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Exploring the Virtues of Gossip: The Prosocial Motivations and Functions of Reputational Information Sharing

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By

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Abstract

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Selfish behavior can plague the formation of cooperative relationships and collective efforts. Understanding ways in which groups can overcome selfish motives and foster cooperation, therefore, becomes essential. Recent research reveals that reputation systems promote cooperation and deter antisocial behavior in groups. Little is known, however, about how and why people share reputational information. In this dissertation, I seek to establish the existence and dynamics of *prosocial gossip,* the sharing of negative evaluative information about a target in a way that protects others from antisocial or exploitative behavior. I present a model of prosocial gossip and the results of five studies testing the model's claims. Results of Studies 1-3 demonstrate that (a) individuals who observe an antisocial act experience negative affect and are compelled to share information about the antisocial actor with a potentially vulnerable person, (b) sharing such information reduces negative affect created by observing the antisocial behavior, (c) individuals possessing more prosocial orientations are the most motivated to engage in such gossip, even at a personal cost, and exhibit the greatest reduction in negative affect as a result. Taken together these results highlight the roles of prosocial motivations and negative affective reactions to injustice in maintaining reputational information sharing in groups. Studies 4-5 explore two ways in which prosocial gossip can effectively deter selfishness and promote cooperation. Study 4 reveals that prosocial gossip promotes cooperation by deterring selfish behavior, especially among those who are more egoistic and prone to exploit others. Study 5 demonstrates how prosocial gossip fosters cooperation by facilitating partner selection, guiding the recipients of the gossip in selecting who to interact with and who to ostracize. I conclude by discussing implications for reputational theories of the maintenance of cooperation in human groups and laying out possibilities for future research.

Introduction

Cooperation is fundamental to social life, yielding benefits ranging from the production of public goods to rewarding feelings of cohesion and solidarity (Axelrod & Hamilton, 1981; Kollock, 1998; Sober & Wilson, 1998). Despite the benefits of cooperation there are strong incentives for individuals to behave selfishly at the expense of others, either by behaving in an untrustworthy way, failing to make costly contributions to group efforts, or defecting when others have cooperated (Dawes, 1980; Kollock, 1998; Weber, Kopelman, & Messick, 2004). Selfish actions like these undermine collective efforts to produce public goods and can result in the depletion of scarce resources (Hardin, 1968).

At the heart of the problem is that a group's interests are often at odds with each group member's individual interest, which creates a situation commonly called a *social dilemma* (Dawes, 1980; Frank, 1988; Komorita and Parks, 1996; Willer, 2009). Social dilemmas occur when every individual in a group earns a higher payoff for socially defecting than for socially cooperating, yet all group members earn a higher payoff if all cooperate and not defect (Dawes, 1980). Social dilemmas are common in the real world, especially when groups of individuals are producing a public good or are using a scarce common-pool resource. An example of a public good is public television (e.g., PBS), which operates solely from the donations of its viewers. Public television is broadcasted to all members of a community regardless of whether they donated any money or not. Thus, there is an incentive for viewers to "free ride" on the donations of others. However, if all members of the community act on this incentive, then no one would donate, and there would be no public television. A similar dilemma occurs for common-pool resources such as having a tax-payer funded service like the fire department. There is an incentive for each person to minimize the amount in taxes they owe (or find a way of not paying them altogether). Yet, if everyone acts on this incentive, then the government's revenue would decline and many social services could no longer be provided.

Social dilemmas pose a fundamental social scientific problem that seems impossible to solve from a biological and rational actor perspective (Kollock, 1998; Weber et al., 2004). From these perspectives, human beings (and their genes) are guided by self-interest, always looking to maximize their own outcomes (Dawkins, 1976). Cooperation inherently involves an individual restraining self-interest, and rather maximizing the group's interest. Thus, from the biological and rational actor perspective, cooperation is a great puzzle -- how can cooperative groups exist and function successfully if the existence of such groups requires individuals to restrain their self-interest for the good of the group? How could natural selection select for cooperativity if all those who evolved a propensity to cooperate face decreased evolutionary fitness (relative to those who would selfishly exploit their cooperativity)? The puzzle of why people cooperate and successfully live in social groups is of central focus across all different disciplines in both the social and biological sciences, ranging from genetics to sociology (Dawes, 1980; Hardin, 1968; Kollock, 1998; Weber et al., 2004).

Solutions to social dilemmas center upon an age-old question: What motivates group members to forego the temptation of selfish action? The literature addressing this question can, in general, be divided into two categories: Individual differences and social mechanisms. Research into individual differences regarding cooperation and prosocial behavior finds evidence for differences at varying levels of analysis, from genetics to personality measures. Below I provide a review of this research before moving on to the social mechanisms literature.

Individual Differences in Cooperative and Prosocial Behavior

Initial evidence indicating a genetic predisposition for prosociality has come from heritability studies (Deater-Deckard, Dunn, O'Connor, Davies, & Golding, 2001; Knafo, Israel, & Ebstein, 2011; Knafo & Plomin, 2006; Rushton, Fulker, Neale, Nias, & Eyesenk, 1986). These studies used comparisons of twins, monozygotic and dizygotic, to calculate the heritability of prosocial traits. Overall, a review of the literature indicates that heritability accounts for approximately 40% (usually ranging from 20-50%) of the variance in prosocial behavior (Knafo et al., 2011; Knafo & Plomin, 2006). This heritability research has used multiple measures of prosociality, including self-reported measures, mother-reported measures, and behavioral measures like contributions in various economic games designed to gauge cooperation and trustworthiness. For instance, Rushton et al. (1986) had both monozygotic and dizygotic twins complete a variety of questionnaires measuring prosocial behavior (e.g., the Altruistic Personality Questionnaire; Rushton, Chrisjohn, & Fekken, 1981). Using an established heritability estimate calculation involving subtracting the shared variance in monozygotic twins by the shared variance in dizygotic twins (Plomin, DeFries, McClearn, & McGuffin, 2001), they found that about 50-60% of the variance on each scale was due to genetic effects.

Building on these heritability studies' findings, researchers have searched for and successfully pinpointed genes that predict prosocial tendencies. For instance, the arginine vasopressin 1a (AVPR1a) repeat, a gene found to influence affiliative behavior in various mammals has been found to be a significant predictor of generous and cooperative behavior in humans (Israel, Lerer, Shalev, et al. 2008; Knafo, Israel, & Darvasi et al., 2007). In particular, the longer a participant's AVPR1a repeat, the more that participant tended to give in a dictator game. As corroborating evidence Knafo et al. (2007) also measured self-reported prosocial behavior and found the same pattern; the longer the AVPR1a repeat, the more likely the participants were to score high on the prosocial behavior questionnaires. Additionally, although the AVPR1a repeat has yielded the most robust findings, research has also implicated other genes associated with dopamine and oxytocin receptors (e.g., DRD and OXTR) as likely predictors of other-oriented and cooperative behaviors (Bacher-Melman, Gritsenko, Nemanov, Zohar, & Ebstein, 2005; Ebstein, Israel, Chew, Zhong, & Knafo, 2010; Israel et al., 2008; Kosfeld, Heinrichs, Zak, Fischbacher, & Fehr 2005).

Corroborating the heritability and genetics research, there is also evidence of individual differences in cooperation, and more generally prosocial behavior, at the personality level. Scattered findings demonstrate that personality constructs such as agreeableness (Koole, Jager, van de Berg, Vlek, & Hofstee, 2001), self-monitoring (Boone, De Brabander, & van Witteloostuijn, 1999; De Cremer, Snyder, & Dewitte, 2001), and trust (Kramer & Goldman, 1995) predict cooperation in social dilemma situations. The majority of the research conducted in this area, however, focuses on Social Value Orientation (SVO; Balliet, Parks, & Joireman, 2009; Kollock, 1998; McClintock, 1972; Simpson, 2004; Simpson & Willer, 2008; Van Lange, 1999; Weber, Kopelman, & Messick, 2004). SVO measures one's preferences for how resources should be distributed between oneself and a hypothetical other. In general, there are three orientations: (1) prosocial – preferring that both self and other get an equal share of the resources, (2) egoist – preferring that self gets as much of the resource as possible regardless of the outcome of other, and (3) competitor – preferring that self maximizes the relative difference between self and other. As one might expect, the SVO has shown clear predictive validity; those with prosocial orientations are significantly more likely to cooperate in social dilemma situations

(Kollock, 1998; Kuhlman & Marshello, 1975; McClintock & Liebrand, 1988; Van Lange, 1999; Weber, et al., 2004). Additionally, research has shown that SVO is not highly overlapping with social desirability concerns (Knight & Kagan, 1977; Platow, 1994), and investigations have demonstrated the scale's test-retest reliability (approximately .81) across a two-month time period (Kulhman, Camac, & Cunha, 1986; Liebrand & Van Lange, 1989).

It should be noted that although many individuals fall into the prosocial category, very few of them will cooperate unconditionally (Kurzban & Houser, 2001; Weber, et al., 2004; Weber & Murnigham, 2008). Rather, most of these individuals (ranging from 42-81% of the population depending the study; Kocher, Cherry, Kroll, Netzer, & Sutter, 2007) are "conditional cooperators" in that they are only willing to cooperate if they know others are going to cooperate as well. If they believe others will defect based on, for example, signals of uncooperativity (e.g., emotion expression), reputational information (e.g., image scoring), or primes of distrust (e.g., Wall Street), they too will defect in response. In other words, these individuals will defect out of fear of being a sucker (Ahn, Ostrom, Schmidt, Shupp, & Walker, 2001; Axelrod, 1984; Bruins, Liebrand, & Wilke, 1989; Kuwabara, 2005; Liberman, Samuels, & Ross, 2004; Simpson, 2003; Wedekind & Milinkski, 2000). For example, Kuwabara (2005), developed a "fear-of-greed game" that disentangled whether participants' choice to defect was due to greed or fear of greed. This research finds clear evidence that fear of greed is a primary motive for defecting in social dilemma situations.

Although individual difference research demonstrates that some individuals possess a disposition for cooperation, this research also indicates that many others do not have such a disposition. As past research has found, these selfish "bad apples" (those who defect out of greed in social dilemma situations) cause defection to spread throughout the group because the prosocial individuals, who would otherwise have chosen to cooperate, react to such selfishness with decreased cooperation out of fear of being exploited (Kollock, 1998; Weber et al., 2004; Weber & Murnigham, 2008). Indeed, it only takes a small number of selfish individuals to cause a chain reaction of defection (Dawes, 1980; Kollock, 1998). As an example, there is a group of six individuals all assigned to a group project. Five of them are conditional cooperators, whereas the sixth is a defector. The work on the project begins, but the defector does not contribute anything to the group's work. One of the conditional cooperators recognizes this and, in response, chooses to defect as well. Now there are two individuals defecting. Another group member notices that these other individuals are defecting, so he or she likewise decides to defect. Soon enough, all individuals in the group choose to defect rather than be a sucker who does all the work for everyone else in the group. As a result, the group's work never gets done.

Reputation as a Social Mechanism for Solving Social Dilemmas

Research suggests that certain social mechanisms can help address the heterogeneity of prosociality described above (Weber et al., 2004). For instance, some studies have shown that restructuring payoffs or reframing group members' understanding of the situation can promote cooperation to some extent (e.g., Liberman, Samuels, & Ross, 2004; Simpson, 2004; Van Lange, Liebrand, Messick, & Wilke, 1992). Yet, most proposed solutions to social dilemmas build on the notion that the problem of cooperation can be solved if cooperative individuals selectively interact with only those individuals who will reliably cooperate (Brown, Palameta, & Moore, 2003; Dunbar, 1996; Feinberg, Willer, & Keltner, 2012; Frank, 1988). Indeed, if cooperators can reliably detect one another, then they can selectively interact, thereby enjoying the benefits of

mutual cooperation while avoiding the costs of exploitation by more egoistic individuals. In order for this mechanism to be effective, however, accurate judgments of others' degree of prosociality are extremely important. Thus, of vital concern is how individuals can make accurate judgments about another's cooperative tendencies, in particular in the initial stages of relationships.

If individuals' reputations from previous interactions are known, then accurate judgments of prosociality can be made readily and reliably. Widespread sharing of reputational information tracks individuals' past behaviors in mixed-motive settings in ways that can help sustain cooperation in groups. Although this role of reputation systems as a solution to the problem of cooperation has garnered a great deal of interest in recent years (Barclay, 2004; Barclay & Willer, 2007; Hardy & van Vugt, 2006; Milinski, Semmann, & Krambeck, 2002; Willer, 2009), little research has examined the dynamics of reputational information sharing.

Before one can fully understand the importance of reputation, it is important to clearly define this term. In general, building on previous accounts of reputation (Bromley, 1993; Craik, 2007; Emler, 1990), Anderson & Shirako (2008) define reputation as "the set of beliefs, perceptions, and evaluations a community forms about one of its members (p. 320)." They emphasize that perceptions of one's *behavior* are the foundation of that person's reputation in the eyes of others. However, because individuals in a community cannot witness all the behaviors that everyone else does, ultimately reputation stems from what one hears from others (the focus of much of this dissertation). Because information gets altered as it is spread from one person to the next, reputation is ultimately grounded in both truth and mutations of the truth (including direct lies). Thus, as will be argued below, one's reputation is a combination of what an individual does and the information others spread about that individual (whether grounded in truth or not).

Importantly, reputation is distinct from similar concepts like one's general impressions and personality. Reputation is different from one's general impressions of another individual because reputation is not based on only one person's assumptions of another. Rather reputation is a conglomeration of perceptions based on what multiple individuals have witnessed and/or conveyed to others about an individual (Anderson & Shirako, 2008). If a target person was only known by one other human in the world, then in theory, that target would not have a reputation.

In addition, reputation differs from personality in a couple of important ways. Personality is conceived to be a stable set of traits that guide an individual's thoughts, mannerisms, and behaviors (John & Srivastava, 1999) and have been shown to be dependent on heredity and genetics (e.g., Floderus-Myrhed, Pedersen, & Rasmuson, 1980; Penke, Denissen, & Miller, 2007), whereas reputation is much more dependent on what others believe about the individual. Indeed, an individual who lived in isolation still would have a personality, but would have no reputation.

In this dissertation I investigate the role of a social process that involves spreading reputational information about others which on the surface seems like an unlikely source of cooperation in groups – gossip.

Defining Gossip

In his review article, Foster (2004) points out, "We all 'know' what gossip is, but defining [gossip] is a complex enterprise for practical investigation (p. 80)." However, as Foster goes on to point out, without a firm definition, scientific research on gossip becomes extremely

complicated because researchers will have diverging conceptual foundations for their investigations. In attempts to establish a clear conceptual foundation for the current research, and hopefully for any research that it spawns, below I attempt to formulate a scientific definition of gossip that stems from our lay understanding of the act.

Although, as Foster (2004) points out, it may not be possible to put into words a definition of gossip that perfectly adheres to most people's intuitive conception of the term, as a starting point, we can attempt to deduce what components are essential for a conversation to be considered gossip. Along those lines, it seems that for a conversation to be considered gossip it must involve two components: The conversation must be about an *absent third party* and the information discussed must have *evaluative content*. If one removes either of these components from the conversation, the intuitive notion that the conversation is gossip will likely disappear for most individuals. Why this is the case is unclear, but what is clear is that when one envisions gossip taking place, there must be a target of the communication that is not present, or at least not able to hear the conversation as it takes place. In fact, this point is further emphasized if one imagines what happens when two individuals are gossiping about a third party and that third party enters the room (or gets within ear shot). This conversation either stops entirely or gets changed to a different topic.

Similarly, gossip seems to involve communication that is inherently evaluative. Without this evaluative component, there would be no difference between sharing news about someone and gossiping. But, it seems, few would consider sharing news about another individual (e.g., Joan got rejected by Berkeley; Joan got stuck in traffic yesterday) to be a form of gossip. Rather, this news needs to be coupled with evaluative information (e.g., Joan was lazy and did not spend much time on her application and got rejected by Berkeley; Joan stupidly refused my advice and took the freeway and then got stuck in traffic yesterday). Thus, based on the above analysis, it seems that gossip, at a minimum, would be defined as "talking about an absent third party in an evaluative manner". This appears to be a good starting ground and is closely aligned with what other researchers have used as their definition (for a review, see Foster, 2004). Yet, there seem to be other important aspects of gossip that should be included in a definition to more clearly distinguish gossip from other forms of conversing.

The valence of the information discussed appears to be very important. Gossip is clearly associated with negativity. Although people do spread positive information about others, it is questionable whether this communication should be classified as gossip. Instead, it seems to be more in line with praise (or if the positive information is about a close other, a form of bragging). People fear being gossiped about and go out of their way to prevent others from talking about them when they are not present. There seems to be little reason for individuals to be so worried about gossip if the information spread about them is positive. In a similar vein, when people engage in gossip, there is usually a clear sense that they are being mean (i.e., "spreading dirt", "talking trash"), oftentimes admitting their cruelty prior to engaging in the behavior (i.e., "I hate to gossip, but …", "I know it is mean to spread this information, but…"). Moreover, from a scientific perspective, it would be almost impossible to parsimoniously group the spreading of negative and positive information about others together since the motivations underlying each of these and the functions that each serve are certainly different.

Another aspect of gossip that seems important to include in its definition is its indirectness and informality. Gossip appears to be inherently "off-record" rather than "on-record", where off-record communication refers to communication that is done informally, indirectly, and implies that the communication is not necessarily true, and on-record

communication refers to more direct (face-to-face) communication that is more formal and conveys more certainty on the matter (Clark, 1996; Grice, 1975). Since gossip communication focuses on an absent third party, it must be indirect – often referred to as a prominent form of "indirect" aggression (Archer & Coyne, 2005). Moreover, in terms of being informal, although this dissertation argues that gossip serves a vital function, lay conceptions of gossip perceive it as idle talk between people who are just passing the time together. It is often conceived to be what people do to take a break from their more formal lives. For instance, gossip is something people do around the water cooler or during a smoking break – moments at work where people can be their most informal. Indeed, once communication about another becomes formal, or on the record (e.g., police report), for most this communication is no longer a form of gossip. Finally, gossip is notorious for being not 100% true or accurate. People are urged to not believe everything they hear and to be extremely skeptical of gossip in particular. Thus, gossip is inherently a form of off-record communication.

In addition, gossip seems to inherently affect the targets' reputation. Although this is closely associated with the fact that gossip entails evaluative content, it is distinct. One could spread evaluative information about another and this information will not have any impact on how others perceive the target of the gossip. For instance, one might complain to a friend about a third party who lives in China that the third party does not know or does not care about. The information this friend receives, though evaluative, will likely not affect the gossip target's reputation in the eyes of this friend (in fact, this friend might not develop any reputational judgments about the target) because the friend does not know the target in any way and likely will never know the target.

The above analysis reveals how complicated it is to define gossip. Surely, some readers will find fault in the above reasoning because each person has different intuitions about what gossip is. Even so, for scientific research to be conducted on gossip, a scientific definition must be established even if it does not perfectly coincide with everyone's lay conception of gossip. Thus, based on the above analysis of the components of gossip, I will use the following as my scientific definition of gossip:

Off the record communication about an absent third party in a negative evaluative manner such that the information provided can influence a recipient's impression of the third-party's reputation.[1]

I contend that a specific type of gossip helps solve the problem of cooperation (Dunbar, 1996; Sommerfeld, Krambeck, Semmann, & Milinski, 2007; Wilson, Wilczynski, Wells, & Weiser, 2000). I refer to this kind of gossip as *prosocial gossip*, the sharing of negative evaluative information about a target in a way that protects others from antisocial or exploitative behavior. Such information sharing is prosocial because of the overall cooperation and group benefit it engenders.

Categorizing Gossip

Before describing how prosocial gossip can engender cooperation and help solve social dilemmas, some information about the various types of gossip is warranted. Although no past research has attempted to break gossiping into separate categories, there is good reason to believe that different types of gossip exist. To better understand the different types of gossip,

here I briefly develop a classification method based on the intersection of gossip's underlying motivations and functions. I provide a matrix describing these categories of gossip in Figure 1.

Regarding motivations, in line with lay conceptualizations of gossip, I contend that much gossip is antisocially motivated, purposefully spread with the hopes of harming another's reputation. However, I also contend that it is possible for prosocial motivations to underlie some gossip. For instance, as will be examined in the current research, individuals may spread reputational information about others in hopes of warning and protecting them from an exploitative other.

One can further classify gossip based on the function the gossip serves. Gossip may serve an antisocial function by, for instance, hurting a target's feelings or leading others to ridicule the target. However, I contend, some gossip also likely serves a prosocial function by, for example, spreading accepted cultural norms that teach individuals how to behave, building friendships, and (the focus of this dissertation) engendering cohesion and cooperation in groups.

Looking at the intersection of the two axes also provides interesting insights. We see that 3 types of gossip emerge. When the motivations underlying gossip are antisocial and the gossip serves an antisocial function, gossip fits with people's more traditional conceptualization of the behavior which involves slandering another person for malicious reasons. If motivations are antisocial but gossip serves a prosocial function, then this gossip involves punishing an individual for positive reasons, and when the gossip both has a prosocial motivation and a prosocial function, the gossip involves warning and protecting. Finally, if the underlying motivation for gossiping is prosocial, but this gossiping ultimately serves an antisocial function such gossip can be deemed "accidental rumor mongering." This gossip is interesting in that it essentially backfires. The gossiper likely does it to help or protect, but for some reason, the gossip ends up hurting and serving a malicious purpose. For the current research, I focus on the gossip that serves a prosocial function (i.e., prosocial gossip), while also exploring the motivational aspects of this gossip to some extent.

Gossip as a Tool for Solving Social Dilemmas

In studies using social dilemmas, select evidence reveals that reputation dynamics, promote cooperation and deter selfishness (e.g., Hardy & Van Vugt, 2006; Milinski et al., 2002). Although never defined in the literature, here I define reputation dynamics as (1) individuals' awareness that their own behavior influences others' impression of them, and (2) individuals use of reputational information they have about someone as a guide for how to interact with that individual. Research has shown that individuals will refrain from defecting on others and selfishly depleting limited group resources if doing so enhances their reputation, so that others hold a more positive impression of them. For instance, in one study (Hardy & Van Vugt, 2006), when participants knew that their contributions were public rather than private, they behaved significantly more altruistically, giving away resources for the good of the group in a public goods dilemma game. In a second study (Milinski et al., 2002), participants interacted in a series of public goods games that pitted self-interest against group-interest. In one condition, after each game was played, participants also played in an indirect reciprocity game. This indirect reciprocity game provided participants the opportunity to reward others based on how they played previously in the public goods game. A control condition did not involve playing this indirect reciprocity game after each round. Results demonstrated that when indirect reciprocity rewards were on the line, participants played significantly more cooperatively during the public

goods games, suggesting that cooperation can flourish if developing a positive reputation by cooperating will earn the cooperator long-term benefits.

Other studies reveal that participants will contribute significantly more to a public good if they can earn greater status and prestige for their generous behavior (Barclay, 2004; Barclay & Willer, 2007; Hardy & Van Vugt, 2006; Willer, 2009). For instance, Willer (2009) found that in social dilemma situations, individuals who prosocially contribute to the group's interests earn status for their generosity (i.e., their partners rated them as having greater status –i.e., perceived as being more honorable, prestigious, and respected). Earning these status ratings subsequently motivates these individuals to contribute even greater amounts to the group's interest. In a similar vein, Hardy and Van Vugt (2006) showed that participants who prosocially contributed to their group's efforts were more likely afforded status, and this status conferral was proportional with the sacrifice they made for the group, such that the greater the sacrifice the more status they received. Furthermore, studies have demonstrated that when individuals know they will receive status benefits for their prosociality, they will even compete with others to be the most prosocial – a phenomenon called "competitive altruism" (Barclay, 2004; Barclay & Willer, 2007; Hardy & Van Vugt, 2006; Roberts, 1998).

Building upon these findings showing that reputational information helps solve social dilemmas, here I focus on how and why such reputational information is spread. Although often considered an antisocial behavior (Archer & Coyne, 2005), gossip may serve as a means by which reputational information is shared, thus helping solve social dilemmas (Dunbar, 1996; Sommerfeld et al., 2007; Wilson, et al., 2000). Through gossip, I suggest, groups can monitor their members and deter antisocial behavior, leading to the proliferation of cooperation and collective action (see also Barkow, 1992; Enquist & Leimar, 1993; McAndrew, 2008).

Ethnographic evidence attests to the benefits of some gossip, leading scholars to introduce the term "good gossip" (Goodman & Ben-Ze'ev, 1994), which refers to any act of gossip that serves a goal other than the selfish personal ends of the gossiper – a category in which prosocial gossip falls. For instance, Gluckman (1963; 1968) concluded from a review of anthropological field data collected across various small tribes and groups (e.g., Makah Indians of Vancouver, inhabitants of Plainsville a town in the Midwest of the USA) that gossip serves to bind groups together, reinforcing cultural norms and rules and marginalizing those who have veered from group-level expectations (Baumeister, Zhang, Vohs, 2004). Similarly, in their review of observational studies of gossip in small societies, Wilson and colleagues (2000) conclude that gossip deters selfishness and free-riding and helps enforce social rules (see also Acheson, 1988; Boehm, 1997; 1999; Ellickson, 1991; Haviland, 1977; Lee, 1990; McPherson, 1991). For example, Ellickson (1991) studied how cattle ranchers utilize gossip (and the threat of gossip) as a means for maintaining order and preventing cheating behavior. In the small community that he studied, ranches are family run and ranchers go out of their way to maintain their family name. Thus, when there is any type of problem, the ranchers quickly remedy it in order to avoid developing a negative reputation for themselves and their families through the spread of gossip. For instance when a cattle fence broke and cattle from one property began migrating onto another, the community of ranchers ensured that the owner of the fence quickly repaired it by spreading gossip about him and his family until he completed the repairs.

Additionally, a recent case study of gossip in an organization revealed that a crucial motive behind some gossip is to enhance group-level interests, finding that a free-rider on a rowing team who shirked his responsibilities by often missing team practices which hindered the organization's success were frequent targets of gossip (Kniffin & Wilson, 2005). This study

found that the gossip led group members to treat the free-rider with contempt and even perceive him as physically less attractive (as compared to the ratings of uninvolved, naïve observers). In the end, the free-rider chose to leave the rowing team.

Along with the aforementioned evidence, a few empirical studies have documented that people use information about an individual's previous actions – cooperative or competitive – to guide their own cooperative or competitive behavior towards that individual (e.g., Barclay, 2004; Sommerfeld et al., 2007; Wedekind & Milinski, 2000). For instance, Barclay (2004) found that participants used information about how other participants played in previous rounds of an economic game as a guide for determining who would make a trustworthy interaction partner in a subsequent economic trust game. Similarly, Wedekind & Milinski (2000) created "image scores" of participants based on how much they gave versus kept in an economic task. Then, other participants had an opportunity to donate some of an allotted endowment to these image scored individuals. The researchers found that participants based their donation decisions on participants' image scores. In particular, participants donated significantly more to those participants who had positive image scores – i.e., a reputation for giving. Finally, building on this work on image scoring, and closely resembling my arguments about gossip as a mechanism for facilitating partner selection, Sommerfeld et al. (2007) found that individuals used reputational information about other participants gleaned from gossip as a guide for determining who to reward and who to not reward in an indirect reciprocity game. This study involved participants learning of another participant's giving or selfish behavior during a task involving the participant choosing to either give 2 Euro to a recipient or keep 1.25 Euro for the self. After observing the target's choices across multiple rounds, participants then wrote a short (<50 words) note to another participant who would later play this same giving/keeping game with that target. Results showed that when the gossip notes informed recipients that their new interaction partner (the target) was generous and kind, these recipients were more likely to select the give 2 Euro option when playing the giving/keeping game. These results suggest that the transmission of reputational information through gossip influenced giving behavior in those who received the gossip.

In addition, a few studies have begun to document that gossip may be one social process by which group members share reputational information to promote cooperation. For example, participants reacted favorably toward individuals portrayed in vignettes who used gossip as a means of maintaining social order and cooperation (Wilson, et al., 2000). Still other studies provide initial evidence for the hypothesis that gossip deters antisocial behavior. Specifically, in one study participants behaved more generously if they knew that their interaction partners had a high propensity to gossip (Beersma & van Kleef, 2011). In this study, the researchers manipulated whether or not an interaction partner would learn about the participants' giving behavior in a generosity task, as well as whether an interaction partner had either a high or low propensity to spread reputational information about others' behavior (provided to participants through a supposed personality profile sheet). Results demonstrated that when participants believed the interaction partner was observing their behavior and this interaction partner had a high tendency to gossip, participants were significantly more generous in the giving task. Interestingly, when participants learned that their interaction partner was observing their behavior but this interaction partner had a low tendency to engage in gossip, participants were equally as selfish as they were if their interaction partner was not observing their behavior. This result suggests that participants behaved generously particularly because they feared that more

selfish behavior might lead their interaction partner to spread negative reputational information about them to others.

In another study, participants in a condition involving them knowing that information about their generous or selfish behavior in a dictator game might get relayed to someone they had become acquainted with also acted in a more generous fashion (Piazza & Bering, 2008). Specifically, the study employed a 2 x 2 design, manipulating whether or not the recipient in the dictator game could relay how the participant played in the dictator game to a third-party, and whether or not that third party was someone the participant had recently become acquainted with during a short interview. Importantly, participants were significantly more generous only when they knew the recipient could relay information about them to a third-party whom they had become acquainted with. Participants did not demonstrate this increase in generosity in the three other conditions. The fact that participants did not also behave generously in the condition where they learned that the recipient could relay information about how generous they were to someone they did not know personally, suggests that it is not the threat of being gossiped about that increases prosocial behavior. Rather, it seems, the threat that gossip might tarnish one's reputation in the eyes of individuals that could punish the selfish actor increases prosocial behavior.

Finally, in a sociometric study of a sorority house, those sisters who reported the greatest tendencies towards Machiavellianism – i.e., selfish, manipulative, and uncooperative behavior – were the most likely to be nominated by their group members as frequent targets of gossip (Keltner, van Kleef, Kraus, & Chen, 2008). Overall, these scattered findings provide suggestive evidence that gossip can enable cooperation in groups.

The Present Research: The Dynamics of Prosocial Gossip

Theoretical claims about how the sharing of reputational information enables cooperation in groups outpace existing empirical evidence. It remains unclear why individuals who possess such valuable reputational information about others would freely share it with others. Also, although some studies have examined gossip's effects on generosity and indirect reciprocity, no studies to date have systematically examined how gossip helps solve social dilemmas by enabling cooperation. In the present research I ask two questions: What motivates individuals to engage in prosocial gossip (i.e., to share reputationally damaging information about selfishly exploitative individuals) when they do not derive any obvious benefit from the act? And, does prosocial gossip actually promote cooperation within social dilemmas?

With respect to the first question, in the present research, I examine the underlying motives behind prosocial gossip. Although there may be multiple reasons for prosocial gossip (e.g., a desire to elicit reciprocal favors from others, an effort to promote one's reputation, forming close social bonds), I hypothesize that prosocial concerns, such as preferences for cooperation and fairness and an aversion to social exploitation, motivate such gossip. I argue, specifically, that selfish and exploitative behavior challenges these prosocial preferences, thereby motivating individuals to restore cooperation and prevent future antisocial behavior. Individuals engage in prosocial gossip as an effective and efficient means for achieving this prosocial goal (see also Feinberg, Cheng, & Willer, 2012).

In addition, I hypothesize that although prosocial goals motivate prosocial gossip, negative affect drives individuals to engage in it. Selfish and exploitative behavior contradicts individuals' prosocial preferences, which in turn causes them to experience negative affect, such as

frustration and annoyance. Such a claim builds upon past research demonstrating the human tendency to react negatively to unfairness and selfishness. Such transgressions elicit negative emotions and physiological arousal (Haidt, 2001; Horberg & Keltner, 2006), and do so in both those personally affected by the injustice and uninvolved bystanders (Fehr & Fischbacher, 2004; Markovsky, 1988; Rupp & Bell, 2010). This kind of emotional reaction to unfairness evokes a desire to undo the injustice, to make things right (e.g., Lerner, 1980; Miller, 2001; Horberg & Keltner, 2006). Indeed, research has shown that negative affect (e.g., anger, frustration) drives responses that help repair the unjust situation, even when action may be costly to the actor (Fetchenhauer & Huang, 2004; Frank, 1988; Miller, 2001), suggesting that although negative affect drives this behavior, the ultimate goal is positive and prosocial. Such a formulation also dovetails with the recent literature on strong reciprocity -- the tendency to cooperate with cooperators and to punish noncooperators (Bowles & Gintis, 2004; Gintis, 2000; Fehr & Fischbacher, 2003; Fehr & Gachter, 2002). In particular, research has demonstrated that strong reciprocity leads to altruistic punishment – sacrificing one's own self-interest to penalize antisocial behavior, a behavior driven by negative affective reactions (Fehr & Gachter, 2002; Fehr & Fischbacher, 2004).

A third hypothesis readily follows from this analysis. If individuals experience negative affect because they witness antisocial behavior that contradicts their prosocial preferences, and engaging in prosocial gossip helps to restore fairness and correct past antisocial acts or prevent future ones, then individuals should experience negative affect relief after engaging in prosocial gossip. Such behavior should lead individuals to experience reduced negative affect because they took action that should lead to outcomes in line with their preference for cooperation and aversion for exploitation. This prediction is in keeping with findings showing that helping others reduces the negative arousal associated with observing someone suffering or in trouble (Cialdini, Darby, & Vincent, 1973; Cialdini & Kenrick, 1976).

Finally, in line with past research, I predict that prosocial gossip will benefit groups, helping to solve social dilemmas by promoting cooperation and deterring selfishness. This hypothesis derives from two arguments. First, recipients of the gossip will avoid interacting with individuals known to be selfish, choosing to interact only with those with a reputation for cooperating (Sommerfeld et al., 2007; Wedekind & Milinski, 2000). Second, when prosocial gossip is possible, individuals will behave more prosocially because they do not wish to develop a negative reputation in the eyes of their future interaction partners (Piazza & Bering, 2008; Beersma & van Kleef, 2011). This latter effect should be especially pronounced among more egoistic group members who are more likely to defect in the absence of the threat of gossip.

My claims about the beneficial functions of prosocial gossip resemble those made about social sanctioning (Horne, 2004; Fehr & Gachter, 2002; Yamagishi, 1986). Social sanctioning involves directly punishing a transgressor either through economic or social means. For instance, a common method involves giving participants taking part in multiple rounds of a public goods game the option of investing a portion of their own earnings toward punishing another participant. More specifically, the amount a participant invests toward punishing this individual gets multiplied (usually by 2) and is then withdrawn from the earnings of the other individual (Fehr & Gachter, 2002). Gossip and social sanctioning are both second-order behaviors (i.e., behaviors enacted by a third party that influence the social interaction between two other individuals), in that they promote cooperation and decreases exploitation in groups. However, a key difference between prosocial gossip and punishment is the target of the action. The sanctioning literature suggests that individuals police deviant behavior by directly punishing

those who behave in a deviant manner (Horne, 2004). Prosocial gossip, by contrast, responds to the actions of exploitative individuals in a less direct manner, spreading reputational information about those who have behaved antisocially but who are not present during the act of gossip. In this way the behavior likely involves little risk of retaliation, making it significantly less costly (Feinberg, Cheng, & Willer, 2012).

Prosocial Orientation and Prosocial Gossip

In my analysis of prosocial gossip I also argue that individual differences in prosociality will moderate the likelihood and consequences of prosocial gossip. Although people generally have preferences for cooperation and fairness (e.g., Henrich, Boyd, Bowles, Camerer, Fehr, Gintis, & McElreath, 2001), such preferences vary across individuals (van Lange, 1999). Individuals possessing a more prosocial orientation place a greater value on the outcomes of others, and have the strongest preferences for fairness and cooperation (Liebrand, 1986; Messick & McClintock, 1968; Pruitt & Kimmel, 1977; Simpson & Willer, 2008).[2] To the extent that certain forms of gossip serve prosocial ends (by warning others of individuals likely to behave selfishly), then the most prosocial individuals should also be the most inclined to engage in such gossip. In light of the analysis I have offered thus far, I would thus expect more prosocial individuals to experience greater negative arousal upon witnessing an unfair act, to be more likely to engage in prosocial gossip, and to experience the most negative affect relief after gossiping in prosocial fashion.

Past research supports the plausibility of these hypotheses. More prosocial individuals respond more negatively toward selfish and unfair acts, behaving in a more aggressive and competitive manner toward transgressors than less prosocial individuals do by taking on an exaggerated persona of the transgressors, playing even more competitively than the transgressors do (Kelley & Stahelsky, 1970; Van Lange, 1992). This "overassimilation effect," where prosocials take on extremely competitive demeanors in response to uncooperative others, has been documented in situations such as social dilemmas where cooperators become extreme defectors, as well as in negotiations (Steinel & De Dreu, 2004), and may help explain the existence of strong reciprocity (Bowles & Gintis, 2004; Gintis, 2000). Additionally, recent neuroscientific research finds that, compared to less prosocial individuals, more prosocial individuals respond with increased amygdala activity when exposed to unfair resource distributions (Haruno & Frith, 2010), suggesting that these prosocials experienced inequity aversion likely driven by an intuitive, affective reaction (Adolphs, Tranel, & Damasio, 1998; Anderson & Phelps, 2002). Taken together, these findings suggest that while negative affective reactions to unfair behavior are normative, more prosocial individuals will experience greater affective reactions and an increased inclination to gossip.

There is also good reason to expect that the individual's prosociality will influence his or her response to prosocial gossip. Given my claim that the fear of being gossiped about deters selfish behavior, I expect those scoring lowest on prosocial orientation to be most influenced by the prospect that others may gossip about them. Thus, those lowest in prosocial orientation should respond to the threat of prosocial gossip by becoming significantly more cooperative. I anticipate this both because such individuals are more likely to behave selfishly in the absence of prosocial gossip, but also because research demonstrates that individuals scoring highly on the egoistic component of the SVO score higher on impression management questionnaires (Willer, Feinberg, Flynn, & Simpson, 2012) and behave more generously only in situations where reputation is at stake (Simpson & Willer, 2008).

Overview of Present Studies

In the present research I test the following hypotheses derived from my theorizing about the motives and functions of prosocial gossip (see Figure 2 for graphical depiction):

Frustration Hypothesis – Witnessing an antisocial act will evoke negative affect, such as frustration and annoyance, especially among more prosocial individuals. The more negative affect individuals experience, the more likely they will be to engage in prosocial gossip.

Prosocial Hypothesis – A primary motivation driving prosocial gossip will be to help and protect others.

Relief Hypothesis – Engaging in prosocial gossip will lead to reduced negative affect, and those highest in prosocial orientation will experience larger amounts of this relief.

Deterrence Hypothesis – Prosocial gossip will help solve social dilemmas by deterring selfish behavior, especially among those who are more egoistic and prone to exploit others.

Partner Selection Hypothesis – Prosocial gossip will facilitate partner selection, guiding recipients of the gossip in selecting who to interact with and who to avoid or ostracize.

I conducted five studies testing these hypotheses. In Study 1, participants observed another study participant behave antisocially in a social dilemma, exploiting the generosity of another individual. Participants were then given the opportunity to gossip to another participant who was to interact next with the transgressor. During the study I measured both physiological and reported emotional reactions to examine the motives and affective reactions associated with such gossip. In Study 2, I included a measure of social value orientation to more directly test my claims about the moderating role of individual differences in prosociality and also used questionnaires and content analyses to measure the role of prosocial motivations in prosocial gossip. Study 3 expanded on these studies, making it costly to engage in prosocial gossip to further assess the extent to which prosocial motivations drive prosocial gossip. In Study 4, I manipulated whether participants' behavior in a social dilemma game was anonymous, observed by a third party, or observed by a third party who could also engage in prosocial gossip. Such a design allowed me to test whether the threat of prosocial gossip can effectively solve social dilemmas by deterring selfish behavior and promoting cooperation, especially in those most prone to exploit others. Finally, in Study 5, I had large groups of participants play in multiple rounds of an economic game that pit their individual interest against the group's interest. I manipulated whether participants could gossip to one another about their interaction partners and whether participants could vote to ostracize participants from their groups. Such a design allowed me to test my *partner selection hypothesis*, specifically examining whether individuals used gossip as a means for determining who to avoid interacting with.

Study 1

In Study 1 participants witnessed another participant act selfishly in a social dilemma situation at the expense of another participant and then, in one condition, were given the opportunity to gossip in a prosocial fashion. Participants in this condition, I hypothesized, would engage in prosocial gossip even without any apparent social or material incentive (*prosocial hypothesis)*. I assessed participants' physiological and self-reported emotional responses both before and after the gossip opportunity. I hypothesized that exposure to antisocial acts would evoke negative affect, such as frustration and annoyance, (*frustration hypothesis*), and that

participants given the chance to gossip would report reduced negative affect, and show reductions in autonomic arousal relative to a control condition (*relief hypothesis*).

Method

Participants. Fifty-three (15 male, 38 female) undergraduates took part in exchange for extra credit in a sociology course. One participant was excluded for expressing suspicion after recognizing the confederate, leaving a total sample size of 52 participants.

Procedure. The study was advertised as a group study involving four participants. When participants arrived at the laboratory, two confederates posing as participants were already waiting for the study to begin. The experimenter noted that they were waiting for one more participant, but that they would begin the study by taking two participants (the participant and one of the confederates) to one of the study rooms. The participant and the confederate took part at adjacent computer stations separated by a cloth divider to prevent them from seeing one another. The experimenter instructed them not to communicate with one another unless instructed to do so. Both the participant and confederate were connected to an MP 150 data acquisition and analysis system (Biopac systems, Inc) to measure heart rate. I sampled electrocardiogram recordings by attaching leads to the right and left side of the abdomen in a Lead II configuration with a 35 Hz filter. The aim of such physiological measures was both to complement the self-report measures and help rule out the possibility that participants' responses might be driven by demand effects.

Participants filled out background surveys lasting approximately fifteen minutes. After completing the surveys, the experimenter informed the participants that all four participants were going to take part in two rounds of an economic exercise. The participant and confederate read the instructions for the "trust game" (Berg, Dickhaut & McCabe, 1995) and answered questions to ensure that they understood the rules of the game.

The game involves two players, the Investor and the Trustee. The Investor receives an initial endowment of 10 points (exchangeable for money at the end of the study). The Investor can choose to send any portion of the 10 points (including 0) to the Trustee and keep the remainder for him or herself. The amount the Investor chooses to send is tripled and the Trustee then has the option to share any number of these points with the Investor. The game offers behavioral measures of the Investor's level of trust – since he or she will send resources to the extent that he or she believes they will be returned – and the Trustee's level of trustworthiness – since he or she is not required to send any resources back.

The instructions for the game informed participants that there would be four game roles - Investor A, Investor B, Trustee, and Observer. In addition, only two trust games would be played. In the first game, Investor A would play with the Trustee. Then, in the second game, Investor B would play with the Trustee. For both rounds, the Observer would be shown the results of the games, including the amounts that Investor A/Investor B sent over and how much the Trustee sent back.

The participant and confederate drew one of four envelopes for their role assignment. All envelopes contained a slip of paper with "Observer" printed on it. Once the participant and confederate selected their envelopes, the experimenter asked them to state what their role assignment was. The confederate always announced that she had selected Investor B. Upon stating that they had selected the role of Observer, the experimenter handed participants $3 in cash as a flat rate payment for their role.

As Investor B, the confederate would play with the Trustee in the second trust game. The participant and the confederate waited silently while Investor A and the Trustee ostensibly played the first round. The experimenter then brought the participant (but not Investor B) a piece of paper with results of how the other two players played during the trust game. In reality, these results always showed that Investor A shared all 10 points, which were tripled to 30, and the Trustee kept all 30 for him or herself, returning nothing to Investor A. The experimenter, who was blind to condition and study hypotheses, also provided the participant and confederate with a small packet with a cover page that stated "Do not open this packet until the computer instructs you to do so." There were two types of packets, one for the experimental condition and one for the control. Which packet a participant received was randomly determined.

After viewing these results, participants completed a brief survey of negative affect (described below) via their computer. The participant and confederate next opened their packets. In the packets the participant was reminded that Investor B would next play the trust game with the Trustee from the previous round. In the gossip condition, participants were instructed that they could pass to Investor B a one to two sentence, hand-written note about any topic of their choosing, which would not be shown to the Trustee. The instructions explicitly stated that writing the note was optional to participants. In addition, participants were told that, although Investor B had been told a piece of paper might be passed to him or her, Investor B had not been informed about the purpose of that paper – ensuring that a choice to not write a note would not evoke any negative perceptions of the participant. Along those lines, the instructions also informed participants that when the game was over all participants would be dismissed separately and would never see each other. All of this information was provided to ensure that participants had no social or material incentive for writing anything in the note. In the control condition, the packet simply asked participants to copy a gibberish statement onto the note form and pass it over to Investor B. So that the participant would not feel embarrassed or uncomfortable giving it to Investor B, participants were told that Investor B was expecting such a note.

After writing and passing the note under the cloth divider (if participants chose to do so), participants completed a second measure of negative affect. In addition, after answering all other affect measures, participants answered two items designed to directly measure negative affect relief: "How relieved do you feel after writing the note?" and "Overall, how much better do you feel after writing the note?". These two items formed a *Relief Composite* (Cronbach's $\alpha = .87$). Although all data were collected at this point, the experimenter and confederate staged the remainder of the trust game, prior to the participant completing a survey designed to probe for suspicion. Finally, participants were disconnected from the physiological device and debriefed.

Self-reported Negative Affect. Before and after passing a note to Investor B, participants reported how frustrated, annoyed, and irritated they felt on a 100-point scale ranging from 0 (Not at All) to 100 (Very Much), as part of a larger set of emotions which served as filler items. Responses were averaged together to form a *Frustration Composite* (Cronbach's α's $> .93$).

Heart rate. Although heart rate measures were gathered over the course of the entire experiment, data were aggregated over 1.5 minute intervals during two critical time periods: upon receiving the results for the first round and immediately after participants passed the note. ECG readings were transformed into a measure of heart rate by detecting the number of beats, measured as R spikes in the QRS complex, using the MP 150 data acquisition and analysis system (Biopac systems, Inc). Heart rate was then averaged over the two 1.5 minute intervals of interest.

Coding of Gossip Notes. Two coders read through the gossip notes and indicated whether each note did or did not correspond with my definition of prosocial gossip: sharing evaluative information about a target in a way that protects others from antisocial or exploitative behavior. Any discrepancies were discussed until agreement was reached. Representative examples of passages from gossip notes include "Trustee didn't send anything back last round. I'd advise not sending anything.", "Try to keep all the money you can, because the trustee will not give you much in return." and "Your trustee is not reliable, he/she is playing for their own selfish interest. Try being careful with your investment."

Results

Coders classified 96% (26 out of 27) of the notes participants in the gossip condition wrote as consistent with my definition of prosocial gossip.[3]

Self-Reported Negative Affect and Relief. I expected that individuals would exhibit negative affect relief in the gossip condition due to writing a note warning the confederate. A 2 x 2 mixed-design ANOVA (*within*: Negative Affect at Time 1 and Time 2; *between*: Experimental Condition) yielded a significant interaction, $F(1,50) = 6.18$, $p < .05$. Simple effect analyses revealed that levels of negative affect for participants in the gossip condition decreased significantly from time 1 to time 2 ($M_{decrease} = 9.69$), $F(1,25) = 13.01$, $p < .01$, whereas there was no significant change for participants in the control condition from time 1 to time 2 ($M_{decrease} = 0.16$), $F(1, 25) = .00$, $p = .96$.[4]

I also examined participants' scores on the *Relief Composite*. Comparing scores on this composite for participants in the gossip condition ($M = 64.35$) with those in the control ($M = 27.65$) yielded a significant difference, $t(50) = 5.61$, $p < .001$, suggesting that engaging in the prosocial gossip generated more relief from negative affect, consistent with my relief hypothesis. Additionally, I compared the means on the *Relief Composite* for each condition with the scale's midpoint of 50, which represented no change in affect. These analyses verified that participants were significantly above the midpoint in the gossip condition, $t(25) = 3.34$, $p < .01$, and significantly below in the control condition, $t(25) = -4.52$, $p < .001$.

Heart Rate. A 2 x 2 mixed-design ANOVA (*within*: Heart Rate at Time 1 and Time 2; *between*: Experimental Condition) revealed a marginally significant interaction, $F(1, 47) = 3.71$, $p = .06$. Simple effects analyses revealed participants' heart rates in the control condition rose from time 1 ($M = 77.02$, $SD = 8.70$) to time 2 ($M = 78.46$, $SD = 9.11$) ($M_{increase} = 1.44$), $F(1, 24) = 5.65$, $p < .05$, but did not significantly change in the gossip condition from time 1 ($M = 74.03$, $SD = 12.64$) to time 2 ($M = 73.82$, $SD = 12.22$) ($M_{decrease} = .21$), $F(1, 23) = .01$, $p = .91$. Such a result suggests that witnessing the unfair play of the Trustee led to elevated heart rates for participants who had no opportunity to gossip, in keeping with my frustration hypothesis, and also consistent with studies linking anger and unfairness to increased cardiovascular arousal (Levenson, Ekman, & Friesen, 1990), whereas engaging in prosocial gossip had a palliative effect, buffering participants from this increase in cardiovascular arousal.

Discussion

In Study 1, participants were given the opportunity to gossip to an individual facing the prospects of playing an economic social dilemma game with a person seen behaving in a selfish and exploitative way. When faced with this situation, participants overwhelmingly chose to engage in prosocial gossip, sharing evaluative information about the Trustee that would protect Investor B from being exploited, even when no apparent social or material incentives were

present (*prosocial hypothesis*). As my analyses of the self-report and physiological measures revealed, people responded to the unfair behavior of the transgressor with negative affect and arousal (*frustration hypothesis*), and doing so led to reductions in the rise in negative affect and arousal experienced upon witnessing the unfair act (*relief hypothesis*). Moreover, because self-report measures were consistent with physiological measures, it is unlikely that participants' responses were driven by demand effects.

Study 2

Although Study 1's results support my hypotheses, it is possible my effects were due more to the act of writing than specifically engaging in prosocial gossip. Past research has shown simply expressing one's emotions on paper can have a palliative effect (e.g., Pennebaker, 1993; 1997). Thus, in Study 2, instead of copying down a gibberish sentence, participants in the control condition got to write the same note as those in the gossip condition, but knew that their note would not be sent to another participant, and therefore would not spread reputational information to anyone. Such a control condition helped me to rule out the possibility that participants in the gossip condition experienced negative affect relief simply by having an opportunity to express their feelings of injustice.

I also examined the motivations underlying participants' prosocial gossip to determine if, as hypothesized, a central motivation driving prosocial gossip was to help others avoid exploitation (*prosocial hypothesis*). Towards this end, I used an array of measures aimed at determining if individuals engage in this behavior for prosocial reasons, including self-reported goals and content analyses of open-ended responses regarding participant motives. In addition, I utilized a measure of prosocial value orientation (Van Lange 1999; Van Lange, Otten, De Bruin, & Joireman, 1997). If, as hypothesized, prosocial gossip is indeed driven by preferences for cooperation and fairness, then I would expect more prosocial individuals to experience greater negative affect after witnessing unfairness be more likely to gossip, (*frustration hypothesis*), and experience greater relief after gossiping (*relief hypothesis*).

Finally, I also included, in the gossip condition, an item measuring participants' beliefs about how much their notes would affect the play of the person they were writing to. I included this item for two reasons. First, I wanted to determine if participants who wrote a prosocial gossip note believed that the recipient of the note would trust and utilize the information provided rather than simply discounting it as "cheap talk" (Farrell & Rabin, 1996). Second, in a related vein, if negative affect motivated participants to pass on helpful information to vulnerable others, then I would expect that perceptions of the efficacy of the information sharing to be positively correlated with the extent of negative affect relief.

Method

Participants. One hundred and eleven (29 male, 81 female, and 1 did not indicate) undergraduates participated for credit in a sociology course.

Procedure. Between 8 and 10 participants took part at a time. An experimenter blind to both experimental condition and study hypotheses seated participants at individual stations separated by dividers in a large computer laboratory. Participants completed a demographic survey followed by a 9-item measure of Social Value Orientation (Van Lange 1999; Van Lange, et al., 1997; described below).

Participants were told they would play multiple rounds of an economic exercise – again the trust game – with other study participants, interacting with one another no more than one

time. The instructions emphasized that all interactions would be completely anonymous with each participant receiving a code name (e.g., Participant C). The instructions explained that there would be 3 different game roles: Investor, Trustee, and Observer. Participants selected a number between 1 and 10 as a means for randomly assigning their game role. Regardless of their selection, all participants were assigned to be the Observer. As Observer, the participants were paid a flat rate of $3 and watched as the Trustee played the trust game with different Investors across multiple rounds.

After waiting for the other participants to finish reading their instructions, participants observed Participant B playing as the Trustee with 3 separate Investors. In each round, the Investors sent a majority of their 10 points (ranging from 6 to 10 points) to Participant B, and in all cases Participant B behaved in an untrustworthy way, keeping all the resources. In actuality, all participants were assigned to be observers and the behavior of the others was simulated.

After round 3, participants filled out the same state affect items as in Study 1 (*Cronbach* α's for *Frustration Composite* = .94), and an additional item measuring how happy participants felt included as a measure of positive affect. Then, participants were given the opportunity to write an electronic note containing any information they wanted to send to Investor C – the next interaction partner of Participant B. The instructions made it clear that writing this note was completely optional. In the gossip condition, the instructions informed participants that the note would be sent to Investor C prior to him or her playing the trust game with Participant B. To help ensure that participants did not act on social desirability concerns, the instructions also emphasized that Investor C was unaware that the participant had this opportunity to send a note and would never know about it if the participants chose not to write anything. In the control condition, the instructions said that the note was hypothetical and would not be sent to anyone. Once participants had written and sent the note, they filled out the state affect measures a second time (Cronbach α's for *Frustration Composite* = .93). Participants in the gossip condition also responded to the following item: "How much do you think your note affected Participant C's play as Investor?". This item was rated on a 100-point scale ranging from 0 (Not at All) to 100 (Very Much). Finally, participants in the gossip condition answered two questions regarding their motives for writing the note: "How much did the note's content aim to help Participant C?" and "How much did the note's content aim to hurt/punish Participant B?", followed by an open-ended item: "If you chose to write the note, please briefly (1-3 sentences) explain why you chose to write it, and why you wrote what you wrote."

Social Value Orientation. The Social Value Orientation (SVO) questionnaire (Van Lange 1999; Van Lange et al. 1997) presents participants with 9 separate decision scenarios designed to gauge general preferences for resource distributions between oneself and a hypothetical other. For each scenario, respondents chose between three options. A prosocial option involves distributing points to maximize the shared gain for both the respondent and the hypothetical other. An egoist option involves maximizing one's own gain independent of the hypothetical other's outcome. Finally, a competitor option maximizes the difference between payoffs to self versus the hypothetical other. Since my primary focus was on prosocial value orientation, I used the number of times participants selected the prosocial option as a measure of prosociality (Feinberg et al., 2012; Piff, Kraus, Cote, Cheng, & Keltner, 2010). The mean number of times the prosocial option was selected was 4.96 with a range of 0 to 9 and a standard deviation of 4.14.

Coding of Gossip Notes. As in Study 1, two coders, indicated either "Yes" or "No" for whether a participant's note corresponded with my definition of prosocial gossip. Discrepancies

were discussed until agreement was reached. Representative examples of prosocial gossip notes include "Be careful when playing with participant B. B does not send back any money at all", "Try not to give too much to participant b. He/she's really selfish," and "Participant B is extremely greedy; send 0 points."

Coding of the Open-Ended Item Measuring Reasons for Gossip. Three coders, blind to study hypotheses, rated the open-ended responses of participants who engaged in prosocial gossip on how much they exhibited intention to *help, protect,* and *warn* Investor C, as well as how much they exhibited intention to *punish* the trustee, and portray the trustee as *immoral* and *unfair*. All ratings were made on 7-point scales ranging from 1 (Not at All) to 7 (Very Much). Agreement between coders was moderate to high (average intraclass correlation = .71). I aggregated the first three variables together to form a *Help Composite* (*Cronbach's* α = .83) and the second three variables together to form a *Punishment Composite* (*Cronbach's* α = .82).[5]

Results

Prosocial Gossip Motivations. I hypothesized that, if the affective motivations underlying prosocial gossip are driven by a preference for cooperation and fairness, then those highest in prosocial value orientation should be the most likely to engage in prosocial gossip (my prosocial hypothesis). A binomial logistic regression analysis yielded a marginally significant, positive effect of prosocial value orientation (B = .19, p =.06), suggesting that the more prosocial participants were, the more likely they were to engage in prosocial gossip.

I further analyzed participants' intentions in the following ways. An analysis comparing self-reported intentions to help Investor C versus hurt or punish the Trustee yielded a significant difference, $t(50) = 3.81$, $p < .001$, indicating that participants aimed to help (M = 77.96) more than they aimed to hurt or punish (M = 57.31). Content analyses of participants' free-response explanations for why they chose to write the note suggested that their aim behind the note was more to warn and protect Investor C (M = 4.63) than to punish the Trustee (M = 3.28), $t(48) = 4.61$, $p < .001$. In total, coders indicated that 43 out of 51 (84%) participants in the gossip condition engaged in prosocial gossip.[6]

Self-Reported Negative Affect. I hypothesized that the more intensely participants experienced negative affect upon witnessing the selfish behavior of the Trustee, the more likely they would be to engage in prosocial gossip (my frustration hypothesis). A binomial logistic regression analysis entering *Frustration Composite* at time 1 in as the predictor, and whether the participant engaged in prosocial gossip or not as the dependent variable, showed a marginally significant effect of negative affect (B = .03, p =.06). This result supports my prediction that negative affect experienced upon witnessing unfair or antisocial behavior motivates individuals to engage in prosocial gossip.

Positive and Negative Affect Change. To test my hypotheses that engaging in prosocial gossip would create negative affect relief and increase positive affect (my relief hypothesis), and that participants' prosocial value orientation would moderate this effect, I conducted a MANOVA entering experimental condition and scores on the SVO measure as the independent variables, and entering participants' change from time 1 to time 2 in my frustration composite and measure of happiness as the dependent variables. I found significant multivariate effects for my experimental condition, $F(2, 97) = 5.52$, $p < .01$, prosocial orientation, $F(2, 97) = 5.03$, $p < .01$, and the interaction of condition and prosocial orientation, $F(2, 97) = 7.52$, $p < .001$. Participants in the gossip condition demonstrated a greater decrease in frustration ($M_{decrease}$ = 18.39) than participants in the control condition ($M_{decrease}$ = 7.16), $F(1, 98) = 7.40$, $p < .01$.

Likewise, participants in the gossip condition demonstrated a greater increase in happiness ($M_{increase}$ = 16.90) than participants in the control condition ($M_{increase}$ = 5.57), $F(1, 98) = 5.85$, $p < .05$. Taken together, these findings are consistent with my claim that relaying reputational information about a transgressor to a vulnerable target led to improved affect over and above the palliative effect of simply expressing one's thoughts on paper.

Prosocial Value Orientation Moderation. To more directly explore the role of prosocial value orientation, I conducted a correlation analysis measuring the association between prosocial orientation and the frustration composite at time 1. This analysis yielded a significant effect, indicating that more prosocial individuals experienced greater frustration after witnessing the Trustee behave selfishly in the first three rounds, $r(110) = .23$, $p < .05$, consistent with my prosocial hypothesis. Next, I tested the hypothesis that more prosocial individuals would experience greater negative affect relief as a result of sharing information with a potentially vulnerable other. Unpacking the significant interactions reported in the MANOVA above between experimental condition and scores on the SVO measure in predicting changes in affect, I used a multiple regression framework to more specifically determine the nature of each of these interactions. In particular, a simple slopes analysis, looking at participants a standard deviation above and a standard deviation below the mean on prosocial value orientation, revealed that more prosocial individuals experienced significantly improved affect due to writing the note or not (*frustration composite decrease*: $B = -23.35$, $p < .001$; *happiness change:* $B = 23.97$, $p < .001$), whereas those with less prosocial orientations experienced no change in affect (*frustration composite change*: $B = 1.91$ $p = .73$; *happiness change:* $B = 2.35$, $p = .72$). Figure 3 depicts the interaction between prosocial orientation and experimental condition on participants' frustration composite changes.

The Role of Perceived Note Efficacy. I also predicted that perceptions of the note's efficacy for participants in the gossip condition would influence changes in affect. Regression analyses revealed that the extent of participants' beliefs that the note would actually affect Investor C's play predicted their increased positive affect ($\beta = .33$, $p < .05$), as well as marginally predicting decreased negative affect ($\beta = .28$, $p = .08$), suggesting that the more participants believed their prosocial gossip would affect Investor C's play, the more their affect improved.

Discussion

In Study 2, participants exhibited, both in self-reported motivations and free response narratives, prosocial reasons for their gossip (*prosocial hypothesis*). Findings related to individual differences also converged on the claim that gossip can serve more prosocial means. Results of Study 2 also provide further evidence that prosocial gossip is driven by feelings of negative affect and brings about feelings of relief. Participants' negative affect was a significant predictor of the likelihood that an individual would engage in prosocial gossip (*frustration hypothesis*). Further, engaging in prosocial gossip led to decreased frustration and increased happiness (*relief hypothesis*), especially when participants believed that their gossip note would effectively influence how the vulnerable individual would interact with the selfish actor. Finally participants' prosocial value orientation moderated the changes in affect participants experienced upon writing the note, suggesting that engaging in prosocial gossip had the strongest emotional impact on those who are more prosocial.

Study 3

Study 3 was designed to document that a primary motivation driving prosocial gossip is to help protect others from exploitation. Although self-reported and coder rated measurements of participants' motivation found that a central motive behind engaging in gossip was to warn and protect vulnerable others, one might argue that this apparent helping was actually an indirect means of punishing the transgressor. Participants' notes tended to instruct the vulnerable investors to be cautious and not send anything over to the trustees, a behavior that both helped the investor and, indirectly, hurt the trustee. Thus, it is possible, that participants actually used this gossip as a means for punishing the selfish trustee by preventing him or her from receiving any resources. Additionally, it is conceivable that participants' reported prosocial reasons for engaging in prosocial gossip were more due to a self-perception dynamic, wherein participants saw their behavior as bringing about prosocial ends and thus convinced themselves that they must have been directed by prosocial intentions. To eliminate this concern, I designed Study 3 so that participants' gossip notes could have no bearing on the transgressor's earnings, and could only affect the receiver of the gossip's study pay. This design feature removed any means by which participants could punish the transgressor.

To further establish the role of prosocial motivations, I also made gossiping a costly behavior. Participants were asked to indicate the greatest amount they were willing to pay to engage in the prosocial gossip, with larger amounts leading to a greater likelihood that the gossip note would be transferred. This design feature allowed me to more confidently infer that participants were gossiping for prosocial reasons, and not simply out of concerns of social desirability.

Method

Participants. Forty-five (18 male, 27 female) undergraduates participated for credit in a sociology course.

Procedure. Participants completed the same Social Value Orientation questionnaire as in Study 2 as part of a larger online survey. The mean number of times the prosocial option was selected was 6.01 with a range spanning from 0 to 9 and a standard deviation of 3.63. Approximately 2-3 months later, participants attended a laboratory session in sessions of 14 to 18 participants. Participants were seated at computer workstations. The experimenter, who was blind to study hypotheses and conditions, explained that the participants would be interacting with one another via computer as they played in multiple rounds of an economic game. The computer then explained to participants how to play an economic exercise –the "dictator game" (Forsythe, Horowitz, Savin, & Sefton, 1994; Ledyard, 1995). The game involved two players, a "Sender" and a "Receiver." The Sender had the option to give any amount of a pool of $11 (including $0) to the Receiver. Instructions explained that participants would be randomly assigned to play as the Sender, a Receiver, or an Observer. In addition, the instructions explained that the Sender would interact with a different Receiver in each round, and that at the beginning of each round, the Receiver could "opt out" of playing the game by taking a flat pay of $4 instead of playing with the Sender for that round. If the Receiver chose to opt out, the Sender would automatically receive all $11 and the round would end. It is important to note that this experimental design eliminated participants' ability to indirectly punish the transgressor, implying that any decision to engage in prosocial gossip was likely due to a desire to help protect the vulnerable other.

The same, apparently random, assignment technique used in Study 2 assigned all participants to be Observers, for which they received a flat payment of $5. Participants were

instructed that they would observe one Sender play multiple rounds of the dictator game with different Receivers each round. In both the first and second rounds, the Sender chose to keep all $11, not sharing any money with the Receiver. Then, prior to the third round, the computer informed participants that they could send a note to the next Receiver, providing him or her with any information they would like to convey. Participants were told that there was a charge for sending the note but that the cost was a secret amount between $0 and $2. Participants could offer any amount they wished between $0 and $2 but they would only be able to write and send the note if the amount they offered was greater than the secret amount. In actuality, if participants offered any amount besides $0, the computer informed them that the amount they offered was higher than the secret amount. Those that offered $0 were told that their offer was lower than the secret amount and they would not be able to write the note. Participants on average invested $.89 to send their note (*SD* = .78, *Range* = $0 to $2). I employed this "secret amount" methodology in order to gauge the maximum amount participants were willing to pay to send the note. Such an amount, I believe, represents a quantifiable behavioral measure of participants' motivation to prosocially gossip.

Participants completed a *frustration composite* measure as part of a larger set of emotions which served as filler items, at two time points: immediately after the results of round 2 (time 1) and after the note-sending portion of round 3 (time 2). This composite asked participants how much of each of the following emotions they were experiencing at that moment, on scales ranging from 0 (not at all) to 100 (very much): Frustrated, Annoyed, Irritated, and Distressed (Cronbach's α's were .96 and .97 for each round respectively). Finally, participants were paid and debriefed.

Results

Prosociality and Prosocial Gossip. Thirty-four of the 45 participants (76%) spent at least $.01 to send their note, even though their notes could have no direct or indirect effect on the transgressor's outcomes. Moreover, these participants paid to engage in prosocial gossip, offering an average of $1.19 to send their gossip note to the Receiver, demonstrating that most participants were willing to endure personal costs to engage in prosocial gossip. Further in keeping with my prosocial hypothesis, the more highly individuals scored on the measure of prosocial value orientation, the more they were willing to pay to send their prosocial gossip note to the Receiver, $r(44) = .32$, $p < .05$.

Negative Affect. I next examined whether participants' levels of frustration were related to their motivation to engage in prosocial gossip. A correlation analysis revealed that the more frustration participants experienced at time 1, the more they were willing to pay to send their gossip notes, $r(44) = .33$, $p < .05$, a finding that is in keeping with my frustration hypothesis. Such a result suggests that the negative affect individuals experience upon witnessing an antisocial act motivates them to engage in prosocial gossip.

I next examined whether those who engaged in prosocial gossip (those who paid a nonzero amount to transfer the note) experienced negative affect relief, and whether such relief was moderated by the amount of money the participants paid to send their prosocial gossip note and/or prosocial orientation. I first ran a paired samples *t*-test to verify that participants' frustration levels dropped from time 1 to time 2. This analysis yielded a significant decrease ($M_{decrease} = 8.09$), $t(34) = 2.29$, $p < .05$, in keeping with my relief hypothesis. I then created a difference score by subtracting time 2 frustration composite scores from time 1's scores, and ran a multiple regression analysis entering both prosocial orientation scores and amount participants

paid to send the note as predictors. This analysis yielded a significant effect of payment, $\beta = .48$, $p < .01$, revealing that the more participants paid to send the note the more negative affect relief they experienced. The multiple regression analysis also yielded a nonsignificant effect of prosocial orientation, $\beta = .14$, $p = .37$, suggesting that the amount paid to send the note (i.e., a behavioral measure of prosocial intentions) was the more robust influence on participants' affective reactions.

Discussion

In Study 3, participants still chose to gossip even when the possibility of influencing a transgressor's outcomes was removed, suggesting that participants were not engaging in prosocial gossip as a means for indirectly punishing the transgressor. Further, many participants gossiped even though doing so required them to expend their own resources, attesting that participants' motivations to convey reputational information to the vulnerable other were both prosocial and nontrivial. Two additional findings also underscored the prosocial nature of the gossip: more prosocial individuals paid more to gossip about a selfish individual, and the more resources participants expended to gossip, the more negative affect relief they experienced.

In my first three studies I examined the motives underlying prosocial gossip. In Studies 4 and 5, I examine whether prosocial gossip can effectively solve social dilemmas by deterring selfishness and promoting cooperation. Past research has shown that reputation systems can promote cooperation both by deterring antisocial behavior (e.g., Milinski et al., 2002) and by facilitating strategic partner choice (e.g., Barclay & Willer, 2007). Guided by these past findings, I hypothesize that prosocial gossip promotes cooperation both (1) by deterring more egoistic individuals from acting selfishly by making known that their selfish reputation will be conveyed to others (my deterrence hypothesis) and (2) by encouraging receivers of the gossip to selectively interact only with those who have a cooperative reputation (my partner selection hypothesis). In Study 4 I test the deterrence hypothesis, and later, in Study 5, I test the partner selection hypothesis.

Study 4

In Study 4 participants played the same economic trust game as participants in Studies 1 and 2, but instead of assigning participants the role of Observer I assigned them the role of Trustee, a role which pits their individual interest against group interests. In one condition I informed participants that an observer would watch their play during the first segment of the game and then have an opportunity to send a gossip note to the participants' interaction partners for the second segment of the game. In a second condition, I only informed participants that they would be observed, but said nothing about the possibility of being gossiped about. Finally, in a control condition, I provided no information about an observer or the potential for gossip. I hypothesized that participants in the *threat of gossip* condition would share more points with their interaction partners, relative to participants in the other conditions. Further I expected that this effect would be primarily due to more egoistic participants in the *threat of gossip* condition giving significantly more than their egoistic counterparts in the other conditions.

Method

Participants. Three hundred and ninety-nine participants (97 male, 302 female) were recruited online from 30 major American cities via craigslist.org websites. In exchange for participation, participants were entered into a drawing for a $50 prize or an iPod.

Procedure. Participants took part online. Upon clicking a recruitment link given in an online posting advertising for the study, participants were told they were part of a large group interaction study. The computer provided participants with a measure of prosocial tendency (described below) and filler questionnaires as they waited for more participants to join the experiment. In actuality, the entire study involved only one participant with all "interaction partners" simulated. When enough participants had ostensibly been recruited for the study session, participants learned how to play the same trust game used in Studies 1 and 2 and answered questions to ensure that they understood the rules of the game. As before, the instructions informed participants that players would interact with one another no more than one time and that all interactions would be completely anonymous with each participant receiving a code name (e.g., Participant C).

Unlike Studies 1 and 2, participants learned that there would be two game segments of three rounds each. Participants in the two observed conditions learned that there would be 3 different game roles: Investor, Trustee, and Observer. For the *threat of gossip* condition, during the first segment of the game, participants were told that the Observer would watch how the Trustee played and then be given the opportunity to write a note about the Trustee to be sent to the Investors that the Trustee would interact with during the second segment of the game. In the *observed* condition, participants were told the Trustee would also be observed, but there was no mention of an opportunity to write a note. Finally, participants in the *control* condition were told that the game involved only two roles: Investor and Trustee, and no mention was made of an Observer role. All participants then selected a number between 1 and 10 as a means for randomly assigning their game role. Regardless of their selection, all participants were assigned to be Trustees.

Participants then played as the trustee for the first three rounds. Investors sent participants eight, six, and ten points across the first three rounds, with the amount sent tripled each time. After participants played the first three rounds (segment 1), the computer informed them that there would be no need to play the final three rounds (segment 2) and the study ended.

NEO-IPI-R Altruism Facet. The altruism facet of the NEO-IPI-R inventory of the five factor model of personality (McCrae & Costa, 1992) is an 8-item measure of altruistic tendency that is part of the agreeableness factor. Participants indicate how much they agree or disagree with each item (e.g., "I think of myself as a charitable person," and "I go out of my way to help others if I can") on a 5-point scale ranging from "Strongly Disagree" to "Strongly Agree." The reliability for the scale was high (*Cronbach's* α = . 81).

Results and Discussion

I calculated the total number of tickets sent back across the 3 rounds to form a measure of participants' cooperative behavior in the trust game (M = 36.76). I then ran a factorial ANOVA entering experimental condition and scores on the NEO measure of altruism (kept continuous) as independent variables. This analysis yielded a significant overall effect of condition, $F(2, 398) = 3.40$, $p < .05$, a non-significant effect of scores on the NEO, $F(1, 398) = .41$, $p = .71$, and a significant omnibus interaction, $F(2, 398) = 3.29$, $p < .05$. Simple comparisons of the means of each experimental condition revealed that, in line with my deterrence hypothesis, participants in the gossip condition sent back significantly more tickets (M =39.43) than participants in either

the observed condition (M =35.42), $t(394) = 2.25$, $p < .05$, or the control condition (M =35.58), $t(394) = 2.16$, $p < .05$, suggesting that knowing an observer could prosocially gossip about their behavior to future interaction partners caused participants to give more of their points to the investors in the first segment of the game. As such, Study 4 provides evidence that prosocial gossip can promote cooperation and deter antisocial behavior in a social dilemma situation.

Next I specifically examine my a priori claim from the deterrence hypothesis that the threat of prosocial gossip would have the strongest effect on participants who scored lower on prosociality, i.e., those who would be most likely to behave antisocially. I conducted simple slopes analyses to compare the effect of condition among participants scoring a standard deviation below the mean on the NEO altruism measure. As Figure 4 reveals, these more egoistic participants (-1 SD below the mean), when assigned to the *threat of gossip* condition, contributed significantly more (M = 41.69) than their egoistic counterparts in either the *observed* condition (M = 35.58), $B = -6.88$, $t(394) = 2.56$, $p = .01$, or the *control* condition (M = 33.86), $B = -5.78$ $t(394) = 3.34$, $p < .001$. Parallel analyses examining the effect of condition on participants scoring a standard deviation above the mean revealed no significant differences across conditions (all ps > .50).

The results from Study 4 complement and expand upon recent research demonstrating that individuals act more prosocially when interacting with others who can easily spread reputation information about them (Piazza & Bering, 2008) and with those known as gossipers (Beersma & van Kleef, 2011). My results indicate that the threat of prosocial gossip can effectively deter selfishness and promote cooperation in a social dilemma situation. In addition, my results suggest that more egoistic individuals drove this effect. Those who scored lower on prosociality gave significantly more when their reputation mattered most --when an observer could comment on their selfish or generous behavior to future game partners. Such results, I believe, extend past research by demonstrating an additional way in which prosocial gossip can help solve social dilemmas.

Study 5

In Study 5, I test my second hypothesized way in which gossip can help promote cooperation in social dilemma situations – by facilitating partner selection. If individuals, through gossip, are made aware of other people's reputation for being cooperative or selfish, then they can use this information as a guide for selectively interacting with only those people known to be cooperative, while ostracizing those known to be selfish. Thus, thanks to gossip, individuals do not need firsthand knowledge of other's behavior to determine if or how they should interact with them. They learn reputational information based on accounts of other people's experiences. As a result, when individuals spread reputational information about one another through gossip, we should expect it to engender greater cooperation in groups because more cooperative individuals will be able to exclude those who are known as selfish, thereby allowing these more cooperative individuals to capitalize on cooperation, reaping the benefits of group efforts while not suffering from exploitation.

Additionally, I hypothesize, that ostracism will serve as a powerful tool for mitigating free-riding. Being ostracized from the group provides an effective economic and social means of punishment. Ostracized individuals will not be able to reap the benefits of group efforts (Ouwerkerk, Kerr, Gallucci, & Van Lange, 2005; Spoor & Williams, 2007; Williams, 2007) giving them an economic disincentive to behave selfishly. Moreover, recent research suggests that social exclusion activates the same unpleasant pain response mechanism as that activated

during a physical injury (Eisenberger, Lieberman, & Williams, 2003; MacDonald & Leary, 2005). Thus, it is likely that ostracized participants will find that the costs of being ostracized outweigh any potential benefits for behaving selfishly. This analysis suggests that after being ostracized individuals will subsequently behave more cooperatively.

In Study 5, I examine the dynamics of my partner selection hypothesis. Specifically, I hypothesize, for gossip to facilitate partner selection and help promote cooperation the following process will occur: First, in line with Studies 1-3, individuals will prosocially gossip about others whom they have interacted with and found to behave in a selfish manner. Second, the recipients of this gossip will use it as a guide for partner selection, ostracizing those who have a reputation for selfishness. Third, after being ostracized, selfish individuals will reform their behavior and act more cooperatively.

Method

Participants. Two hundred and sixteen participants (82 male, 134 female) took part for a flat pay of $5 and the opportunity to earn an additional payment ranging from $5-$15.

Procedure. The study involved nine separate groups of 24 participants and took place in a large computer laboratory. The experimenter seated all participants at separate computer stations and requested that they not verbally communicate with anyone else at any time during the study. The experimenter then informed participants that the study would take place on the computer and directed them to follow the directions provided on the computer in front of them.

After completing a basic demographics questionnaire, participants learned how to play a public goods exercise (Fehr & Gachter, 2002). The exercise involves four participants in a group. Each participant receives an allotment of 10 points at the beginning of the exercise. Each point is worth 2.5 cents. All four participants then determine how many of these 10 points they wish to contribute to a group fund and how many they wish to keep for themselves. Whatever number of points all four participants contribute to the group fund as a whole is then doubled and redistributed equally to each group member. For example, if all participants contribute the maximum 10 points, then the group fund would become 80 points (40 x 2), and each participant would end up with 20 points at the end of the exercise (80 ÷ 4). Researchers commonly use this public goods exercise to examine social dilemmas since each participant will benefit the most by selfishly free-riding off of everyone else's contributions while contributing nothing themselves (e.g., Fehr & Gacther, 2002; Kollock, 1998). For instance, if a participant contributed 0 to the group fund, but the other three members of the group contributed all 10 points, then this selfish participant would end up with a total of 25 points.

The study was modeled after Fehr & Gachter's (2002) well-established experimental paradigm. The current research involved a within-subjects design with participants playing in 3 different economic games. Participants learned that during each of these games they would play multiple rounds of the public goods exercise. While playing in each game, the only identifiable information participants had was a code letter (e.g., Participant A, Participant B). Importantly, after participants completed their participation in one of the three games, their assigned code letter changed so there would be no reputational carryover from one game to the next. The instructions also explained that while playing in each of the games, participants would be assigned to groups in a round-robin format, such that every participant would interact with every other participant only one time (during that condition).

The three games were the basic, gossip, and gossip with ostracism games. Instructions informed participants that all twenty-four participants would take part in each game at the same

time. The order in which participants in a given study session played the games was counterbalanced and did not significantly affect the results presented below[7]. Prior to participants starting a game, the computer informed them what that game entailed. The basic game involved participants playing the public goods exercise with no additions or changes. Thus, in each round, participants played in groups of four and each participant contributed as much as they wished of their 10 points to the group fund. After all twenty-four participants made their contribution decisions for that round, participants learned how much their three current interaction partners contributed and earned for that round. Participants were then assigned to a new group and played the next round of the public goods exercise with these new partners. The game continued in this way for six total rounds.

Both the gossip and gossip with ostracism games paralleled the basic game's procedure with slight changes. In both the gossip and the gossip with ostracism games, after learning the results of each round, participants had an opportunity to write a short note about one of the partners they had just interacted with. They could write anything they wanted about the target individual, and whatever they wrote was then sent on to the three interaction partners that the target would interact with in the next round. Thus, at the beginning of a round in these two games, participants might receive information about their upcoming round's interaction partners (if such information had been sent).[8]

Furthermore, in the gossip with ostracism game, prior to playing each round of the public goods exercise, participants had the option to vote to ostracize one of their interaction partners from participating in that current round. If an individual received at least two ostracism votes from the three other group members, he or she would be removed from that round's public goods exercise and receive 0 points for the round, leaving the remaining three participants to play in that round. Importantly, in the gossip with ostracism game, if group members ostracized someone from the group, the remaining three participants would play the public goods exercise with a new multiplier. Instead of multiplying the group's contributions to the group fund by two, contributions would be multiplied by 1.5 instead. Changing the multiplier in such a fashion is a common procedure used in public goods exercise research that involves changing a group's size (e.g., Isaac & Walker, 1988; Isaac, Walker, & Williams, 1994). Doing so ensures that the value of each contributed point (i.e., the marginal per capita return for each invested point) remains constant.

In total, participants played 6 rounds of the public goods exercise for a total of eighteen rounds (see Figure 5). Once participants completed the final round of the last game, the experimenter informed them that the study was over. The experimenter then debriefed the participants, paid them the amount of money they had earned, and dismissed them from the study.

Results and Discussion

My central hypothesis in Study 5 was that gossip promotes cooperation by facilitating partner selection. To test this hypothesis, I first compared the total amount participants contributed to their group fund aggregated across all six rounds in each of the experimental games. In line with the norm for research examining public goods behavior (e.g., Fehr & Gachter, 2002; Gachter, Herrmann, & Thoni, 2010; Milinski et al., 2002), I used non-parametric statistics to account for the non-normal distribution of participant contributions (i.e., participants tended to either contribute 0 or 10 points in many rounds). I employed a Friedman Analysis of Ranks Test which involved assigning a rank of 1, 2, or 3 to each group's aggregate scores for each experimental

condition. For instance, if the aggregates were 120, 150, and 180 for the control, gossip, and gossip with ostracism conditions, respectively, then the control would receive a rank of 1, gossip a rank of 2, and gossip with ostracism a rank of 3. Each of the nine experimental group's aggregate scores was ranked in this way. The null hypothesis was that there would be no systematic pattern of the ranks such that each experimental condition for each group had an equal likelihood of being ranked as a 1, 2, or 3. In addition, the Friedman Analysis of Ranks Test was useful because it accounts for interdependent data points, treating the analysis as repeated measures (Friedman, 1937), which was important because all participants participated in all three games. The analysis yielded a significant omnibus difference across conditions, $\chi^2(2) = 12.00$, $p < .01$. Comparisons between conditions, using a similar ranking procedure designed for the comparison of two groups (i.e., the Wilcoxon Signed Rank Test), revealed that participants contributed significantly more when in the gossip condition ($M = 29.79$) than they did when in the neutral condition ($M = 17.54$), Wilcoxon Signed Rank Test: $Z = 2.20$, $p < .05$, suggesting that simply knowing that their reputation could be spread to future partners influenced participants' tendencies to cooperate to some extent. Further comparisons revealed that when participants were in the gossip with ostracism condition ($M = 42.89$), they contributed significantly more than they did when in either the neutral, Wilcoxon Signed Rank Test: $Z = 2.20$, $p < .05$, or gossip conditions, Wilcoxon Signed Rank Test: $Z = 2.20$ $p < .05$. Importantly, the contribution differences between gossip with ostracism and the two other conditions occurred even though ostracized participants could not contribute anything for the round(s) they were ostracized in. Overall, these results are in line with previous research (Barclay, 2004; Barclay & Willer, 2007) showing individuals behave more cooperatively when their behavior will be known by future partners, and especially when those future partners can choose to interact with them or not. However, the current finding suggests that individuals recognize that such signaling is possible even when their future interaction partners cannot directly observe their behavior.

I next examined the influence of experimental condition across the six game rounds (see Figure 5). In round 1, there was a significant omnibus difference due to condition, Friedman Analysis of Ranks Test: $\chi^2(9) = 6.89$, $p < .05$. Participants contributed significantly more when in the gossip with ostracism condition ($M = 6.86$) than they did when in the neutral condition ($M = 4.90$), Wilcoxon Signed Rank Test: $Z = 2.19$, $p < .05$, however, there was only a marginally significant difference between the gossip condition ($M = 6.02$) and the neutral condition, Wilcoxon Signed Rank Test: $Z = 1.72$, $p = .09$, and no significant difference between the gossip with ostracism condition and gossip conditions, Wilcoxon Signed Rank Test: $Z = .77$, $p = .44$. Such results suggest that even in round 1, before any reputational information could be spread, participants were beginning to be influenced by experimental condition. By round 6, these differences due to experimental condition were pronounced, Friedman Analysis of Ranks Test: $\chi^2(9) = 18.00$, $p < .001$. Participants contributed significantly more when in the gossip with ostracism condition ($M = 8.73$) than when in the neutral ($M = 1.87$) or gossip conditions ($M = 4.23$), Wilcoxon Signed Rank Tests: Zs $= 2.67$, ps $< .01$, and the difference between the gossip and neutral conditions was likewise significant, Wilcoxon Signed Rank Tests: $Z = 2.67$, $p < .01$.

I next calculated a Spearman rank order correlation for the relationship between participants' contributions and round in each experimental condition for the nine study sessions (i.e., capturing whether group contributions tended to increase or decrease as rounds progressed). I then used the correlation coefficients for each group as data points to compare whether contribution trends from rounds 1-6 differed due to condition. I found a significant difference due to condition, Friedman Analysis of Ranks Test: $\chi^2(9) = 14.11$, $p < .001$, (mean correlation

coefficients were -.95, -.71, and .81 for the neutral, gossip, and gossip with ostracism conditions, respectively). Comparisons between conditions revealed that the gossip with ostracism condition's correlation was significantly different than that of either the neutral condition or gossip condition, Wilcoxon Signed Rank Test: *Z*s = 2.68, $p < .001$, and the gossip condition was not significantly different than the neutral condition, Wilcoxon Signed Rank Test: $Z = 1.26$, $p = .21$. An examination of correlation coefficients for each condition (-.95, -.71, and .81 for the neutral, gossip, and partner selection conditions, respectively) revealed that whereas in the neutral and gossip conditions there was a decrease in contributions as rounds progressed, in the gossip with ostracism condition there was an increase in contributions as rounds progressed (see figure 5), suggesting that gossip with ostracism continually increased levels of cooperation.[9]

How Gossip Promotes Cooperation

Above, I hypothesized that the process by which gossip could promote cooperation through partner selection would involve three components: (1) participants would gossip about one another, especially about those who behave selfishly during the public goods game, (2) recipients would use this reputational information as a guide for partner selection and ostracism, and (3) ostracized participants would reform their selfish behavior and act more cooperatively in subsequent interactions, Below I provide analyses that explore each step of this hypothesized process.

Participants will gossip about one another, especially those who behave selfishly. In line with the findings from Studies 1-3, I found that, in the two conditions where gossiping was possible, participants gossiped quite often. In the gossip condition, of the six opportunities participants had to gossip, they did so an average of 5.10 times. Similarly, participants in the gossip with ostracism condition engaged in gossip an average of 4.32 times across the 6 rounds, with the smaller number in this condition reflecting the fact that ostracized participants could not write a gossip note. Further, to examine who participants wrote notes about, I created a variable measuring how much each participant's contribution deviated from their group's mean for a given round. Logistic regression analyses revealed that the lower participants scored on this variable, the more likely they were to be the subject of the notes in each round of the game (*gossip condition rounds*: *B*s $\leq$ -.16, *p*s < .001; *gossip with ostracism rounds*: *B*s $\leq$ -.15, *p*s < .01), suggesting that those perceived as more selfish were more likely to be targeted. Overall, aggregating across all 6 rounds, for every point in contribution size that individuals fell below the group mean, the odds they would be gossiped about increased by 17% in the gossip condition and 21% in the gossip with ostracism condition. Such results suggest that participants readily spread gossip about one another, especially those who played selfishly in the public goods game.

Gossip facilitates partner selection. To examine whether participants in the gossip with ostracism condition utilized the reputational information spread to them through gossip as a guide for partner selection, I created a variable called "reputation strength." Three coders blind to hypotheses rated each note on whether it portrayed the target of the note in a positive, negative, or neutral manner. Coders had unanimous agreement across 86% of notes. All discrepancies between coders were resolved through discussion. Based on these ratings, I assigned a single reputation value score to each note: positive (+1), negative (-1), or neutral (0). For any round, the maximum number of notes that could be written about a single target was three (one from each of his or her interaction partners for that round). I aggregated the reputation value scores for each note together for any participant who had more than one note sent about them in a given round. Thus, a participant could earn a reputation strength score ranging from -3 to +3, with -3

indicating that a participant had three notes written about them each conveying negative reputational information, whereas a +3 indicated a participant had three positive reputation notes written about them. Logistic regression analyses revealed that reputation strength significantly predicted whether an individual would be ostracized or not in the upcoming round, *B*s $\leq$ -1.23, *p*s < .001, suggesting that the more negatively previous interaction partners portrayed an individual, the more likely the individual would be ostracized by their new interaction partners.

Next, I more directly tested whether participants' gossiping about other's selfish behavior facilitated ostracism. First, logistic regression analyses revealed that the more participants' contributions deviated negatively from their group's mean, the more likely they were to be ostracized in the next round of the game, *B*s $\leq$ -.32, *p*s < .01, indicating that those who kept the most for themselves relative to their fellow group members were the participants most likely to be excluded. Then, I conducted mediation analyses testing whether the relationship between participants' deviation scores and likelihood of being ostracized was explained by reputation strength. As reported above, deviation scores predicted participants' reputation strength scores, and reputation strength scores predicted whether an individual would be ostracized or not. Entering both of these variables as simultaneous predictors in a multiple regression analysis revealed that the relationship across rounds between relative selfishness and ostracism was explained by the reputation strength variable, *Sobel Z*s $\geq$ 2.65, *p*s < .01, suggesting that the more selfish individuals behaved in a previous round, the more likely it was that they would be gossiped about negatively by members of their group, resulting in a greater chance that their upcoming-round partners would vote to ostracize them.

Ostracized individuals will constrain their selfishness. I next tested if the higher levels of cooperation in the gossip and ostracism condition were due, in part, to ostracized individuals playing more cooperatively in the rounds following their exclusion. I find clear support for this argument. In the round following their exclusion, a paired-samples t-test comparing contributions in the round prior to ostracism with contributions in the round post ostracism revealed that ostracized participants increased their contribution by an average of 2.86 points, *t*s (13 $\leq$ *dfs* $\leq$ 27) > 2.24, *p*s < .05. In fact, when participants returned after being ostracized, their contribution amounts tended to not be significantly different from the contributions of participants who had not been excluded in the previous round (excluded in *Round 2*: $t(183) = 2.63$, $p < .001$; *Rounds 3-5*: *t*s $\leq$ 1.94, *p*s > .22). Such a result suggests that being ostracized taught these selfish participants to behave as cooperatively as everyone else.

Next, I tested whether the cooperation levels increased within the gossip with ostracism game not only because participants could ostracize those who had developed a selfish reputation, but also because exposure to others getting ostracized taught participants to increase their own contributions. In particular, I examined whether being in an interaction group where another participant was ostracized influenced the contribution levels of participants who did not themselves vote to ostracize anyone. I looked at the changes in contributions of participants who themselves did not vote to ostracize someone in the current round, but other participants in their group nonetheless ostracized someone. In round 2, 13 participants fit these criteria. These participants demonstrated no significant difference in their contributions from round 1 to round 2 (7.46 to 7.38), $t(12) = .08$, $p = .94$. I found a similar null effect for participants who fit these criteria in rounds 3 (n = 72), 4 (n = 86), 5 (n = 78), and 6 (n = 50), *t*s < 1.26, *p*s > .21. Moreover, to further test the possibility that exposure to ostracism increased levels of cooperation in the gossip with ostracism game, I examined whether the number of ostracizing groups a participant was a part of in rounds 2 through 5 predicted how cooperative a participant would be in round 6.

This analysis did not yield a significant effect, β = -.10, p = .19. Finally, I also tested this possibility by examining the overall correlation between the total number of ostracizing groups participants were a member of across the 6 rounds and participants' average contributions in the gossip with ostracism game. This analysis yielded an unexpected significant negative correlation, r = -.33, p < .05. Altogether, these results suggest that simply being exposed to others being ostracized did not elevate cooperation levels, and possibly, actually decreased cooperation.

I also examined whether voting to ostracize someone led this voter to either behave more or less cooperatively in that round. I had competing hypotheses regarding how the voter might subsequently behave. On the one hand, participants who ostracize might be doing so as an expression of their prosocial preferences, and thus I would expect them to also behave more cooperatively in line with these preferences. However, on the other hand, in line with moral licensing research (Monin & Miller, 2001), those who vote to ostracize may feel licensed to behave more selfishly. To examine the effect voting to ostracize had on a voter's cooperation levels, I first examined contribution changes from round 1 (prior to ostracism) to round 2 (first ostracism voting opportunity) within the gossip with ostracism game, testing whether voting to ostracize moderated these changes. A mixed-design ANOVA (within: Round 1 and Round 2 contributions; between: voted to ostracize in Round 2) yielded a significant interaction, F(1, 172) = 7.28, p < .01. A simple effects analysis revealed that there was no significant difference between round 1 and round 2 contributions for those participants who did not vote to ostracize someone in round 2 ($M_{\text{difference}}$ = .08, F(1,52) = .07, p = .79). However, there was a significant difference in contributions for participants who voted to ostracize someone in round 2 ($M_{\text{difference}}$ = .78, F(1,120) = 21.32, p < .001). To further examine the effect of voting to ostracize on cooperation behavior, I aggregated the total number of times a participant voted to ostracize across rounds and tested if this score predicted greater contributions in the gossip with ostracism game overall. A regression analysis yielded a marginally significant result, β = .12, p = .07, suggesting a trend in which the more participants voted to ostracize someone, the more cooperative they behaved.

Overall, the results of Study 5 suggest that the spread of reputational information in the form of gossip can help promote cooperation through partner selection dynamics. When given the opportunity, participants readily engaged in spreading reputational information about other participants, and recipients of this gossip used it as a guide for determining who to ostracize from the group. Such ostracism, in turn, not only removed the selfish individuals from the group but also helped reform these individuals such that upon their return they were significantly more cooperative.

General Discussion

Gossip is a complex social behavior, astonishingly common yet widely criticized. In this dissertation, I propose that gossip solves a basic problem of social groups: gossip enables group members to track the cooperative or egoistic reputations of fellow group members, a central problem in analyses of the emergence of cooperation (Axelrod & Hamilton, 1981; Kollock, 1998; Wedekind & Milinski, 2000). Guided by these theoretical assumptions, I posited that one form of gossip, prosocial gossip, acts as a means by which group members warn others of selfish and exploitative others.

The five studies presented here used different methods and measures to establish support for hypotheses derived from my analysis of prosocial gossip. My *prosocial hypothesis* asserted that

gossip can be prosocially motivated. I argued that prosocial gossip primarily stems from motivations to help others avoid being the targets of exploitation and antisocial behavior. My findings demonstrated the prosociality underlying such gossip in several ways: Content analyses of participants' reasons for writing their gossip notes as well as self-reported reasons for gossiping indicated that an integral motivation driving participants' gossip was to help and protect others from exploitation (Study 2). Gossip was more common in individuals with prosocial orientations (Studies 2 and 3). Finally, in Study 3, I ensured that participants' gossip notes could not serve as a means for punishing the transgressor and still found that individuals readily shared this valuable reputational information, and did it even when sharing such information was costly.

My *frustration hypothesis* asserted that witnessing an unfair act would evoke negative arousal, especially among more prosocial individuals, and that the more negative affect participants felt, the more compelled they would be to engage in prosocial gossip. I found results consistent with these predictions. Participants exposed to exploitative behavior felt negative affect (Studies 1-3), and this was especially true for more prosocial individuals (Studies 2-3), a striking finding when one considers that in general prosocial individuals are dispositionally prone to more positive emotions (Shiota, Keltner, & John, 2006). Likewise, my results demonstrated that participants' negative affect predicted their likelihood of engaging in prosocial gossip (Studies 2-3). In addition, in line with my *relief hypothesis*, after engaging in prosocial gossip, participants experienced a reduction in negative affect, a result that was most pronounced among more prosocial individuals (Studies 1-3).

These findings shed light on the social consequences of negative affect, such as frustration and anger. In many contexts, frustration and anger compel negative outcomes (Berkowitz, 2003). Children who feel high levels of frustration and anger are more prone to antisocial behavior (e.g., Keltner, Moffitt, & Stouthamer-Loeber, 1995). In marriages, displays of negative affect predict marital difficulties (Levenson, Carstensen, & Gottman, 1994). More generally, feelings of negative affect can be powerful, proximal determinants of antisocial behavior (Berkowitz, 2003). Yet in my studies, negative affect predicted more prosocial gossip, and was more strongly felt by more prosocial individuals, who also felt greater negative affect relief upon gossiping. These patterns of results are in keeping with broader claims that negative affect helps guard basic social rules regarding selfishness, fairness, and public resources (Steinel & De Dreu, 2004) –rules that are the fabric of cooperative social groups (Haidt, 2003; Nesse, 1990). Although negative emotions are frequently tied to antisocial behaviors, when situated within groups and the motivator of prosocial gossip, their prosocial functions come into focus.

Study 4 yielded evidence for my *deterrence hypothesis*, that gossip acts as a deterrent for exploitative behavior and promotes cooperation – that it is a solution to social dilemmas. Participants behaved more cooperatively when they knew that observers could potentially gossip about their behavior in a trust game. Most significantly, I found that the potential to be gossiped about had the greatest impact on those who have the most selfish tendencies, implying that the threat of prosocial gossip effectively deterred these individuals from pursuing egoistic strategies.

Study 5 further demonstrated how gossip can promote cooperation and help solve social dilemmas. This study found that individuals rely on reputational information gleaned through gossip as a guide for whom they choose to interact and whom they choose to ostracize. The study also revealed that ostracism was an effective mechanism of reform for those participants who initially behaved selfishly. Indeed after being ostracized, most participants demonstrated

significantly greater levels of cooperation and often behaved just as cooperatively as those participants who had not been ostracized.

Altogether, the results of Studies 4 and 5 suggest a clear model for how prosocial gossip can help solve the cooperation problem. Receivers of prosocial gossip are likely to avoid or ostracize selfish individuals, opting instead to interact with individuals with more positive reputations. And, those who would otherwise exploit cooperative individuals restrain their selfishness in order to avoid developing a negative reputation. Of course, as shown in Studies 4 and 5, gossip did not create 100% cooperation – many participants still behaved selfishly to some extent. Even so, it does seem that prosocial gossip is a significant mechanism for fostering cooperation in groups. As such, prosocial gossip at least partially answers why individuals will behave cooperatively in groups (even if their natural predisposition is to be behave self-interestedly).

The present research points to a potential answer to an important question raised by the burgeoning literature on reputation systems as solutions to social dilemmas (e.g., Barclay, 2004; Barclay & Willer, 2007; Milinski et al., 2002; Wedekind & Milinski, 2000; Willer, 2009). Where past theory and research have established that reputational systems can help group members overcome problems of cooperation and trust (e.g., Barclay, 2004; Hardy & van Vugt, 2006; Willer 2009, Willer et al., 2010), how reputational information is shared and why individuals would readily share such valuable information has largely gone unaddressed. Particularly, because reputational information is of value to other group members, it was puzzling what motivations drive such information sharing. The present research demonstrates that one proximal motive driving prosocial gossip is negative affective reactions to unjust or selfish behavior. These findings suggest that an answer to the puzzle of why reputational information is shared is similar to social psychological answers to "first-order" social dilemmas: Individuals' underlying prosociality, their regard for the well-being of others, drives them to share information of value to vulnerable others. In this way, prosociality may be critical to the functioning of reputation systems.

It is noteworthy that unlike many other methods for solving social dilemmas, such as peer sanctioning (Fehr & Gachter, 2002; Horne, 2004) or formal sanctions administered by a central authority, sharing reputational information in the form of prosocial gossip is cheap and efficient. As such, prosocial gossip may effectively bypass the "second-order free-rider problem", wherein the costs associated with solving one social dilemma produces a new one (Heckathorn, 1989; Kiyonari & Barclay, 2008). Many other proposed solutions to social dilemmas involve either a costly punishment or reward system that group members must pay for, which itself entails a social dilemma. Prosocial gossip, being essentially free and affectively motivated, such that people feel intrinsically compelled to spontaneously engage in it, should not face a second-order free-rider problem (Feinberg, Cheng, Willer, 2012). Indeed, Study 3's results demonstrate that individuals will even expend resources to engage in prosocial gossip.

The present research also converges with Dunbar's (1996) theory about the evolution of language and gossip's role in that process. Dunbar hypothesizes that as our human ancestors began to live in larger groups, it became impossible for them to personally monitor the behavior of all group members, as the number of group members and past interactions precluded any attempt to record each individual's tendency to cooperate or defect. This gave rise to the evolution of linguistic practices, in particular gossip, as a means for sharing reputational information about the past behavior of group members. Linguistic practices like gossip allowed group members to track one another's reputation as trustworthy interaction partners, even if they could not personally observe others' behavior themselves. With reputational concerns almost

always present, group members were forced to keep selfish motives in check or risk ostracism. Though the present research does not directly test this evolutionary argument, it is consistent with it, as my study participants demonstrated strong motivations to utilize gossip as a means for policing defectors.

Importantly, however, even if a propensity to behave in a certain way evolved because it serves an important adaptive function, the motives underlying the behavior at a proximal level are still greatly important, in line with the argument of the present research. For instance, as the present research demonstrated, if a person's proximal motives for engaging in gossip are weak (e.g., the person has minimal emotional or physiological reactions to witnessing an unfair act), then even if that person has an evolved predisposition to engage in gossip, he or she will likely not engage in the behavior. In addition, one's proximal motives for gossiping will likely dictate what type of gossip a person will engage in. For instance, if individuals are motivated by antisocial intentions, then they may be more likely to engage in a slandering type of gossip which may not serve any prosocial function.

Furthermore, proximal motives should be influential for recipients of gossip. If a recipient can decipher a gossiper's proximal motives (e.g., prosocial or antisocial), then the recipient can utilize this information to guide how much to trust or distrust the gossiped information, and ultimately whether or not to act in response to the gossip and/or spreads it on to others. For instance, if a recipient perceives the gossiper to be motivated by malice, then the recipient might deem the gossiped information to be exaggerated or even untrue. As a result the recipient will be less likely to spread this information on to others.

Recognizing that there are both proximal and ultimate motives underlying gossip also helps provide insight into why individuals engage in "celebrity gossip". At first, celebrity gossip may seem highly dysfunctional since it is almost impossible that the recipient of the gossip will ever interact with the celebrity being gossiped about. When one recognizes that humans likely evolved a tendency to spread reputational information about others and that humans evolved in much smaller groups than we currently live in (~100 people), then the fact that people eagerly gossip about celebrities makes more sense. Historically, all people that anyone knew were the same people that everyone else knew. So, when people in present day engage in celebrity gossip, they are likely acting on this ultimate motive.

Questions and Future Directions

Clearly my focus on prosocial gossip raises important questions about gossip for future research to pursue. One intriguing possibility concerns the social costs and benefits for engaging in prosocial gossip. My studies clearly show that prosocial gossip involves taking a position and potentially costly action regarding what is and is not socially acceptable behavior. In this fashion, gossip, while frowned upon in many ways, may actually serve as a social signal that one adheres to prosocial norms (Baumeister, Zhang, &Vohs, 2004; Willer, 2009; Willer, Feinberg, Irwin, Schultz, & Simpson, 2010). Observers of this signal, in turn, may feel more compelled to interact with and trust prosocial gossipers. For example, were one to use the paradigms from Studies 1 through 3, one might imagine that participants might view the observers of unfair actions who did gossip as more prosocial, likeable, and trustworthy than those who did not.

Prosocial gossip might also benefit the gossiper because people share reputational information with the expectation of reciprocity, anticipating that they will in turn receive information back on who can and cannot be trusted. If this were true then it would suggest that

people would be less likely to continue sharing reputational information if they do not receive information back in kind. Still another possibility is that prosocial gossip can benefit the gossiper by deterring the antisocial behavior of others since it informs them that the gossiper has an extensive social network through which he or she will readily spread reputational information (Willer, 2009; Willer et al., 2010). By engaging in prosocial gossip, then, individuals advertise that any transgression against them will become well publicized, resulting in a severely tarnished reputation for the transgressor. Thus, egoists contemplating taking advantage of a prosocial gossiper may instead focus their sights on a different target that does not prosocially gossip. Future research could test this possibility by recruiting known egoists to participate in a study in which they choose potential interaction partners for economic games, and provide them with a choice between potential partners who have a reputation for prosocially gossiping and those who do not.

Although individuals may gain many of the benefits hypothesized above, this does not necessarily mean that individuals are motivated to engage in prosocial gossip in pursuit of such benefits. Such thinking raises another pertinent question regarding whether prosocial gossip is altruistically motivated. Based on my findings highlighting the role of prosociality in motivating prosocial gossip, one could conclude that such behavior was altruistically motivated (i.e., participants had no self-interested reasons for engaging in prosocial gossip). On the other hand, one could argue that participants engaged in prosocial gossip for the selfish reason of reducing the negative affect they experienced upon witnessing the transgressor behave unfairly, closely resembling a long-standing argument against the existence of empathy-induced altruism (e.g., Cialdini, Schaller, Houlihan, Arps, Fultz, & Beaman, 1987). Yet, my results provide no indication that the reduction of negative affect was what led participants to engage in prosocial gossip. I also found consistent evidence for a causal role of prosocial motivations underlying prosocial gossip. My findings suggest that prosocially motivated participants, frustrated upon observing antisocial acts, gossiped in an effort to protect a vulnerable other and then experienced reduced negative affect as a by-product, a reaction to their knowing that the vulnerable other would likely utilize the information they sent. Further, the results of Study 3 showed that participants were even willing to suffer a personal cost to help another; a pattern that conforms to typical conceptions of altruism (e.g., Batson & Shaw, 1991). That said, future research could more directly investigate the question of whether prosocial gossip is altruistically motivated. If future results offer further evidence that such gossip is altruistic, it would clearly contradict the lay notions of gossip as an antisocial act.

There is also a dearth of knowledge about why receivers of gossip would trust the information conveyed to them. People may have negatively tinged views of gossip because of the deceptive nature of some gossip. Acts of gossip could appear to be prosocial, in warning others of exploitative individuals, but the information conveyed could be unreliable, inaccurate, or even intentionally misleading (Wilson et al., 2000). Despite such negative attributes, as my current studies suggest, recipients of gossip seem willing to trust it and even utilize such information in their decisions and behaviors (Sommerfeld et al., 2007). Why might this be the case? Why do recipients not simply perceive it as "cheap talk?" In my studies there would be little reason to suspect a gossiper of deception given the absence of ulterior motives. In the field, where ulterior motives may often exist, a potential check on the prevalence of "false gossip" may lie in the social costs of spreading inaccurate information. If, as I claim, gossip serves an integral role in maintaining a smoothly functioning group, then propagating falsehoods could threaten a group's cohesion and viability, making such acts decidedly antisocial. Thus, developing a

reputation as a false gossiper would likely be quite damaging and would undo any potential benefits one might achieve through spreading such false gossip. If I am correct, then false gossip should be rare, and recipients of gossip should willingly trust the information they receive. Overall, I believe that the processes by which group members establish the validity of reputational information in gossip is a fascinating question warranting future research.

I argue that prosocial gossip fosters cooperation in groups, helping individuals selectively interact with those who have a reputation for cooperation while ostracizing those who have a reputation for selfishness. Along these lines, prosocial gossip should make behaving selfishly difficult, even maladaptive. Yet cases of individuals behaving selfishly and exploiting others are common in everyday life, suggesting that egoistic strategies continue to exist. If prosocial gossip is so effective, how do these less prosocial strategies exist? I believe that although prosocial gossip may be an essential factor in the maintenance of cooperation within groups, its ability to eliminate antisocial strategies is not perfect. Individuals wanting to exploit others, for instance, can ensure that they behave antisocially only when others are unlikely to observe their actions. Likewise, these individuals can selectively exploit others with less extensive social networks, making it less likely that the transgressor's negative reputation spreads widely. In addition, recent research has found an association between individuals' propensities for egoism and strategic impression management (Willer, Feinberg, Flynn, & Simpson, 2012). As such, it is likely the case that more egoistic strategies could persist by being strategically prosocial where reputation is at stake. Results from Study 4 fit with this argument, as less prosocial participants behaved like their more prosocial counterparts when the threat of prosocial gossip was present.

Additionally, although I explore the dynamics and potential downstream consequences of spreading negative evaluative information, I have not addressed the spread of *positive* evaluative information. Conveying positive evaluative information about others does not fall into the realm of prosocial gossip as I conceptualize it. I recognize, however, that conveying positive evaluative information to others would also be useful in promoting cooperation in groups. It remains to be seen whether and when individuals, after witnessing another behave in a highly prosocial manner, spread positive reputational information about this prosocial other. When individuals do spread such information, I would hypothesize that the behavior would have more positive emotional underpinnings, such as elevation, inspiration, or awe. Overall, such questions about the sharing of positive reputational information about others leave open a potentially fruitful avenue for future research.

Another important unanswered question is how prosocial gossip compares to other proposed social mechanisms for solving social dilemmas. In the past decade there has been much interest in altruistic punishment (Fehr & Gachter, 2002; Fehr & Fischbacher, 2004) whereby individuals spend their own resources in order to decrease the resources of others (i.e., pay to sanction).The literature on altruistic punishment finds that, especially in western cultures, such punishment increases and sustains cooperation in groups both by teaching selfish participants a lesson and, ultimately, by deterring their selfishness in the future. Thus, altruistic punishment solves the cooperation problem in a similar way as that found in the current research. However, certain issues arise when it comes to altruistic punishment that calls into question its effectiveness and external validity. For instance, cross-cultural research has found that many cultures around the world will not only punish selfish players during social dilemmas, but also those who contribute the most to the group fund (Herrmann, Thoni, & Gachter, 2008). Furthermore, research has demonstrated that being an altruistic punisher is strongly correlated with lower outcomes for the self (Dreber, Rand, Fudenberg, & Nowak, 2008) challenging the notion that individuals would

engage in altruistic punishment in the real world (Guala, 2012). Indeed, Guala (2012) argues that it is almost impossible to find evidence of altruistic punishment outside the laboratory.

Building on these concerns regarding altruistic punishment, I contend that the altruistic punishment hypothesis is only partially correct. It is correct in that humans have likely evolved a strong reciprocity motive (i.e., the motivation to remedy selfishness and unfair behavior), but it is likely incorrect in how this motive manifests itself in the real world. Rather than paying to punish others who have behaved selfishly, it seems more likely that individuals will spread gossip about them as the current research suggests. Prosocial gossip does not face the above mentioned problems that altruistic punishment faces. Since there is minimal cost to gossiping, there should be no correlation between being a prosocial gossiper and having lower outcomes in a social dilemma. Likewise, it seems illogical that individuals would spread negative reputational information about those who behave the most cooperatively. But, even if they did, the spread of such reputational information should not tarnish the reputation of these cooperative individuals in the eyes of the recipient of the gossip. Furthermore, unlike altruistic punishment, numerous anthropological studies verify that prosocial gossip occurs all over the world outside the laboratory (Dunbar, 2004). Future research should test this claim about the superiority of prosocial gossip. Studies pitting the two against one another should provide interesting insight.

One such study would involve combining Study 5 of the current research together with the established altruistic punishment paradigm (Fehr & Gachter, 2002). Some participants would be in a gossip with ostracism condition, whereas other participants would be in the altruistic punishment condition. Such a study would reveal which treatment fostered greater cooperation at the individual level. This study would also allow for a comparison of overall group outcomes. Would groups able to prosocially gossip earn larger group totals than groups able to altruistically punish? Considering that altruistic punishment is costly, I would hypothesize that groups in the gossip with ostracism condition would earn significantly more overall. A second study might not have conditions, but rather, allow participants to choose whether they would like to gossip or altruistically punish (or neither). Results from this study would provide insight into participant preferences. It might also reveal how such preferences change as rounds progress and behavior adapts.

Finally, another issue that has proven problematic for any cooperation enforcing mechanism that involves punishment is that such sanctioning produces skepticism about others' cooperative behavior (Mulder, van Dijk, De Cremer, & Wilke, 2006). In particular, when sanctioning is involved, participants tend to believe others are more selfish and only motivated to cooperate out of fear of being sanctioned. After interacting in social dilemma situations involving punishment, participants subsequently trusted others significantly less. It is an open question whether interacting in a social dilemma situation involving gossip would produce similar levels of skepticism. The future research mentioned above that would pit prosocial gossip against altruistic punishment would provide an opportunity to measure participants' perceptions of one another, testing whether participants in the gossip condition developed less skepticism.

Limitations

The present studies are limited in many ways. The reliance upon self-report data in parts of my research is limited for making inferences about motives for behavior. My claims based on those data – that gossip is driven by prosocial motives and negative affective reactions – would

be well served by experimental manipulations and observations of real gossip behavior, though I have tried here to complement these findings with behavioral and physiological data.

Another concern is demand effects. Experiments examining gossiping behavior require creating situations impactful enough that participants will engage in gossip, but not so strong that all participants feel they are required to do so. This difficult balance may help explain why there are few experimental studies examining gossiping behavior and motives (Wilson et al., 2000) despite the ubiquity and social significance of the behavior. Throughout the current research I took many precautions to avoid creating situations where participants engaged in gossip because they felt that such behavior had been expected of them. For instance, I emphasized in Studies 1-3 that writing the notes was completely optional, and consistent with this, there were participants in each of my studies who chose not to write anything. Also, in Study 1 I employed physiological measures, and in Study 3 made sending the note personally costly, in both cases to avoid demand effects. Even so, I believe that an important goal of future research in this vein should be the development of even better methodologies that successfully avoid such methodological concerns.

Another limitation to the research was that it was conducted in laboratory settings using procedures that allowed for strong experimental control, but limited the extent to which one can generalize the results to the complexities of gossip in the real world. Indeed, unlike my studies that involved anonymous interactions, most real-world gossip occurs face-to-face between friends. On this, it would be compelling for researchers to track real situations where selfish behavior occurs and observers do or do not choose to convey reputational information about the selfish actor. It would be interesting to survey the motivations behind the observers' chosen action, as well as to follow how receivers of such gossip behave towards the selfish actor. Do they, as I would hypothesize, trust him or her less, or even ostracize him or her?

Conclusion

Though often viewed as trivial or even antisocial these results support a view of gossip as in fact prosocial and critical to the reputation systems that help sustain fairness and cooperation in groups. Through the sharing of reputational information, antisocial individuals' reputations can precede them, serving as warning to others who might otherwise have faced exploitation. A critical factor driving individuals' reputational information sharing is their underlying prosocial motivations, their desires to benefit and help others. As a result of these benevolent motives, individuals can more carefully select their interaction partners, developing mutually beneficial and trusting relationships with others.

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Footnotes

[1] Defining gossip is a complicated task (see Foster, 2004 for a discussion). Researchers have not come to a consensus. I have chosen my definition of gossip here because I believe it is closest to the lay understanding of the word.

[2] One might wonder how different levels of prosociality could have emerged via natural selection. Some evolutionary game theorists suggest that relative proportions of prosocial versus egoistic individuals would be likely to fluctuate over time rather than settling at a single equilibrium wherein one "strategy" dominates (e.g., Frank, 1988). This is because a community of egoists could be "invaded" by a group of cooperators if the cooperators could identify and selectively interact with one another. By virtue of greater returns for cooperation, these traits would spread in the population for the greater fitness they offer, reducing the proportion of egoists. As cooperation spreads, however, the profitability of defection in turn increases, favoring increased proportions of egoists. Additionally, as prosociality increases in a population, the value of capacities to identify and selectively interact with other cooperators declines and may no longer be selected for, also making a community of cooperators vulnerable to invasion.

[3] All analyses presented below exclude this one participant's data. If included, however, all significant and marginally significant results are maintained.

[4] Throughout all of the studies I examine the potential influence of participant gender on the results. I found no significant effects of gender in any analysis (all *p*s > .35).

[5] To ensure that the help items and punishment items formed two distinct factors, I conducted a principal components factor analysis (with varimax rotation). This analysis confirmed that the items fit together as the two hypothesized factors.

[6] As in Study 1, unless otherwise noted, analyses presented below exclude those whose note was not classified as prosocial gossip. However, when their data are included, all significant effects remain significant.

[7] I tested whether there were order effects in a variety of ways. First, in line with Fehr and Gachter (2002), I found that contributions in the gossip with ostracism game were statistically equivalent regardless of the order in which participants played in this condition (first, second, or third; Kruskal Wallis Test, χ^2 (2) = 3.97, p = .14. Likewise, there were no contribution differences due to game order for the gossip game (Kruskal Wallis Test, χ^2 (2) = 3.19, p = .20) or the basic game (Kruskal Wallis Test, χ^2 (2) = 3.11, p = .21). Second, I conducted three repeated measures ANOVAs comparing participants' average contributions in the three games. For each of the three ANOVAs, I entered as a covariate a dummy-coded variable of whether the participant played the gossip with ostracism, gossip, or basic game first. Results showed that even when controlling for which game participants played in first, there was a significant difference due to condition: Controlling for ostracism first, F(2, 428) = 199.50, p < .001; Controlling for gossip first, F(2, 428) = 162.78, p < .001; Controlling for basic first, F(2, 428) = 150.71, p < .001. Third, in a similar manner, I separated the study sessions depending on which game participants played first and then examined whether there were significant differences across the three games: Gossip with Ostracism game first, F(2, 142) = 60.97, p < .001, Gossip game first: F(2, 142) = 102.46, p < .001: Basic game first, F(2, 142) =103.46, p < .001 (see Figures 6 and 7)

[8] It should be noted that I included the gossip (without ostracism) game primarily as a means for helping to disentangle whether increased cooperation found in the gossip with ostracism game was due to the threat of being gossiped about in general, or the more specific hypothesis

that increased cooperation was due to the downstream effects of such gossip (i.e., partner selection dynamics).

[9] To complement these analyses, I also conducted repeated-measures ANOVAs, examining the contribution trends across the 6 rounds at the individual level. This analysis revealed a significant increasing trend across rounds for contributions during the gossip with ostracism game, $F(1, 215) = 17.18$, $p < .001$. For both the gossip and basic games, I found significant downward trends, $F(1, 215) = 54.44$, $p < .001$ and $F(1, 215) = 162.43$, $p < .001$, respectively. In addition, looking at the change from round 1 to round 6 due to experimental game, I found that within the basic game participants decreased from 4.91 to 1.82 (a decrease of 3.09 points or 63%) and in the gossip game participants decreased from 6.01 to 4.13 (a decrease of 1.88 points or 31%). However, in the gossip with ostracism game, participants increased from 8.12 to 9.13 (an increase of 1.01 points or 12%).

Figure 1. A classification system of gossip based on the intersection of the motivations underlying the behavior and the functions the behavior serves.

Functions

Motivations	**Prosocial**	**Antisocial**
Prosocial	*Warning*	Accidental Rumor Mongering
Antisocial	*Punishing*	*Slandering*

Figure 2. Diagram of the Motivations and Functions of Prosocial Gossip. *Motivational (Studies 1,2, & 3).* Upon witnessing a selfish act, individuals will experience both negative affect and a motivation to restore cooperation (which reinforce one another), because the selfish act contradicts an individual's preferences for cooperation and fairness *(frustration hypothesis)*. The extent to which an individual experiences negative affect and a motivation to restore cooperation will depend on how strongly an individual has a preference for cooperation and fairness *(prosocial hypothesis)*. The negative affect and motivation to restore cooperation will increase the likelihood that an individual does something about the selfish act that has been witnessed. One thing an individual can do is spread reputational information about the individual who behaved selfishly –i.e., prosocially gossip. As a result of engaging in prosocial gossip, the individual will experience a reduction in the negative affect that motivated the individual to engage in prosocial gossip *(relief hypothesis)*. The extent to which an individual experiences this reduction in negative affect will depend on the extent to which the individual has prosocial motivations.

Functional Studies (4 & 5). Prosocial gossip will lead to increased cooperation. Individuals will be deterred from behaving selfishly when they know that others can spread gossip about them if they behave selfishly *(deterrence hypothesis)*. Recipients of the gossip will use this information as a guide for partner selection – they will selectively interact with only those known to behave cooperatively *(partner selection hypothesis)*.

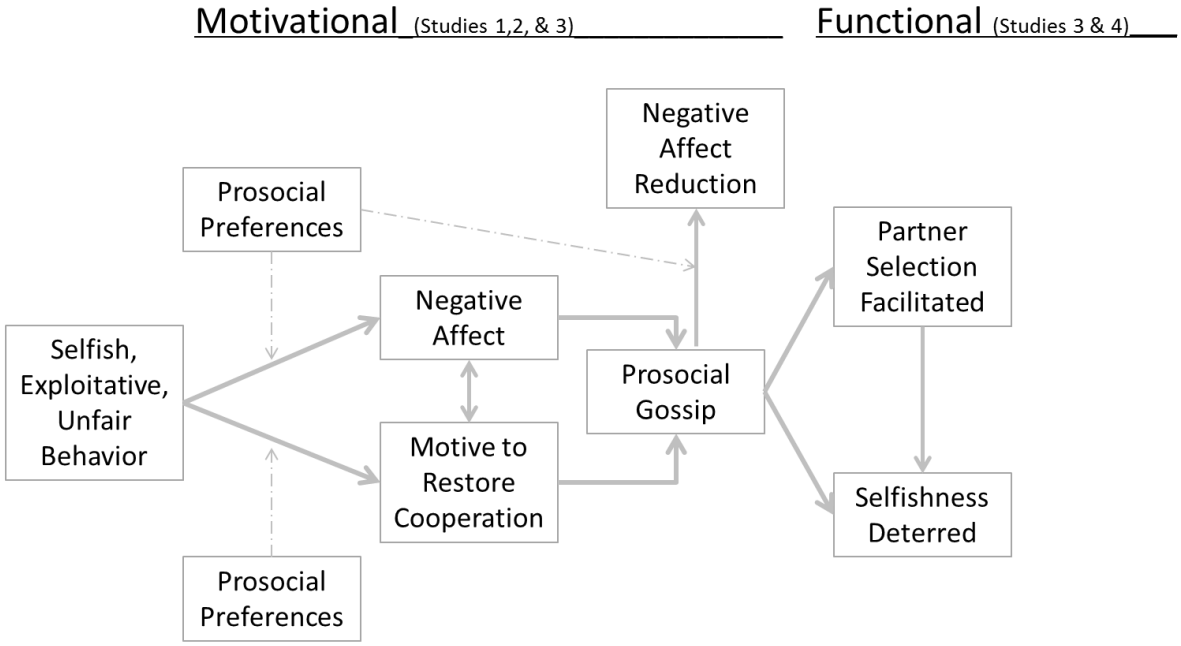


Figure 3. Negative Affect Changes due to the Interaction of Prosocial Value Orientation and Experimental Condition. High and low prosocial orientations are depicted at +1 and -1 standard deviations above the mean (Study 2).

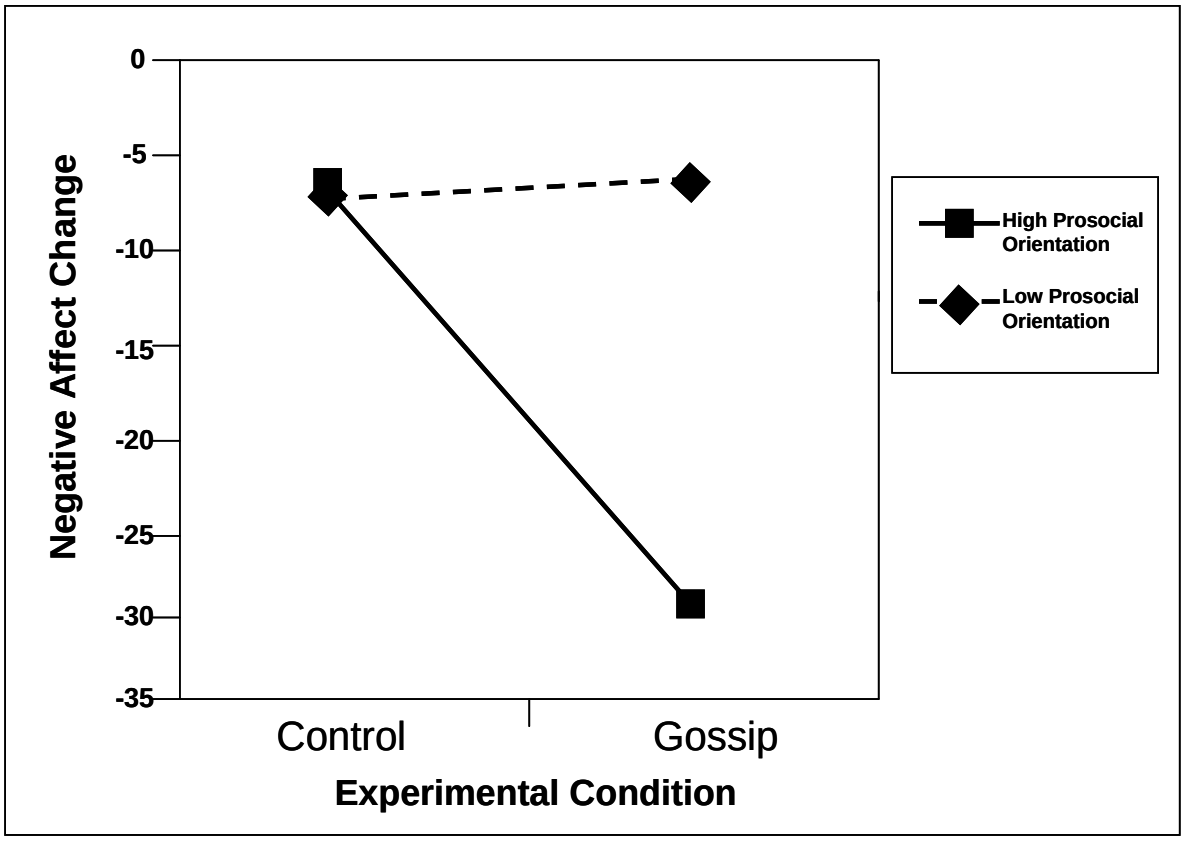


Figure 4. The interaction between prosocial orientation and experimental manipulation in predicting the portion of points returned to investors across the first 3 rounds of the trust game (Study 4). High and low prosocial orientations are depicted at +1 and -1 standard deviations above the mean (p < .05, ** p < .01, *** p < .001).*

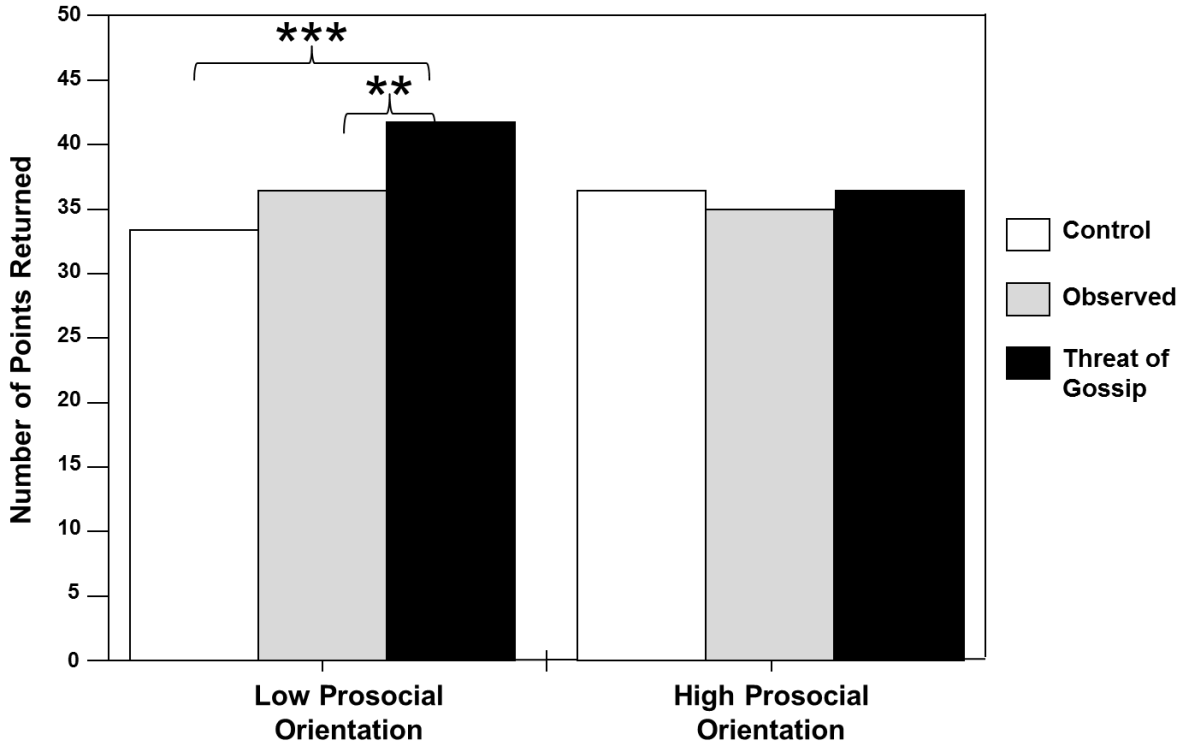


Figure 5. Diagram of the methods of Study 5

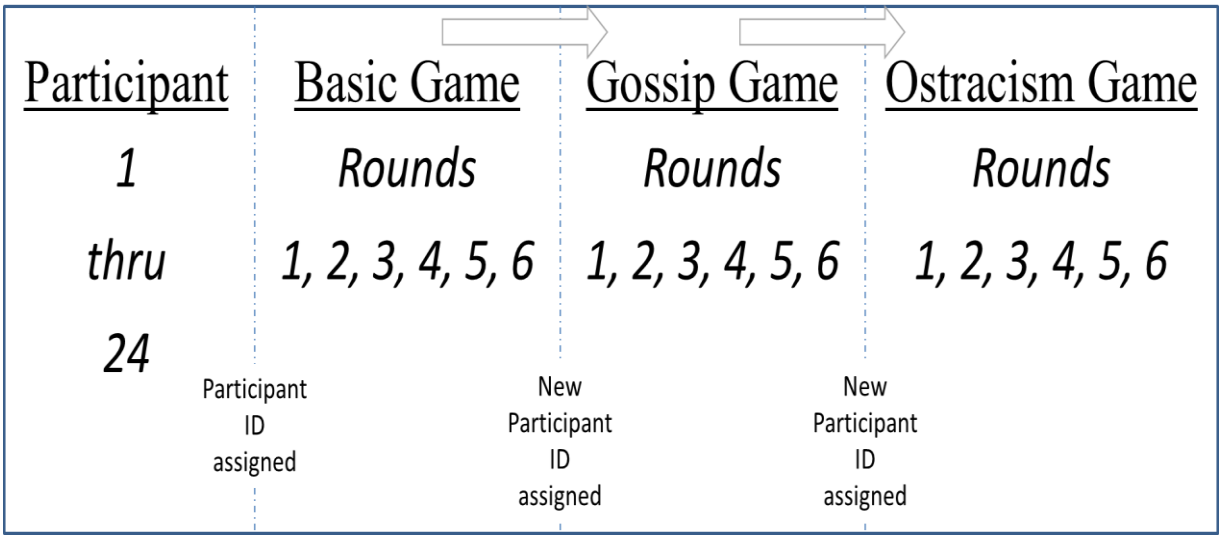


Figure 6. Participants' total contributions for each experimental game separated by which game the participants' played first.

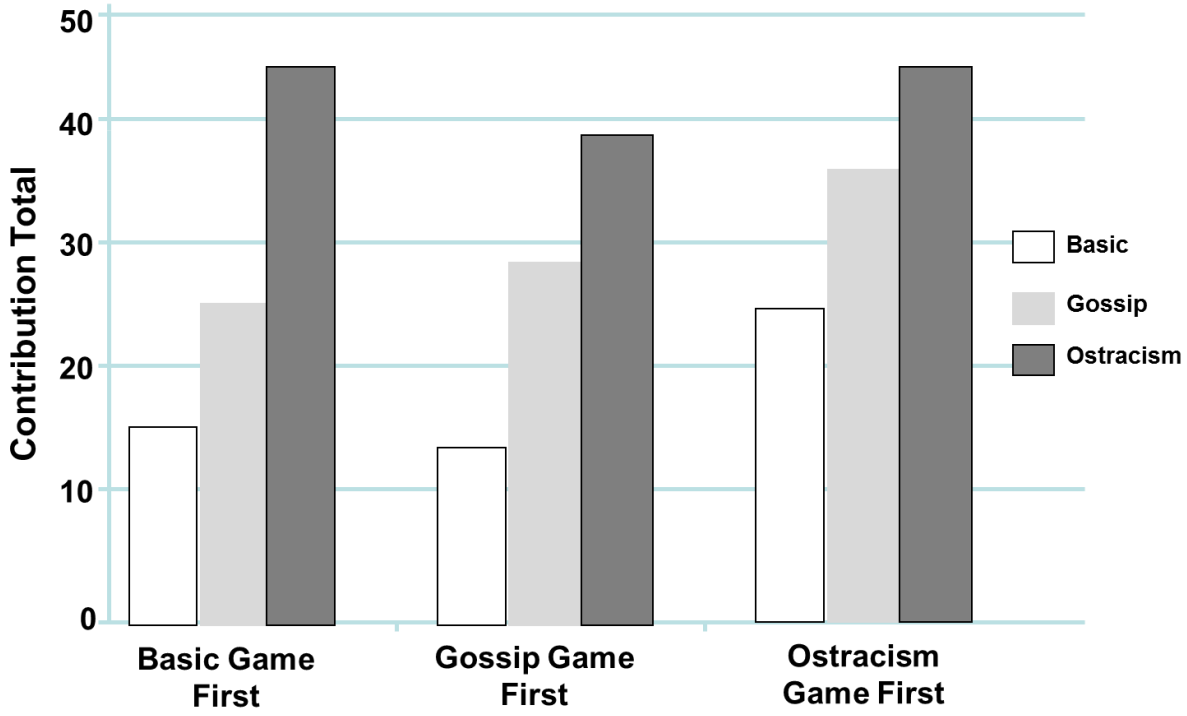
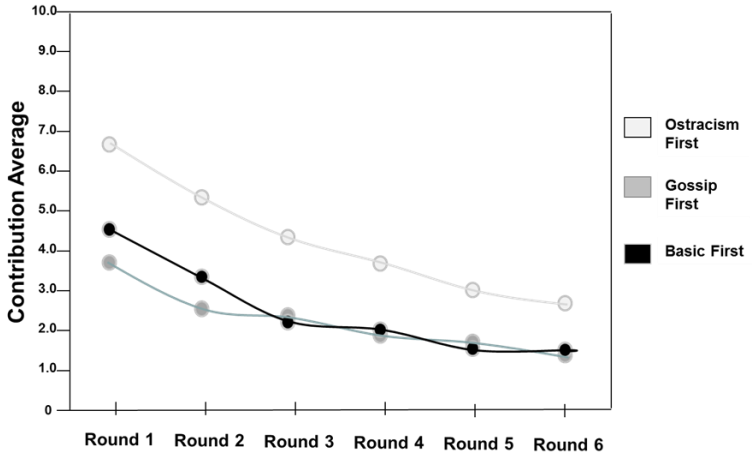
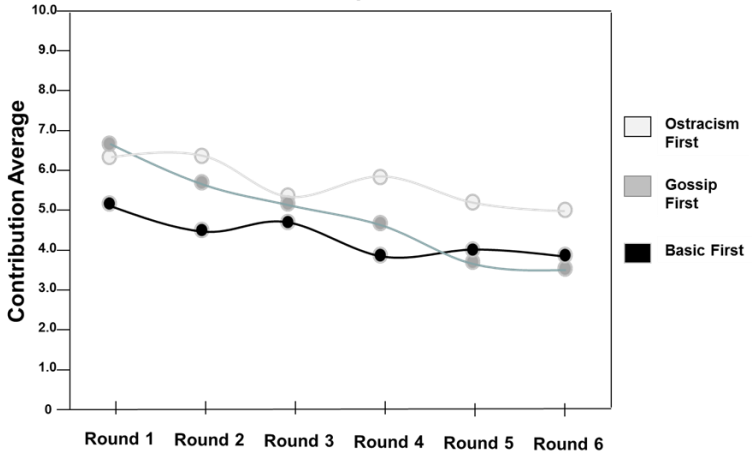


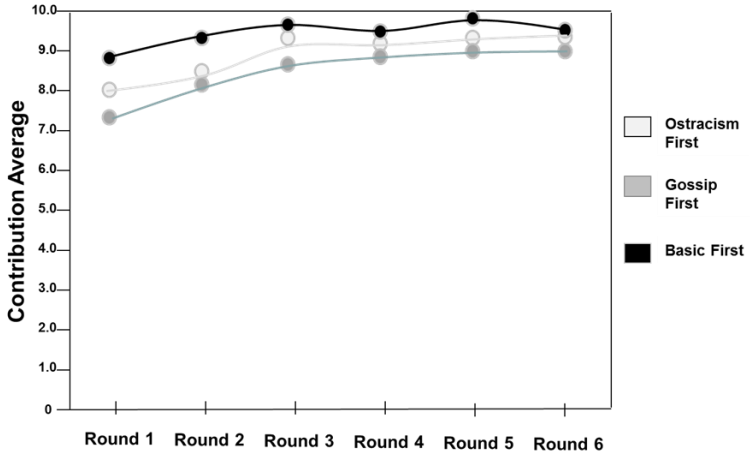
Figure 7. Participant contributions by round due to conditions separated by first game played



Contributions During Basic Game



Contributions During Gossip Game



Contributions During Gossip with Ostracism Game

Figure 8. Average participant contributions in a given round separated by experimental condition (Study 5).