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Wu, J.

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Chapter 7

General Discussion

7 General Discussion

The emergence and maintenance of cooperation is fundamental for groups, organizations, and societies to thrive. Over the past several decades, behavioral scientists have identified various factors and solutions that can promote cooperative decisions. Such factors can be classified into two broad categories: (a) person factors, such as other-regarding preferences (Balliet, Parks, & Joireman, 2009), and life history strategies (see Del Giudice, Gangestad, & Kaplan, 2015); (b) situational factors, such as monetary reward and punishment (Balliet, Mulder, & Van Lange, 2011; Fehr & Gächter, 2002a), and situational cues of reputation (e.g., “watching” eyes, gossip; Bateson, Nettle, & Roberts, 2006; Beersma & Van Kleef, 2011; Mifune, Hashimoto, & Yamagishi, 2010; Milinski, 2016). However, it is still unclear under what conditions reputation can be more or less effective in promoting cooperation. There is also little empirical evidence supporting the relation between life history strategies and cooperation. The present dissertation contributes to solving the puzzle of human cooperation by addressing the influence of (a) gossip and reputation, and (b) life history strategies through one review chapter (Chapter 2) and four empirical chapters (Chapters 3 to 6). Here, I will summarize the key findings of each empirical chapter, and outline the broader implications, strengths, limitations and avenues for future research.

Overview of the Empirical Findings

Chapters 3 and 4 examined when and how gossip and reputation can promote cooperation. We focused on two situational features: (a) whether one perceives a “shadow of the future” (i.e., expected future interactions; see also Axelrod, 1984; Barclay, 2012) with the gossip recipients, and (b) others’ social connections and gossip potential in one’s social network. Chapter 5 further compared a reputation system (i.e., gossip) with punishment to examine their relative ability to promote and maintain cooperation. Chapter 6 examined whether variations in life history strategies (i.e., optimal resource allocation strategies in response to early-life and current environments) predict cooperation in social interactions.

The Efficiency of Reputation in Solving Cooperation Problems

Chapter 3 examined whether gossip promotes cooperation only when one anticipates future interactions with the gossip recipients. Across three studies, we found support for the hypothesis that people were more generous when their partner could gossip to their future partner(s), compared to when gossip was sent to irrelevant person(s) they would never meet, or the no-gossip situation. We found no difference in generosity between the latter two conditions. Moreover, proself individuals displayed a larger increase in generos-

ity when they expected to interact with the gossip recipients later. This finding suggests that reputation has the potential to make people who tend to behave selfishly switch to cooperative strategies.

Chapter 4 empirically extended the previous chapter by testing whether people would condition their cooperation on others' social connections and gossip potential. Drawing on an evolutionary psychology perspective, we hypothesized that people would be more generous in response to gossip to only one other person (*single-tie hypothesis*) or many others (*multiple-ties hypothesis*) in their network, with whom they might interact in the future. Findings from three studies, along with the meta-analytic results, suggest that people are more generous in response to gossip to even one potential future partner (vs. no gossip). They also increase their generosity as the number of gossip recipients increases. Moreover, both prosocials and proselfs tend to condition their levels of generosity on cues of gossip. Study 4.3 further varied the stake size in the trust game to test an alternative rational choice account (i.e., people cooperate to maximize indirect benefits). Results of this study suggest that people are consistently more generous in response to cues of gossip even when the cost of building a reputation outweighs potential future benefits in the low-stake trust game.

We also tested whether reputational concern and/or expected indirect benefits could explain the effect of gossip on generosity. The findings from the first two empirical chapters suggest that one's concerns for reputation, rather than calculated benefits from one's future partners, mainly explain this effect. Moreover, proselfs seem to show more reputation-based generosity, given the more pronounced mediation of reputational concern for them, compared to prosocials. These findings imply that people do not rationally calculate potential future benefits they may gain from a good reputation or condition their decision on these calculated benefits, even when the situation affords them to do so (see Levine & Kurzban, 2006).

Chapter 5 examined the relative efficiency of gossip and punishment in promoting and maintaining cooperation through a real-time experiment. Participants interacted with others in a four-round public goods game (PGG), and then a two-round trust game (TG). Gossip (vs. no gossip) and punishment (vs. no punishment) options existed in the PGG, and then were removed in the TG. We found that gossip significantly increased both cooperation and individual earnings in the PGG. However, punishment had no overall effect on cooperation (although it had a small positive effect in the last two rounds of the PGG) and negatively affected individual welfare in terms of monetary earnings. Moreover, the initial gossip option made people more trusting and trustworthy in the TG, whereas punishment in the initial game did not influence behaviors in the TG. These initial findings imply that gossip may be more effective and efficient than punishment to promote and maintain cooperation.

Life History Strategy and Cooperation

In Chapter 6, we used life history theory to make the prediction that people adopting slower, compared to faster, life history (LH) strategy would be more cooperative in social interactions (Del Giudice et al., 2015). Studies 6.1 and 6.2 correlated two LH strategy measures with cooperation in various economic games. Studies 6.3 to 6.5 took an experimental approach and operationalized life history strategy as a magnifying effect of early-life environments contingent on current resource scarcity (see Griskevicius et al., 2013). Thus, the last three studies measured participants' childhood SES and childhood unpredictability, and manipulated current resource scarcity. Overall, we find no support for the hypothesis that slower LH strategy relates to more cooperation, or early childhood environments interact with current resource scarcity in predicting cooperation. However, some initial findings suggest that people following slower LH strategy tend to be more concerned about their reputation, more prosocially oriented, and more likely to trust others, and these factors partly explain the relation between LH strategy and cooperation.

Broader Implications

Social Networks, Reputation, and Cooperation

The present findings on the utility of gossip and reputation contain broader theoretical, empirical, and societal implications. First, the theoretical implication is partly inspired by our evolutionary approach of social networks to understand reputation-based cooperation. We acknowledge that social network is a broad concept, and we did not address several other features of social networks. For example, social networks often contain “communities” or clusters of individuals from different groups (McGlohon, Akoglu, & Faloutsos, 2011). Indeed, people are more cooperative toward ingroup, compared to outgroup, members (Balliet, Wu, & De Dreu, 2014; Yamagishi, Jin, & Kiyonari, 1999), and display this favoritism when their reputation is at stake (Mifune et al., 2010; Yamagishi & Mifune, 2008). This implies that group membership is an important cue that affects when people cooperate to secure a good reputation in social networks. Importantly, cooperation can also be affected by other social network properties, such as degree of separation between network members (Apicella, Marlowe, Fowler, & Christakis, 2012), network density (Gallo & Yan, 2015), and possibility to update network connections based on others' reputation (Gross & Blaskius, 2008; Rand, Arbesman, & Christakis, 2011; Van Segbroeck, Santos, Pacheco, & Lenaerts, 2010). Thus, the dynamic properties that generalize across social networks may also provide insights into potential situational cues people use to manage their reputation.

Second, the empirical implication follows from the emerging literature on subtle cues of being watched that may affect one's reputation. A seminal case in point is the classic finding that the presence of eye images (versus flowers) enhances financial donations to

an honesty box used to collect money for drinks (Bateson et al., 2006), and the recent finding that cues of watching eyes help reduce littering at cafeterias (Ernst-Jones, Nettle, & Bateson, 2011). Such findings suggest that implicit cues of reputation can also promote cooperation. Looking at our findings, it may be that the mere fact that a stranger unconnected to one's social network is "watching" (i.e., someone from an unrelated study is informed of one's behavior) is not sufficient for people to sacrifice their own outcome to benefit others. Although various explanations are viable, we wish to draw one interesting implication. Perhaps implicit cues of reputation may promote low-cost cooperation, such as paying for one's milk or looking for a garbage can rather than littering, where the norm is to cooperate or behave decently. In contrast, the norm in a dictator game is not to engage in excessive cooperation, because the costs for self equal the gains for the other. It is indeed plausible that when a small personal cost yields relatively higher outcome for others, subtle reminders of reputation may enhance greater cooperation. Indeed, some initial evidence shows that subtle reminders of reputation can promote low-cost helping (Van Bommel, Van Prooijen, Elffers, & Van Lange, 2012).

Third, the societal implication is grounded in the extensive scientific literature on sanctioning systems. Although both punishment and reward systems can effectively increase cooperation (Balliet, et al., 2011; Fehr & Gächter, 2002a), they are costly for organizations and societies and in many instances negatively affect both individual and group welfare, and thus are inefficient in promoting cooperation (Dreber, Rand, Fudenberg, & Nowak, 2008; Egas & Riedl, 2008; Wu et al., 2009). Moreover, the opportunities to punish free riders may induce retaliations that lead to the breakdown of cooperation (Nikiforakis, 2008). Inspired by some recent evidence and our own research comparing gossip with punishment, we suggest that gossip and reputation monitoring may provide an efficient solution to promoting cooperation and maintaining group norms (Dunbar, 2004; Feinberg, Cheng, & Willer, 2012; Rockenbach & Milinski, 2006). Thus, the informal and less costly reputation systems may offer a better prospect to solve social dilemmas and other real-life problems. For example, asking for urgent donations to noble causes in public settings (e.g., around a stadium where people gather with friends) may be more effective than doing so in private settings (e.g., at the front door of one's house). In addition, a set of (relevant) eyes that may serve as reminder of reputation may efficiently prevent norm violations. Similarly, reputation systems, such as anonymous ratings of employees among peers at irregular intervals, may help to promote organizational citizenship behaviors in organizations. Moreover, the person who monitors and transmits information about others' behavior does not even need to be an important person who can formally evaluate others, but can be a low-status observer who is merely connected to others' social networks. For example, a low-status research assistant working in a full professor's lab may be enough to minimize unethical research practices.

Variations in Cooperation within the Life History Framework

The present work on life history strategy and cooperation suggests that slower life history strategy does not directly relate to cooperation. However, people adopting slower, compared to faster, life history strategies tend to exhibit stronger concern for reputation, as well as enhanced levels of prosocial orientation, and general trust. These findings contain broader implications for both theory development and practice. First, life history theory suggests that individuals following slower strategies may invest more in genetically related individuals (Figueredo et al., 2005), but such investment may not generalize to costly behavior that serves to promote the welfare of random strangers. It is also plausible that life history variation in cooperation may depend on cues regarding the features of one's interaction partner or perceived "shadow of the future" with others in social interactions. For example, people following faster strategies may need to form strong coalitions with others in the same family networks or communities, and condition their behavior strictly on others' group membership. In contrast, people with slower strategies may be more likely to trust and cooperate with others in general. Second, although life history strategies reflect individuals' adaptive responses to their ecological conditions (Ellis, Figueredo, Brumbach, & Schlomer, 2009), slower strategies seem to be more functional in social domains, such as facilitating trust, concern for others, and ultimately, cooperation. As such, providing children with benign and secure (vs. harsh and insecure) environment during their early years may help to build prosocial traits and prevent impulsive and aggressive behaviors later in life (Simpson, Griskevicius, Kuo, Sung, & Collins, 2012).

Strengths, Limitations, and Direction for Future Research

The present dissertation has both theoretical and methodological strengths. In terms of theory, it helps address the classic question of human cooperation by integrating insights and theories from evolutionary perspectives, economics, and psychology to generate testable hypotheses. In terms of methods, we take the strength of relatively large samples across our studies to guarantee reasonable statistical power. Moreover, the online environment guarantees anonymity between participants and makes the experimental manipulations (e.g., partner's network connections and gossip potential) "clean" and easy to implement. Such anonymity is especially important for us to use the novel web-based platform for a real-time online experiment that compares gossip with punishment. We must also note the use of pre-programmed strategies on one's partner's decision in most of the studies. However, such strategies in one-shot interactions are not likely to affect participants' decisions. In addition, decisions in each game determined participants' final payoff or their chance to win a 2-dollar bonus, and thus revealed their motive to cooperate with others.

Despite the importance of the present work, we also acknowledge some limitations and outline several promising avenues for future research. First, we initiated part of the present work (i.e., Chapters 3 and 4) using an experimental approach with a relatively

subtle interdependence and a limited time horizon. Yet it seems plausible that information about others' social connectivity (and potential to spread one's reputation) may affect generosity in even more profound ways in many daily life contexts. On the one hand, people may inquire about others' social connectivity and quickly translate relatively mundane observations—how frequently others interact with or mention someone else—into an implicit “connectivity score”. This information implies others' potential power to boost or damage one's reputation and possible indirect benefits, and therefore serves as an implicit norm to regulate one's behavior toward others. On the other hand, people may seek to increase their connectivity to boost social capital (e.g., social networking), and convey information about their degree of connectivity, such as name-dropping, with the expectation of being treated well.

Second, part of the present work involved real-time interactions between anonymous people online, during which they could freely send and receive gossip about each other. We found that gossip not only promoted cooperation, but also made people more trusting and trustworthy in future interactions where trust and cooperative motives matter as goals, rather than strategies. This may suggest the importance of reputation-based trust, particularly in small communities where people can easily keep track of each other's reputation. Notably, the freedom to gossip about each other in social interactions may promote cooperation through two different routes. One route may be labeled as reputational concern: gossip may make people more concerned about their reputation within their group, which can motivate them to cooperate with others. A second route may be rooted in descriptive norms. The positive or negative gossip received about others may affect one's perceived descriptive norms (i.e., what most other people do), and beliefs about whether others will cooperate or not (Lindenberg, 2014). For example, people are more likely to cooperate if they are told that most others have cooperated (Frey & Meier, 2004). This logic suggests that receiving positive gossip may lead to more trust and positive expectation that others will cooperate, whereas negative gossip may harm trust and cooperation. Indeed, we found that a large portion of gossip notes in our experiment (i.e., Chapter 5) involved positive evaluations that may work in both routes. Future research could disentangle these two plausible routes (i.e., reputational concern vs. beliefs about others' cooperative intent) through which gossip may affect cooperation in groups and social networks.

Third, past research suggests that people who frequently gossip about others negatively are perceived as less powerful and less likeable than positive gossipers (Farley, 2011). It is plausible that relative to positive gossip, negative gossip may require more trust (and closeness) between the gossiper and the gossip recipient. Thus, a potential direction for future research is to examine how people selectively conceal or disclose positive or negative reputation about other third parties depending on (a) whether they trust the gossip recipient and (b) the interpersonal closeness between the gossiper and the gossip recipient.

Fourth, one assumption underlying the present research is that allocating benefits to

others would establish a good reputation, without taking into account the recipient's past behavior or reputation (i.e., 2nd-order information). An important question to address is to what extent people cooperate with others who have a reputation of cooperation (vs. free riding) or punishing non-cooperators (vs. no punishment behavior). Indeed, people do actively seek information about their partners' past cooperation, and condition their cooperative decisions on this information to enhance their reputation (Swakman, Molleman, Ule, & Egas, 2016). Furthermore, people who punish free riders also receive help more often (dos Santos, Rankin, & Wedekind, 2013). While this 2nd-order information reflects the context of others' (un)cooperative behavior, and allows one to judge the real intentions of others' behavior, it is plausible that not everyone treats this information equally. As a case in point, cross-cultural evidence suggests that Westerners tend to be context-independent, whereas Asians tend to be context-dependent when perceiving a salient object (Nisbett & Miyamoto, 2005). This variation in perception style may also exist in interpersonal context, such that Westerners and Asians may treat 1st-order and 2nd-order information about others' behavior differently while deciding whether to cooperate or not. Thus, future research could examine whether Asians are more likely to take the social context (i.e., 2nd-order information) into account when making their cooperative decisions toward an interaction partner to enhance their reputation.

Concluding Remarks

Social interactions do not occur in a vacuum. They often take place in groups and large social networks, where all members' behaviors and reputations affect each other. Across four empirical chapters, the present dissertation provides novel insights into why, when, and how people are willing to cooperate with others. The findings suggest that people are conditionally more cooperative toward others when their future partners are able to know about their reputation through gossip, or when their interaction partner or a third-party observer has more social connections and gossip potential to affect their reputation within their social network. More importantly, we also provide some initial evidence that gossip is relatively more effective and efficient than punishment to promote and maintain cooperation, when gossip is free and punishment is modestly costly (i.e., cost-to-fine ratio of 1:3). We have also learned that variations in faster and slower life history strategies do not seem to relate strongly to cooperation in one-shot interactions with random strangers. Indeed, a total of five studies revealed no significant findings on this relation. Interestingly, people adopting slower, compared to faster, life history strategies tend to be more concerned about their reputation, more prosocially oriented, and in general more likely to trust others. Clearly, future research needs to clarify how variations in cooperation fit with a life history framework, by investigating potential moderators (e.g., genetically related others vs. friends and community members vs. strangers; one-shot vs. repeated interactions) that may explain these variations.

Taken together, the present findings underscore the utility of reputation as a strong candidate to promote trust and cooperation in a cost-effective manner, perhaps even more so among people who are inclined to behave selfishly and need to be “persuaded” to cooperate. This research also conveys the relevance of social network structure to understand generosity and cooperation. Thus, we emphasize the importance of reputation monitoring and spreading in dynamic social networks to resolve social dilemmas and promote human cooperation.