution. All interactions, however, ultimately yielded small to trivial effects owing primarily to large and unstable standard errors.

Lastly, no measures of individual traits and values yielded notable variability or moderated effects for negative affect. The indirect effect of negative affect on amount paid forward remained near zero for all three justice sensitivity perspectives (β from 0.000 to 0.017), belief in karmic justice (β from 0.003 to 0.010), religiosity (β from 0.001 to 0.009), empathy (β from 0.002 to 0.027), and fairness orientation (β from -0.007 to 0.027). Only self-uncertainty yielded a significant interaction with negative affect in the path toward amount paid forward ($\beta =$

0.242, $p = 0.027$) but ultimately yielded no significant mediation effect across all three levels (β from -0.031 to 0.036, p from 0.067 to 0.952).

Discussion

Pairwise comparisons across the allocation conditions supported the general hypothesis that individuals pay both greed and generosity forward. However, participants in the greed condition paid forward an average of $4.7—only marginally less than giving an even split (i.e., $5)—and those in the equity and generosity conditions paid forward more than the even split. Thus, results suggest that participants were more generous across all conditions than in prior literature (e.g., Gray et al., 2014). One explanation for this may be that participants became more prosocial in response to COVID-19 (data were collected during the Spring of 2020). Several studies in the past have shown that prosocial behaviors increase in response to adverse life events or traumatic experiences (Frazier et al., 2013; Maki et al., 2019; Vollhardt, 2009). Regardless, receiving a greedy allocation appeared to inhibit individuals from being *more than fair*.

Perceived Fairness

As expected, the greed condition participants rated the allocation they received as being less fair than those in the equity or generosity conditions. Despite the clear monetary difference in allocation received, there was no difference in fairness perception between the equity and generosity conditions. Thus, the participants appeared to display a self-serving bias in their appraisal of fairness (Cappelen et al., 2016). Indeed, when given context, such as observation of others' behavior in this study, individuals apply a more nuanced and complex understanding of fairness than pure distributive equity (Almas et al., 2010; Ochs & Roth, 1989). In particular, Bolton and Ockenfels (2005) argued that determinations of fairness are influenced by reference points. In the case of the current findings, individuals across all conditions may have inferred

their own offers as having been equally fair despite varying degrees of objective monetary amounts because each person determined the fairness of their action relative to the allocation they received. For instance, the offer of $0/$10 in the greedy condition was construed as being less than fair, and thus the participants' subsequent average allocation of $4.7 is perceived to be fair in comparison. In contrast, the offer of $10/10 in the generous condition was construed as being more than fair, and thus the participants' subsequent average allocation of $8 is perceived to only be fair in comparison.

Nonetheless, another interesting finding was that participants in the generosity condition, compared to those in the equity condition, reported a greater frequency of indicating that the allocation they received was *less than fair*. This is in line with recent analyses where generosity may manifest from unfairness as it inherently requires one to be unfair to themselves to be more than fair to another (Im & Chen, *in prep*). It is also worth mentioning, however, that several equity condition participants rated the allocation they received as being more than fair, consistent with the general view of behavioral economists and evolutionary biologists that non-self-interested behaviors (including equity) are generous.

Affective Response

In contrast to prior findings (Baker & Bulkley, 2014; Gray et al., 2014), affective response played no mediating role in the generalized reciprocity process. In Study 4 of Gray et al. (2014), participants were given a similar dictator game paradigm, but monetary allocations were replaced with tasks that differed in difficulty that they to complete for monetary compensation. In this case, participants were to be compensated regardless of tasks given and hence any consequence befalling the participants did not affect the ultimate compensation outcome, only the difficulty it took to obtain it. In the case of Baker and Bulkley's (2014) study,

participants used an online system to request or give help. Participants could make specific requests for helps and provide specialized aid via free-form text boxes. Similar to Gray et al. (2014), the success of whatever task the participants in Baker and Bulkley's (2014) study needed to complete did not entirely hinge on whether their requests were addressed by another individual. The lack of mediation effect held true even after conducting the same mediation model (e.g., removing the control condition and causal attributions) as Gray et al. (2014) (see *Appendix* for additional analyses). These sets of findings that contradict prior studies may be due to the nature of the measurements used.

The current study's manipulation, in contrast to both Gray et al.'s (2014) and Baker and Bulkley's (2014), provided no fixed guarantee payout nor was a means of making the task any easier. Rather, the initial outcome of the participant rested entirely on the decision of the other. Thus, whether the treatment received directly affects the payout or the process of obtaining it may be a determining factor for which mechanism plays a role for paying negativity forward. For instance, because with other tasks to complete as a process of achieving one's outcomes, the task itself may conjure an emotional response (e.g., difficult or tedious task induces frustration) and may ultimately serve to establish psychological distance between outcome and the antagonist. On the other hand, when the fate of the participant's outcome is unilaterally determined by the other player, the psychological proximity of outcome to antagonist may explain why one's affective response does not mediate the process of generalized reciprocity.

Greed Attribution

Reminiscent of findings indicating that individuals engage in more complex cognitive processes in displacing greed after being subjected to unfair treatment (Hu et al., 2018; Y. Wu et al., 2015), the findings of this study also suggest that cognitive attribution of causality precedes

negative generalized reciprocity. This is also consistent with prior evidence that individuals use perceptions and inferences of causal intent prior to determining their own actions directed toward unknown others (Foulk et al., 2016; Sun et al., 2020). That is, individuals would attribute causality of greed or generosity to whatever treatment they received which subsequently informed and guided their next behavior. Like previous studies, the subjection to greed may have activated a semantic network of similar concepts that serve to loosen one's self-restraints for engaging in like behaviors (Foulk et al., 2016; Wheeler, 1966). This contrasts with the findings of Cardella et al. (2019) in which the researchers found no support for the mediating role of greed perceptions in behavioral contagion. Specifically, this study found that for participants in the greed condition, the process of generalized reciprocity was fully mediated by greater attribution of greed and lower attribution of concern. On the other hand, no such mediating effect was observed for those who experienced generosity.

In Cardella et al. (2019), participants were given the common pools resource dilemma in which the harm (i.e., reduction in monetary gains) was a bilateral, indirect consequence of both the opponent and participant's behavior in maximizing their own possible payout. Hence, the opponent's withdrawal behavior may be used as a reference for whether to remain steadfast in their risk avoidant strategy and gravitate towards the Nash Equilibrium, consistent with the greed contagion effect observed in Cardella et al. (2019). Like the case with affective response, this contrasts with the measurement used in this study where any reduction in monetary compensation on the participant is a unilateral, direct consequence of the other's decision. Hence, any subsequent behavior in this study cannot readily be ascertained to be a byproduct of adjusting one's behaviors to the likelihood of the other player being greedy in subsequent

interactions, but rather one in which the participant decides that paying forward the same amount as they received ought to be justified.

Consideration of Individual Variability

None of the proposed measures of individual variability in prosocial behavior induced differential behavioral responses in allocation amounts to receiving greedy or generous offers. Further, the series of moderated mediation analyses yielded little deviation from the original mediation results. The set of nonsignificant to trivial findings provide strong support for the claim that situational greed attribution plays a pivotal role in generalized reciprocity compared to individual differences or variability. One possible explanation may be the lack of context associated with the use of dictator game. Although the repeated dictator pay-it-forward measure (Gray et al., 2014) provides the advantage of isolating contextual influences from contaminating affective and causal attributional inferences, it also comes at the cost of reducing the effects of social ecological interactions with personal values. Indeed, in a series of contextualized (e.g., local social norms) and uncontextualized dictator games, Lesorogol (2007) found evidence that individual demographic variables only yielded predictive power in contextualized scenarios.

As discussed before, the traditional one-off dictator game where participants only take on the role of the dictator presents a very stripped down, decontextualized examination of one's giving behavior. However, with no social cues for participants to infer appropriate behavior, they must rely on their own past experiences and values to determine their offer (Bettenhausen & Murnighan, 1985; Guala & Mittone, 2010). This limitation may explain why prior studies have shown large effects across various personality and dispositional social values influencing one-off giving behavior using the dictator game but little to no effect was observed in this current study for how individuals may differentially respond to the offers they were given. That is, as

individuals received an initial response, said initial response may have served to cue the participants of a norm that they may use to reference their own behaviors in a new setting (Bolton & Ockenfels, 2005).

Conclusively, Study 1 partially supported the comprehensive model, showing evidence of the mediating role of greed attribution, but not affective state, in the generalized reciprocity process. However, Study 1 came with notable limitations. Specifically, although Study 1 found evidence that participants in the greedy condition reported greater inference of unfairness in the treatment, and subsequently adjusted their own behaviors to what was subjectively construed as being fair in comparison, there was no direct examination of norm learning. In other words, participants in Study 1 appeared motivated to rectify others' defections from norms of equity (greed condition) or maintain what can only be inferred as the normative state of endowment (generosity condition). However, because a direct measure of norm learning was absent, evidence of participants adjusting their expectations of the normative levels of giving remained unclear.

Further, several limitations of Study 1 warrant additional inquiry. Firstly, prior literature has posited that discrete negative emotions specifically conducive to mistreatment are driving factors of negative generalized reciprocity rather than general negative affect. The negative affect factor of the short PANAS used in Study 1 and prior studies (Gray et al., 2014) arguably lacks conceptual power in measuring affect specifically tailored to certain situations. Secondly, the causal attribution scale used in Study 1 was developed for use in N-person prisoner's dilemma cooperation games and not for unilateral economic allocation games. Hence, certain items had wording that were not tailored to the generalized reciprocity economic game (e.g., "…the person always wants to win"). Lastly, results from Study 1 implied that participants were

adjusting their judgments of behaviors based on the treatment experienced. However, because Study 1 did not explicitly measure norms, and given prior evidence that individuals use observations and personal experiences to infer normative behavior in otherwise ambiguous or novel situations (Jung et al., 2014; Shang & Croson, 2009), a more specific measurement of learned norms may provide fruitful results. Thus, subsequent Studies in this dissertation were developed to address these limitations and conceptual gaps.

Study 2: Norm Learning in Generalized Reciprocity

Norm inferences play key roles in guiding one's behaviors (Bicchieri & Xiao, 2009) and is an adaptive function for social integration (Higgs, 2015). Indeed, norms reflect appropriate behavior within the context of the situation, but also represent and define the identity of the social group and its members (McDonald & Crandall, 2015). Hence, the pressure to conform to norms induces a social desirability effect in individuals to engage in what they believe others expect them to do (i.e., *normative expectations*) (Eckel et al., 2011). However, even without direct pressure, the mere process of thinking about or observing others' behaviors can increase one's own prosocial behaviors (Bicchieri & Xiao, 2009; Krupka & Weber, 2009).

Under ambiguous situations and absence of observable cues to guide one's perceptions of normative behavior, individuals may default to greater inferences of norms of equity or generosity (Bettenhausen & Murnighan, 1985; Jung et al., 2014; Whitt & Wilson, 2007). Given that simple norms of equitable fairness are important for ensuring social cohesion (Putnam, 2000), such norms are strong and pervasive even in less than hospitable environments (Whitt & Wilson, 2007). Such defaults to personal estimates, however, lead to several errors in estimation as people inaccurately estimate based on perceptions (Frederick, 2012; Matthews et al., 2016). Indeed, individuals' tendency to default to personal experiences and inferences about normative

behavior in ambiguous situations may partly explain the wide variability often observed for one-off allocation economic tasks like the traditional dictator game (Guala & Mittone, 2010) particularly across cultures and social scenarios (Hoff, 2010).

Humans, however, are cognitively advanced social animals and are predisposed to infer one's surroundings for simple norm cues to guide their behaviors (Whitt & Wilson, 2007) and follow what they perceive as being normative (Bicchieri & Xiao, 2009; Krupka & Weber, 2009). In contextually ambiguous situations (e.g., dictator games), people are particularly motivated to probe for cues to infer normative behaviors (Guala & Mittone, 2010) and are highly responsive to experiences in readjusting and narrowing the scope of their expectations (Güney & Newell, 2015). For instance, Cardella et al. (2019) proposed that people adjust their behaviors in response to others' actions stemming from norm learning in otherwise ambiguous scenarios. In studies utilizing dictator games, dictators allocated more money to others when they were given information about normative levels of generosity (Krupka & Weber, 2009) and behaviors conformed more with social norms under context (vs. more varied under ambiguity) (Lesorogol, 2007). Patterns of norm conformity persist outside economic games, however. In a prior study of pay-it-forward, participants who had knowledge of the prior individual's payment behavior accordingly adjusted their own payment in response in comparison to those who were naïve to any cues of what may be construed as normative behavior (Jung et al., 2014). A metaphor to best capture this phenomenon may be one of tourism:

> *An American tourist travelling to Japan for the first time without any knowledge of social norms in Japan may first refer to American cultural norms to determine what behaviors constitute politeness and rudeness. Unbeknownst to the American tourist, he leaves a tip for the server out of goodwill as one would in the States after a nice meal, only for the*

gesture to be strongly rejected by the restaurant owner and server. The American tourist then realizes that the norms of what is construed as polite (e.g., tipping) in the States can sometimes be considered rude in Japan and ceases the behavior heading forward.

This example is illustrative of prior studies documenting how in a contextually novel or ambiguous situation, individuals default to their own prior experiences to make estimates about what may be socially desirable behavior (Bettenhausen & Murnighan, 1985; Jung et al., 2014; Whitt & Wilson, 2007). In such cases, a single novel situational cue may be highly informative about what constitutes normative behavior. Indeed, in a prior study examining donation behaviors to a radio station, Shang and Croson (2009) found that the behavioral contagion effect was strong for whom the situation was a novel one, but absent for whom the situation was familiar. Hence, in the repeated dictator game pay-it-forward paradigm (Gray et al., 2014), the initial experience serves as the frame of reference with which one may readjust their expectations and behaviors by conferring a new norm within the confines of the experimental setting (Bolton & Ockenfels, 2005). To directly illustrate the generalized reciprocity situation with a similar metaphor, an American businessman on a trip to Japan may be unaware of the Japanese customs for handing out business cards (e.g., bowing, giving card with both hands). However, after the American businessman receives a business card in the traditional Japanese manner from a Japanese businessman, the American businessman mimics the behavior when handing his own business card out to another Japanese client the next day.

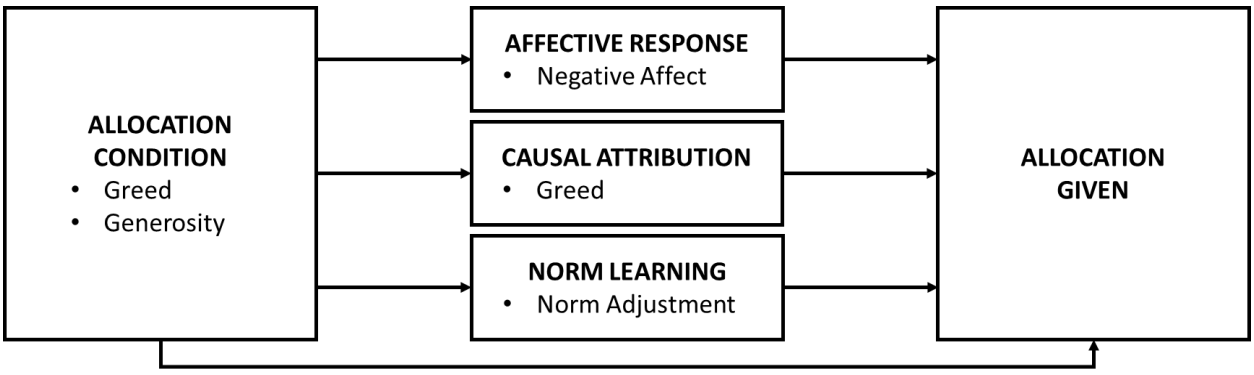
In the case of generalized reciprocity, the initial experience of having received a greedy or generous offer may induce particularly strong norm inferences. Indeed, the experimental setting presents a context-ambiguous setting for inferring new norms (Guala & Mittone, 2010; Shang & Croson, 2009). In doing so, the initial experience serves two purposes: 1) to focus

participants' attention to the norm and 2) to provide information about others' behaviors (Krupka & Weber, 2009). As both attention and observation of behavior can increase prosocial behavior (Krupka & Weber, 2009), the initial experience can heighten one's awareness of their responsibility to adhere to perceived norms (Berkowitz & Daniels, 1964).

This is observed in the findings of Study 1. Participants in the greed condition rated the offer given to them as being far more unfair than those in the equity or generosity conditions. However, despite large differences in the amounts subsequently paid forward across conditions, the participants' ratings for their own allocations were equal. In other words, individuals judged the initial offer they received using the norm of fair equity as a frame while judging their own subsequent allocation using the offer they received as a frame (i.e., greed condition participants viewed their offer as being fair *relative to* $0; likewise, generosity condition participants viewed their offer as being fair *relative to* $10). In other words, when participants are given $0/10 in the greed condition, they may be compelled to act more generously than the prior individual to enhance one's own self-identity as a caring individual (Grant & Dutton, 2012) and rectify prior perceptions of norms of fair equity. In comparison, although the opposite trend may be expected for the generous condition under the same argument, participants may be more hesitant to gravitate back to an equitable split after having been the recipient of generosity as doing so will challenge their own identity as a generous individual (Grant & Dutton, 2012).

Figure 6

Proposed Revised Model to Generalized Reciprocity



This possibility is partly supported by participants' fairness; although there were clear discrepancies between conditions in participants' appraisals of the fairness of the monetary allocation they received, the lack of difference between conditions for participants' fairness appraisal of their own allocations paid forward suggest that they relied on experiences as a frame of reference for guiding the judgment of their own behaviors. Thus, given the literature on how individuals use experiences and available social cues to infer normative behavior, experience of negative treatment ought to reduce people's inferred normative giving amount. Accordingly, norm learning is expected to play a mediating role (Figure 6).

Study 2 built on Study 1 by proposing a comprehensive model (Figure 6) and addressing the methodological limitations by tailoring the mediating measures to generalized reciprocity. Specifically, compared to Study 1 that used measures that were originally used for prisoners' dilemmas, Study 2 utilized items more specific to the behavioral task of generalized reciprocity to measure attribution and affect while accounting for the extent to which participants may learn of new norms in a novel experimental situation. Further, because Study 1 did not measure participants' dispositional greed or generosity, Study 2 examined the prevalence of generalized reciprocity and its underlying mechanisms beyond generic tendencies for acting greedily or generously.

Method

Procedures

Participants first completed a scale to measure their dispositional greed and generosity. To best minimize priming effects, participants then completed a series of unrelated scales and tasks that lasted approximately 10 minutes. Participants were then randomly assigned to either the greed condition or the generosity condition. Following the procedures from Study 1, participants in the greed condition were told that they were given $0 out of $10 by the individual before them. Participants in the generosity condition were told that they were given $10 out of $10 by the individual before them. After receiving this information, participants then completed measures on affect and attribution before determining how much money to pay forward. After making their own allocation, participants completed measures on perceived fairness of the allocation received and given, as well as a single-item measure on what they believed was the average individuals paid forward.

Participants

A total of 392 university students participated in the study. Ten observations were removed for inattention and two observations were removed for complete missing data for a total of 380 participants ($M \pm SD_{age} = 21.053 \pm 2.942$, 81.3% female).

Measures

Demographics. The same demographic information was measured and calculated as in Study 1. Participants self-reported their age, gender identity, and parental education (as proxy for SES).

Dispositional Greed & Generosity Trait. Greed trait was measured via the Dispositional Greed Scale (Krekels & Pandelaere, 2015) which included 4 items measuring

greed and 2 items measuring generosity (e.g., "No matter how much I have of something, I always want more") on a 7-point Likert scale (1 = *Strongly Disagree,* 7 = *Strongly Agree*). Generosity trait was measured via six newly constructed items pertaining to constructs opposite to the Dispositional Greed Scale (e.g., "When I help others, I expect nothing in return" and "I tend to others' needs before mine"). Mirroring the Dispositional Greed Scale, four items pertained to generosity while two items pertained to greed qualities to be reverse-coded. Fitting all twelve items into a 2-factor confirmatory factor analysis revealed poor fit, $\chi^2(53) = 381.330$, CFI = 0.716, TLI = 0.647, SRMR = 0.125, RMSEA = 0.128, 90% CI [0.116, 0.140]. Reverse-coded items for both dispositional greed and generosity proved problematic with low measurement quality and were subsequently dropped. The revised shortened two factor CFA yielded good fit, $\chi^2(19) = 72.114$, CFI = 0.932, TLI = 0.900, SRMR = 0.065, RMSEA = 0.086, 90% CI [0.065, 0.107], $\omega_{greed} = 0.761$, $\omega_{generosity} = 0.760$, but were treated independently in subsequent analyses due to low covariance between factors.

Greed & Generosity Attribution. To achieve better surface validity in measuring the attribution of greed and generosity compared to Study 1, attribution items were adjusted to fit the context of generalized reciprocity. Participants were told to:

> *…carefully think about why this participant may have decided to split the money in this way. The reason that the other participant decided on this split is likely because this person:*

Participants were then given 10 total items, 5 items measuring greed attribution (e.g., "has an urge to possess more") and 5 items measuring generosity attribution (e.g., "wants to provide for others"). All items were measured on a 7-point Likert scale (1 = *Strongly Disagree,* 7 = *Strongly Agree*). Two factor CFA showed good fit, $\chi^2(34) = 99.355$, CFI = 0.988, TLI = 0.983,

SRMR = 0.015, RMSEA = 0.071, 90% CI [0.055, 0.088], ω_{greed} = 0.934, $\omega_{generosity}$ = 0.981. Generosity attribution was reverse coded such that all scores measured greed attribution given high factor covariance.

Norm Learning. To assess newly learned norms about giving behavior, participants were asked a single item, "On average, how much money do you think people give to the next participant?" Participants could choose from a range of $0 to $10 in increments of $1.

Negative Affect. To assess positive and negative affect associated with primarily gratitude and anger, respectively, ten new items were constructed. Participants were asked "to what extent did receiving this amount made [them] feel" angry (5 items, e.g., "mad," "upset," etc.) or grateful (5 items, e.g., "happy," "pleased," etc.). One item per positive and negative affect was dropped in the final analysis due to conceptual redundancy and inflated residual covariances. All items were measured on a 7-point Likert scale (1 = *Not at all*, 7 = *Extremely*). Two factor CFA showed good fit, $\chi^2(19) = 68.302$, CFI = 0.988, TLI = 0.982, SRMR = 0.041, RMSEA = 0.083, 90% CI [0.062, 0.104], ω_{neg} = 0.942, ω_{pos} = 0.981.

Fairness Perception. Following procedures from Study 1, participants were asked to rate the fairness of the allocation they received and the allocation they paid forward. Both items were rated on a 5-point Likert scale ranging from 1 (*Much less than fair*), 3 (*Fair*), to 5 (*Much more than fair*).

Results

Table 5

Study 2; Descriptive statistics and means comparisons.

	Greed	Generosity				
	M ± SD	**M ± SD**	***t***	***df***	***p***	***d***
Demographic / Covariates						
Age	21.114 ± 3.149	20.995 ± 2.738	-0.392	362.712	0.695	-0.040
Gender	0.819	0.820	-	-	-	-

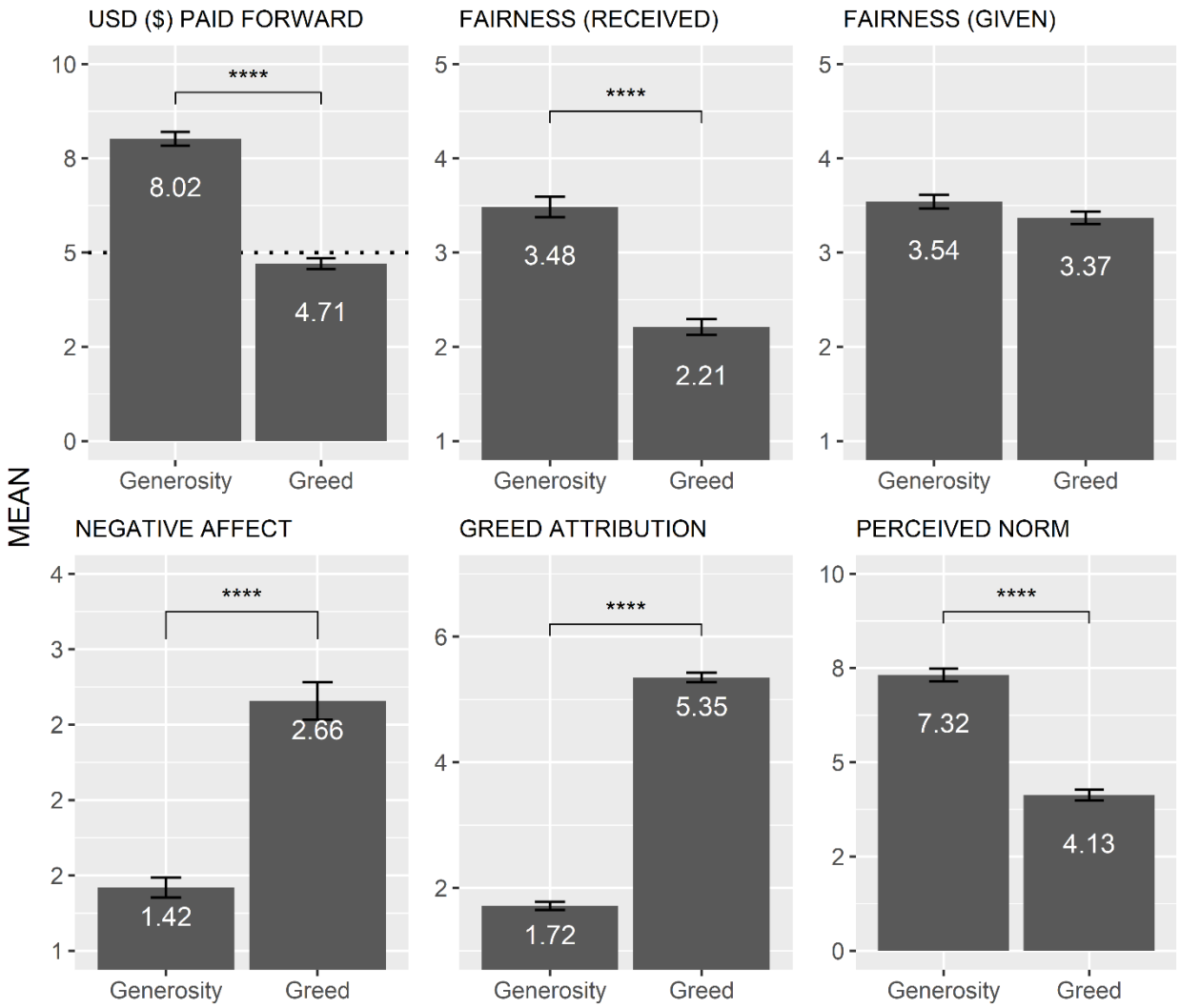
SES	3.320 ± 1.846	3.337 ± 1.682	0.094	366.214	0.925	0.010
Greed Personality	4.200 ± 1.173	3.982 ± 1.128	-1.843	374.212	0.066	-0.190
Generosity Personality	5.135 ± 0.944	5.376 ± 0.991	2.426	376.999	0.016	0.249
Mechanisms						
Negative Affect	2.657 ± 1.699	1.420 ± 0.923	-8.768	282.711	< .001	-0.905
Greed Attribution	5.353 ± 1.035	1.716 ± 0.919	-36.163	368.568	< .001	-3.716
Norm Learning	4.129 ± 1.952	7.320 ± 2.357	14.396	370.238	< .001	1.474
Outcomes						
Allocation	4.710 ± 1.995	8.021 ± 2.518	14.237	365.147	< .001	1.457
Fairness (Other)	2.210 ± 1.141	3.485 ± 1.497	9.361	359.900	< .001	0.958
Fairness (Self)	3.371 ± 0.893	3.541 ± 1.034	1.721	373.975	0.086	0.176

Note: Welch's t-test used; *Gender percentages are given as the proportion of females

Participants in the two conditions did not differ in age (d = -0.040, p = 0.695), gender (z = -0.141, p = 0.889), or SES (d = 0.010, p = 0.925). Although the participants were randomly assigned to one of two conditions, the two conditions nonetheless marginally differed in greed (d = -0.190, p = 0.066) and significantly differed in generosity personality (d = 0.249, p = 0.016) (Table 5). Thus, subsequent analyses were conducted controlling for individual differences in greed and generosity dispositions. Visual means comparison of the outcome and mechanism variables are given in Figure 7.

Figure 7

Study 2; Means Comparisons Between Conditions



*Note: ****p < 0.001; error bars depict SE*

As expected, those in the greed condition paid forward significantly less than those in the generosity condition (Table 5, Figure 7). Similar to findings in Study 1, participants still paid forward an average of $4.71. One-tailed one-sample t-test with a hypothetical mean of 5 (i.e., equitable split of $10) indicated that individuals in the greed condition tended to pay forward significantly less than the equitable split ($t(185) = -1.982$, $p = 0.024$). Likewise, individuals in the generosity condition tended to pay forward much more than the equitable split ($t(193) = 16.711$, $p < 0.001$). Consistent with findings from Study 1, participants in the greed condition reported lower appraisal of fairness in the allocation they received compared to those in the

generosity condition but reported equal appraisal of fairness in the allocation they, themselves, gave to the next person. Further, those in the greed condition reported more negative affect and attributed greed to the other participant than those in the generosity condition. Lastly, those in the greed condition reported lower expectations of how much people generally give to the next person than those in the generosity condition.

Table 6

Study 2; Descriptive Statistics for Study Outcome Variables and Covariates

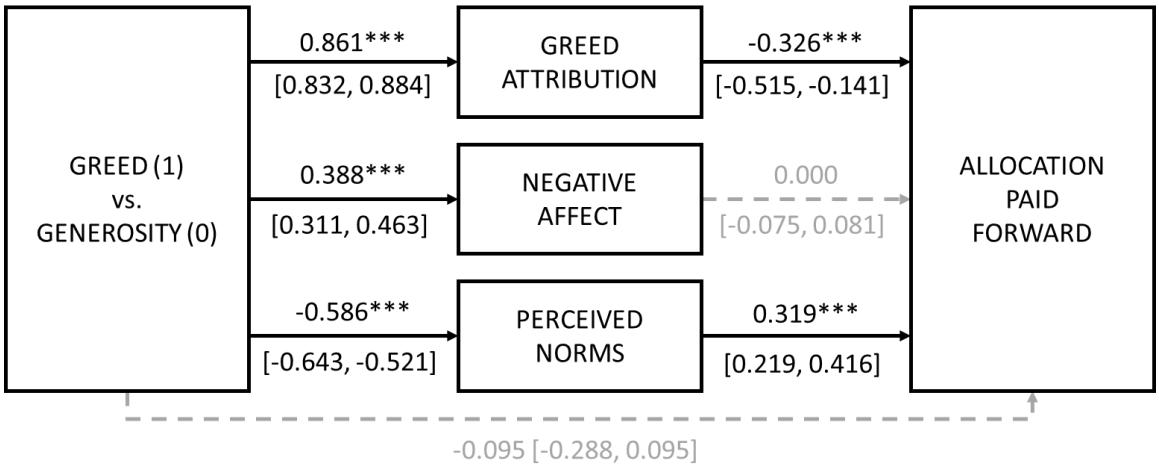
Variable	M	SD	1	2	3	4	5	6	7
1. Allocation	6.400	2.814	-						
2. Greed Pers	4.088	1.154	-0.163**	-					
3. Gener Pers	5.259	0.975	0.209***	-0.011	-				
4. Condition	-	-	-0.589***	0.095	-0.124*	-			
5. Attribution	3.496	2.065	-0.605***	0.163**	-0.203***	0.881***	-		
6. Neg Affect	2.026	1.492	-0.308***	0.145**	-0.189***	0.415***	0.508***	-	
7. Norm	5.758	2.691	0.558***	-0.072	0.123*	-0.594***	-0.512***	-0.232***	-

Note: $*p < 0.05$, $**p < 0.01$, $***p < 0.001$

Positive affect correlated too highly with greed (r = -0.739) and generosity perception (r = 0.871) and was subsequently dropped to limit multicollinearity. As expected, greedy and generous personality were, respectively, negatively and positively associated with the amount paid forward (Table 6). Participants in the greed condition paid forward significantly less than their counterparts in the generosity condition. Attributing greed as a causal factor to the treatment was strongly negatively associated with the amount paid forward. Compared to Study 1, negative affect showed a strong negative correlation with the amount paid forward. Norm learning was strongly positively related to the amount paid forward. Those in the greed condition reported greater tendency to attribute greed as a causal factor to the treatment received as well as greater negative affect. Those in the greed condition accordingly reported thinking that the normative amount allocated by others was significantly less than their counterparts in the generosity condition.

Figure 8

Study 2; PLS-SEM mediation results of generalized reciprocity



Note: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; standardized coefficients given; measurement model not shown; controlling for greed and generosity personality; non-significant paths denoted in gray.

To examine the mediation effects of attribution, negative affect, and norm learning, PLS-SEM with 1,000 bootstrap sampling was used. Missing data were first handled via k-nearest neighbor (KNN) imputation using 10 nearest neighbors and weighted averaging. Consistent with linear regression models, the effect of condition on the amount paid forward was fully mediated by attribution (β = -0.285, [-0.448, -0.122], $p < 0.001$) and norm learning (β = -0.188, [-0.25, -0.126], $p < 0.001$) but not negative affect (β = 0.001, [-0.031, 0.032], $p = 0.975$) (Figure 8).

Table 7

Study 2; Mediation effect of negative affect by discrete emotion.

		95% Confidence Interval			
Discrete Emotion	**Estimate**	**Lower**	**Upper**	***p***	**% Mediated**
Angry	-0.032	-0.194	0.126	0.702	0.042
Mad	-0.029	-0.192	0.144	0.710	0.044
Upset	0.027	-0.110	0.187	0.754	0.011
Annoyed*	0.015	-0.227	0.271	0.942	0.032
Irritated	0.039	-0.196	0.273	0.768	0.010

*Note: *Annoyed originally dropped from final negative affect calculation; controlling for effects of greed attribution, perceived norm, and greed and generosity personality.*

To examine the robustness of the lack of mediation via negative affect, each discrete emotion was analyzed separately using linear regression model-based mediation (Table 7). None of the five discrete negative emotions significantly mediated the effect of condition on the allocation paid forward.

Discussion

Results from Study 2 replicated and further supported Study 1's findings that receiving greedy treatment increased one's negative affect response but this, in turn, did not mediate the process of generalized reciprocity. This remained consistent and robust across all five discrete negative emotions of being angry, mad, upset, annoyed, and irritated, each only mediating a very small portion of the total effect. In contrast, attribution of greed remained a pervasive mechanism in determining what one pays forward, supporting findings from Study 1. This result was also consistent with prior findings where causal attribution was an important component in instigating the behavioral contagion effect (e.g., Falk & Fischbacher, 2006; Foulk et al., 2016).

Further, Study 2 provided support that norm learning mediated the generalized reciprocity process. That is, under contextually ambiguous situations, individuals appeared to adjust their norm beliefs in response to the initial offer they received. This result is consistent with conceptual reasoning and empirical findings of norm-behavior adjustment to novel situations (e.g., Shang & Croson, 2009) and that even single instances of behavior can yield profound effects for inferences of norm inferences (Gino et al., 2009). Indeed, Study 2 also found convergent evidence with Study 1 that participants expectedly reported significantly lower perceived fairness of the greedy offer (vs. generous offer) they received but reported equal

fairness perceptions in their own offers. Consistent with findings from Study 1, participants appeared to have judged the fairness of the offer received through the lens of personal values of norm of equity in contrast to the fairness of the offer given relative to the initial offer received. Lastly, experience of greedy treatment yielded no direct effect on negative generalized reciprocity, parallel to findings from Study 1. Thus, Study 2 provided convergent evidence that negative generalized reciprocity may be funneled through causal attribution of treatments received and norm learning.

Study 3: Causal Attribution – Manipulating Locus of Control

Findings from both Studies 1 and 2 supported the claim that causal attribution of greed in the experience of negative treatment mediated the generalized reciprocity process. That is, if participants believed that the other player's behavior was due to them being greedy or generous, the amount the participants subsequently paid forward followed suit. Given prior research on the role of causal attribution of behavior on instigating generalized reciprocity, interventions aimed at isolating the greedy behavior from its greed attribution ought to be useful in attenuating the tendencies to generally reciprocate greed (Foulk et al., 2016). That is, if the treatment received is concordant with one's interpretations of how the individual is (e.g., greedy individual behaves as greedily), participants ought to infer greater intent and malice on part of the other. This increased attribution of greed should then increase negative generalized reciprocity. On the other hand, treatment received that is motivated by justifiable reasons may negate such causal attributions that otherwise elicit generalized reciprocity among the recipient. Thus, Study 3 experimentally manipulated whether the other player engaged in greedy/generous behaviors *for greedy/generous reasons* and investigated the extent to which concordant behaviors-reasons increased generalized reciprocity.

Method

Participants

A total of 202 participants were recruited through Prolific AC. Three observations were subsequently removed due to not completing enough of the study (n = 2) and revoking consent following the study debrief (n = 1) for a total sample of 199 participants (Mean age ± SD = 32.005 ± 11.009; 51.8% female). The majority of participants resided in Canada (63.3%) with the rest residing in the United States (25.1%), Australia (6.0%), and New Zealand (5.5%). Participant sampling was restricted to these four countries due to their usage of dollar currencies and similar valuation to USD.

Procedure

Participants gave informed consent before being taken to the main study. Participants were told that they would be matched with an anonymous participant before them who was given a hypothetical allocation of USD $10 and had decided how to divide up the money between themselves and the participant. Participants were then randomly assigned to one of four conditions in a 2 (Greed vs. Generosity Experience) × (Internal vs. External Attribution) design. Participants in the greed (generosity) experience were told that the prior participant before them gave them $0 ($10) out of $10. Those in the internal (external) norm intervention were given a short passage depicting the prior participant's dispositional (situational) reason for giving the amount that they did:

"I just wanted all the money lol" *[Greed + Internal]*

"I'm financially struggling and need the money, sorry…" *[Greed + External]*

"I want to help others and give some positivity" *[Generosity + Internal]*

"I just don't need it" *[Generosity + External]*

Participants then were given a hypothetical $10 of their own to divide between themselves and an anonymous participant after them. After making their decision, participants then rated the fairness of the amount they received (in general) and the fairness of the amount they, themselves, paid forward. Lastly, participants provided demographic information before being debriefed. Participants were paid $0.54 for the study that took approximately 3-4 minutes.

Measures

Socioeconomic Status & Education. Participant SES was measured via the single-item MacArthur Scale of Subjective Social Status on an 11-point Likert scale (0 = *Least amount of money, little to no education, and no jobs*, 5 = *An average amount of money and education, and decent jobs*, 10 = *Most amount of money, highest amount of education, and really good jobs*). Education was measured via an 8-point Likert scale question adapted from the US Census (1 = *Less than High School*, 2 = *High School/GED*, 3 = *Some college*, 4 = *2-year College degree [Associate's]*, 5 = *4-year College [Bachelor's]*, 6 = *Master's Degree*, 7 = *Professional Degree [e.g., M.D., J.D.]*, 8 = *Doctoral Degree [e.g., Ph.D.]*).

Pay-it-forward Dictator Game. Participants were given the same pay-it-forward dictator game with changing partners design as prior studies to measure their tendency to pay forward greed or generosity.

Fairness Perception. Following Studies 1-2, participants were asked to rate the fairness of the allocation they received and the allocation they gave.

Results

Randomization checks revealed no significant differences across all groups regarding country of residence ($\chi^2(9) = 6.501$, $p = 0.689$), gender ($\chi^2(6) = 5.302$, $p = 0.506$), subjective SES (SS = 1.95, F = 0.208, $p = 0.891$, partial $\eta^2 = 0.003$), and education attainment (SS = 2.412, F =

0.404, $p = 0.75$, partial $\eta^2 = 0.006$). A series of 2 (Greed vs. Generosity Experience) × (Internal vs. External Attribution) factorial ANOVAs were run to examine the main effects and interaction effects of the given conditions across study variables.

Figure 9.

Study 3; Interaction Graphs (Experience × Reappraisal) for Study Variables.

In examining the amount paid forward, experience of greed-generosity revealed a significant main effect (SS = 186.841, F = 24.766, $p < 0.001$, partial $\eta^2 = 0.113$) but no effect was found for the attribution condition (SS = 13.121, F = 1.739, $p = 0.189$, partial $\eta^2 = 0.009$) (Figure 9a). Further, no interaction effect was found between the two (SS = 3.067, F = 0.407, $p = 0.524$, partial $\eta^2 = 0.002$). Pairwise post-hoc comparisons with Tukey's HSD correction showed that participants in the generosity experience and external condition (M ± SD = 5.86 ± 2.356) paid forward more money than their counterparts in the greed experience condition, regardless of whether they received the external (M ± SD = 3.673 ± 2.711; t(195) = 3.96, $p < 0.001$, $d = 0.796$, 95% CI [0.392, 1.200]) or internal condition (M ± SD = 3.408 ± 2.669; t(195) = 4.441, $p < 0.001$, $d = 0.893$, 95% CI [0.486, 1.299]). Further, those who experienced generosity but was given the internal condition (M ± SD = 5.098 ± 3.177) paid forward more money than their greed

experience counterparts across both internal (t(195) = 3.076, p = 0.013, d = 0.615, 95% CI [0.216, 1.015]) and external conditions (t(195) = 2.593, p = 0.0498, d = -0.519, 95% CI [-0.917, -0.121]). There were no differences across attribution conditions for either greed experience (t(195) = 0.478, p = 0.964, d = 0.097, 95% CI [-0.302, 0.495]) or generosity experience (t(195) = 1.394, p = 0.505, d = 0.277, 95% CI [-0.116, 0.671]).

Regarding participants' perceptions of the fairness of the allocation they received, there was a significant main effect of greed-generosity experience (SS = 133.704, F = 91.494, p < 0.001, partial η^2 = 0.319) and small main effect of attribution condition (SS = 8.57, F = 5.865, p = 0.016, partial η^2 = 0.029). However, no interaction effect was found (SS = 0.45, F = 0.308, p = 0.58, partial η^2 = 0.002). As was the case for the previous studies, there were no differences regarding the perceived fairness of one's own allocations for greed-generosity experience (SS = 3.278, F = 3.408, p = 0.066, partial η^2 = 0.017), attribution condition (SS = 0.875, F = 0.910, p = 0.341, partial η^2 = 0.005), or interaction between the two (SS = 0.42, F = 0.436, p = 0.510, partial η^2 = 0.002).

Discussion

Contrary to expectations, manipulating the internal-external reason for the behavior bore no effect on generalized reciprocity. Indeed, the effect of initial treatment on one's own subsequent behavior, as well as the appraisal of the fairness of the amount received, remained large and steady. As was the case with prior studies, one's judgment of their own allocated amount did not differ across conditions. Considering these results, one's inference of the internal-external justifiability behind another's actions may not be an effective way to nudge recipients toward paying forward positivity and restraining paying forward negativity.

Study 4: Causal Attribution – Cognitive Reappraisal Intervention

Results from Studies 1-2 indicated that causal attributions of behavior mediated the relation between experiencing greedy treatment and paying negativity forward. Findings from Study 3 found no evidence that the inference of internal-external justifiability of behavior influences subsequent behavior. However, because Study 3's efficacy is contingent upon information about the other's behavior being transparent, it may not readily be applicable to real world scenarios or settings. Cognitively altering these causal attributions influences one's own responses to experiences, possibly serving to initiate positive generalized reciprocity and mitigate negative generalized reciprocity. Study 4 implemented a cognitive reappraisal intervention in which participants were asked to think about the stable (e.g., personality, disposition) and unstable reasons (e.g., situational) for why the other player gave the greedy or generous allocation. In doing so, this study examined if un-stabilizing greed mitigated negative generalized reciprocity and stabilizing generosity promoted positive generalized reciprocity.

Method

Participants

A total of 204 participants were recruited through Prolific AC. Nine observations were subsequently removed due to not providing consent (n = 1), not completing enough of the study or only finishing the consent form (n = 5), and failing to reaffirm consent or revoking consent following the study debrief (n = 3) for a total sample of 195 participants (Mean age ± SD = 30.435 ± 10.589; 56.8% female). The plurality of participants resided in Canada (44.8%) with the rest residing in the United States (20.6%), Australia (29.4%), and New Zealand (5.2%). Participant sampling was restricted to these four countries due to their usage of dollar currencies and similar valuation to USD.

Measures

Socioeconomic Status & Education. The same SES and education variables as Study 3 were used.

Pay-it-forward Dictator Game. Participants were given the same pay-it-forward dictator game with changing partners design as prior studies to measure their tendency to pay forward greed or generosity.

Fairness Perception. Following Studies 1-2, participants were asked to rate the fairness of the allocation they received and the allocation they gave. Both items were rated on a 5-point Likert scale ranging from 1 (*Much less than fair*), 3 (*Fair*), to 5 (*Much more than fair*).

Justifiability Perception. Participants also rated the justifiability of the allocation received on a 5-point Likert scale ranging from 1 (*Not at all*) to 5 (*A lot*).

Procedure

Participants gave informed consent before being taken to the main study. Participants were told that they would be matched with an anonymous participant before them who was given a hypothetical allocation of USD $10 and had decided how to divide up the money between themselves and the participant. Participants were then randomly assigned to one of four conditions in a 2 (Greed vs. Generosity Experience) × (Stable vs. Unstable Reappraisal) design. Participants in the greed (generosity) experience were told that the prior participant before them gave them $0 ($10) out of $10. Those in the stable (unstable) reappraisal intervention were told to write about the personality characteristics and internal dispositions (situational and external factors) that may have led the prior participant to have given the amount that they did:

> What kind of **personality traits** or **internal characteristics** may have led this participant to give you this amount? (Examples: greedy, generous, selfish, kind) *[Stable Condition]*

What kind of **situational factors** or **external considerations** may have led this participant to give you this amount? (Examples: financial need, rich, unemployed, wealthy, mistake) *[Unstable Condition]*

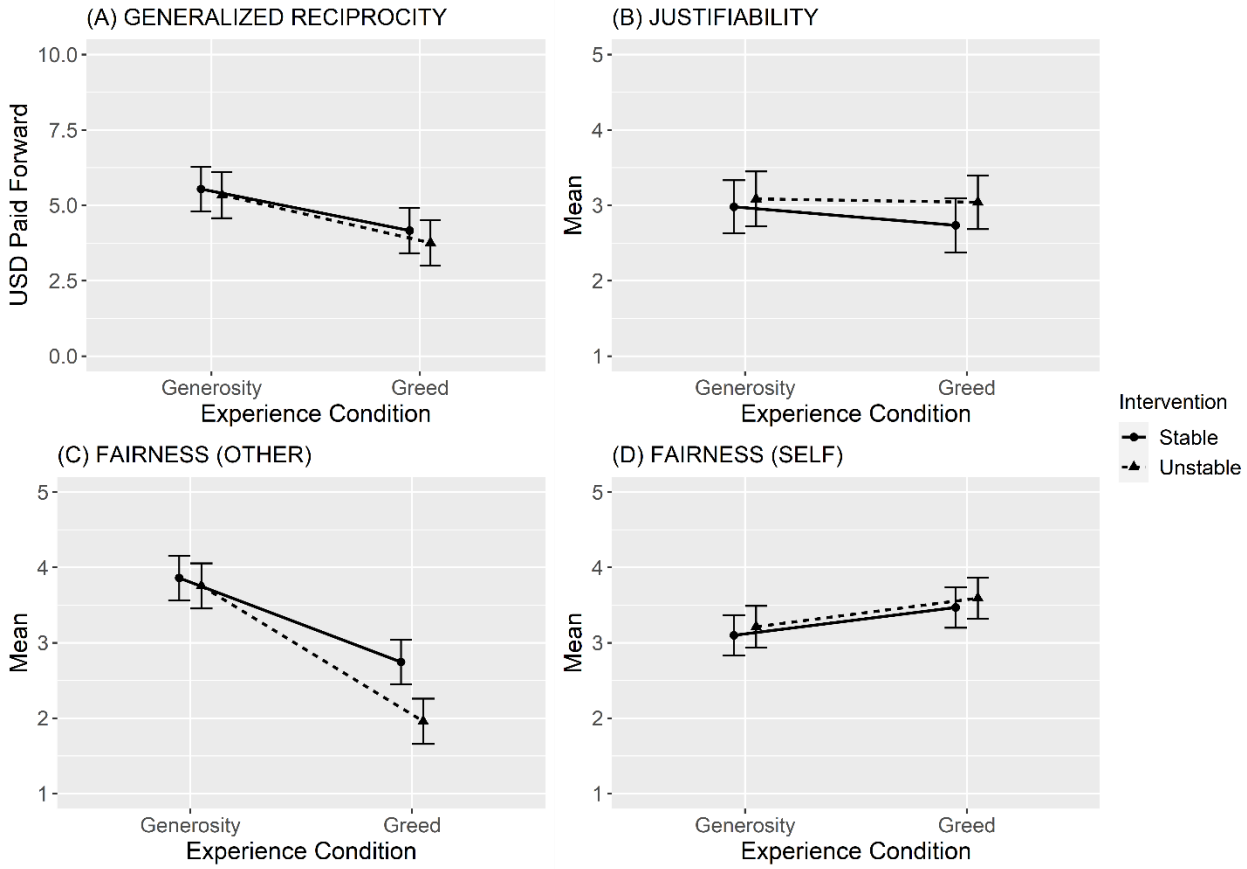
Participants then were given a hypothetical $10 of their own to divide between themselves and an anonymous participant after them. After making their decision, participants then rated the fairness of the amount they received (in general) and the fairness of the amount they, themselves, paid forward. Lastly, participants provided demographic information before being debriefed. Participants were paid $0.54 for the study that took approximately 3-4 minutes.

Results

Randomization checks revealed no significant differences across all groups regarding country of residence ($\chi^2(9) = 10.393$, $p = 0.320$), gender ($\chi^2(3) = 1.353$, $p = 0.717$), subjective SES (SS = 1.565, F = 0.159, $p = 0.924$, partial $\eta^2 = 0.002$), and education attainment (SS = 1.344, F = 0.18, $p = 0.91$, partial $\eta^2 = 0.003$). A series of 2 (Greedy vs. Generous Experience) × (Stable vs. Unstable Reappraisal) factorial ANOVAs were run to examine the main effects and interaction effects of the given conditions across study variables.

Figure 10.

Study 4; Interaction Graphs (Experience × Reappraisal) for Study Variables.



Note: error bars denote marginal means 95% confidence interval.

To first examine whether the cognitive reappraisal intervention worked properly, a factorial ANOVA was conducted to examine one's appraisal of the justifiability of the amount the other participant gave them. No main effects were found for either the greed-generosity experience (SS = 1.022, F = 0.637, $p = 0.426$, partial $\eta^2 = 0.003$) or stable-unstable reappraisal (SS = 2.06, F = 1.285, $p = 0.258$, partial $\eta^2 = 0.007$) (Figure 10). Accordingly, no interaction effect was found between the two (SS = 0.492, F = 0.307, $p = 0.58$, partial $\eta^2 = 0.002$).

Given the lack of effect from the intervention, there was only a corresponding significant main effect for the greed-generosity experience (SS = 106.876, F = 15.135, $p < 0.001$, partial $\eta^2 = 0.073$) but no effect of the stable-unstable reappraisal intervention (SS = 4.499, F = 0.637, $p = 0.426$, partial $\eta^2 = 0.003$) or an interaction (SS = 0.530, F = 0.075, $p = 0.784$, partial $\eta^2 = 0.000$).

Pairwise post-hoc comparisons with Tukey's HSD correction showed that participants in the generosity experience and unstable attribution condition (M ± SD = 5.34 ± 2.768) paid forward more than their counterparts who experienced greed (M ± SD = 3.755 ± 2.314; t(191) = 2.922, p = 0.02, d = 0.597, 95% CI [0.189, 1.004]). Similarly, those who in the generosity experience and stable attribution condition (M ± SD = 5.54 ± 3.284) paid forward more than those who experienced greed and unstable attribution (M ± SD = 3.755 ± 2.314; t(191) = 3.341, p = 0.005, d = 0.672, 95% CI [1.074, 0.269]). However, no effect was found between the two reappraisal conditions for greed experience (t(191) = -0.76, p = 0.872, d = -0.154, 95% CI [-0.552, 0.245]) or generosity experience (t(191) = -0.37, p = 0.983, d = -0.075, 95% CI [-0.476, 0.326]).

With regard to participants' perceptions of the fairness of the allocation they received, there was a significant main effect of greed-generosity experience (SS = 152.851, F = 116.22, p < 0.001, partial η^2 = 0.378) and a small effect of stable-unstable attribution reappraisal intervention (SS = 5.705, F = 4.338, p = 0.039, partial η^2 = 0.022), but no interaction effect (SS = 0.101, F = 0.077, p = 0.782, partial η^2 = 0.000). Unlike prior studies, however, there was a significant main effect of greed-generosity experience on perceived fairness of one's own allocations (SS = 6.824, F = 7.388, p = 0.007, partial η^2 = 0.037), but no effects for either the stable-unstable attribution reappraisal intervention (SS = 0.674, F = 0.73, p = 0.394, partial η^2 = 0.004) or interaction (SS = 0.001, F = 0.001, p = 0.972, partial η^2 = 0.000).

Discussion

Study 4 results were generally consistent with Study 3, showing that a simple cognitive reappraisal intervention failed to adequately influence participants' judgments about the justifiability as well as the amount paid forward. It may be such that inferences about justifiability or reasons behind actions cannot adequately override the pervasive initial

experience of greed or generosity. Indeed, results for perceived fairness of amount received and given again show the same patterns as prior studies, suggesting that the effects were primarily driven by initial experience rather than any subsequent behavioral interventions. In contrast to prior findings (Foulk et al., 2016), findings from both Studies 3 and 4 imply that knowing or reappraising the reasons behind behavior is not sufficient enough to impede behavioral contagion. One reason may be that attribution typically consists of two components: 1) intention and 2) trait. For instance, the items used to measure greed attribution in Studies 1-2 implied both intention and trait. If dispositional trait (i.e., Studies 3-4) showed no effect in mitigating negative generalized reciprocity, manipulating intentionality may prove more fruitful.

Study 5: Causal Attribution – Inferring Intentionality

Both Studies 3-4 found no evidence that attempting to alter the internal-external reason underlying the behavior influenced generalized reciprocity. Nonetheless, internal-external attribution remains only one component of causal attribution. Indeed, another component of causal attribution is contingent upon inferring whether the behavior was intentional or accidental. Although prior studies have generally found that attributing reason behind behaviors was important for generalized reason (e.g., Foulk et al., 2016), other studies (Hu et al., 2018; Sun et al., 2020) have proposed that inferring intent influenced the extent to which one generally reciprocates experiences toward others. Thus, Study 5 manipulated the extent to which the greedy/generous treatment received stemmed from greedy/generous intent or were accidental.

Method

Participants

A total of 205 participants were recruited through Prolific AC. Nine observations were subsequently removed due to not providing consent (n = 1), not completing enough of the study

(n = 4), and failing to reaffirm consent or revoking consent following the study debrief (n = 3) for a total sample of 198 participants (Mean age ± SD = 30.82 ± 10.547; 51.0 % female). The plurality of participants resided in the United States (43.9%) with the rest residing in Canada (32.8%), Australia (17.2%), and New Zealand (5.6%). Participant sampling was restricted to these four countries due to their usage of dollar currencies and similar valuation to USD. One participant (0.5%) moved to the United Kingdom after the study had been conducted.

Measures

Socioeconomic Status & Education. The same SES and education variables as Study 3 were used.

Pay-it-forward Dictator Game. Participants will be given the same pay-it-forward dictator game with changing partners design as prior studies to measure their tendency to pay forward greed or generosity.

Fairness Perception. Following Studies 1-2, participants were asked to rate the fairness of the allocation they received and the allocation they gave. Both items were rated on a 5-point Likert scale ranging from 1 (*Much less than fair*), 3 (*Fair*), to 5 (*Much more than fair*).

Justifiability Perception. Participants also rated the justifiability of the allocation received on a 5-point Likert scale ranging from 1 (*Not at all*) to 5 (*A lot*).

Procedure

Participants gave informed consent before being taken to the main study. Participants were told that they would be matched with an anonymous participant before them who was given $10 and had decided how to divide up the money between themselves and the participant. All participants were then randomly assigned to one of four conditions in a 2 (Greed vs. Generosity Experience) × (Intentional vs Unintentional Attribution) design. Participants in the greed

(generosity) experience were told that the prior participant before them gave them $0 ($10) out of $10. Those in the intentional (unintentional) norm intervention were given a short passage depicting the prior participant's purposeful (accidental) reason for giving the amount that they did:

> "If I can keep all the money then why not. Besides, I don't know the next person" *[Greed + Intentional]*
>
> "If I can give all the money then why not. I don't need the money so I might as well help others and spread some positivity" *[Generosity + Intentional]*
>
> "Sorry, I meant to give a different amount but I think I misread the instructions" *[Greed/Generosity + Unintentional]*

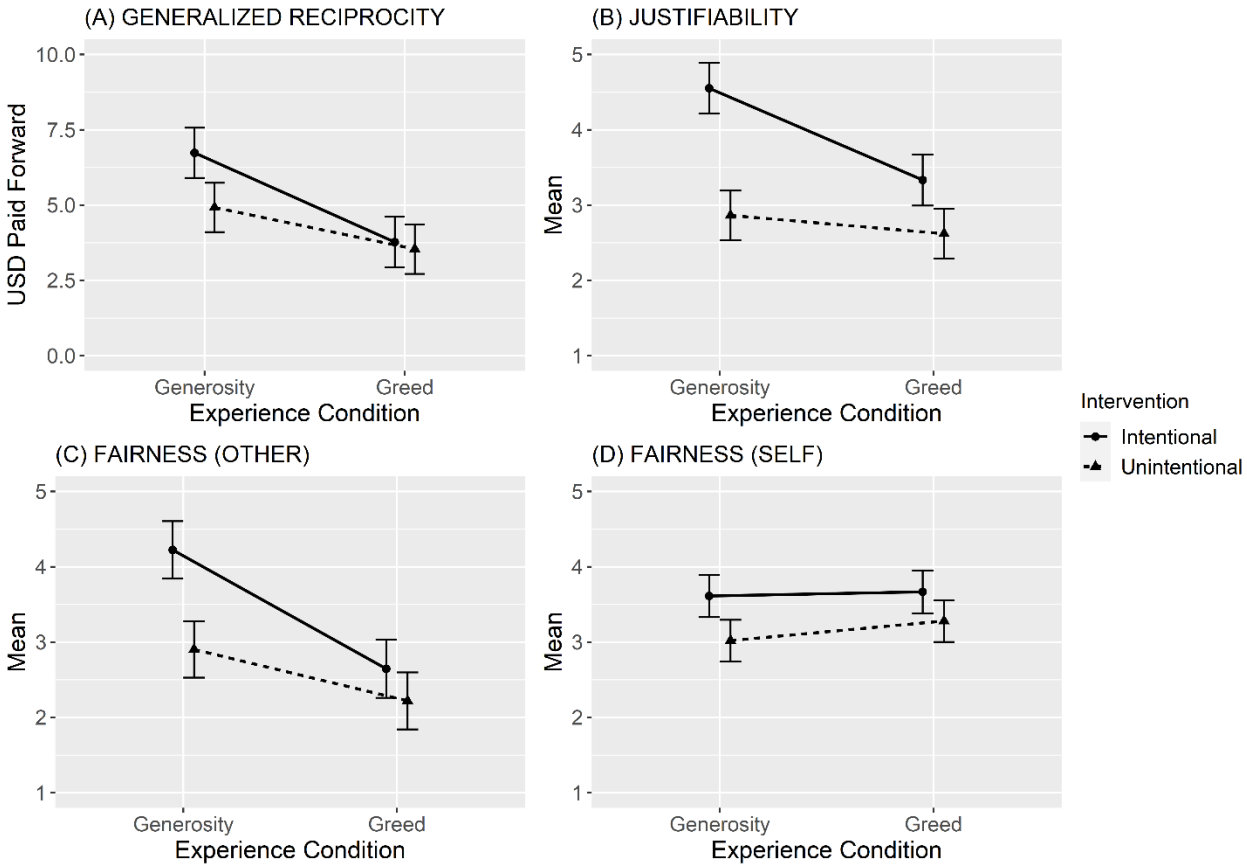
Participants then were given a hypothetical $10 of their own to divide between themselves and an anonymous participant after them. After making their decision, participants then rated the fairness of the amount they received (in general) and the fairness of the amount they, themselves, paid forward. Lastly, participants provided demographic information before being debriefed. Participants were paid $0.54 for the study that took approximately 3-4 minutes.

Results

Randomization checks revealed no significant differences across all groups regarding country of residence ($\chi^2(12) = 5.123$, $p = 0.954$), gender ($\chi^2(3) = 3.015$, $p = 0.389$), subjective SES (SS = 4.14, F = 0.421, $p = 0.738$, partial $\eta^2 = 0.006$), and education attainment (SS = 7.413, F = 1.157, $p = 0.328$, partial $\eta^2 = 0.018$). A series of 2 (Greedy vs. Generous Experience) × (Intentional vs Unintentional Attribution) factorial ANOVAs were run to examine the main effects and interaction effects of the given conditions across study variables.

Figure 11.

Study 5; Interaction Graphs (Experience × Intentionality) for Study Variables.



Note: error bars denote marginal means 95% confidence interval.

To first examine the effect of the intentionality manipulation, a factorial ANOVA was conducted to examine one's appraisal of the justifiability of the amount the other participant gave them (Figure 11). Main effects were found for both the greed-generosity experience (SS = 52.633, F = 23.863, $p < 0.001$, partial $\eta^2 = 0.11$) and intentionality (SS = 116.403, F = 52.776, $p < 0.001$, partial $\eta^2 = 0.214$). Further, a significant interaction effect was found between the two conditions (SS = 23.706, F = 10.748, $p = 0.001$, partial $\eta^2 = 0.052$).

Consistent with this initial effect, there was a significant effect of both greed-generosity experience (SS = 233.555, F = 26.745, $p < 0.001$, partial $\eta^2 = 0.121$) and intentionality (SS = 51.673, F = 5.917, $p = 0.016$, partial $\eta^2 = 0.03$) but only a nonsignificant, marginal effect for the

interaction (SS = 30.967, F = 3.546, $p = 0.061$, partial $\eta^2 = 0.018$) in terms of the amount paid forward. Pairwise post-hoc comparisons with Tukey's HSD correction showed that participants in the generosity experience and intentional condition (M ± SD = 6.735 ± 3.22) paid forward significantly more than all three other conditions of generosity-unintentional (M ± SD = 4.922 ± 3.161; t(194) = 3.067, $p = 0.013$, d = 0.614, 95% CI [1.013, 0.214]), greed-unintentional (M ± SD = 3.54 ± 2.305; t(194) = 5.378, $p < 0.001$, d = -1.081, 95% CI [-1.492, -0.67]), and greed-intentional (M ± SD = 3.771 ± 3.047; t(194) = 4.939, $p < 0.001$, d = 1.003, 95% CI [0.59, 1.416]). However, no significant differences were found for any other pairing (p from 0.091 to 0.980).

Regarding participants' perceptions of the fairness of the allocation they received, there was a significant main effect of greed-generosity experience (SS = 63.209, F = 34.387, $p < 0.001$, partial $\eta^2 = 0.151$) and intentionality (SS = 37.808, F = 20.569, $p < 0.001$, partial $\eta^2 = 0.096$). Further, the two conditions showed a significant interaction effect (SS = 9.945, F = 5.41, $p = 0.021$, partial $\eta^2 = 0.027$). Regarding perception of the fairness of one's own allocations, there was no main effect for greed-generosity (SS = 1.226, F = 1.23, $p = 0.269$, partial $\eta^2 = 0.006$) but a significant effect for intentionality (SS = 11.862, F = 11.901, $p < 0.001$, partial $\eta^2 = 0.058$) with no interaction between the two (SS = 0.525, F = 0.526, $p = 0.469$, partial $\eta^2 = 0.003$).

Discussion

Results showed that although intentionality did not alter the effect of greed experience on generalized reciprocity, being the beneficiary of unintentional generosity appeared to significantly impede one's own tendency pay generosity forward. Thus, results show a clear pattern by which the generosity may become more contagious if individuals infer that there was purpose behind said kindness. What was also notable was that recipients of unintentional

generosity showed no difference from the greed treatment groups across all outcome variables, supporting the notion that positive generalized reciprocity is heavily contingent upon inferred intent. In contrast, the effect of greed on generalized reciprocity was not influenced by intentionality, suggesting that negative behavioral contagion may occur regardless of whether the treatment itself was intentional or not.

Study 6: Norm Learning – Descriptive Norm Intervention

Results from Studies 3-5 provided evidence that the causal attribution influenced generalized reciprocity to the extent that individuals inferred intentionality behind the treatment they experienced. However, Study 2 also found strong evidence that inferred norms may play a similar, critical role. A growing body of literature has inquired into the efficacy of *norms appeals* in influencing behavior. *Descriptive norms*, the informational summaries of how a group behaves, inform others of what others currently do (Cialdini et al., 1991). In Goldstein et al.'s (2008) seminal work examining the efficacy of normative appeals on behavioral change, hotel guests who were signaled descriptive norms about towel reuse rates were significantly more likely to reuse their towels compared to guests who were only given industry standard appeals for environmental conservation (cf., Bohner & Schlüter, 2014). Subsequent studies have documented similar findings in prejudice (McDonald & Crandall, 2015), energy use (Schultz et al., 2007, 2015; cf., Harries et al., 2013), and eating (Higgs, 2015). However, those that exceed social norms (e.g., using less energy than neighbors) are likely to increase consumption. That is, although social norms may prove useful in influencing behavior, it can induce people to regress back toward the alleged norm if one is performing better.

In a similar vein, recent studies have documented conflicting evidence of the efficacy of descriptive norm appeals in increasing charitable or giving behavior (Lindersson et al., 2019;

McAuliffe et al., 2017). Agerström et al. (2016) found supportive evidence that descriptive norm appeals increased charitable contributions among university students, particularly when norms appealed to local ones. Shang and Croson (2009) further found that descriptive norm appeals increased donors' monetary contributions to an on-air radio fund drive, but only when the callers were new donors compared to recurring donors. In both cases, the efficacy of descriptive norms was accompanied by caveats.

Based on evidence for the efficacy of descriptive norms in influencing behavior, as well as evidence that local norms (vs. global norms) yield stronger effects (Agerström et al., 2016; Bohner & Schlüter, 2014; Goldstein et al., 2008; Raihani & McAuliffe, 2014; Shang & Croson, 2009), Study 6 incorporated descriptive norm appeals to mitigate negative generalized reciprocity and promote positive generalized reciprocity. Specifically, descriptive norms were established via participants being given information about empirical expectations pertaining to other participants' average allocations as well as the specific offer they were given as a cue about normative expectation (Bicchieri & Xiao, 2009).

Method

Participants

A total of 205 participants were recruited through Prolific AC. Nine observations were subsequently removed due to not providing consent (n = 2), not paying attention (n = 1), and not completing enough of the study or only finishing the consent form (n = 3) for a total sample of 199 participants (Mean age ± SD = 33.337 ± 12.699; 55.6% female). The plurality of participants resided in Canada (42.1%) with the rest residing in the United States (35.0%), Australia (13.7%), and New Zealand (9.1%). Participant sampling was restricted to these four countries due to their usage of dollar currencies and similar valuation to USD.

Measures

Socioeconomic Status & Education. The same SES and education variables as Study 3 were used.

Pay-it-forward Dictator Game. Participants will be given the same pay-it-forward dictator game with changing partners design as prior studies to measure their tendency to pay forward greed or generosity.

Fairness Perception. Following Studies 1-2, participants were asked to rate the fairness of the allocation they received and the allocation they gave. Participants also rated the fairness of the allocation received with respect to the norm average. All items were rated on a 5-point Likert scale ranging from 1 (*Much less than fair*), 3 (*Fair*), to 5 (*Much more than fair*).

Procedure

Participants gave informed consent before being taken to the main study. Participants were told that they would be matched with an anonymous participant before them who was given USD 10¢ and had decided how to divide up the money between themselves and the participant. All participants were then randomly assigned to one of four conditions in a 2 (Greed vs. Generosity Experience) × (Greedy vs Generous Norm) design. Participants in the greed (generosity) experience were told that the prior participant before them gave them $0 ($10) out of $10. Those in the greed (generosity) norm intervention were told that on average, participants have given $2.57 ($7.43) to the next person. Participants then were given a hypothetical $10 of their own to divide between themselves and an anonymous participant after them. After making their decision, participants then rated the fairness of the amount they received (in general), the fairness of the amount they received relative to the norm, and the fairness of the amount they,

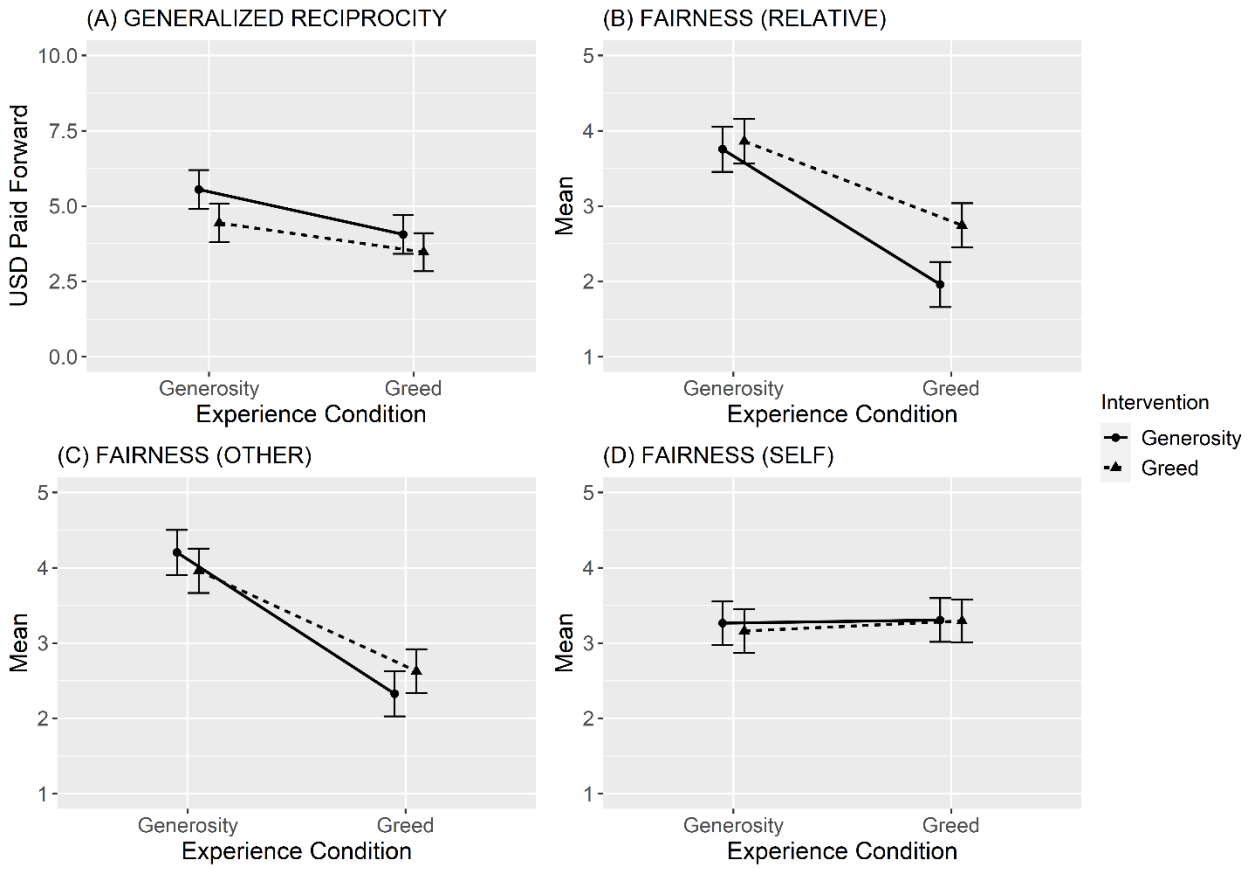
themselves, paid forward. Lastly, participants provided demographic information before being debriefed. Participants were paid $0.54 for the study that took approximately 3-4 minutes.

Results

Randomization checks revealed no significant differences across all groups regarding country of residence ($\chi^2(9) = 2.165$, $p = 0.989$), gender ($\chi^2(3) = 6.636$, $p = 0.084$), subjective SES (SS = 10.008, F = 0.983, $p = 0.402$, partial $\eta^2 = 0.015$), and education attainment (SS = 7.501, F = 1.141, $p = 0.334$, partial $\eta^2 = 0.017$). A series of 2 (Greedy vs. Generous Experience) × (Greedy vs Generous Norm) factorial ANOVAs were run to examine the main effects and interaction effects of the given conditions across study variables.

Figure 12.

Study 6; Interaction Graphs (Experience × Descriptive Norm) for Study Variables.



Note: error bars denote marginal means 95% confidence interval.

To first examine the effect of the descriptive norm manipulation, a factorial ANOVA was conducted to examine one's appraisal of the fairness of the amount the other participant gave them *relative* to the descriptive norm (Figure 12). Main effects were found for both the greed-generosity experience (SS = 105.352, F = 93.09, $p < 0.001$, partial $\eta^2 = 0.323$) and greedy-generous norm (SS = 9.867, F = 8.719, $p = 0.004$, partial $\eta^2 = 0.043$). Further, a significant interaction effect was found between the two conditions (SS = 5.767, F = 5.096, $p = 0.025$, partial $\eta^2 = 0.025$).

In line with this initial effect, there was a significant effect of both greed-generosity experience (SS = 75.198, F = 14.292, $p < 0.001$, partial $\eta^2 = 0.068$) and greedy-generous norm (SS = 36.005, F = 6.843, $p = 0.01$, partial $\eta^2 = 0.034$) but no effect for the interaction (SS = 3.367, F = 0.64, $p = 0.425$, partial $\eta^2 = 0.003$).

Pairwise post-hoc comparisons with Tukey's HSD correction showed that participants in the generosity experience and generous norm condition (M ± SD = 5.551 ± 2.492) paid forward significantly more than their counterparts in the greed experience regardless of whether the norm was greedy (M ± SD = 3.471 ± 1.891; t(195) = 4.534, $p < 0.001$, d = 0.907, 95% CI [0.502, 1.312]) or generous (M ± SD = 4.061 ± 2.106; t(195) = 3.215, $p = 0.008$, d = 0.649, 95% CI [0.246, 1.053]). Further, there was a nonsignificant but marginal difference with the generosity experience and greedy norm condition (M ± SD = 4.44 ± 2.62; t(195) = 2.41, $p = 0.079$, d = 0.484, 95% CI [0.085, 0.884]). No significant differences were found for any other pairing (p from 0.149 to 0.844).

With regard to participants' perceptions of the fairness of the allocation they received, there was a significant main effect of greed-generosity experience (SS = 128.13, F = 114.309, p

< 0.001, partial $\eta^2 = 0.37$) but no effect for greedy-generous norm (SS = 0.040, F = 0.036, p = 0.85, partial $\eta^2 = 0.000$) or the interaction between the two (SS = 3.693, F = 3.295, p = 0.071, partial $\eta^2 = 0.017$). Similar with prior studies, there were no effects for greed-generosity experience (SS = 0.381, F = 0.358, p = 0.550, partial $\eta^2 = 0.002$), greedy-generous norm (SS = 0.171, F = 0.161, p = 0.689, partial $\eta^2 = 0.001$), or the interaction (SS = 0.108, F = 0.102, p = 0.75, partial $\eta^2 = 0.001$) regarding the perceived fairness of one's own allocations.

Discussion

Study 6 showed evidence that descriptive norm appeals significantly influenced generalized reciprocity. However, a point worth noting is that despite the statistical significance, the size of the effect was fairly small. That is, in contrast to intention interventions (i.e., Study 5), norm appeal interventions, even when significant, may not yield sizable benefits. Nonetheless, in the absence of other viable interventions or when changing one's attribution of the other's behavior (e.g., situations lacking context of communication or behavior), descriptive norm appeals may have notable longitudinal benefits despite small magnitudes (Funder & Ozer, 2019).

Study 7: Norm Learning – Injunctive Norm Intervention

Since the publication of several studies showing the efficacy of descriptive norm appeals in influencing behavior (Agerström et al., 2016; Goldstein et al., 2008; Shang & Croson, 2009), there has been increasing interest in *injunctive norm* appeals—the perceptions of what behavior is appropriate (e.g., what people *ought* to do) (Cialdini et al., 1991). Accordingly, recent evidence has also called to attention the influence of injunctive norm appeals (e.g., one *should* give $X) on one's giving behavior compared to purely descriptive appeals (e.g., people *on average* give $X) (Raihani & McAuliffe, 2014). At the least, prior evidence of literature suggests that injunctive norms yield comparable effects to descriptive norms (House, 2018; McAuliffe et

al., 2017) while others suggest that injunctive norms may induce greater changes (Raihani & McAuliffe, 2014). Like the issues with the use of descriptive norm appeals, however, injunctive norms also come with several caveats. Raihani and McAuliffe (2014) found that when injunctive and descriptive expectations are discordant, descriptive norms predict behavior. Indeed, data from Bicchieri and Xiao (2009) indicate that injunctive normative appeals are only as effective as the extent to which it aligns with what people believe are descriptively normative. Thus, Study 7 examined the efficacy of injunctive norm appeals in mitigating negative generalized reciprocity and promoting positive generalized reciprocity. To establish injunctive norms, participants were given information pertaining to the monetary allocation amount that other participants, on average, suggest one *should* pay forward to the next participant.

Method

Participants

A total of 206 participants were recruited through Prolific AC. Nine observations were subsequently removed due to not providing consent (n = 2), not completing enough of the study or only finishing the consent form (n = 4), and revoking consent (n = 2) for a total sample of 198 participants (Mean age ± SD = 31.726 ± 10.517; 43.1 % female). The majority of participants resided in Canada (54.0%) with the rest residing in the United States (15.7%), Australia (17.7%), and New Zealand (12.6%). Participant sampling was restricted to these four countries due to their usage of dollar currencies and similar valuation to USD.

Measures

Socioeconomic Status & Education. The same SES and education variables as Study 3 were used.

Pay-it-forward Dictator Game. Participants were given the same pay-it-forward dictator game with changing partners design as prior studies to measure their tendency to pay forward greed or generosity.

Fairness Perception. Following Studies 1-2, participants were asked to rate the fairness of the allocation they received and the allocation they gave. Both items were rated on a 5-point Likert scale ranging from 1 (*Much less than fair*), 3 (*Fair*), to 5 (*Much more than fair*).

Pay-it-forward Recommendation. Participants also reported the amount they recommended others to give to the next participant ranging from $0 to $10.

Procedure

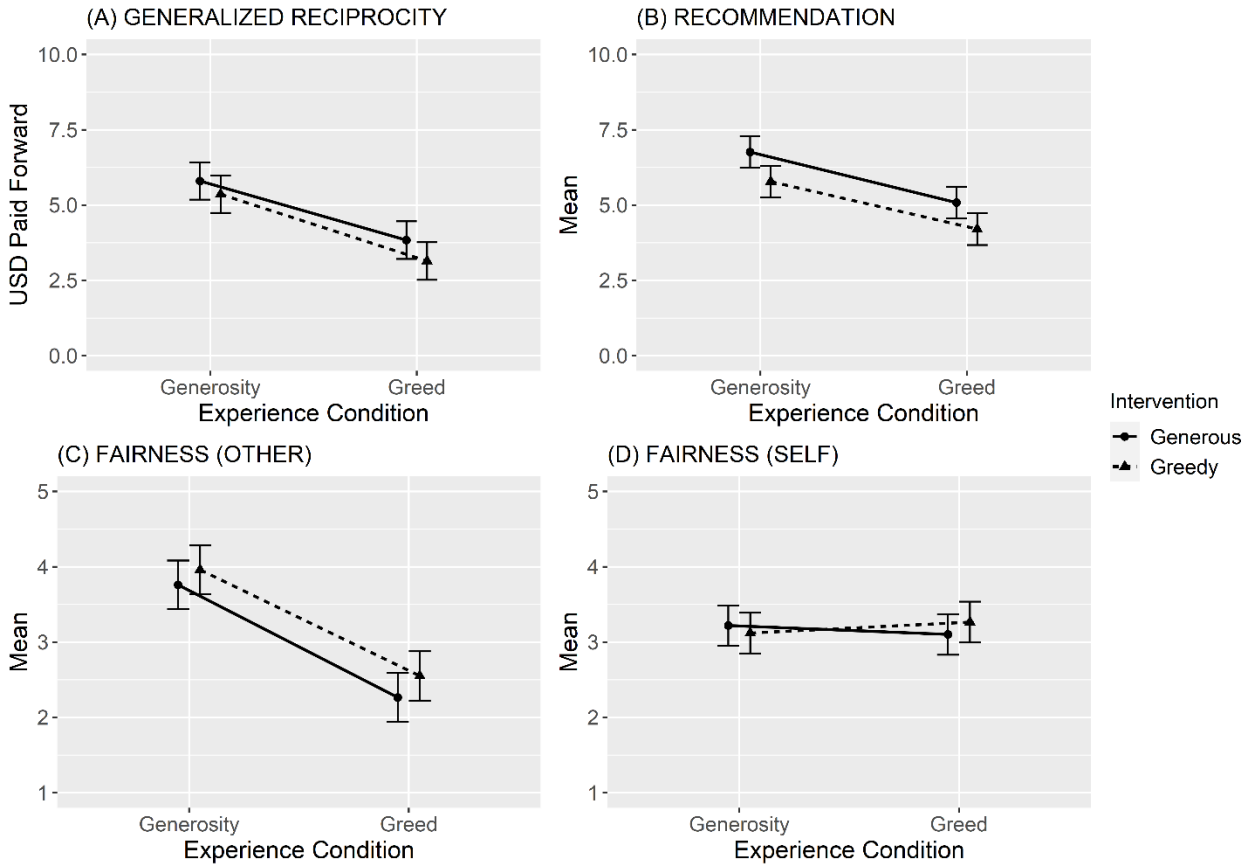
Participants gave informed consent before being taken to the main study. Participants were told that they would be matched with an anonymous participant before them who was given USD 10¢ and had decided how to divide up the money between themselves and the participant. All participants were then randomly assigned to one of four conditions in a 2 (Greed vs. Generosity Experience) × (Intentional vs Unintentional Attribution) design. Participants in the greed (generosity) experience were told that the prior participant before them gave them $0 ($10) out of $10. Those in the greed (generosity) norm intervention were told that on average, participants have recommended giving $2.57 ($7.43) to the next person. Participants then were given a hypothetical $10 of their own to divide between themselves and an anonymous participant after them. After making their decision, participants then rated the fairness of the amount they received (in general), the fairness of the amount they, themselves, paid forward, and the amount they recommended others give to the next person. Lastly, participants provided demographic information before being debriefed. Participants were paid $0.54 for the study that took approximately 3-4 minutes.

Results

Randomization checks revealed no significant differences across all groups regarding country of residence ($\chi^2(9) = 4.105$, $p = 0.904$), gender ($\chi^2(3) = 2.832$, $p = 0.418$), subjective SES (SS = 8.5, F = 0.768, $p = 0.513$, partial $\eta^2 = 0.012$), and education attainment (SS = 5.904, F = 0.783, $p = 0.505$, partial $\eta^2 = 0.012$). A series of 2 (Greedy vs. Generous Experience) × (Greedy vs Generous Norm) factorial ANOVAs were run to examine the main effects and interaction effects of the given conditions across study variables.

Figure 13.

Study 7; Interaction Graphs (Experience × Injunctive Norm) for Study Variables.



Note: error bars denote marginal means 95% confidence interval.

To first examine the effect of the injunctive norm manipulation, a factorial ANOVA was conducted to examine one's own recommendations for the amount of money to pay forward (Figure 13). Main effects were found for both the greed-generosity experience (SS = 131.043, F = 37.095, $p < 0.001$, partial $\eta^2 = 0.161$) and greedy-generous norm (SS = 42.696, F = 12.086, $p < 0.001$, partial $\eta^2 = 0.059$). However, no interaction effect was found between the two conditions (SS = 0.130, F = 0.037, $p = 0.848$, partial $\eta^2 = 0.000$).

Partially consistent with this initial effect, there was a significant effect of both greed-generosity experience (SS = 216.241, F = 43.964, $p < 0.001$, partial $\eta^2 = 0.185$) but only nonsignificant, marginal effect of greedy-generous norm (SS = 15.909, F = 3.234, $p = 0.074$, partial $\eta^2 = 0.016$). No interaction effect was found between the two (SS = 0.798, F = 0.162, $p = 0.688$, partial $\eta^2 = 0.001$). Pairwise post-hoc comparisons with Tukey's HSD correction showed that participants in the generosity experience and generous norm condition (M ± SD = 5.8 ± 2.222) paid forward significantly more than their counterparts in the greed experience regardless of whether the norm was greedy (M ± SD = 3.143 ± 1.979; t(194) = 5.96, $p < 0.001$, d = 1.198, 95% CI [0.784, 1.612]) or generous (M ± SD = 3.837 ± 1.886; t(194) = 4.404, $p < 0.001$, d = 0.885, 95% CI [0.479, 1.291]). Further, those in the generous experience and greedy norm condition (M ± SD = 5.36 ± 2.686) also paid forward significantly more than those in the greed experience condition regardless of greedy (t(194) = 4.973, $p < 0.001$, d = 1, 95% CI [0.591, 1.409]) or generous norm (t(194) = 3.417, $p = 0.004$, d = -0.687, 95% CI [-1.089, -0.284]). However, no difference was detected between the two norm conditions for either generosity experience (t(194) = 0.992, $p = 0.754$, d = 0.198, 95% CI [-0.197, 0.593]) or greed experience (t(194) = 1.549, $p = 0.411$, d = 0.313, 95% CI [-0.087, 0.713]).

With regard to participants' perceptions of the fairness of the allocation they received, there was a significant main effect of greed-generosity experience (SS = 104.327, F = 77.631, $p < 0.001$, partial $\eta^2 = 0.286$) but no effect for greedy-generous norm (SS = 2.919, F = 2.172, $p = 0.142$, partial $\eta^2 = 0.011$) or the interaction between the two (SS = 0.091, F = 0.068, $p = 0.795$, partial $\eta^2 = 0.000$). Similar with prior studies, there were no effects for greed-generosity experience (SS = 0.009, F = 0.010, $p = 0.921$, partial $\eta^2 = 0.000$), greedy-generous norm (SS = 0.050, F = 0.053, $p = 0.817$, partial $\eta^2 = 0.000$), or the interaction (SS = 0.858, F = 0.925, $p = 0.337$, partial $\eta^2 = 0.005$) regarding the perceived fairness of one's own allocations.

Discussion

In contrast to Study 6, Study 7 found no evidence that injunctive norm appeals influenced generalized reciprocity. However, an interesting finding was the significant effect of injunctive norm appeal on one's own recommendations for others. That is, despite people not abiding by the injunctive norms given to them, they nonetheless prescribed the norms onto others. Thus, should individuals be motivated to endorse injunctive norms for others but have no intention to adhere to them, injunctive norm appeal interventions appear limited in its capacity to promote positive generalized reciprocity and mitigate negative generalized reciprocity.

Study 8: Replicating Study 5 with Real Allocations

Given that Study 5 was the only effective intervention among the causal attribution studies (i.e., 3-5), Study 8 sought to replicate the findings of Study 5 using real monetary allocations. Although prior studies have shown that the use of hypothetical and real monetary allocations generally do not differ (M. W. Johnson & Bickel, 2002; Locey et al., 2011), other studies have called into question whether the use of real money may instigate different levels of psychological reactance (Vlaev, 2012; Xu et al., 2016). Thus, Study 8 served to provide more

confidence of the application of inferring intentionality, or lack thereof, outside hypothetical compensations.

Method

Participants

A total of 200 participants were recruited through Prolific AC. Fifteen observations were subsequently removed due to revoking consent following the study debrief (n = 1) and expressing suspicion of the study objectives (n = 14) for a total sample of 185 participants (Mean age ± SD = 32.404 ± 10.01; 46.7 % female). The plurality of participants resided in the United States (45.9%) with the rest residing in Canada (24.3%), Australia (19.5%), and New Zealand (10.3%). Participant sampling was restricted to these four countries due to their usage of dollar currencies and similar valuation to USD.

Measures

Socioeconomic Status & Education. The same SES and education variables as Study 3 were used.

Pay-it-forward Dictator Game. Participants were given the same pay-it-forward dictator game with changing partners design as prior studies to measure their tendency to pay forward greed or generosity.

Fairness Perception. Following Studies 1-2, participants were asked to rate the fairness of the allocation they received and the allocation they gave. Both items were rated on a 5-point Likert scale ranging from 1 (*Much less than fair*), 3 (*Fair*), to 5 (*Much more than fair*).

Justification Perception. Participants also rated the justifiability of the allocation received on a 5-point Likert scale ranging from 1 (*Not at all*) to 5 (*A lot*).

Procedure

Participants gave informed consent before being taken to the main study. Participants were told that they would be matched with an anonymous participant before them who was given USD 10¢ and had decided how to divide up the money between themselves and the participant. All participants were then randomly assigned to one of four conditions in a 2 (Greed vs. Generosity Experience) × (Intentional vs Unintentional Attribution) design. Participants in the greed (generosity) experience were told that the prior participant before them gave them 0¢ (10¢) out of 10¢. Those in the intentional (unintentional) norm intervention were given a short passage depicting the prior participant's purposeful (accidental) reason (e.g., greed-intentional, "If I can keep all the money then why not. Besides, I don't know the next person"; generosity-unintentional, "Sorry, I mean to give a different amount but I think I misread the instructions") for giving the amount that they did. Participants then were given 10¢ of their own to divide between themselves and an anonymous participant after them. After making their decision, participants then rated the fairness of the amount they received, the fairness of the amount they, themselves, paid forward, as well as writing the reason for why. Lastly, participants provided demographic information before being debriefed. Participants were paid $0.76 plus a bonus of $0.20 for the study that took approximately 4-5 minutes.

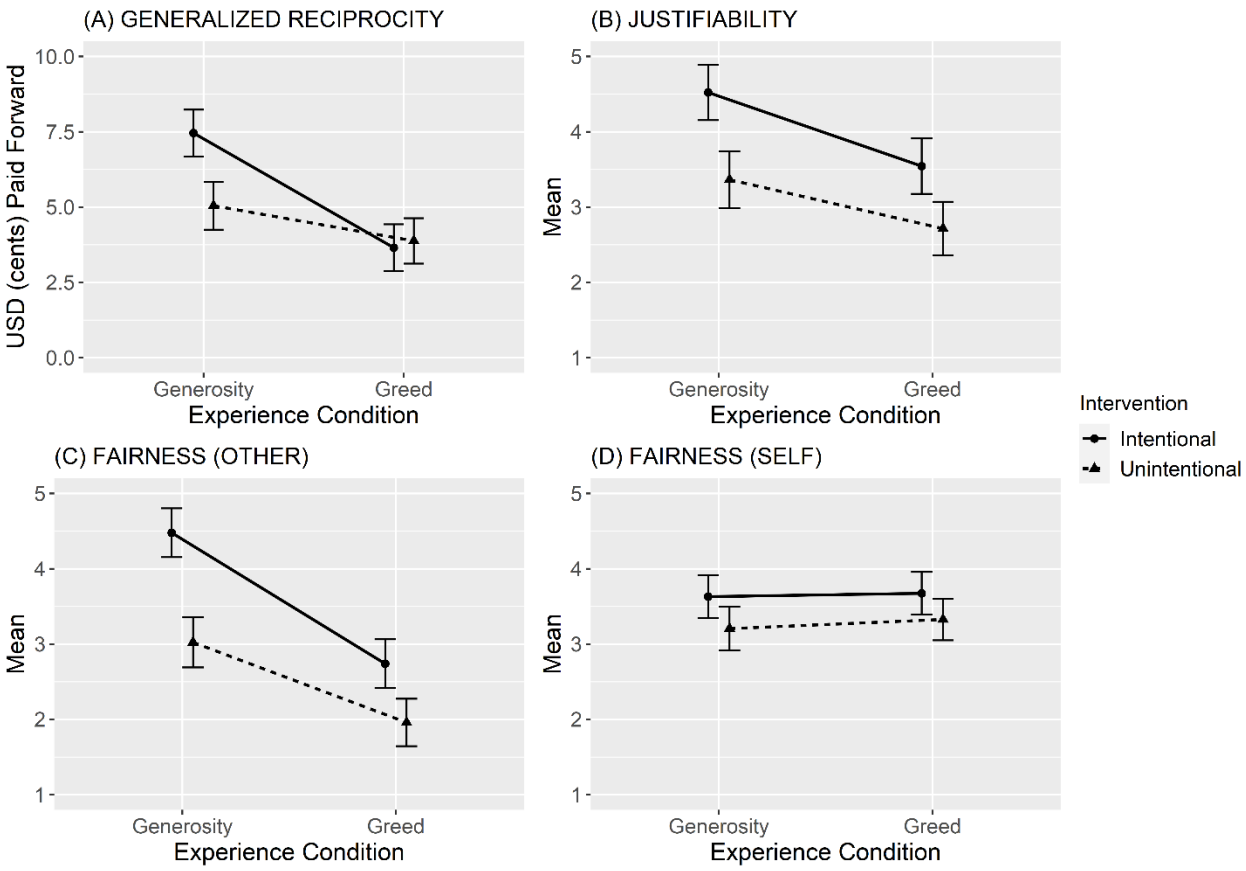
Results

Randomization checks revealed no significant differences across all groups regarding country of residence ($\chi^2(9) = 4.972$, $p = 0.837$), gender ($\chi^2(6) = 7.045$, $p = 0.317$), subjective SES (SS = 14.155, $F = 1.369$, $p = 0.254$, partial $\eta^2 = 0.022$), and education attainment (SS = 4.378, $F = 0.558$, $p = 0.644$, partial $\eta^2 = 0.009$). A series of 2 (Greedy vs. Generous Experience) ×

(Intentional vs Unintentional Attribution) factorial ANOVAs were run to examine the main effects and interaction effects of the given conditions across study variables.

Figure 14.

Study 8; Interaction Graphs (Experience × Intentionality) for Study Variables.



Note: error bars denote marginal means 95% confidence interval.

To first examine the effect of the intentionality manipulation, a factorial ANOVA was conducted to examine one's appraisal of the justifiability of the amount the other participant gave them (Figure 14). Main effects were found for both the greed-generosity experience (SS = 57.744, $F = 22.307$, $p < 0.001$, partial $\eta^2 = 0.11$) and intentionality (SS = 76.162, $F = 29.422$, $p < 0.001$, partial $\eta^2 = 0.14$). However, no interaction effect was found between the two conditions (SS = 3.445, $F = 1.331$, $p = 0.25$, partial $\eta^2 = 0.007$).

In line with results from this initial effect, there was a significant effect of both greed-generosity experience (SS = 285.443, $F = 39.957$, $p < 0.001$, partial $\eta^2 = 0.181$) and intentionality (SS = 55.156, $F = 7.721$, $p = 0.006$, partial $\eta^2 = 0.041$) in terms of the amount paid forward. There was also a significant interaction effect between the two (SS = 80.251, $F = 11.234$, $p < 0.001$, partial $\eta^2 = 0.058$). Pairwise post-hoc comparisons with Tukey's HSD correction showed that participants in the generosity experience and intentional condition (M ± SD = 7.457 ± 2.842) paid forward significantly more than all three other conditions of generosity-unintentional (M ± SD = 5.045 ± 2.614; t(181) = -4.278, $p < 0.001$, d = -0.902, 95% CI [-1.329, -0.476]), greed-unintentional (M ± SD = 3.878 ± 2.377; t(181) = 6.522, $p < 0.001$, d = -1.339, 95% CI [-1.767, -0.911]), and greed-intentional (M ± SD = 3.652 ± 2.846; t(181) = 6.826, $p < 0.001$, d = 1.423, 95% CI [0.986, 1.860]). However, no significant differences were found for any other pairing (p from 0.068 to 0.977).

With regard to participants' perceptions of the fairness of the allocation they received, there was a significant main effect of greed-generosity experience (SS = 90.69, $F = 72.876$, $p < 0.001$, partial $\eta^2 = 0.287$) and intentionality (SS = 57.697, $F = 46.364$, $p < 0.001$, partial $\eta^2 = 0.204$). Further, the two conditions showed a significant interaction effect (SS = 5.27, $F = 4.235$, $p = 0.041$, partial $\eta^2 = 0.023$). Regarding perception of the fairness of one's own allocations, there was no main effect for greed-generosity (SS = 0.316, $F = 0.331$, $p = 0.566$, partial $\eta^2 = 0.002$) but a significant effect for intentionality (SS = 6.904, $F = 7.233$, $p = 0.008$, partial $\eta^2 = 0.038$) with no interaction between the two (SS = 0.071, $F = 0.075$, $p = 0.785$, partial $\eta^2 = 0.000$).

Discussion

Results generally replicated and supported findings from Study 5. However, the interaction between greed-generosity and intentional-unintentional was much stronger and

significant in the current study, suggesting that the use of real money, compared to hypothetical money, may to some extent influence responsiveness to cues for greed and generosity. Further, compared to Study 5, intentionality yielded a significant main effect for the perceived fairness of the treatment received, whereby those who received unintentional treatments perceived it to be much less fair. Thus, Study 8 generally observed slightly stronger effects than what were found in Study 5, possibly indicating that the use of hypothetical money may slightly dampen the effects expected when using real money. Nonetheless, consistent with Study 5, experiencing unintentional generosity appeared to mitigate positive generalized reciprocity while perceived intentionality appeared to hold no bearing on negative generalized reciprocity.

Study 9: Replicating Study 6 with Real Allocations

As was the case with Study 8, Study 9 served to replicate the findings of Study 6 using real monetary compensations. Because Study 6 yielded a small interaction effect size, Study 9 used the extreme ends (i.e., 0/10 and 10/10) for monetary allocations to induce stronger effects. Although an initial sample of 200 was determined based on *a priori* power analyses, results with the first 200 observations did not replicate the findings of Study 6 pertaining to the main effect of descriptive norm appeals but appeared to be trending toward the direction. To investigate whether the effects were merely smaller with real monetary compensations and the current investigation was underpowered, the sample size was increased to achieve approximately 300 participants in total.

Method

Participants

A total of 307 participants were recruited through Prolific AC. Fourteen observations were subsequently removed due to inattention (n = 1), not completing enough of the study or

only finishing the consent form (n = 6), expressing suspicion about the study (n = 4), and failing to reaffirm consent or revoking consent following the study debrief (n = 3) for a total sample of 293 participants (Mean age ± SD = 34.386 ± 11.742; 44.2% female). The majority of participants resided in the United States (62.5%) with the rest residing in Canada (21.2%), Australia (11.3%), and New Zealand (5.1%). Participant sampling was restricted to these four countries due to their usage of dollar currencies and similar valuation to USD.

Measures

Socioeconomic Status & Education. The same SES and education variables as Study 3 were used.

Pay-it-forward Dictator Game. Participants were given the same pay-it-forward dictator game with changing partners design as prior studies to measure their tendency to pay forward greed or generosity.

Fairness Perception. Following Studies 1-2, participants were asked to rate the fairness of the allocation they received and the allocation they gave. Participants also rated the fairness of the allocation received with respect to the norm average. All items were rated on a 5-point Likert scale ranging from 1 (*Much less than fair*), 3 (*Fair*), to 5 (*Much more than fair*).

Procedure

Participants gave informed consent before being taken to the main study. Participants were told that they would be matched with an anonymous participant before them who was given USD 10¢ and had decided how to divide up the money between themselves and the participant. All participants were then randomly assigned to one of four conditions in a 2 (Greed vs. Generosity Experience) × (Greedy vs. Generous Descriptive Norm) design. Participants in the greed (generosity) experience were told that the prior participant before them gave them 0¢

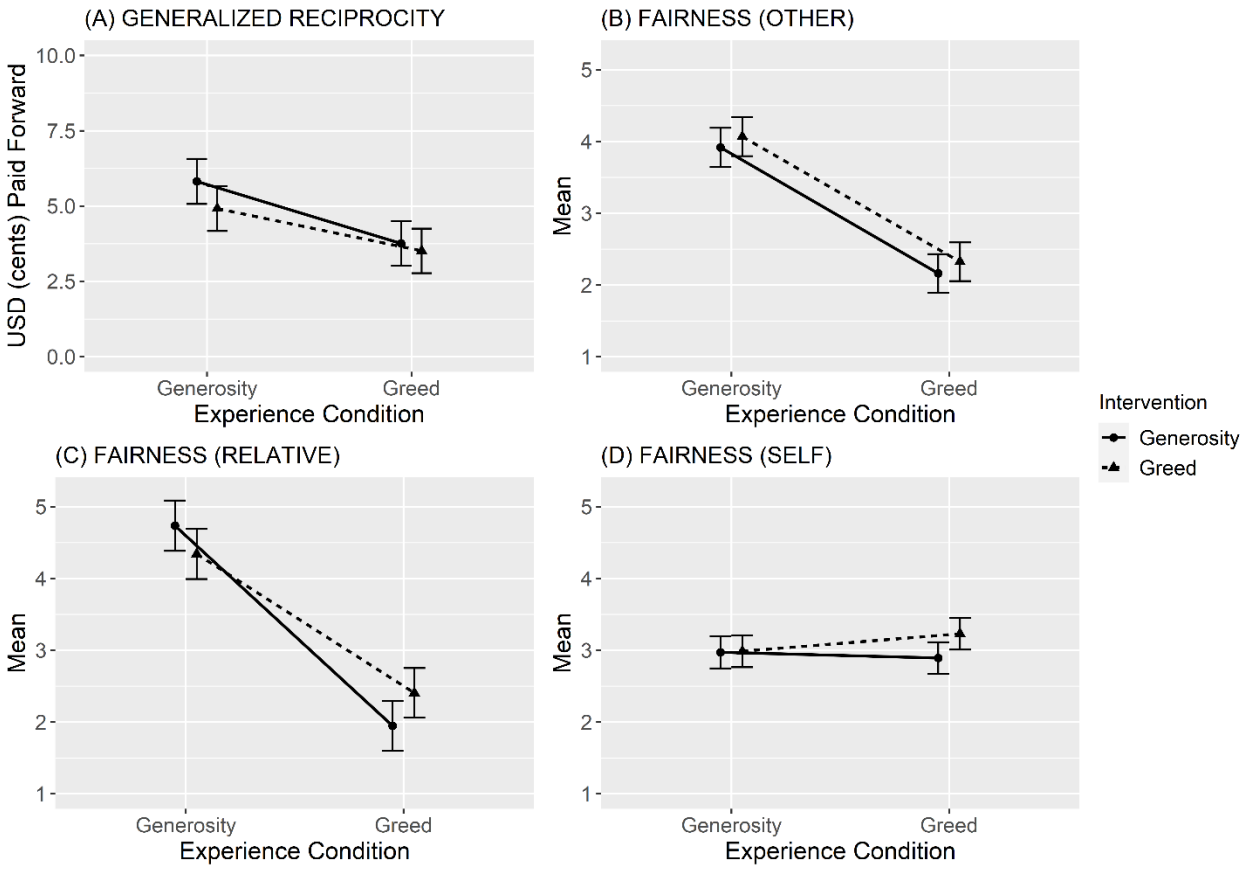
(10¢) out of 10¢. Those in the greedy (generous) norm intervention were told that on average, participants have given 2.57¢ (7.43¢) to the next person. Participants then were given 10¢ of their own to divide between themselves and an anonymous participant after them. After making their decision, participants then rated the fairness of the amount they received (in general), the fairness of the amount they received relative to the norm, and the fairness of the amount they, themselves, paid forward. Lastly, participants provided demographic information before being debriefed. Participants were paid $0.54 with a bonus of $0.20 for the study that took approximately 3-4 minutes.

Results

Randomization checks revealed no significant differences across all groups regarding country of residence ($\chi^2(9) = 7.324$, $p = 0.603$), gender ($\chi^2(3) = 0.230$, $p = 0.973$), subjective SES (SS = 8.397, F = 0.793, $p = 0.499$, partial $\eta^2 = 0.008$), and education attainment (SS = 8.341, F = 1.255, $p = 0.290$, partial $\eta^2 = 0.013$). A series of 2 (Greedy vs. Generous Experience) × (Greedy vs. Generous Descriptive Norm) factorial ANOVAs were run to examine the main effects and interaction effects of the given conditions across study variables.

Figure 15.

Study 9; Interaction Graphs (Experience × Descriptive Norm) for Study Variables.



Note: error bars denote marginal means 95% confidence interval.

To first examine whether the intervention worked properly, a factorial ANOVA was conducted to examine one's appraisal of the fairness of the amount received *relative* to the norm (Figure 15). Greed-generosity experience showed a significant main effect (SS = 409.17, F = 178.075, $p < 0.001$, partial $\eta^2 = 0.381$) but norm intervention showed no effect (SS = 0.079, F = 0.035, $p = 0.853$, partial $\eta^2 = 0.000$). Nonetheless, there was a significant interaction effect between the two variables (SS = 13.326, F = 5.800, $p = 0.017$, partial $\eta^2 = 0.020$) (Figure 15C). Among those who experienced generosity, there was no difference between greedy (M ± SD = 4.342 ± 1.797) and generous norm (M ± SD = 4.736 ± 1.510; t(289) = 1.564, $p = 0.401$, d = 0.26, 95% CI [-0.068, 0.587]) nor was there any difference between the greedy (M ± SD = 2.405 ± 1.384) and generous norm (M ± SD = 1.946 ± 1.333) for those who experienced greed (t(289) = -

1.844, $p = 0.255$, d = -0.303, 95% CI [-0.628, 0.021]). However, those who experienced generosity reported greater fairness appraisal relative to the normative amount than those who experienced greed, regardless of the norm intervention.

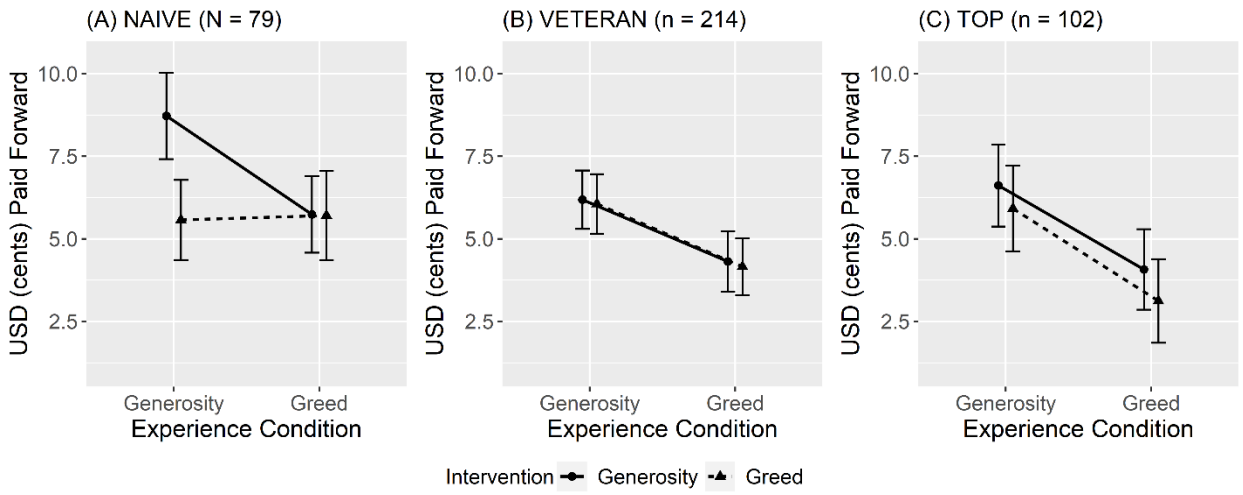
In examining the amount paid forward, experience of greedy treatment revealed a significant main effect (SS = 220.087, F = 21.059, $p < 0.001$, partial $\eta^2 = 0.068$) but no effect was found for the norm condition (SS = 24, F = 2.296, $p = 0.131$, partial $\eta^2 = 0.008$) (Figure 15A). Further, no interaction effect was found between the two conditions (SS = 7.937, F = 0.759, $p = 0.384$, partial $\eta^2 = 0.003$). Pairwise post-hoc comparisons with Tukey's HSD correction showed that participants in the generosity experience and generous norm condition (M ± SD = 5.819 ± 3.482) paid forward more money than their counterparts in the greedy experience condition, regardless of whether they received the greedy norm (M ± SD = 3.514 ± 2.999; t(289) = 4.309, $p < 0.001$, d = 0.713, 95% CI [0.382, 1.044]) or generous norm (M ± SD = 3.757 ± 3.069; t(289) = 3.854, $p < 0.001$, d = 0.638, 95% CI [0.308, 0.968]). Further, those who experienced generosity but was given the greedy norm (M ± SD = 4.918 ± 3.365) still paid forward more than their counterparts who experienced greed and given the greedy norm (t(289) = 2.633, $p = 0.044$, d = 0.434, 95% CI [0.108, 0.761]).

With regard to participants' perceptions of the fairness of the allocation they received, there was a significant main effect of greed-generosity experience (SS = 224.129, F = 161.76, $p < 0.001$, partial $\eta^2 = 0.359$) but no effect of norm intervention (SS = 1.805, F = 1.303, $p = 0.255$, partial $\eta^2 = 0.004$) and no interaction effect (SS = 0.002, F = 0.001, $p = 0.97$, partial $\eta^2 = 0.000$) (Figure 15B). As was the case for the previous studies, there were no differences regarding the perceived fairness of one's own allocations for greed-generosity experience (SS = 0.487, F = 0.523, $p = 0.47$, partial $\eta^2 = 0.002$), norm intervention (SS = 2.268, F = 2.435, $p = 0.12$, partial η^2

= 0.008), or interaction between the two (SS = 1.919, F = 2.061, p = 0.152, partial η^2 = 0.007) (Figure 15D).

Figure 16.

Study 9; Amount paid forward by participant research experience.



Note: Naïve participants defined as those who participated in 75 or less studies; veteran as having participated in more than 75 studies; top as having participated in more than 500 studies.

Given prior evidence that descriptive norm appeals may be subject to novelty (Shang & Croson, 2009), additional analyses were conducted examining how participant naivety to social experimental studies may partly explain the difference in effects. Participants were initially separated into two categories based on naivety to behavioral research: 1) naïve (participated in 75 or less studies) and 2) veteran (participated in more than 75 studies). Further, among veteran participants, those who participated in more than 500 studies were categorized as top. When analyzed separately in these three categories, significant differences emerge. In particular, naïve participants show significant main effects for experience (SS = 39.492, F = 5.083, p = 0.027, partial η^2 = 0.063) and norm intervention (SS = 49.340, F = 6.350, p = 0.014, partial η^2 = 0.078) (Figure 16A). With an omnibus partial η^2 = 0.182, the naïve participant analyses were

sufficiently powered at 0.944. Further, the two conditions significantly interacted (SS = 47.300, F = 6.088, $p = 0.016$, partial $\eta^2 = 0.075$). However, veteran participants only showed a significant main effect for experience (SS = 189.882, F = 17.462, $p < 0.001$, partial $\eta^2 = 0.077$) and no effect for norm intervention (SS = 1.072, F = 0.099, $p = 0.754$, partial $\eta^2 < 0.001$) (Figure 16B). Accordingly, no interaction effect was found for the two conditions (SS = 0.011, F = 0.001, $p = 0.975$, partial $\eta^2 < 0.001$). With an omnibus partial $\eta^2 = 0.078$, the veteran participant analyses were sufficiently powered at 0.956. Top participants with more than 500 prior participations showed a particularly strong reactance to experience (SS = 181.300, F = 17.794, $p < 0.001$, partial $\eta^2 = 0.154$) with non-significant effects from norm intervention (SS = 17.381, F = 1.706, $p = 0.195$, partial $\eta^2 = 0.017$) or the interaction (SS = 0.415, F = 0.041, $p = 0.840$, partial $\eta^2 < 0.001$) (Figure 16C). With an omnibus partial $\eta^2 = 0.166$, the top participant analyses were sufficiently powered at 0.972.

Discussion

Even with the increased sample size, Study 9 failed to replicate the main effect of descriptive norm appeal evident in Study 6. Although the use of real monetary compensation and extreme ends (i.e., 0 & 10) compared to the more moderate allocations (2 & 8) were initial suspects, subsequent analyses indicated that participant naivety to behavioral studies was more likely to be the culprit in differentiated effects. Indeed, naïve participants showed effects in the expected direction, whereby greed norms inhibited the effect of having received generosity. In contrast, participants who reported having significant experience participating in prior research, they were only influenced by initial experience of the treatment and not to the presentation of the norm appeal. Although the sample size was not large enough to adequately test a moderated moderation model, the discrepancy in results is nonetheless consistent with prior literature

documenting that descriptive norm appeals only worked for those whom the situation was a novel one and not a familiar one (Shang & Croson, 2009). Study 6 was also rerun by splitting the sample into naïve and veteran participants which indicated some trending results for an interaction among the naïve group. Nonetheless, the naïve group was underpowered (n = 55, power = 0.688) and a conclusive argument cannot be inferred. Thus, the argument that the efficacy of descriptive norm appeals is contingent upon the extent to which individuals can infer the validity of the norms under a novel situation has partial conceptual and empirical backing but requires further testing.

Study 10: Mini Meta-Analysis of Generalized Reciprocity

All nine studies showed significant effects for generalized reciprocity yet yielded varied effect sizes. In other words, while the findings of the prior studies imply a robust and consistent effect, there remains a need to examine under what situations or circumstances the generalized reciprocity effect may be strong or weak. Following recommendations put forth by Goh et al. (2016), a mini meta-analysis was conducted with all nine experimental studies in this dissertation as well as studies from methodologically similar programs of research (Gray et al., 2014; Sun et al., 2020). In doing so, both random and fixed effects were probed to investigate the overall general size of effect as well as predictors of large effect sizes.

Study Selection

The studies included in this mini meta-analysis were conveniently selected for their methodological similarity to the current program of research. All nine studies from this dissertation were included along with two papers (Gray et al., 2014; Sun et al., 2020) with which the current program of research was heavily based on. In total, 16 studies across three papers (N

= 2,730) were selected for this mini meta-analysis. Twelve studies used monetary units as the outcome variable whereas four studies used labor as the outcome variable.

Inclusion Criteria

Studies from the selected programs of research were included if they used 1) randomized assignment in between-subjects design comparing greed and generosity and 2) a repeated-dictator game with changing partner paradigm with some form of currency (e.g., tokens, hypothetical cash earnings, real cash earnings, etc.).

Participants included all gender identities (e.g., male, female, non-binary, etc.) and adults ages 18 and over.

Behavioral intervention studies were included to examine the robustness of initial experience on generalized reciprocity, accounting for different influential situational cues.

Control groups depicting equity treatment (i.e., even split experience) were not considered in the calculation of effect sizes to isolate the differential effect of subjection to the greatest greed and generosity reasonably possible within the study paradigm.

Exclusion Criteria

Due to existing literature illustrating deviating strategies for generalized reciprocity in repeating iterations (Axelrod, 1986; Axelrod & Dion, 1988; J. Wu & Axelrod, 1995), studies that utilized within-subjects designs (e.g., Hu et al., 2018; Leimgruber et al., 2014) were excluded from consideration. Further, studies that used some other form of behavioral economic decision-making game (e.g., prisoners' dilemma; Cardella et al., 2019) were not considered. Lastly, studies that used labor to examine generalized reciprocity (Studies 3-4b, Gray et al., 2014; Study 2, Sun et al., 2020) were not included in the first analysis due to possible psychological differences and only were subsequently included in the second, overall analysis.

Effect Sizes

Effect sizes for differences in generalized reciprocity across negative and positive treatments were calculated with the 'esc' R package (Lüdecke, 2019) and given descriptive statistics reported in the selected articles themselves. Due to missing exact standard errors on Studies 1, 2, and 4 of Gray et al. (2014), conservative estimates of standard errors based on given visual figures were instead entered. Further, Study 2 of Sun et al. (2020) reported standard deviations of 0.12, leading to a Cohen's d estimate of 3.75. However, their ANOVA main effect of greed-generosity treatment revealed a partial η^2 value of 0.06, which roughly translates to an approximate Cohen's d of 0.50. Erring on the side of caution, a pooled standard deviation of approximately 0.90 for both treatment conditions was used to estimate an effect size of $d = 0.50$.

Bias Diagnostic

For all analyses, the Egger's regression test (Egger et al., 1997) and Begg-Mazumdar's rank correlation test for Funnel plot asymmetry (Begg & Mazumdar, 1994) were conducted to test for bias.

Results

Table 8.

Study 10; Meta-Analysis Statistics by Study

					95% Confidence Interval		
Author	**Study**	**Effect Size**	**SE**	**Variance**	**Lower**	**Upper**	**N**
Monetary							
Im & Chen[1]	Study 1	1.252	0.124	0.015	1.008	1.496	309
Im & Chen[1]	Study 2	1.458	0.115	0.013	1.231	1.684	382
Im & Chen[1†]	Study 3	0.708	0.146	0.021	0.421	0.994	199
Im & Chen[1†]	Study 4	0.563	0.146	0.021	0.277	0.849	195
Im & Chen[1†]	Study 5	0.720	0.147	0.022	0.432	1.007	198
Im & Chen[1†]	Study 6	0.532	0.144	0.021	0.249	0.814	199
Im & Chen[1†]	Study 7	0.944	0.150	0.022	0.650	1.238	198
Im & Chen[1†]	Study 8	0.904	0.154	0.024	0.602	1.207	185

Im & Chen[1†]	Study 9	0.536	0.119	0.014	0.303	0.769	293
Sun et al.[2]	Study 1	0.805	0.193	0.037	0.427	1.183	116
Gray et al.[3]	Study 1	1.077	0.303	0.092	0.484	1.671	116
Gray et al.[3†]	Study 2	0.337	0.201	0.041	-0.058	0.732	50
Labor							
Sun et al.[2†]	Study 2	0.500	0.189	0.036	0.130	0.870	100
Gray et al.[3]	Study 3	0.621	0.264	0.070	0.102	1.139	60
Gray et al.[3]	Study 4a	0.726	0.298	0.089	0.142	1.310	48
Gray et al.[3†]	Study 4b	0.699	0.228	0.052	0.253	1.145	82

Note: [1]Current paper; [2]Sun et al. (2020); [3]Gray et al. (2014); Effect size in Cohen's *d*; †used some form of intervention (e.g., luck, affective, causal attribution, norm)

Although the examined studies were similar in methodology, the studies nonetheless differed across various aspects of their design (Table 10). These included the monetary compensation, the nature of the compensation, and the different types of interventions implemented. Due to these reasons, slight deviations in effect sizes from one study to another were expected. Thus, all meta-regressions were conducted using random effects restricted maximum likelihood method.

First, a meta-analysis of the nine dissertation studies was conducted (Figure 17). Diagnostic tests both showed no bias in examining the regression test for Funnel plot asymmetry (Egger's test; z = -1.406, $p = 0.160$) as well as the rank correlation test (Begg-Mazumdar's test; $\tau = 0.141$, $p = 0.600$). The effect size across the 12 studies revealed a large and significant effect (d = 0.851, 95% CI [0.63, 1.072], SE = 0.113, z = 7.542, $p < 0.001$).

A second analysis was conducted incorporating the implementation of interventions (i.e., Im & Chen Studies 3-9) and fake money (i.e., Im & Chen Studies 1-7) as covariates. The analysis again showed no bias (Egger's test, z = 1.531, $p = 0.126$; Begg-Mazumdar's test, $\tau = 0.141$, $p = 0.600$). Studies that implemented no intervention observed significantly higher generalized reciprocity effect than intervention studies (d = 0.668, 95% CI [0.388, 0.948], SE =

0.143, z = 4.679, $p < 0.001$). However, no difference was observed between studies that used fake/hypothetical money and real money (d = -0.001, 95% CI [-0.294, 0.292], SE = 0.15, z = -0.008, $p = 0.994$). The overall generalized reciprocity effect remained large (d = 0.692, 95% CI [0.448, 0.936], SE = 0.125, z = 5.56, $p < 0.001$).

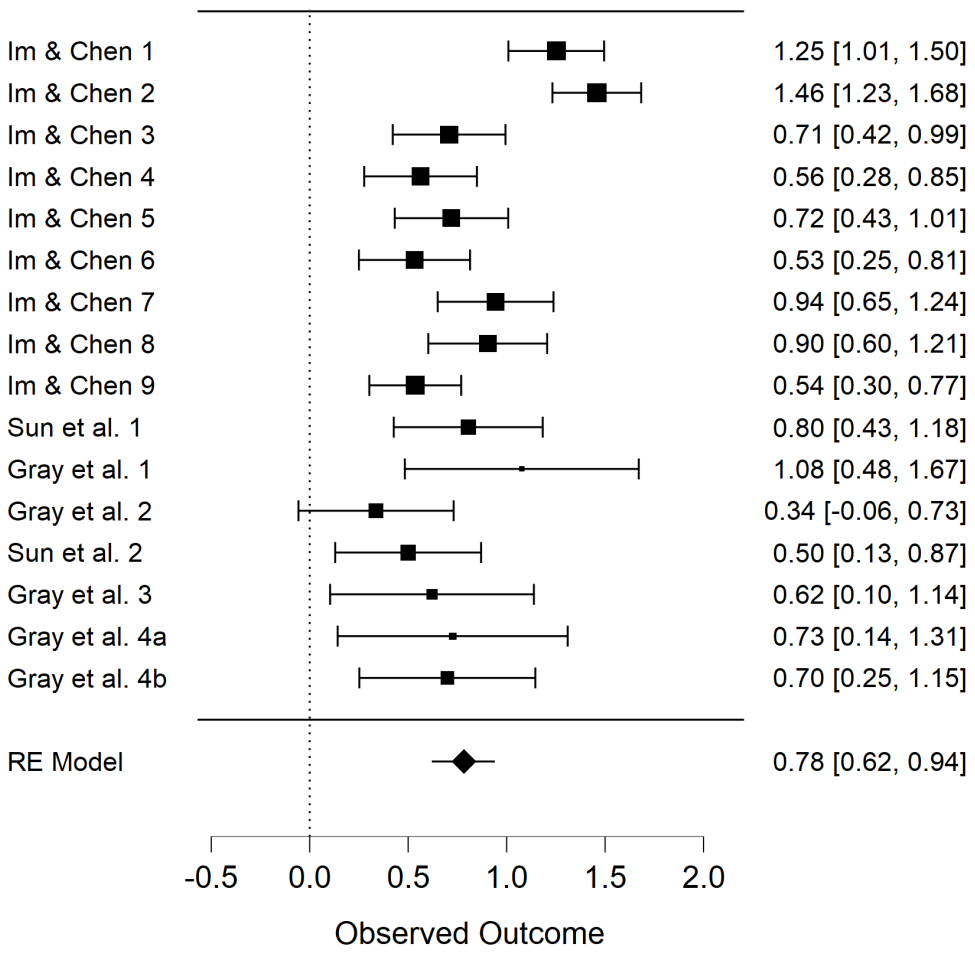
A third analysis was conducted including studies from Gray et al. (2014) and Sun et al. (2020). Three additional covariates were included to control for the type of compensation (i.e., monetary compensation vs. labor), whether the studies stemmed from the current program of research, and whether the sample stemmed from student samples. The analysis showed no bias (Egger's test, z = 1.282, $p = 0.200$; Begg-Mazumdar's test, $\tau = 0.092$, $p = 0.620$) and the generalized reciprocity effect remained large and significant (d = 0.497, 95% CI [0.203, 0.790], SE = 0.150, z = 3.319, $p < 0.001$). Studies that used no intervention again showed significantly higher generalized reciprocity effects compared to those that did (d = 0.410, 95% CI [0.141, 0.679], SE = 0.137, z = 2.990, $p = 0.003$) while there were no differences observed for studies that used hypothetical money (d = 0.007, 95% CI [-0.278, 0.291], SE = 0.145, z = 0.046, $p = 0.964$), labor compensation (d = -0.120, 95% CI [-0.502, 0.261], SE = 0.195, z = -0.618, $p = 0.537$), were from the dissertation (d = 0.194, 95% CI [-0.183, 0.572], SE = 0.193, z = 1.008, $p = 0.313$), or used student samples (d = 0.239, 95% CI [-0.024, 0.501], SE = 0.134, z = 1.784, $p = 0.074$).

Finally, a fourth analysis was conducted including a covariate for whether the interventions yielded successful results (as measured by statistical significance) in addition to the covariates already included in the third analysis. The analysis again showed no bias (Egger's test, z = 0.981, $p = 0.327$; Begg-Mazumdar's test, $\tau = 0.0.092$, $p = 0.620$). The generalized reciprocity effect remained large and significant (d = 0.459, 95% CI [0.139, 0.778], SE = 0.163, z = 2.812, *p*

= 0.005). Consistent with the third analysis, Studies that used no intervention again showed significantly higher generalized reciprocity effects (d = 0.479, 95% CI [0.143, 0.815], SE = 0.171, z = 2.796, *p* = 0.005) while there were no differences observed for studies that used hypothetical money (d = 0.008, 95% CI [-0.290, 0.306], SE = 0.152, z = 0.054, *p* = 0.957), labor compensation (d = -0.155, 95% CI [-0.557, 0.247], SE = 0.205, z = -0.758, *p* = 0.449), were from the dissertation (d = 0.194, 95% CI [-0.197, 0.585], SE = 0.200, z = 0.971, *p* = 0.332), used student samples (d = 0.203, 95% CI [-0.083, 0.489], SE = 0.146, z = 1.392, *p* = 0.164), or yielded successful interventions (d = 0.097, 95% CI [-0.168, 0.361], SE = 0.135, z = 0.716, *p* = 0.474).

Figure 17.

Study 10; Forest Plot of Study Effects



Note: Study weighting determined by accuracy of standard error

Discussion

Consideration of effect sizes across all 16 studies that used the repeated dictator game with changing partners paradigm revealed strong and robust effect sizes for the main effect of initial greed-generosity experience on subsequent behavior. Notably, the three largest effect sizes stemmed from studies that utilized no form of intervention or interference. Results allude that when left to its own devices, being treated negatively has strong effects in promoting greed, or at the very least, limiting generosity. Even across all the studies that used different forms of interventions, the effect of initial experience on generalized reciprocity remained large and robust. Thus, while some interventions (e.g., intentionality inference, norm appeals) showed

potential for mitigating negative and promoting positive generalized reciprocity, behavioral contagion itself appears to persist. Meta-regression analyses show that various methodological factors yield little to no differences in influencing generalized reciprocity. Indeed, factors such as the use of hypothetical (vs real) money and type of compensation appear to not budge the contagion effect.

One of the largest predictors of the size of the generalized reciprocity effect appeared to be the mere presence of interventions, regardless of whether the intervention was successful, or sample demographics used. Indeed, studies that implemented some form of intervention observed effects nearly half the size of those without any interventions. Further, this dampening of the generalized reciprocity effect appeared to not be altered by whether the intervention itself yielded significant differences in participant behavior. Thus, although the interventions themselves may shift the absolute amount of money donated to the next participant, adjusting the *contagiousness* of initial experience on subsequent behavior toward a third-party (i.e., the relative difference between those who experienced generosity vs greed) is not contingent upon the efficacy of the intervention. This may suggest that the mere activation of any cognitive reflection of one's behavior may be enough to dampen the generalized reciprocity effect.

General Discussion

All studies found convergent evidence of both negative and positive generalized reciprocity, i.e., people show tendency to pay forward the treatment they received. Although Studies 1-2 showed that individuals who received a greedy treatment tended to pay forward an amount surprisingly close to an equitable amount ($5 out of $10), the remaining studies, regardless of whether hypothetical or real compensation was used, showed a stronger deviation from the equitable amount. One explanation for the higher-than-normal allocation observed in

Studies 1-2 may simply be that the participant sample was taken from a university student population. Studies 3-9, on the other hand, sampled participants from Prolific which may include participants more conscious about their finances given the willingness to participate in an irregular schedule of research studies for often a few cents at a time. Although the current analysis showed no significant difference between university or non-university samples, the *p*-value was marginal and may warrant further investigation.

Regardless of average differences between Studies 1-2 and Studies 3-9, however, the pattern of findings supporting the manifestation of generalized reciprocity nonetheless remained consistent. Studies 1-2 further found convergent evidence of the mediating effects of causal attribution and norm learning. However, both Studies 1-2 failed to replicate prior findings documenting affective response as a key catalyst for generalized reciprocity (Baker & Bulkley, 2014; Gray et al., 2014) even after revising the affective responses to be more consistent with the experimental paradigm. This remained true after also examining affective response in isolation of other mediating variables. Nonetheless, the extensive body of literature documenting and proposing affective response to play a key role in generalized reciprocity and behavioral contagion implies that a strong rejection of it based on the findings of Studies 1-2 is premature. Firstly, the current set of studies utilized the repeated dictator game paradigm similar to Gray et al. (2014) and is limited in its replication of non-lab scenarios in workplaces (Baker & Bulkley, 2014) or university campuses (Pressman et al., 2015) where both positive and negative treatments are likely to conjure much stronger affective responses. In non-lab scenarios, the prevalence of peripheral social cues, environmental context, and varied type of treatment may play large roles in inducing feelings of gratitude or anger. Thus, the current set of studies can only provide preliminary evidence in opposition to Gray et al.'s (2014) finding and further

research is necessary to examine the robustness of the current findings across multiple situations and scenarios. Future research may investigate whether affective response is varied across different *types* of treatments (e.g., rudeness, greed, hostility), degrees of severity (e.g., holding doors open, harassment), and environments (e.g., workplace, home).

Causal Attribution in Generalized Reciprocity

Studies 1-2 found that causal attribution was a robust and strong mediating factor in generalized reciprocity. There is a consensus within the field that attribution is an important facet in reciprocity and contagion effect (Falk & Fischbacher, 2006; Foulk et al., 2016; Sun et al., 2020). Findings from Study 1 and 2 show that perceptions of greed strongly predict generalized reciprocity, supporting the propositions made by Foulk et al. (2016) that being subjected to negative treatment activates a network of concepts related to the nature of said treatment. That is, when participants are the victims of greed, *greed* itself becomes more salient to participants. It is possible that the increased saliency of greed and its related concepts also served to loosen the self-restraints one had that normally deterred said behavior in one's own subsequent actions against an unrelated third-party.

However, findings from Studies 3, 4, 5, and 8 show that the *type* of attribution may be more important in generalized reciprocity. For instance, attributing *internal or external reasons* (Studies 3-4) to the other player yielded no clear deviation from the generalized reciprocity effect. However, attributing *intentionality* yielded the largest effect for influencing generalized reciprocity (Studies 5 and 8). Indeed, Sun et al. (2020) found that whether intentionality can be inferred (i.e., offer made by human vs. computer, under the pretense that computers cannot have agentic intent) played a significant role in how individuals paid forward treatments. However, given that Sun et al.'s (2020) study only examined the presence of the ability to infer intent, the

current set of studies contribute to this area of research by showing that the way in which benefactors portray their good-deeds may be key in promoting positivity.

Like with the studies on causal attribution, the non-lab settings are likely to consist primarily of instances where context is abundant. For instance, workplace rudeness from a supervisor may be overlooked by the employees if the rudeness comes immediately following a failed project that was very important to the supervisor. Or, perhaps, a Sergeant being berated by a Lieutenant may be less likely to displace their aggression onto the Privates or Corporals if the Sergeant is aware that the Lieutenant had just come back from a stressful operation. Regardless of whether contextual cues are learned of before or after the initial treatment, inferring intentionality for behaviors may be fruitful in mitigating negative generalized reciprocity and promoting positive generalized reciprocity.

Nonetheless, social interactions with ambiguous contextual cues are still common. With the COVID-19 pandemic still raging, many businesses, universities, and services have transitioned to remote work. In cases where interactions are communicated via video (e.g., Skype, Zoom, Microsoft Teams), visual cues may assist in contextualizing one's intentions and messages. However, social interactions that only utilize deconstructed means of communication (e.g., emails, messaging boards) provide fertile ground for recipients to attribute perceived rudeness to internal characteristics.

Norm Learning in Generalized Reciprocity

Findings from Study 2 found that inferences of new norms strongly mediated the generalized reciprocity process. Specifically, given the ambiguous context the participants were placed in, the single experience yielded a strong effect in influencing inferred norms for pay-it-forward behavior, supporting prior findings that knowledge of others' behaviors yields stronger

effects on novel situations (e.g., Jung et al., 2014; Shang & Croson, 2009). However, only partial evidence in support of interventions on descriptive appeals suggests that norm learning has its limitations in application. How readily people adapt to new cues of social norms may be evidenced through findings on fairness appraisal and impact of naivety.

Across all studies, individuals displayed a self-serving bias in their appraisal of fairness (Cappelen et al., 2016). Indeed, when given context, such as observation of others' behavior in this study, individuals apply a more nuanced and complex understanding of fairness than pure distributive equity (Almas et al., 2010; Ochs & Roth, 1989). In particular, Bolton and Ockenfels (2005) argued that determinations of fairness are influenced by reference points. In the case of the current findings, individuals across all conditions may have inferred their own offers as having been equally fair despite varying degrees of objective monetary amounts because each person determined the fairness of their action relative to the offer they received. For instance, the experience of greed was routinely construed as being *less than fair*, and thus the participants' subsequent average allocation, even if it was less than distributive equity, was perceived to be *fair* in comparison. In contrast, a generous allocation was construed as being *more than fair*, and thus the participants' subsequent allocation, even if it was more than distributive equity, was perceived to only be *just fair* in comparison. Adding to the conclusions derived for norm learning, these findings suggest that individuals readily adjust and adapt to new social cues as frames of references to determine their subsequent actions.

Secondly, although individuals may readily consult own experiences (i.e., others' treatments) as representative cues of normative behavior under contexts riddled with uncertainty or novelty (Güney & Newell, 2015; Lesorogol, 2007), such cues are likely to not supersede one's preexisting knowledge of norms in an otherwise familiar environment (Shang & Croson, 2009).

This was made most evident when the mediating and influential role of descriptive norms was much stronger among participants more naïve to behavioral studies and largely ineffective among those who reported high exposure to social and behavioral experiments. This trend was particularly only evident in Studies 6 and 9, where descriptive norm interventions were used. Further, compared to descriptive norms, injunctive norms influenced people's impressions about how *others* ought to act but failed in changing their own behaviors. This presents an underlying predicament to implementing norm interventions in practice.

In the case of workplaces, if an employee is fully situated within their work environment and perceives it as being friendly and generous, one instance of negativity will likely not take precedence over existing inferences of norms (Im, 2021). However, if it is the employee's first day in a novel work environment, the employee may seek to mimic the observations of others to inform their own behavior. That is, a single instance of greed exposure is likely to play a larger role in influencing the extent to which an individual adapts their perceptions of norms in the latter context than the prior (Gino et al., 2009; Shang & Croson, 2009). Further, injunctive norm appeals aimed to dictating behaviors through messages may be ineffective if not concordant with behaviors to indicate behavioral integrity.

Behavioral Tendencies in Generalized Reciprocity

Findings across all studies and the mini-meta-analysis yielded strong confidence that the generalized reciprocity effect is robust and pervasive. Although past studies have posited that initial experiences of negativity or positivity will induce different affective states that promote treating third-parties in similar manners (Baker & Bulkley, 2014; Gray et al., 2014), the current set of studies at least question whether the generalized reciprocity process is that simple. In particular, even after taking into consideration the numerous interventions that aimed to target

luck, affect, norms, and causal attribution, the generalized reciprocity process still yielded a strikingly high effect size ($d > 0.50$). Nonetheless, it is worth reiterating that the generalized reciprocity effect size became notably smaller when an intervention was used, regardless of its success in influencing the absolute amount paid forward. That is, participants were less likely to simply use their experience as a platform for their own behaviors. In other words, so long as the objective is to merely mitigate behavioral contagion, then the efficacy of utilizing various interventions may still be fruitful. However, if the objective is to reduce negative generalized reciprocity, current recommendations may be limited to intervening one's causal attribution of intentions.

Limitations & Future Directions

The current set of studies have several limitations to be considered. Firstly, as discussed throughout the paper, the use of decontextualized repeated dictator games is beneficial in not only building on the current body of literature but also in isolating the generalized reciprocity phenomenon in a controlled setting without extraneous, latent confounds. Nonetheless, this limits its applicability to non-lab settings where numerous existent social norms and other interactions may strengthen or weaken the paths identified in the studied models as well as the interventions. Accordingly, the current set of studies is limited in its external validity given that the closest example of the given experimental design in the real world is one of fast-food drive-thru lanes where one is positioned in a continuous, unidirectional chain of a pay-it-forward movement. In other real-world situations, it may be more common for the individual to know those who have helped them as well as those who they plan to help, at least proximally (e.g., coworkers).

Another limitation is the immediacy of the repeated dictator game measurement. Participants in the current study had the opportunity to immediately engage in generalized

reciprocity following the treatment they experienced. Although some cases in the non-lab offer such immediate opportunities to engage in generalized reciprocity (e.g., drive-thru lanes, coffee lines, etc.), many more situations would likely involve a temporal gap between experience and subsequent generalized reciprocity behavior. In such cases, affective response may still serve to mediate the generalized reciprocity process as suggested before due to lingering affective associations with whatever task or activity followed the initial experience.

In both cases, future studies may benefit from examining various mediating components across different situations and manipulating various social cues. Specifically, the identity and membership characteristics of the individual whom one is forwarding the treatment to may be of particular interest. For instance, as local norms induce stronger effects than global norms (Agerström et al., 2016; Goldstein et al., 2008), should the initial treatment be from an outgroup member (vs. ingroup member), individuals may be less prone to infer that the experience was indicative of norms in general. Further, should individuals' identities or group membership characteristics be available, close intragroup ties or hostile intergroup dynamics may influence generalized reciprocity. For instance, future studies may examine the extent to which groups traditionally hostile towards one another (e.g., Democrats vs. Republicans) may opt to rather engage in antisocial behaviors regardless of what initial treatment they received.

Conclusion

Generalized reciprocity continues to be a perplexing psychological process that manifests across different sectors of society. Although the prototypical drive-thru pay-it-forward chains often capture the attention of the general public, generalized reciprocity can manifest in more complex situations in subtle ways. In particular, negative generalized reciprocity presents the greatest challenge for scholars and practitioners moving forward. Based on the findings of the

current study, negative generalized reciprocity thankfully appears to be difficult to exacerbate. Unfortunately, the same could be said for promoting positive generalized reciprocity, with only a select few factors increasing the tendency to pay positivity forward.

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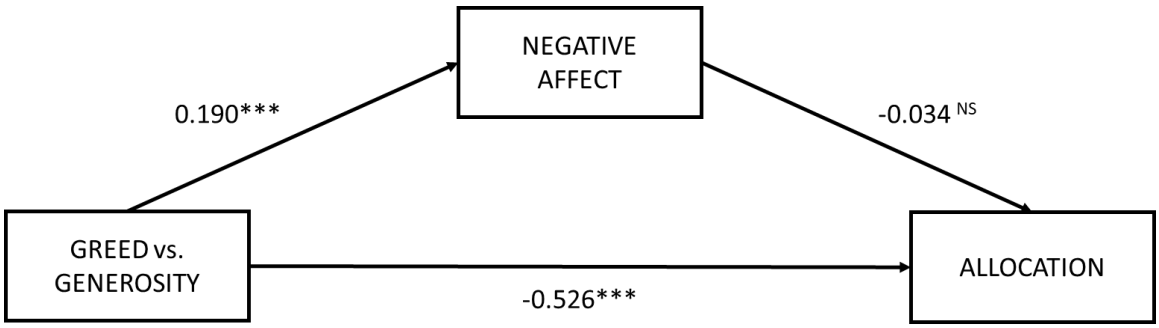
Appendix

Study 1 Additional Analyses

Mediating Effect of Negative Affect

Figure A.

Mediation Model as Reported in Gray et al. (2014)



To test the same mediation model (Figure A) as reported in Study 4 of Gray et al. (2014), the equity condition was removed from the analyses, leaving only the participants placed into the greed and generosity conditions (n = 308). Further, causal attributions were removed from the model, leaving only negative affect as the mediator. However, the indirect effect was still nonsignificant (p = 0.496) owing to the nonsignificant path from negative affect to allocation given (p = 0.487).

Comparison of Fairness Appraisal

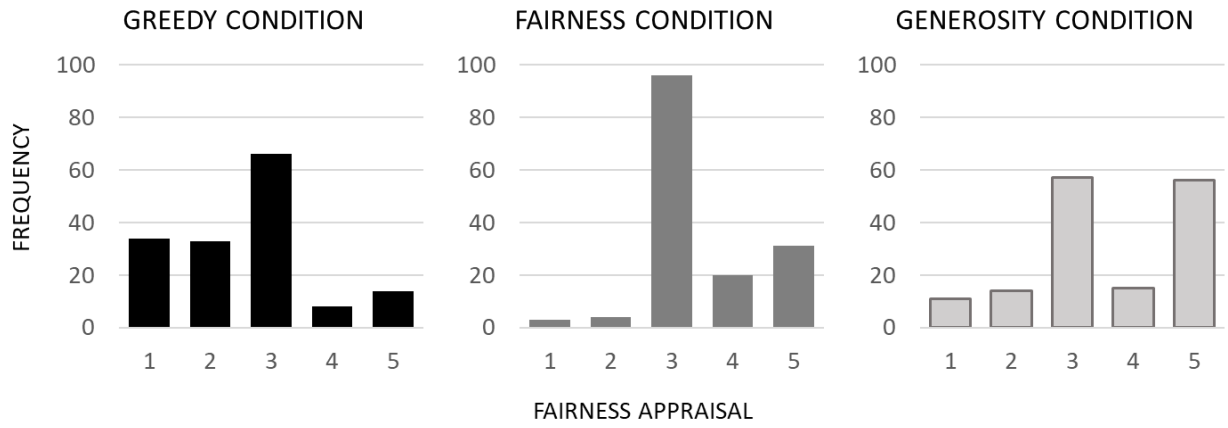
Table A.

Frequency Distribution of Fairness Appraisal in Allocation Received

	Conditions		
Fairness	**Greedy**	**Equity**	**Generosity**
1 Not at all Fair	34	3	11
2	33	4	14
3 Fair	66	96	57
4	8	20	15
5 More Than Fair	14	31	56

Figure B.

Frequency Plots of Fairness Appraisal Across Conditions



The number of participants that rated the Fairness allocation as being less than fair (i.e., appraisal of fairness < 3) was 7 out of 154 total participants (Table A; Figure B). In contrast, the number of participants that rated the Generosity allocation as being less than fair was 25 out of 153 participants. Thus, more participants in the Generosity condition regarded the allocation they received as being less than fair than those in the Equity condition ($z = 3.382$, $p = 0.001$) despite the generosity allocation being greater. However, in assessing appraisal of just fairness (i.e., appraisal of fairness = 3), more participants in the Equity condition reported this option than those in the Generosity condition ($z = 4.395$, $p < 0.001$). In a similar manner, more participants in the Generosity condition rated the allocation received as being more than fair (i.e., appraisal of fairness > 3) than those in the Equity condition ($z = 2.379$, $p = 0.017$).

Upon removing those who rated the allocation received as being less than fair from the calculation, we see that participants in the Generosity condition show significantly higher ratings of fairness (n = 128, M ± SD = 3.992 ± 0.883) than those in the Equity condition (n = 147, M ± SD = 3.558 ± 0.668), $t(234)_{\text{Welch}} = 4.543$, $p < 0.001$. These results suggest that the non-significant mean difference in fairness appraisal between the Equity and Generosity conditions

reported in Study 1 is due to the larger collection of individuals in the Generosity condition pulling the mean down.

Study 1 Materials

[Individual Values Measures]

[Religiosity Scale (McDaniel & Burnett, 1990)] Please read each statement carefully. Then indicate the extent to which you agree or disagree by selecting the number corresponding to your feeling.

- I am very religious (1)
- My religion is very important to me (2)
- I believe in God (3)
    - *1 Completely Disagree*
    - *2*
    - *3*
    - *4*
    - *5 Neither Agree nor Disagree*
    - *6*
    - *7*
    - *8*
    - *9 Completely Agree*

[General Religious Guidance Scale (Joseph & DiDuca, 2007)] Read each statement carefully and indicate the extent to which you agree or disagree with the statements:

- I pray for guidance (1)
- God does not help me to make decisions (2)
- I try to follow the laws laid down in religious scriptures (3)
- I cannot make important decisions without God's help (4)
- Religious figures' lives are examples to me (5)
    - *1 Strongly Disagree*
    - *2*
    - *3*
    - *4*
    - *5 Strongly Agree*

[Karmic Justice Scale (White, Norenzayan, et al., 2019)] Please carefully read each statement below and rate the extent to which you agree or disagree with each statement:

- When people are met with misfortune, they have brought it upon themselves by previous behavior in their life (1)
- When people experience good fortune, they have brought it upon themselves by previous behavior in their life (2)
- If a person does something bad, even if they are no immediate consequences, they will be punished for it in some future time in their life (3)
- When someone does a good deed, even if there are no immediate consequences, they will be rewarded for it in some future time in their life (4)

- In the long-run, good things happen to good people and bad things happen to bad people (5)
    - *1 Strongly Disagree*
    - *2*
    - *3*
    - *4*
    - *5 Strongly Agree*

[Self-Uncertainty Measure (Rast et al., 2012, 2013)] Please read each statement carefully and indicate the extent to which you agree or disagree.

- I am uncertain about myself (1)
- I am uncertain about my future (2)
- I am concerned about my future (3)
- I am worried about my future (4)
- I am uncertain about my place in the world (5)
- I am worried about my place in the world (6)
- I am concerned about my place in the world (7)
    - *1 Strongly Disagree*
    - *2*
    - *3*
    - *4*
    - *5 Strongly Agree*

[Empathic Concern Subscale from Interpersonal Reactivity Index (Davis, 1980, 1983)] The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: 1, 2, 3, 4, or 5. When you have decided on your answer, click the item number. READ EACH ITEM CAREFULLY BEFORE RESPONDING. Answer as honestly as you can.

- I often have tender, concerned feelings for people less fortunate than me. (1)
- Sometimes I don't feel very sorry for other people when they are having problems. (2)
- When I see someone being taken advantage of, I feel kind of protective towards them. (3)
- Other people's misfortunes do not usually disturb me a great deal. (4)
- When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (5)
- I am often quite touched by things that I see happen. (6)
- I would describe myself as a pretty soft-hearted person. (7)
    - *1 Does not describe me well*
    - *2*
    - *3*
    - *4*

- *5 Describes me very well*

[Perspective Taking Subscale from Interpersonal Reactivity Index (Davis, 1980, 1983)] The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: 1, 2, 3, 4, or 5. When you have decided on your answer, click the item number. READ EACH ITEM CAREFULLY BEFORE RESPONDING. Answer as honestly as you can.

- I sometimes find it difficult to see things from the "other guy's" point of view. (1)
- I try to look at everybody's side of a disagreement before I make a decision. (2)
- I sometimes try to understand my friends better by imagining how things look from their perspective. (3)
- If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (4)
- I believe that there are two sides to every question and try to look at them both. (5)
- When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (6)
- Before criticizing somebody, I try to imagine how I would feel if I were in their place. (7)

[Fairness subscale from Moral Foundations Questionnaire (Graham et al., 2011)] When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking? Please rate each statement using this scale:

- Whether or not some people were treated differently than others (2)
- Whether or not someone acted unfairly (5)
- Whether or not someone was denied his or her rights (7)
    - *0 Not at all relevant*
    - *1 Not very relevant*
    - *2 Slightly relevant*
    - *3 Somewhat relevant*
    - *4 Very relevant*
    - *5 Extremely relevant*

[Fairness subscale from Moral Foundations Questionnaire Part 2 (Graham et al., 2011)] Please read the following sentences and indicate your agreement or disagreement:

- When the government makes laws, the number one principle should be ensuring that everyone is treated fairly. (2)
- Justice is the most important requirement for a society. (5)
- I think it’s morally wrong that rich children inherit a lot of money while poor children inherit nothing. (7)
    - *0 Strongly disagree*
    - *1 Moderately disagree*
    - *2 Slightly disagree*
    - *3 Slightly agree*

- *4 Moderately agree*
- *5 Strongly agree*

[Justice Sensitivity Scale for Victim Sensitivity (Schmitt et al., 2010)] People react quite differently in unfair situations. How about you? First, we will look at situations to the advantage of others and to your own disadvantage.

- It bothers me when others receive something that ought to be mine. (1)
- It makes me angry when others receive a reward that I have earned. (2)
- I cannot easily bear it when others profit unilaterally from me. (3)
- It takes me a long time to forget when I have to fix others' carelessness. (4)
- It gets me down when I get fewer opportunities than others to develop my skills. (5)
- It makes me angry when others are undeservingly better off than me. (6)
- It worries me when I have to work hard for things that come easily to others. (7)
- I ruminate for a long time when other people are treated better than me. (8)
- It burdens me to be criticized for things that are overlooked with others. (9)
- It makes me angry when I am treated worse than others. (10)
    - *0 Not at all*
    - *1*
    - *2*
    - *3*
    - *4*
    - *5 Exactly*

[Justice Sensitivity Scale for Observer Sensitivity (Schmitt et al., 2010)] Now, we will look at situations in which you notice or learn that someone else is being treated unfairly, put at a disadvantage, or used.

- It bothers me when someone gets something they don't deserve. (1)
- I am upset when someone does not get a reward he/she has earned. (2)
- I cannot easily bear it when someone unilaterally profits from others. (3)
- It takes me a long time to forget when someone else has to fix others' carelessness. (4)
- It disturbs me when someone receives fewer opportunities to develop his/her skills than others. (5)
- I am upset when someone is undeservingly worse off than others. (6)
- It worries me when someone has to work hard for things that come easily to others. (7)
- I ruminate for a long time when someone is treated nicer than others for no reason. (8)
- It gets me down to see someone criticized for things that are overlooked with others. (9)
- I am upset when someone is treated worse than others. (10)
    - *0 Not at all*
    - *1*
    - *2*
    - *3*
    - *4*

- *5 Exactly*

[Justice Sensitivity Scale for Advantage Sensitivity (Schmitt et al., 2010)] Now, we will look at situations that turn out to <u>your advantage</u> and to the disadvantage of others.

- It disturbs me when I receive what others ought to have. (1)
- I have a bad conscience when I receive a reward that someone else has earned. (2)
- I cannot easily bear it to unilaterally profit from others. (3)
- It takes me a long time to forget when others have to fix my carelessness. (4)
- It disturbs me when I receive more opportunities than others to develop my skills. (5)
- I feel guilty when I am better off than others for no reason. (6)
- It bothers me when things come easily to me that others have to work hard for. (7)
- I ruminate for a long time about being treated nicer than others for no reason. (8)
- It bothers me when someone tolerates things with me that other people are being criticized for. (9)
- I feel guilty when I receive better treatment than others. (10)
    - *0 Not at all*
    - *1*
    - *2*
    - *3*
    - *4*
    - *5 Exactly*

[Generalized Reciprocity Task Instructions]

You will now be given an economic decision-making task.

Please read the instructions given to you carefully.

Imagine yourself in a situation in which you can keep or give to another person, all or any portion of $10. You may give money only in increments of $1. For example, you can give $0 and keep $10 or give $2 and keep $8, or give $8 and keep $2. These are only hypothetical examples,

and the decision of how much to give is entirely yours. In this situation, you are the ***giver*** and the other person is the ***receiver***.

You will be given a similar task with hypothetical money allocations. When you are ready, click next to proceed to the task.

---*Page Break*---

You have been chosen as a ***receiver*** in this economic decision-making task. The participant before you has been chosen as a ***giver*** and received $10.

This participant was told that the $10 was theirs to keep but could divide up the money between themselves and you to receive.

Please click next when you have understood the information given above and wish to be matched with another participant.

---*Page Break*---

Please wait while we match you with another participant. [Program to wait 3-5 seconds]

---*Page Break*---

[Greed Condition]

The participant before you decided to give you $0 out of the $10 they received. This means **you get $0** and **they keep $10**.

[Equity Condition]

The participant before you decided to give you $0 out of the $10 they received. This means **you get $5** and **they keep $10**.

[Generosity Condition]

The participant before you decided to give you $0 out of the $10 they received. This means **you get $10** and **they keep $10**.

---*Page Break*---

Please think about the amount you received.

Recall that the participant before you decided to give you $X out of $10.

This means you get $X and they keep $[10 – X]. [Replace X with condition amount]

[Short PANAS (Thompson, 2007)]: Thinking about yourself and how you feel ***right now***, to what extent do you feel:

- Upset (1)
- Hostile (2)
- Alert (3)

- Ashamed (4)
- Inspired (5)
- Nervous (6)
- Determined (7)
- Attentive (8)
- Afraid (9)
- Active (10)
- Angry (11)
    - *1 Not at all*
    - *2*
    - *3*
    - *4*
    - *5 Completely*

---*Page Break*---

Please think about the amount you received.

Recall that the participant before you decided to give you $X out of $10.

This means you get $X and they keep $[10 – X]. [Replace X with condition amount]

In the space below, please write what you think may be the most probable cause(s) for the other participant giving you this amount.

[Open Response]

---*Page Break*---

You stated that the reason(s) for why the other participant giving you $X was: [Replace X with condition amount]

"[Pipe text from open response]"

Please indicate below the extent to which you agree or disagree with the following statements:

[Causal Attribution of Choice Behavior Scale (van Lange et al., 1990)] Please indicate below the extent to which you agree or disagree with the following statements:

[Concern] The reason indicates that the person:

- wants to give chances to others as well (1)
- is concerned about others' interest (2)
- feels oneself responsible for others (3)
- wants to give something to others (4)
- wants to share profits in a fair way (5)

[Greed] The reason indicates that the person:

- always wants to win (1)
- has an urge to possess (2)
- wants to earn as much as possible (3)
- wants to earn more than a reasonable outcome (4)
- has a high need to achieve (5)
- prefers to get as much as possible (6)
- wants to get more than others (7)
    - *1 Disagree*
    - *2*
    - *3*
    - *4*
    - *5 Agree*

---Page Break---

Recall that the participant before you decided to give you $X out of $10.

This means **you get $X** and **they keep $[10 – X].** [Replace X with condition amount]

[Instructions] Now you have a chance to be the **giver** in this economic decision-making task. You are given $10. The $10 is yours to keep. The next future participant will now receive any amount of money that you decide to transfer to them. It is up to you to determine how to divide up the money you and the next participant will receive.

How much of your $10 would you like to transfer to the next participant?

- $0 … $10

---Page Break---

Recall that the participant before you decided to give you $X out of $10. [Replace X with condition amount]

[Fairness Other] How fair was their decision to give you this amount?

- *1 Much less than fair*

- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Fairness Self] You decided to give $[Pipe amount selected by participant] out of $10 to the next participant. How fair do you think your choice was?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Demographic Questions]

What is your age?

- 18… 60 and over

Are you male or female?

- Female
- Male
- Other (please specify; e.g., gender nonconforming):

Please indicate your ethnicity:

- Black American / African-American
- Black Non-American (African, West Indian, etc.)
- Caucasian (White/or European ancestry)
- East Asian (Chinese, Japanese, Korean, etc.)
- Hispanic/Latino/Chicano/Puerto-Rican
- Pacific Islander (Filipino, Samoan, etc.)
- South Asian (Indian, Pakistani, etc.)
- Southeast Asian (Cambodian, Laotian, Vietnamese, etc.)
- Mixed (please specify):
- Other (Please Specify):

What is the highest level of education your father has completed? (Note: if you are adopted, please answer for whom you regard as your father in everyday life)

- Less than High School
- High School/GED
- Some college
- 2-year College degree (Associate's)
- 4-year College (Bachelor's)

- Master's Degree
- Professional Degree (e.g., M.D., J.D.)
- Doctoral Degree (e.g., Ph.D.)
- I don’t know

What is the highest level of education your mother has completed? (Note: if you are adopted, please answer for whom you regard as your father in everyday life)

- Less than High School
- High School/GED
- Some college
- 2-year College degree (Associate's)
- 4-year College (Bachelor's)
- Master's Degree
- Professional Degree (e.g., M.D., J.D.)
- Doctoral Degree (e.g., Ph.D.)
- I don’t know

Study 2 Materials

[Dispositional Greed & Generosity] Please read each of the following carefully and rate the extent to which you agree or disagree with the statements given:

- No matter how much I have of something, I always want more
- One can never have enough
- Even when I am fulfilled, I often seek more
- The pursuit of more and better is an important goal in life for me
- A simple basic life is sufficient for me
- I am easily satisfied with what I've got
- When I help others, I expect nothing in return
- Helping others is an important goal in life for me
- I tend to others' needs before mine
- I try to give more than I take
- I am often dissatisfied with what I have
- I would be more likely to help when there's a reward
    - *1 Strongly Disagree*
    - *2*
    - *3*
    - *4*
    - *5*
    - *6*
    - *7 Strongly Agree*

[Generalized Reciprocity]

[Instructions] For this last part of the study, you will now be given an economic decision-making task.

Please read the instructions given to you carefully.

Imagine yourself in a situation in which you can keep or give to another person, all or any portion of $10. You may give money only in increments of $1. For example, you can give $0 and keep $10 or give $2 and keep $8, or give $8 and keep $2. These are only hypothetical examples, and the decision of how much to give is entirely yours. In this situation, you are the ***giver*** and the other person is the ***receiver***.

You will be given a similar task with hypothetical money allocations. When you are ready, click next to proceed to the task.

---Page Break---

You have been chosen as a ***receiver*** in this economic decision-making task. The participant before you was chosen as a ***giver*** and received $10.

This participant was told that the $10 was theirs to keep but could divide up the money between themselves and you.

Please click next when you have understood the information given above and wish to be matched with another participant.

---*Page Break*---

Please wait while we match you with another participant. [Program to wait 3-5 seconds]

---*Page Break*---

[Greed Condition]

The participant before you decided to give you $0 out of the $10 they received. This means **you get $0** and **they keep $10**.

[Generosity Condition]

The participant before you decided to give you $0 out of the $10 they received. This means **you get $10** and **they keep $10**.

---*Page Break*---

Please think about the amount you received.

Recall that the participant before you decided to give you $X out of $10.

This means you get $X and they keep $[10 – X]. [Replace X with condition amount]

[Revised PANAS]: Thinking about yourself and how you feel ***right now***, to what extent did receiving this amount made you feel?

- Angry
- Mad
- Upset
- Annoyed
- Irritated
- Happy
- Cheerful
- Grateful
- Pleased
- Thankful
    - *1 Not at all*
    - *2*
    - *3*
    - *4*
    - *5*
    - *6*
    - *7 Extremely*

---Page Break---

Please think about the amount you received.

Recall that the participant before you decided to give you $X out of $10.

This means you get $X and they keep $[10 – X]. [Replace X with condition amount]

[Attribution Revised Scales] Carefully think about why this participant may have decided to split the money in this way. The reason that the other participant decided on this split is likely because this person:

- Has an urge to possess more
- Wants to keep more than a reasonable amount
- Is not satisfied with what they currently have
- Wants to get more than others
- Is greedy
- Wants to provide for others
- Wants to help others
- Wants to give more to others
- Cares about others
- Is generous
    - *1 Strongly Disagree*
    - *2*
    - *3*
    - *4*
    - *5*
    - *6*
    - *7 Strongly Agree*

---Page Break---

Recall that the participant before you decided to give you $X out of $10.

This means you get $X and they keep $[10 – X]. [Replace X with condition amount]

[Allocation] Now you have a chance to be the **giver** in this economic decision-making task. You are given $10. The $10 is yours to keep. The next future participant will now receive any amount of money that you decide to transfer to them. It is up to you to determine how to divide up the money you and the next participant will receive.

How much of your $10 would you like to transfer to the next participant?

- $0 … $10

---Page Break---

Recall that the participant before you decided to give you $X out of $10. [Replace X with condition amount]

[Fairness Other] How fair was their decision to give you this amount?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Fairness Self] You decided to give $[Pipe amount selected by participant] out of $10 to the next participant. How fair do you think your choice was?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Norm Learning] On average, how much money do you think people give to the next participant?

- $0 … $10

[Demographic Questions]

What is your age?

- 18… 60 and over

Are you male or female?

- Female
- Male
- Other (please specify; e.g., gender nonconforming):

Please indicate your ethnicity:

- Black American / African-American
- Black Non-American (African, West Indian, etc.)
- Caucasian (White/or European ancestry)
- East Asian (Chinese, Japanese, Korean, etc.)
- Hispanic/Latino/Chicano/Puerto-Rican
- Pacific Islander (Filipino, Samoan, etc.)
- South Asian (Indian, Pakistani, etc.)
- Southeast Asian (Cambodian, Laotian, Vietnamese, etc.)

- Mixed (please specify):
- Other (Please Specify):

What is the highest level of education your father has completed? (Note: if you are adopted, please answer for whom you regard as your father in everyday life)

- Less than High School
- High School/GED
- Some college
- 2-year College degree (Associate's)
- 4-year College (Bachelor's)
- Master's Degree
- Professional Degree (e.g., M.D., J.D.)
- Doctoral Degree (e.g., Ph.D.)
- I don’t know

What is the highest level of education your mother has completed? (Note: if you are adopted, please answer for whom you regard as your father in everyday life)

- Less than High School
- High School/GED
- Some college
- 2-year College degree (Associate's)
- 4-year College (Bachelor's)
- Master's Degree
- Professional Degree (e.g., M.D., J.D.)
- Doctoral Degree (e.g., Ph.D.)
- I don’t know

Study 3 Materials

[Generalized Reciprocity]

[Instructions]

Please read the instructions given to you carefully.

Imagine a situation where you can keep or give any portion of $10 to another person in increments of $1. For example, you can give $0 and keep $10 or give $2 and keep $8. These are only hypothetical examples, and the decision of how much to give is entirely yours. In this situation, you are the ***divider*** and the other person is the ***receiver***.

You will now be given a similar task with *hypothetical* allocations.

When you are ready, click next to proceed to the task.

---*Page Break*---

You will first be a ***receiver*** in this economic decision-making task. You will be matched with another participant before you who was a ***divider.***

This participant was given $10 and told that the $10 was theirs to keep but could divide up the money in any manner between themselves and you.
You will also be given some context about their decision.

Please click next when you have understood the information given above and wish to be matched with another participant.

---*Page Break*---

Please wait while we match you with another participant. [Program to wait 3-5 seconds]

---*Page Break*---

[Greed + Internal Condition]

You have been matched with participant 10045. This participant decided to give you $0 out of the $10 they received.

This means **you get $0** and **they keep $10**.

The participant gave the following reason:

"I just wanted all the money lol"

[Greed + External Condition]

You have been matched with participant 10045. This participant decided to give you $0 out of the $10 they received.

This means **you get $0** and **they keep $10**.

The participant gave the following reason:

"I'm financially struggling and need the money, sorry…"

[Generosity + Internal Condition]

You have been matched with participant 10045. This participant decided to give you $10 out of the $10 they received.

This means **you get $10** and **they keep $0**.

The participant gave the following reason:

"I want to help others and give some positivity"

[Generosity + External Condition]

You have been matched with participant 10045. This participant decided to give you $10 out of the $10 they received.

This means **you get $10** and **they keep $0**.

The participant gave the following reason:

"I just don't need it"

---Page Break---

Recall that the participant before you decided to give you $X out of $10.

This means **you get $X** and **they keep $[10 – X].** [Replace X with condition amount]

The participant gave the following reason:

"[Condition text]"

Now you have a chance to be the ***divider*** in this economic decision-making task. You are given $10. The $10 is yours to keep. The next future participant will now receive any amount of money that you decide to transfer to them. It is up to you to determine how to divide the money.

You will remain *completely anonymous* to the next participant.
How much of your $10, if any, would you transfer to the next participant?

- $0 … $10

---Page Break---

Recall that the participant before you decided to give you $X out of $10.

This means **you get $X** and **they keep $[10 – X].** [Replace X with condition amount]

The participant gave the following reason:

"[Condition text]"

[Fairness Other] How fair was their decision to give you this amount?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Fairness Self] You decided to give $[Pipe amount selected by participant] out of $10 to the next participant. How fair do you think your choice was?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Demographic Items]

[SES] A person's socioeconomic status is based on a combination of their levels of wealth, education, and the quality of their jobs. Please indicate on a scale from 0 to 10 where you feel you are currently.

- *0 Least amount of money, little to no education, and no jobs*
- *1*
- *2*
- *3*
- *4*
- *5 An average amount of money and education, and decent jobs*
- *6*
- *7*
- *8*
- *9*

- *10 Most amount of money, highest amount of education, and really good jobs*

[Education] What is the highest level of education you have completed?

- *Less than High School*
- *High School/GED*
- *Some college*
- *2-year College degree (Associate's)*
- *4-year College (Bachelor's)*
- *Master's Degree*
- *Professional Degree (e.g., M.D., J.D.)*
- *Doctoral Degree (e.g., Ph.D.)*
- *I don't know/Prefer not to say*

[Collect age and gender information directly from Prolific]

Study 4 Materials

[Generalized Reciprocity]

[Instructions]

Please read the instructions given to you carefully.

Imagine a situation where you can keep or give any portion of $10 to another person in increments of $1. For example, you can give $0 and keep $10 or give $2 and keep $8. These are only hypothetical examples, and the decision of how much to give is entirely yours. In this situation, you are the ***divider*** and the other person is the ***receiver***.

You will now be given a similar task with *hypothetical* allocations.

When you are ready, click next to proceed to the task.

---*Page Break*---

You will first be a ***receiver*** in this economic decision-making task. You will be matched with another participant before you who was a ***divider.***

This participant was given $10 and told that the $10 was theirs to keep but could divide up the money in any manner between themselves and you.
You will also be given some context about their decision.

Please click next when you have understood the information given above and wish to be matched with another participant.

---*Page Break*---

Please wait while we match you with another participant. [Program to wait 3-5 seconds]

---*Page Break*---

[Greed Condition]

You have been matched with participant 10045. This participant decided to give you $0 out of the $10 they received.

This means **you get $0** and **they keep $10**.

[Generosity Condition]

You have been matched with participant 10045. This participant decided to give you $10 out of the $10 they received.

This means **you get $10** and **they keep $0**.

---Page Break---

Recall that the participant before you decided to give you $X out of $10.

This means **you get $X** and **they keep $[10 – X].** [Replace X with condition amount]

[Stable Task Condition]

Please take a moment to think about the money this participant decided to give you. What kind of ***personality traits*** or ***internal characteristics*** may have led this participant to give you this amount? (Examples: greedy, generous, selfish, kind)

[Unstable Task Condition]

Please take a moment to think about the money this participant decided to give you. What kind of ***situational factors*** or ***external considerations*** may have led this participant to give you this amount? (Examples: financial need, rich, unemployed, wealthy, mistake)

---Page Break---

Recall that the participant before you decided to give you $X out of $10.

This means **you get $X** and **they keep $[10 – X].** [Replace X with condition amount]

You wrote the following for why this participant may have given you this amount:

"[Pipe text from task]"

Now you have a chance to be the ***divider*** in this economic decision-making task. You are given $10. The $10 is yours to keep. The next future participant will now receive any amount of money that you decide to transfer to them. It is up to you to determine how to divide the money.

You will remain *completely anonymous* to the next participant.
How much of your $10, if any, would you transfer to the next participant?

- $0 … $10

---Page Break---

Recall that the participant before you decided to give you $X out of $10.

This means **you get $X** and **they keep $[10 – X].** [Replace X with condition amount]

You wrote the following for why this participant may have given you this amount:

"[Pipe text from task]"

[Fairness Other] How fair was their decision to give you this amount?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Justified Other] How justified do you think they were in giving you this amount?

- *1 Not at all*
- *2*
- *3*
- *4*
- *5 A lot*

[Fairness Self] You decided to give $[Pipe amount selected by participant] out of $10 to the next participant. How fair do you think your choice was?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Demographic Items]

[SES] A person's socioeconomic status is based on a combination of their levels of wealth, education, and the quality of their jobs. Please indicate on a scale from 0 to 10 where you feel you are currently.

- *0 Least amount of money, little to no education, and no jobs*
- *1*
- *2*
- *3*
- *4*
- *5 An average amount of money and education, and decent jobs*
- *6*
- *7*
- *8*
- *9*
- *10 Most amount of money, highest amount of education, and really good jobs*

[Education] What is the highest level of education you have completed?

- *Less than High School*
- *High School/GED*
- *Some college*

- *2-year College degree (Associate's)*
- *4-year College (Bachelor's)*
- *Master's Degree*
- *Professional Degree (e.g., M.D., J.D.)*
- *Doctoral Degree (e.g., Ph.D.)*
- *I don’t know/Prefer not to say*

[Collect age and gender information directly from Prolific]

Study 5 Materials

[Generalized Reciprocity]

[Instructions]

Please read the instructions given to you carefully.

Imagine a situation where you can keep or give any portion of $10 to another person in increments of $1. For example, you can give $0 and keep $10 or give $2 and keep $8. These are only hypothetical examples, and the decision of how much to give is entirely yours. In this situation, you are the ***divider*** and the other person is the ***receiver***.

You will now be given a similar task with *hypothetical* allocations.

When you are ready, click next to proceed to the task.

---*Page Break*---

You will first be a ***receiver*** in this economic decision-making task. You will be matched with another participant before you who was a ***divider.***

This participant was given $10 and told that the $10 was theirs to keep but could divide up the money in any manner between themselves and you.
You will also be given some context about their decision.

Please click next when you have understood the information given above and wish to be matched with another participant.

---*Page Break*---

Please wait while we match you with another participant. [Program to wait 3-5 seconds]

---*Page Break*---

[Greed + Intentional Condition]

You have been matched with participant 10045. This participant decided to give you $0 out of the $10 they received.

This means **you get $0** and **they keep $10**.

The participant gave the following reason:

"If I can keep all the money then why not. Besides, I don't know the next person"

[Greed + Unintentional Condition]

You have been matched with participant 10045. This participant decided to give you $0 out of the $10 they received.

This means **you get $0** and **they keep $10**.

The participant gave the following reason:

"Sorry, I meant to give a different amount but I think I misread the instructions"

[Generosity + Intentional Condition]

You have been matched with participant 10045. This participant decided to give you $10 out of the $10 they received.

This means **you get $10** and **they keep $0**.

The participant gave the following reason:

"If I can give all the money then why not. I don't need the money so I might as well help others and spread some positivity"

[Generosity + Unintentional Condition]

You have been matched with participant 10045. This participant decided to give you $10 out of the $10 they received.

This means **you get $10** and **they keep $0**.

The participant gave the following reason:

"Sorry, I meant to give a different amount but I think I misread the instructions"

---Page Break---

Recall that the participant before you decided to give you $X out of $10.

This means **you get $X** and **they keep $[10 – X].** [Replace X with condition amount]

The participant gave the following reason:

"[Condition text]"

Now you have a chance to be the ***divider*** in this economic decision-making task. You are given $10. The $10 is yours to keep. The next future participant will now receive any amount of money that you decide to transfer to them. It is up to you to determine how to divide the money.

You will remain *completely anonymous* to the next participant.
How much of your $10, if any, would you transfer to the next participant?

- $0 … $10

---Page Break---

Recall that the participant before you decided to give you $X out of $10.

This means **you get $X** and **they keep $[10 – X].** [Replace X with condition amount]

The participant gave the following reason:

"[Condition text]"

[Fairness Other] How fair was their decision to give you this amount?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Justified Other] To what extent do you think their reason for giving this amount was justified?

- *1 Not at all*
- *2*
- *3*
- *4*
- *5 A lot*

[Fairness Self] You decided to give $[Pipe amount selected by participant] out of $10 to the next participant. How fair do you think your choice was?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Demographic Items]

[SES] A person's socioeconomic status is based on a combination of their levels of wealth, education, and the quality of their jobs. Please indicate on a scale from 0 to 10 where you feel you are currently.

- *0 Least amount of money, little to no education, and no jobs*
- *1*

- *2*
- *3*
- *4*
- *5 An average amount of money and education, and decent jobs*
- *6*
- *7*
- *8*
- *9*
- *10 Most amount of money, highest amount of education, and really good jobs*

[Education] What is the highest level of education you have completed?

- *Less than High School*
- *High School/GED*
- *Some college*
- *2-year College degree (Associate's)*
- *4-year College (Bachelor's)*
- *Master's Degree*
- *Professional Degree (e.g., M.D., J.D.)*
- *Doctoral Degree (e.g., Ph.D.)*
- *I don't know/Prefer not to say*

[Collect age and gender information directly from Prolific]

Study 6 Materials

[Generalized Reciprocity]

[Instructions]

Please read the instructions given to you carefully.

Imagine a situation where you can keep or give any portion of $10 to another person in increments of $1. For example, you can give $0 and keep $10 or give $2 and keep $8. These are only hypothetical examples, and the decision of how much to give is entirely yours. In this situation, you are the ***divider*** and the other person is the ***receiver***.

You will now be given a similar task with *hypothetical* allocations.

When you are ready, click next to proceed to the task.

---Page Break---

You will first be a ***receiver*** in this economic decision-making task. You will be matched with another participant before you who was a ***divider.***

This participant was given $10 and told that the $10 was theirs to keep but could divide up the money in any manner between themselves and you.
You will also be given some context about their decision.

Please click next when you have understood the information given above and wish to be matched with another participant.

---Page Break---

Please wait while we match you with another participant. [Program to wait 3-5 seconds]

---Page Break---

[Greed + Greed Norm Condition]

You have been matched with participant 10045. This participant decided to give you $2 out of the $10 they received.

This means **you get $2** and **they keep $8**.

On average, participants have so far given $2.57 to the next person.

[Greed + Generosity Norm Condition]

You have been matched with participant 10045. This participant decided to give you $2 out of the $10 they received.

This means **you get $2** and **they keep $8**.

On average, participants have so far given $7.43 to the next person.

[Generosity + Greed Norm Condition]

You have been matched with participant 10045. This participant decided to give you $8 out of the $10 they received.

This means **you get $8** and **they keep $2**.

On average, participants have so far given $2.57 to the next person.

[Generosity + Generosity Norm Condition]

You have been matched with participant 10045. This participant decided to give you $8 out of the $10 they received.

This means **you get $8** and **they keep $2.**

On average, participants have so far given $7.43 to the next person.

---*Page Break*---

Recall that the participant before you decided to give you $X out of $10.

This means **you get $X** and **they keep $[10 – X].** [Replace X with condition amount]

On average, participants have so far given $X to the next person. [Replace X with 2.57 or 7.43 depending on condition]

Now you have a chance to be the ***divider*** in this economic decision-making task. You are given $10. The $10 is yours to keep. The next future participant will now receive any amount of money that you decide to transfer to them. It is up to you to determine how to divide the money.

You will remain *completely anonymous* to the next participant.
How much of your $10, if any, would you transfer to the next participant?

- $0 … $10

---*Page Break*---

Recall that the participant before you decided to give you $X out of $10.

This means **you get $X** and **they keep $[10 – X].** [Replace X with condition amount]

On average, participants have so far given $X to the next person. [Replace X with 2.57 or 7.43 depending on condition]

[Fairness Other] How fair was their decision to give you this amount?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Fairness Relative] How fair was their decision to give you this amount compared to the average amount given by participants so far?

- *1 Not at all*
- *2*
- *3*
- *4*
- *5 A lot*

[Fairness Self] You decided to give $[Pipe amount selected by participant] out of $10 to the next participant. How fair do you think your choice was?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Demographic Items]

[SES] A person's socioeconomic status is based on a combination of their levels of wealth, education, and the quality of their jobs. Please indicate on a scale from 0 to 10 where you feel you are currently.

- *0 Least amount of money, little to no education, and no jobs*
- *1*
- *2*
- *3*
- *4*
- *5 An average amount of money and education, and decent jobs*
- *6*
- *7*
- *8*
- *9*
- *10 Most amount of money, highest amount of education, and really good jobs*

[Education] What is the highest level of education you have completed?

- *Less than High School*
- *High School/GED*
- *Some college*
- *2-year College degree (Associate's)*
- *4-year College (Bachelor's)*
- *Master's Degree*
- *Professional Degree (e.g., M.D., J.D.)*
- *Doctoral Degree (e.g., Ph.D.)*
- *I don't know/Prefer not to say*

[Collect age and gender information directly from Prolific]

Study 7 Materials

[Generalized Reciprocity]

[Instructions]

Please read the instructions given to you carefully.

Imagine a situation where you can keep or give any portion of $10 to another person in increments of $1. For example, you can give $0 and keep $10 or give $2 and keep $8. These are only hypothetical examples, and the decision of how much to give is entirely yours. In this situation, you are the ***divider*** and the other person is the ***receiver***.

You will now be given a similar task with *hypothetical* allocations.

When you are ready, click next to proceed to the task.

---Page Break---

You will first be a ***receiver*** in this economic decision-making task. You will be matched with another participant before you who was a ***divider.***

This participant was given $10 and told that the $10 was theirs to keep but could divide up the money in any manner between themselves and you.
You will also be given some context about their decision.

Please click next when you have understood the information given above and wish to be matched with another participant.

---Page Break---

Please wait while we match you with another participant. [Program to wait 3-5 seconds]

---Page Break---

[Greed + Greed Norm Condition]

You have been matched with participant 10045. This participant decided to give you $2 out of the $10 they received.

This means **you get $2** and **they keep $8**.

On average, participants so far suggest that you give approximately $2.57 to the next person.

[Greed + Generosity Norm Condition]

You have been matched with participant 10045. This participant decided to give you $2 out of the $10 they received.

This means **you get $2** and **they keep $8**.

On average, participants so far suggest that you give approximately $7.43 to the next person.

[Generosity + Greed Norm Condition]

You have been matched with participant 10045. This participant decided to give you $8 out of the $10 they received.

This means **you get $8** and **they keep $2**.

On average, participants so far suggest that you give approximately $2.57 to the next person.

[Generosity + Generosity Norm Condition]

You have been matched with participant 10045. This participant decided to give you $8 out of the $10 they received.

This means **you get $8** and **they keep $2.**

On average, participants so far suggest that you give approximately $7.43 to the next person.

---*Page Break*---

Recall that the participant before you decided to give you $X out of $10.

This means **you get $X** and **they keep $[10 – X].** [Replace X with condition amount]

On average, participants so far suggest that you give approximately $X to the next person. [Replace X with 2.57 or 7.43 depending on condition]

Now you have a chance to be the ***divider*** in this economic decision-making task. You are given $10. The $10 is yours to keep. The next future participant will now receive any amount of money that you decide to transfer to them. It is up to you to determine how to divide the money.

You will remain *completely anonymous* to the next participant.
How much of your $10, if any, would you transfer to the next participant?

- $0 … $10

---*Page Break*---

Recall that the participant before you decided to give you $X out of $10.

This means **you get $X** and **they keep $[10 – X].** [Replace X with condition amount]

On average, participants so far suggest that you give approximately $X to the next person. [Replace X with 2.57 or 7.43 depending on condition]

[Fairness Other] How fair was their decision to give you this amount?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Fairness Self] You decided to give $[Pipe amount selected by participant] out of $10 to the next participant. How fair do you think your choice was?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Recommend] How much do you recommend others give to the next participant after them?

- *$0 ... $10*

[Demographic Items]

[SES] A person's socioeconomic status is based on a combination of their levels of wealth, education, and the quality of their jobs. Please indicate on a scale from 0 to 10 where you feel you are currently.

- *0 Least amount of money, little to no education, and no jobs*
- *1*
- *2*
- *3*
- *4*
- *5 An average amount of money and education, and decent jobs*
- *6*
- *7*
- *8*
- *9*
- *10 Most amount of money, highest amount of education, and really good jobs*

[Education] What is the highest level of education you have completed?

- *Less than High School*
- *High School/GED*
- *Some college*

- *2-year College degree (Associate's)*
- *4-year College (Bachelor's)*
- *Master's Degree*
- *Professional Degree (e.g., M.D., J.D.)*
- *Doctoral Degree (e.g., Ph.D.)*
- *I don’t know/Prefer not to say*

[Collect age and gender information directly from Prolific]

Study 8 Materials

[Generalized Reciprocity]

[Instructions]

Imagine a situation where you can keep or give any portion of 10¢ to another person in increments of 1¢. For example, you can give 0¢ and keep 10¢ or give 2¢ and keep 8¢. These are only hypothetical examples, and the decision of how much to give is entirely yours. In this situation, you are the ***divider*** and the other person is the ***receiver***.

You will now be given two similar tasks with ***real allocations*** involving ***USD 10¢*** (10 cents) in increments of 1¢ (1 cent) each.

(Please note, USD 10¢ converts to CAD 12¢, AUD 13¢, NZD 14¢, EUR 8c, and GBP 7p)

When you are ready, click next to proceed to the task.

---Page Break---

You will first be a ***receiver*** in this economic decision-making task. You will be matched with another participant before you who was a ***divider.***

This participant was given 10¢ and told that the 10¢ was theirs to keep but could divide up the money in any manner between themselves and you.
You will also be given some context about their decision.

Please click next when you have understood the information given above and wish to be matched with another participant.

---Page Break---

Please wait while we match you with another participant. [Program to wait 3-5 seconds]

---Page Break---

[Greed + Intentional Condition]

You have been matched with participant 10045. This participant decided to give you 0¢ out of the 10¢ they received.

This means **you get 0¢** and **they keep 10¢**.

The participant gave the following reason:

"If I can keep all the money then why not. Besides, I don't know the next person"

[Greed + Unintentional Condition]

You have been matched with participant 10045. This participant decided to give you 0¢ out of the 10¢ they received.

This means **you get 0¢** and **they keep 10¢**.

The participant gave the following reason:

"Sorry, I meant to give a different amount but I think I misread the instructions"

[Generosity + Intentional Condition]

You have been matched with participant 10045. This participant decided to give you 10¢ out of the 10¢ they received.

This means **you get 10¢** and **they keep 0¢**.

The participant gave the following reason:

"If I can give all the money then why not. I don't need the money so I might as well help others and spread some positivity"

[Generosity + Unintentional Condition]

You have been matched with participant 10045. This participant decided to give you 10¢ out of the 10¢ they received.

This means **you get 10¢** and **they keep 0¢**.

The participant gave the following reason:

"Sorry, I meant to give a different amount but I think I misread the instructions"

---Page Break---

Recall that the participant before you decided to give you X¢ out of the 10¢ they received.

This means **you get X¢** and **they keep [10 – X]¢**. [Replace X with condition amount]

The participant gave the following reason:

"[Condition text]"

Now you have a chance to be the ***divider*** in this economic decision-making task. You are given 10¢. The 10¢ is yours to keep. The next future participant will now receive any amount of money that you decide to give to them. It is up to you to determine how to divide the money.

You will remain *completely anonymous* to the next participant.
How much of your 10¢, if any, would you give to the next participant?

- 0¢ … 10¢

---Page Break---

Recall that the participant before you decided to give you X¢ out of the 10¢ they received.

This means **you get X¢** and **they keep [10 – X]¢**. [Replace X with condition amount]

The participant gave the following reason:

"[Condition text]"

[Fairness Other] How fair was their decision to give you this amount?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Justified Other] To what extent do you think their reason for giving this amount was justified?

- *1 Not at all*
- *2*
- *3*
- *4*
- *5 A lot*

[Fairness Self] You decided to give $[Pipe amount selected by participant] out of $10 to the next participant. How fair do you think your choice was?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Demographic Items]

[SES] A person's socioeconomic status is based on a combination of their levels of wealth, education, and the quality of their jobs. Please indicate on a scale from 0 to 10 where you feel you are currently.

- *0 Least amount of money, little to no education, and no jobs*
- *1*

- *2*
- *3*
- *4*
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[Education] What is the highest level of education you have completed?

- *Less than High School*
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- *Some college*
- *2-year College degree (Associate's)*
- *4-year College (Bachelor's)*
- *Master's Degree*
- *Professional Degree (e.g., M.D., J.D.)*
- *Doctoral Degree (e.g., Ph.D.)*
- *I don't know/Prefer not to say*

[Collect age and gender information directly from Prolific]

Study 9 Materials

[Generalized Reciprocity]

[Instructions]

Imagine a situation where you can keep or give any portion of 10¢ to another person in increments of 1¢. For example, you can give 0¢ and keep 10¢ or give 2¢ and keep 8¢. These are only hypothetical examples, and the decision of how much to give is entirely yours. In this situation, you are the ***divider*** and the other person is the ***receiver***.

You will now be given two similar tasks with ***real allocations*** involving ***USD 10¢*** (10 cents) in increments of 1¢ (1 cent) each.

(Please note, USD 10¢ converts to CAD 12¢, AUD 13¢, NZD 14¢, EUR 8c, and GBP 7p)

When you are ready, click next to proceed to the task.

---*Page Break*---

You will first be a ***receiver*** in this economic decision-making task. You will be matched with another participant before you who was a ***divider.***

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---*Page Break*---

Please wait while we match you with another participant. [Program to wait 3-5 seconds]

---*Page Break*---

[Greed + Greed Norm Condition]

You have been matched with participant 10045. This participant decided to give you 0¢ out of the 10¢ they received.

This means **you get 0¢** and **they keep 10¢**.

On average, participants have so far given 2.57¢ to the next person.

[Greed + Generosity Norm Condition]

You have been matched with participant 10045. This participant decided to give you 0¢ out of the 10¢ they received.

This means **you get 0¢** and **they keep 10¢**.

On average, participants have so far given 7.43¢ to the next person.

[Generosity + Greed Norm Condition]

You have been matched with participant 10045. This participant decided to give you 10¢ out of the 10¢ they received.

This means **you get 10¢** and **they keep 0¢**.

On average, participants have so far given 2.57¢ to the next person.

[Generosity + Generosity Norm Condition]

You have been matched with participant 10045. This participant decided to give you 10¢ out of the 10¢ they received.

This means **you get 10¢** and **they keep 0¢**.

On average, participants have so far given 7.43¢ to the next person.

---*Page Break*---

Recall that the participant before you decided to give you X¢ out of the 10¢ they received.

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On average, participants have so far given X¢ to the next person. [Replace X with condition amount]

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- 0¢ … 10¢

---*Page Break*---

Recall that the participant before you decided to give you X¢ out of the 10¢ they received.

This means **you get X¢** and **they keep [10 – X]¢**. [Replace X with condition amount]

On average, participants have so far given X¢ to the next person. [Replace X with condition amount]

[Fairness Other] How fair was their decision to give you this amount?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Fairness Relative] How fair was their decision to give you this amount compared to the average amount given by participants so far?

- *1 Not at all*
- *2*
- *3*
- *4*
- *5 A lot*

[Fairness Self] You decided to give $[Pipe amount selected by participant] out of $10 to the next participant. How fair do you think your choice was?

- *1 Much less than fair*
- *2*
- *3 Fair*
- *4*
- *5 Much more than fair*

[Demographic Items]

[SES] A person's socioeconomic status is based on a combination of their levels of wealth, education, and the quality of their jobs. Please indicate on a scale from 0 to 10 where you feel you are currently.

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- *Professional Degree (e.g., M.D., J.D.)*
- *Doctoral Degree (e.g., Ph.D.)*
- *I don't know/Prefer not to say*

[Collect age and gender information directly from Prolific]