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Delay discounting in dyads and small groups: Group leadership, status information, and actor-partner interdependence

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ABSTRACT

Delay discounting is usually studied at the individual level, though there exist many situations where dyads and small groups have to make intertemporal decisions about delayed rewards. In the current study, we investigated the social dynamics in collective intertemporal decision making by experimentally manipulating group leadership and status differentials among dyad and group members. Participants in all experiments completed three phases of an intertemporal decision-making task: an individual pre-collaboration phase, a collaboration phase in dyads or small groups, and an individual post-collaboration phase. In Experiments 1 and 2, small groups of three made collective decisions during the collaboration phase, with one member of the group being assigned a leadership position. Groups believed that leaders were chosen either randomly (Experiment 1) or systematically based on the normativity of the leader's pre-collaboration decisions (Experiment 2). Leaders exerted a stronger influence on group preferences than non-leaders, but only when participants believed leaders were chosen systematically. Experiment 3 then demonstrated that lower-status dyad members were more affected by a collaborative experience compared to higher-status members, suggesting that social influence on delay discounting depends on the relative status between dyad and group members.

1. Introduction

Intertemporal tradeoffs between immediate and delayed rewards are pervasive throughout human decision making. A common finding is that humans often have difficulty waiting for delayed rewards, opting instead for immediate consumption (e.g., Mischel, Shoda, & Rodriguez, 1989). This devaluing of delayed rewards is referred to as delay discounting in the research literature. Higher rates of delay discounting relate to a variety of maladaptive outcomes, including reduced savings rates (Finke & Huston, 2013) and addiction (Reynolds, 2006).

The vast majority of research on delay discounting has focused on intertemporal decisions made by individuals. As a result, less is known about how small groups of individuals make collective decisions that involve delayed rewards. This gap in the literature is problematic because there exist many circumstances where decisions about delayed rewards must be made by dyads or small groups (e.g., spouses, budgetary committees). To understand decision making in these situations, it is necessary to study how small groups combine and transform the preferences of individual group members into collective decision preferences. Furthermore, studying delay discounting in small group settings affords the ability to measure the extent decision preferences of individuals are socially influenced by others. By overly focusing on individual decision-making paradigms, prior research may have overlooked the interdependent nature of intertemporal preference formation and revision.

1.1. Delay discounting in social contexts

Delay discounting is affected by social context. For example, individuals make intertemporal decisions differently for themselves versus other people (e.g., Albrecht, Volz, Sutter, Laibson, & von Cramon, 2011; Ziegler & Tunney, 2012; but see Weatherly & Ruthig, 2013). Another social context investigated recently is the extent individuals make intertemporal decisions differently when alone or in the presence of others. Late adolescents are more likely to prefer immediate rewards over delayed rewards when in the presence of peers than when making decisions alone (O'Brien, Albert, Chein, & Steinberg, 2011). However, this difference is eliminated when late adolescents make decisions in front of a group that includes a slightly older adult (Silva, Chein, & Steinberg, 2016). The above research demonstrates that individuals' intertemporal decisions are affected by social context, but it does not shed light on the processes involved in collective intertemporal

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decisions making.

Gaining a better understanding of how intertemporal decisions are made by small groups motivated a recent study by Bixter, Trimber, and Luhmann (2017). Participants completed three phases of an intertemporal decision-making task: an individual pre-collaboration phase, a collaboration phase in dyads or small groups, and an individual post-collaboration phase. This collaborative decision-making paradigm allows one to explore how intertemporal decisions are made by dyads and small groups, as well as how collaboration subsequently influences the preferences of individual group members during the post-collaboration phase. Two group effects were of note. First, group preferences during the collaboration phase were strongly related to the mean of group members' pre-collaboration preferences (an averaging effect). Second, group members' individual preferences were more similar post-collaboratively compared to pre-collaboratively (a convergence effect). These results demonstrate that socially interacting with others in small-group settings can lead to revisions in delay discounting, with these revisions being driven by the decision preferences observed in other group members during collaboration. Bixter and Rogers (2019) replicated and extended these findings by observing the averaging and convergence effects in an older adult sample, suggesting that social influences on delay discounting extend into older adulthood.

1.2. Group leadership

The social dynamics and processes involved in collective intertemporal decision making remain largely unknown. This is problematic because hierarchies in power and status often exist among group members. As a result, there is a long tradition in social psychology of studying the role of leaders in shaping small-group preferences and behavior (Berkowitz, 1953; Burke, 1974). A major focus is the extent leadership qualities and status differentials among group members influence group outcomes and performance (Dubrovsky, Kiesler, & Sethna, 1991; Lucas & Lovaglia, 1998). Hierarchies within a group can exert both positive and negative impacts on group/team effectiveness (for meta-analytic evidence, see Greer, de Jong, Schouten, & Dannals, 2018). For instance, interpersonal conflicts can stem from status inequality among group members, especially in situations where status differentials are paired with power differentials (Anicich, Fast, Halevy, & Galinsky, 2016). However, certain leadership qualities can help mitigate group conflict and promote prosocial behavior, such as the prototypicality of a leader (Hogg & van Knippenberg, 2003; Rast, Gaffney, Hogg, & Crisp, 2012; van Knippenberg & van Knippenberg, 2000) and the social identification by the leader with a group (Scholl, Sassenberg, Ellemers, Scheepers, & de Wit, 2018; Tost & Johnson, 2019).

One important leadership distinction is whether leaders are chosen randomly or selected systematically based on some personal characteristic (Haslam et al., 1998; Henningsen, Henningsen, Jakobsen, & Borton, 2004). Randomly-chosen leaders are given leadership responsibilities over groups (e.g., leading group discussions, authority in resolving disagreements), but members of the group are made aware that the leader is being assigned these responsibilities through a random process. Systematically-selected leaders, on the other hand, are chosen because some personal characteristic of theirs is believed to make them better suited to represent the group as a leader. In these latter situations, status information can be either shared or unshared among group members (e.g., Bonner, Baumann, & Dalal, 2002). In shared information conditions, all members of the group are made aware of the relative standing of all group members. In unshared information conditions, status information is only made available to a possible subset of group members.

Bixter et al. (2017) did not manipulate or control for group leadership in their study, so it remains unclear if leadership status (whether based on random or systematic selection) influences collective intertemporal decisions. Moreover, it is unknown the extent that leaders and non-leaders are differently influenced by collaborative experiences. As mentioned above, Bixter et al. (2017) found that individuals revised their delay discounting following collaboration to be more aligned with their respective group's preferences. If leaders disproportionally influence group intertemporal decision making during collaboration, there would likely be less of a discrepancy between their preferences and their respective group's preferences. This might then result in leaders revising their post-collaborative preferences less than non-leaders.

1.3. Actor-partner interdependence

Studying decision making in dyadic and small-group designs presents certain statistical problems, due to the dependency of the data. However, statistical methods have been developed that quantify social influence while taking into account the interdependency of group data. This is most easily seen in research on dyadic relationships, with the actor-partner interdependence model (APIM; Cook & Kenny, 2005; Kenny, 1996) being one commonly used method. The APIM most often uses a structural equation modeling framework to estimate both actor and partner effects simultaneously. Actor effects refer to the influence of an individual's score on an independent variable on his or her score on a dependent variable. Partner effects refer to the influence of a partner's score on the independent variable on the actor's dependent variable score. By estimating actor and partner effects simultaneously, the APIM allows social influence to be directly estimated. The APIM can be applied to the collaborative decision-making paradigm used by Bixter et al. (2017) to quantify social influence in intertemporal decision making. Specifically, individuals' post-collaboration preferences can be simultaneously predicted by the individual's own pre-collaboration preferences (the actor effect) and the pre-collaboration preferences of his or her dyadic partner (the partner effect).

One critical distinction in dyadic research is whether members of dyads are distinguishable or indistinguishable on a particular variable. Using the variable sex as an example, husbands and wives would be considered distinguishable whereas pairs of same-sex friends would be considered indistinguishable. Manipulating group leadership leads to members of a dyad or small group to be distinguishable (i.e., leaders vs. non-leaders) with regards to status, which allows the differential influences of the group members to be estimated. That is, the partner effects of leaders on non-leaders can be compared to the partner effects of non-leaders on leaders. The degree of social influence on delay discounting can then be measured for both the leaders and non-leaders of decision-making dyads.

1.4. Overview of current study

The current study sought to address a gap in the literature by exerting experimental control over the social dynamics during collaborative intertemporal decision making. Specifically, we manipulated leadership positions and status differentials among collaborators. Participants completed three phases of an intertemporal decision-making task. In both the pre-collaboration and post-collaboration phases, participants completed the task individually. However, in the intervening collaboration phase, participants completed the task in small groups of three (Experiments 1 and 2) or dyads (Experiment 3). We were interested in two types of collaborative decision-making effects. The first refers to the influence of group members' pre-collaboration preferences on group delay discounting during collaboration. That is, how do the delay-discounting preferences of individual group members shape the delay-discounting preferences of groups during collaboration? The second type of effect deals with the extent a collaborative experience subsequently influences the post-collaboration preferences of the individual group members. Specifically, to what extent do individuals' delay-discounting preferences change from pre- to post-collaboration due to the intervening collaborative experience?

Leadership was assigned to a member of a group prior to