WHO GETS TO FREE RIDE?

STATUS & PUNISHMENT IN A PUBLIC GOODS GAME

A Dissertation

by

MARY KATHRYN CONSTANTIN

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Chair of Committee,	Jane Sell
Committee Members,	Mary Campbell
	Catherine Eckel
	Holly Foster
Head of Department,	Patrick Goldsmith

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ABSTRACT

Previous research demonstrates that status expectations for cooperation and the possibility of punishment increase contributions and decrease free riding within public goods settings. Very little work, however, examines how these two mechanisms interact. This dissertation addresses this gap by examining how status relations among actors affect the degree to which they punish free riders.

I examine this question within the context of the Theory of Status Characteristics and Expectation States (SCES) and demonstrate how SCES translates to public goods settings. Drawing on this theoretical program, I outline four competing views about the effect of status on punishment. Some literature predicts that higher status actors are held to a higher standard and will therefore be punished more than lower status actors. Some literature predicts that lower status actors will be punished more than higher status actors, and other literature predicts that the status of the punisher and the status of the punished will interact with one another.

To arbitrate between these views, I use a standard, public goods experiment with a 2x2 (status of participant x status of free rider) factorial design. I manipulate status by generating a manager/employee relationship between participants. Results demonstrate that neither the status of the free rider nor the interaction (between the status of the free rider and the status of the punisher) have a significant effect on punishment decisions. The status of the punisher, on the other hand, does have a statistically significant effect. Contrary to previous findings, in this study, higher status actors punish free riders significantly more than do lower status actors. Implications and avenues for future research are discussed.

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1. INTRODUCTION

Labor unions, public radio, public school systems, and national security are a few examples of public goods. Unlike private goods, such as food and clothing, everyone has the potential to benefit from these goods, regardless of whether or not they contribute to their production, and no single individual's use of a public good reduces its availability to others. These types of goods, however, can only be sustained as long as enough people contribute their time, money, and/or effort to the good (Sell and Son 1997; Kollock 1998).

Public goods can be classified as one kind of a broad class of social phenomena known as social dilemmas. Social dilemmas take many forms including prisoner's dilemmas, commons dilemmas, and public goods dilemmas, but the defining factor is that at any given point in time, the individual payoff for defection (or not cooperating) is higher than that of cooperation. If everyone chooses to defect, their payoff in the long run will be lower than it would have been if everyone had chosen to cooperate by contributing to the good (Dawes 1980). Thus, social dilemmas pit the short-term interests of individuals against the short and long-term interests of the group.

Individuals who fail to contribute to a public good from which they benefit are often defined as free riders (Fehr and Gächter 2000; Fischbacher, Gächter, and Fehr 2001). Although these individuals pose little immediate threat to the generation and maintenance of most goods, their presence within groups can pose a threat to the stability of public goods over time because they generate fear within groups that others are profiting from the good for free. This fear leads group members to reduce the size of their contributions to the good. Under these circumstances, goods

such as public parks and schools will not be properly maintained or enriched. As a result, groups who value public goods must find ways to eliminate or diminish free riding.

According to Ostrom (1990, 2000, 2010), there are a variety of "design principles" that groups can adopt to strengthen their ability to solve social dilemmas. These principles include: (a) resource and membership boundaries that clearly define the parameters of a given good as well as who can and cannot use it; (b) resource and membership monitoring systems that oversee the status of a given good as well as the behavior of its users; (c) face-to-face communication between members; (d) collective-choice arrangements that give members the ability to contribute to the development of membership rules; (e) rapid, low-cost conflict resolution mechanisms that give members the ability to discuss and respond to rule violations; (f) graduated sanctions that condition punishment for rule violations upon the type and context of the users offense; and (g) strong, clear leadership within the group (Ostrom 2000; Ostrom 2010).

While leadership is mentioned as a design issue, it is not altogether clear how leadership might be achieved. One characteristic that is directly related to leadership is status. Status is a position in a social network that involves status beliefs or perceptions about the worthiness and competence of individuals occupying a particular status position (Ridgeway et al. 1998; Ridgeway and Correll 2006; Ridgeway 2014). When status beliefs shape expectations for cooperation within public goods settings, the average contributions of group members rise. This increase results from status expectations that push higher status group members to demonstrate leadership by increasing their own contributions to the good and lower status group members to demonstrate deference by following their example (Sell 1997; Hardy and Van Vugt 2006; Willer

2009; Eckel, Fatas, and Wilson 2010; Kumru and Vesterlund 2010; Simpson, Willer, and Ridgeway 2012).

Although it is clear that status is related to leadership, research has yet to examine how status affects other design principles such as graduated sanctions. The effects of sanctions and punishment on behavior within social dilemmas, on the other hand, have received considerable attention over the past several decades. Researchers have found that the provision of a public good is much more likely when group members are both willing and able to punish free riders (Sell and Wilson 1999; Fehr and Gächter 2000; Ertan, Page, and Putterman 2008; Casari and Luini 2009). Trigger strategies, monetary fines, ostracism, and the spread of negative reputational information, for instance, have all been found to increase contributions and decrease the proportion of free riders within public goods settings (Sell 1997; Sell and Wilson 1999; Sefton, Shupp and Walker 2007; Feinberg et al. 2012; Feinberg, Willer, and Shultz 2014).

Previous research demonstrates that status-based expectations for cooperation via clear leadership and the possibility of punishment both increase contributions to goods and decrease free riding within public goods settings (Sell 1997; Hardy and Van Vugt 2006; Willer 2009; Eckel et al. 2010; Kumru and Vesterlund 2010; Simpson et al. 2012). Research, however, has yet to determine how these two mechanisms interact. In this study, I address this gap by examining how status relations between individuals affect the degree to which they punish free riders. I ask whether the status of the *punisher* or the status of the *punished* has a direct effect on the punishment of free riders and whether there is an interaction between the status of the punisher and the punished. As I demonstrate, some literature predicts that higher status actors are held to a higher standard and will

therefore be punished more than lower status actors; other literature predicts the opposite. My study will arbitrate between these lines of literature, and these questions will be investigated within the context of the Theory of Status Characteristics and Expectations States (SCES) and public goods.

2. LINKING EXPECTATION STATES TO PUBLIC GOODS

The Theory of Status Characteristics and Expectation States (SCES) is a theoretical research program directed toward understanding the development of power and prestige in small, task-oriented groups. It comprises several interrelated theories, methodological strategies, shared concepts and assumptions, and a host of relevant research (Berger, Wagner, and Zelditch 1983; Berger, Wagner, and Webster 2014). In general, SCES focuses on the ways in which cultural beliefs about status characteristics affect interpersonal interactions and lead to the development of status hierarchies within small groups (Correll and Ridgeway 2003). The scope of this research program, however, is generally limited to encounters in which actors are (1) task-oriented and (2) collectively oriented (Berger et al. 1972). When actors within a group are task oriented, they are concerned with completing a task whose outcome they value. Collective orientation, on the other hand, occurs when actors within a group believe it is necessary to take each other's behavior into account while trying to solve a task (Berger and Webster 2006). To date, these scope conditions have been applied to a variety of different settings. Public goods, however, have only recently become one of them.

In this paper, I also argue that the scope of SCES generalizes to public goods settings. When a public good is valued, for example, actors should be oriented towards producing the good. When a public good is not valued, on the other hand, actors will have no incentive to contribute. As a result, actors who do contribute to the good demonstrate task-orientation. Collective orientation is also evident when actors choose to contribute to a public good because the structure of these goods requires that actors who are oriented toward producing the good take each other's behavior into

account. For this reason, actors who are task-oriented should also be collectively oriented. If both of these conditions are met, I expect the presentation of status information will affect the degree to which actors punish free riders.

3. STATUS CHARACTERISTICS & EXPECTATION STATES

Theory of Status Characteristics and Expectation States (SCES) contains several different theoretical branches, and among these branches competing views about the effect of status on punishment emerge. In the section that follows, I outline a few theoretically relevant branches as well as the fundamental concepts that formulate the bulk of SCES. I then delineate how this framework can be used to predict how status will affect the punishment of free riders in a public goods game.

3.1 Theory of Power and Prestige

The theory of power and prestige was developed to account for the development, alignment, and stabilization of inequalities in participation and influence within small task-oriented groups with members of equal status (Berger et al. 1983, Berger et al. 2014). As the first branch of SCES, the theory of power and prestige lies at the heart of this broad theoretical program. According to this theory:

> Definition 1: *Power and Prestige Behaviors* are behaviors such as an actor's action
>
> opportunities, performance outputs, reward actions, and influence that account for
>
> the development, alignment, and stabilization of inequalities in small task-oriented
>
> groups (Berger et al. 1983).

Action opportunities refer to the chances an actor is given to contribute to the group, and performance outputs are an actor's actual attempts to contribute. Evaluations of an actor's

performance given to the actor by the group are reward actions, and an actor's ability to exercise influence is defined by their ability to change the opinions of other group members (Berger et al. 1983).

Originally, this branch focused on how aggregated performance outputs among actors of equal status lead to the formation of generalized performance expectations that then stabilize overtime into an observable power and prestige order (Berger et al. 1983).

> Definition 2: *Performance Expectations* are beliefs or anticipations about the abilities and usefulness of the contributions of self and others to a given task (Lawler, Ridgeway, and Markovsky 1993; Berger and Webster 2006).

Over the past several decades, the theory has been broadened to incorporate interactions between actors of unequal status as well, and for actors of unequal status, the order of power and prestige is influenced by all salient characteristics (Berger et al. 1983).

3.2 Status Characteristics Theory

Unlike the theory of power and prestige, status characteristics theory was specifically developed to account for the emergence of expectation (dis)advantages for actors differentiated by status. Within this branch of SCES:

Definition 3: *Status characteristics* are categorical indicators that bind performance

expectations, or assumptions about an actor's ability to contribute to the group, to

particular groups of individuals (Lawler et al. 1993).

There are two different types of status characteristics – specific and diffuse – and any characteristic around which beliefs and expectations come to be organized can become a status characteristic (Berger and Webster 2006). Diffuse status characteristics refer to socially important characteristics that have at least two distinct states associated with different levels of worth and generalized expectations. They are social categories that bind certain positive or negative behavioral assumptions, or performance expectations, to groups of individuals, and they typically include traits that are more or less physically observable such as race, class, or gender (Correll and Ridgeway 2003; Berger and Webster 2006). Specific status characteristics, on the other hand, refer to characteristics with two or more differentially evaluated states related to performance or ability within a particular setting, and they include traits such as intelligence, creativity, dexterity, and so forth. (Berger et al. 2014).

There are five core assumptions within status characteristics theory: (1) all status information relevant to the situation is salient, (2) actors generalize status advantages to all new situations, (3) groups restructure themselves as new information is introduced, (4) actors combine all salient, status information to form performance expectations, and (5) actors' observable power and prestige behaviors are a direct function of their relative expectation advantage (Martin and Sell 1985, Berger and Webster 2006). Relying on these assumptions, the theory suggests that actors use status markers such as these characteristics to identify the levels of competence, esteem, and

respect others deserve within any given encounter (Ridgeway 2006). In unequal status groups, actors use status characteristics, in conjunction with behavioral interchange patterns and social rewards, to form aggregated performance expectations for both themselves and others within social interactions (Correll and Ridgeway 2003, Webster and Rashotte 2010). As a result, status characteristics convey power and prestige significance that translates into performance expectations and interaction (dis)advantages such that:

Proposition 1: Higher status characteristics create higher performance expectations that then convey power and prestige significance that translates into interaction advantages within small groups (Berger and Conner 1969; Webster and Rashotte 2010)

Proposition 2: Lower status characteristics convey negative power and prestige significance that translates into lower performance expectations and interaction disadvantages within small groups (Berger and Conner 1969; Webster and Rashotte 2010)

According to Berger, Cohen, and Zelditch (1972), these status-based outcomes are the product of a status organizing process. Within this process, if a status characteristic differentiates actors within an interaction, it becomes relevant to the task and shapes actors' expectations (for both themselves and others) for task success. If, on the other hand, a status characteristic does not differentiate actors from one another, it will not become relevant to the task. From the actor's point

of view, this "equating information is equivalent to no information" and therefore has no effect on actors' expectations for task success (Martin and Sell 1985:181). As Martin and Sell (1985), note:

> Proposition 3: Only salient status characteristics that differentiate actors are used to
>
> form performance expectations and influence behavior.

However, even when status characteristics do differentiate actors from one another, the way in which actors use this information depends upon their relative rank. Differentiating status information, for instance, affects the expectations of lower status actors significantly more than higher status actors (Greenstein and Knotternus 1980; Martin and Sell 1985). And, it is easier to change higher status actors' performance expectations for lower status actors than it is to change lower status actors' performance expectations for themselves (Cohen 1982).

3.3 Status Construction Theory

Status beliefs are cultural beliefs that pair social categories with differential evaluations of social esteem, honor, worthiness and competence. For Ridgeway (2014), status beliefs are the key to status processes because they create inequalities by (a) biasing people's judgments and behavior, (b) creating self-fulfilling prophecies, (c) introducing systematic, associational preference biases, (d) motivating high status groups to defend their structural positions, and (e) encouraging lower status individuals to accept their positions.

There are three differentiating levels or orders of status beliefs – 1st, 2nd, and 3rd. Status Construction Theory focuses on how the context of encounters between people of different social

categories affect the spread of status beliefs by aligning all three orders. First order beliefs denote an individual's personal evaluation or ranking of a group (Ridgeway 2006), and second order beliefs refer to an individual's perception of another actor's evaluation or ranking. In general, we assume that our first and second order beliefs will be congruent with one another (Berger and Webster 2006). Third order beliefs, on the other hand, refer to an individual's perception of the generalized evaluation of a particular group within society. They are an individual's perception of everyone else's beliefs about the group, and although they do not always align with first and second order beliefs, they are collectively legitimated status beliefs (Ridgeway 2006).

According to Ridgeway and Correll (2006), status beliefs are characterized by three distinct properties. First, both those advantaged and disadvantaged by status beliefs accept the differential evaluations of the groups to which they belong. Second, these cultural beliefs refer to entire groups or categories of people rather than individuals. And third, they are 3rd order beliefs meaning that they are believed to be legitimate and valid within the eyes of the general public (Ridgeway 2006). For a status belief to become legitimate, members of one categorical group must acquiesce to another and accept their lower rank within the order of power and prestige (Berger and Webster 2006). Once status beliefs have been legitimized, they contribute to the development of stable ranks of influence within groups (Lawler et al. 1993). Within these groups, higher status actors are accorded more influence than lower status actors. Consequently, within collectively oriented and task-oriented groups:

Proposition 4: Higher status actors are expected to act more proactively than lower status actors to achieve task success (Berger, Ridgeway, and Zelditch 2002; Simpson et al. 2012).

3.4 Reward Expectations and the Status Value Theory of Distributive Justice

Theories of distributive justice are concerned with actor's preferences for, perceptions of, and responses to different types of reward allocations — including those perceived to be disadvantageous, inequitable, or unjust. From a social psychological standpoint, justice is dependent upon a comparison process in which the group serves as a standard or reference (Hegtvedt 2005).

Definition 4: *Justice* occurs when actual reward outcomes correspond with expectations drawn from a distribution rule within a given moral community (Cook 1975; Hegtvedt 2005).

Although justice norms are often associated with equality, within SCES, justice concerns are framed in terms of the status-value of rewards. As a result, status may shift expectations for justice away from pure equality toward more complex conceptions of equity and reciprocity. To date, the relationship between status and perceptions of justice has received little attention within social psychological work. Results from Wagner's (1995) experimental investigation of reward preferences in task groups, however, suggest that preferences for equity – rather than equality – are more likely to develop in status-differentiated groups (Cook and Hegvedt 1983; Hegtvedt 1992; Hegtvedt 2005).

The Status Value Theory of Distributive Justice focuses specifically on the "honorific significance" of goal objects and actors' attributes (Anderson et al. 1969:2). Like rewards, goal objects refer to anything that an actor might want or need, but they are not necessarily limited to positively valued objects that provide direct gratification to actors or to tools used to reinforce an actor's behavior (Anderson et al. 1969; Zelditch et al. 1970). Actor attributes, on the other hand, refer to states of status-valued characteristics. According to Cook (1975), expectations for justice within this branch of distributive justice are restricted to situations characterized by (a) a socially valued outcome or goal object, (b) a distribution rule or referential structure, (c) a perception of the legitimacy of the rule or structure, and (d) a well-defined expectation state connecting the rule to individual actor's reward expectations. Referential structures, within this branch, refer to collectively validated frames of reference which generate expectations for justice by linking distribution rules to generalized (rather than particular) individuals who possess a status-valued characteristic associated with a status valued, goal object (Zelditch et al. 1970; Berger et al. 1983).

According to Berger, Zelditch, Anderson, and Cohen (1972) and Cook (1975), when a distribution rule (i.e., referential structure) is poorly defined or a goal object is not socially valued, actors are unlikely to care whether a situation is just. Alternatively, when a distribution rule is well defined and a goal object is socially valued, actors develop stereotypical beliefs about the association between status-valued characteristics and goal objects (Hegtvedt 2005). When the possession of a state of a characteristic is associated with the possession of the state of a particular goal-object, for example, the characteristic and goal object are said to represent a relational unit. If the status values of the state of the characteristic and the goal object are the same, the relational unit is balanced and stable (Zelditch et al. 1970). Under these conditions, actors often come to believe that individuals

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have the moral right to a given goal object because of their possession of a given state of a particular characteristic (Anderson et al. 1969)

Within the Theory of Reward Expectations (Berger et al. 1985), when a status characteristic is activated within an encounter, any referential structure that links states of the characteristic to states of a goal object will begin to shape actors' reward expectations. As Correll and Ridgeway (2003) note, this relationship between the distribution of status characteristics and rewards/goal objects is reciprocal. Status beliefs influence the allocation of goal objects, and the distribution of goal objects simultaneously affects the development of status beliefs. As a result, actors with higher status characteristics expect and are expected to receive a higher quality or quantity of rewards/goal objects than actors with lower status characteristics, and actors who receive a higher quality or quantity of rewards are assumed to possess higher status characteristics. When an actor's actual outcomes are incongruent with status position, actors will most likely come to view the situation as unjust (Hegtvedt 2005). Therefore,

> Definition 5: *Injustice* is defined as a violation of moral expectations – where moral expectations are drawn from a stable, collectively legitimated frame of reference about how rewards should be distributed within a given situation (Anderson et al. 1969; Zelditch et al. 1970).

Furthermore:

Proposition 5: When an outcome or goal object is valued and the situation is found

to be unjust, actors feel pressure to manipulate the situation in a way that moves it

towards a more equitable (i.e., just) distribution of rewards – where equitable is

defined by the norms of the context (Anderson et al. 1969; Cook 1975).

According to Anderson and colleagues (1969), both under- and over-rewarded actors feel pressure

to challenge unjust situations. Because of differences in their structural locations, however, the

emotional consequences of an injustice manifest themselves differently between the two. While

over rewarded actors often experience embarrassment or guilt, under-rewarded actors typically

experience dissatisfaction and anger. As a result, under-rewarded actors, regardless of their status

position, are more likely than over-rewarded actors to attempt to alter the situation and/or exact

retribution.

3.5 Double Standards Theory

According to Foschi (2000), actors use different requirements or standards to infer performance

expectations for individuals based upon the status groups to which they belong even when their

actual performances are equivalent to one another. Within SCES:

Definition 6: *Standards* are norms that define personal and behavioral requirements

necessary for the inference of an attribute and/or morality (Foschi 2000).

They (sub)consciously impact interpretations of objective measures in a way that preserves the

existing order of power and prestige, and there are five core elements involved in the generation

of double standards (Foschi 2000). As Berger and Webster (2006) note, these elements include: (a) status differentiation between actors, (b) possession of the same attribute/ability level, (c) objective evidence demonstrating equality between actors in terms of this attribute/ability level, (d) the invocation of multiple standards to interpret this evidence, and (e) the invocation of higher expectations for members of lower status groups.

As Foschi (2000) argued, double standards are most likely to be used when actors possess limited information about one another. Under these circumstances, when task ability is defined as relevant to the higher state of the differentiating status characteristic or the relationship between the two is not explicitly defined, double standards will be invoked. Thus:

> Proposition 6: When an inference about a specified performance is made, lower status individuals are held to a stricter standard than their higher status counterparts (Foschi 2000).

Therefore:

> Proposition 7: Higher status actors have their contributions evaluated more positively than lower status actors (Simpson et al. 2012)

The standards will be strongest, however, when the task ability is explicitly defined as relevant to the higher state of the differentiating characteristic.

According to Foschi (2000), double standards will not be invoked when task ability is defined as relevant to the lower state of the differentiating characteristic or strictly dissociated from the differentiating characteristic. Results from Pugh and Wahrman's (1983) study on techniques for reducing inequality in mixed-sex work groups, however, demonstrate that double standards may develop even in situations in which actors receive a verbal disclaimer explicitly dissociating the differentiating characteristic from task ability.

4. FREE RIDERS, PUNISHMENT, & EXCHANGE NETWORKS

Within the public goods literature, the term free rider has repeatedly been used to refer to any actor who contributes less than the "socially optimal amount" (Ertan et al. 2008:505). This definition, however, is somewhat ambiguous and imprecise. In recognition of this challenge, others have limited their conceptualization of free riders to those who completely fail to contribute to the good (Fehr and Gächter 2000; Fischbacher et al. 2001). While this definition of free riding is more precise, it can also be somewhat restrictive (Boosey 2017). If one were to use this definition, for example, an actor who contributed only 1 percent of their initial endowment within a standard public goods game would not be categorized as a free rider, despite the fact that they would clearly profit at the expense of the group. To avoid either issue, I distinguish between two types of free riders:

> Definition 7: A *full free rider* is one who contributes nothing to the public good.

> Definition 8: A *partial free rider* is one whose contributions to the good are less than half of the average contributions of other group members.

Research shows that in repeated public goods games in which actors are unable to communicate or punish one another contributions typically converge towards full free riding over time (Casari and Luini 2009). When actors are given the opportunity to discuss expectations for cooperation and punish free riders, however, they can reach near optimal results (Ostrom, Walker, and

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Gardner 1992). According to Masclet, Noussair, and Villeval (2013), cooperation can also increase without the use of punishment if the ability to issue punishment threats is made available and actors are willing to follow through. When actors who make threats fail to follow through, the effectiveness of the threat is diminished, trust is lost, and cooperation within the exchange relation decreases (Fehr and List 2004; Masclet, Noussair, and Villeval 2013). Even when communication between actors (and therefore punishment threats) is not available, the potential to punish can increase contributions and decrease the proportion of free riders within public goods games (Sell and Wilson 1999; Fehr and Gächter 2000; Ertan et al. 2008; Bigoni, Camera, and Casari 2013).

According to Molm (1994), punishment is defined as a sanction that either adds negative value or removes positive value. It is a power strategy actors can use to increase their reward outcomes by influencing the behavior of others within a given exchange network (Molm, Quist, and Wiseley 1993). Punishment power is an actor's ability to generate losses for others, and research demonstrates that it can be used to influence others when its use is consistently contingent upon a given behavior (Molm 1994). The use of punishment power, however, is relatively rare – particularly when compared to the use of reward power (Molm 1989).

In their investigation into the fairness of power strategies in exchange networks, Molm Quist, and Wiseley (1993) demonstrate one reason actors favor reward strategies over punishment strategies. Results from their laboratory experiment indicated that actors prefer to use rewards over punishment because punishments are viewed as significantly less fair. According to Molm Quist, and Wiseley (1993), actors view the withholding of rewards as passive and somewhat

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ambiguous, and as a result, they are unable to clearly ascertain the intention of the withholder. Actors view the imposition of a punishment, on the other hand, as both active and intentional. Therefore, actors who choose to use punishment also risk retaliation via the withholding of rewards or the imposition of punishment (Molm 1989; Molm et al. 1993). Because most individuals are loss averse, the risks associated with the use of punishment strategies fail to outweigh the potential for reward. As a result, Molm (1989) argues, actors who have low reward power are the most likely to rely on punishment to influence others. Punishment use, however, may still vary in exchange relations that are structurally balanced. In this study,

> Definition 9: *Punishment* refers to any cost imposed upon a group or individual at
> time 2 for a behavior enacted at time 1.

The majority of Molm and colleagues' work uses monetary sanctions to instantiate punishment. Previous studies of group processes, however, have used a variety of formal and informal sanctions including trigger strategies, the imposition of fines, social exclusion or ostracism, and the spread of negative reputational information (Sell 1997; Sell and Wilson 1999; Sefton et al. 2007; Feinberg et al. 2012; Feinberg, et al. 2014).

A trigger strategy is a punishment strategy actors use to sanction noncontributors by withdrawing their own contributions from the group, and the trigger threshold is the level of noncooperation an actor is unwilling to tolerate and therefore the point at which the actor will resort to defection (Sell and Wilson 1999). Trigger strategies can either be forgiving or grim. If the decision to

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defect is only temporary, it is a forgiving trigger. If, on the other hand, the decision to defect is permanent, it is a grim trigger (Sell 1997). Unlike other forms of punishment, trigger strategies affect the entire welfare of the group (Sell and Wilson 1999). However, actors cannot use triggers — or any other form of punishment — unless they have information about the contributions of others (Sell and Wilson 1991).

According to Kamei and Putterman (2018), the reporting of reputational information should be viewed as distinct from punishment strategies because the two behaviors represent different stages of action. Unless reputational information is common knowledge, actors are unable to distinguish noncontributors from contributors. Consequently, the reporting of such information is a necessary precursor to punishment. It increases cooperation by facilitating actors' ability to punish noncontributors and thereby compels would be noncontributors to avoid punishment by increasing their own contributions (Feinberg et al. 2014). Although actors are significantly less likely to spread reputational information when it is costly to the reporter, the costly reporting of noncontributors by contributors is still relatively common (Kamei and Putterman 2018).

Under conditions in which punishment is costly to the punisher, most actors initially express an aversion to the use of punishment (Molm 1997; Ertan et al. 2008; Putterman 2010). As a result, costly punishment is sometimes referred to as a second order public good. All actors are better off if free riders are deterred, but deterrence can still be achieved without consensual punishment (Casari and Luini 2009). Therefore, it is in the interest of each individual actor to preserve their resources by relying on others to punish noncontributors, and yet, if all actors shirk from punishment, noncontributors will be left free to mooch off of the group (Fehr and Gächter 2002).

According to Ostrom (2000), the provision and maintenance of public goods is much more likely when groups contain willing punishers, and research has consistently demonstrated that actors are willing to incur costs to punish those who make below-average contributions within public goods games (Fehr and Gächter 2000). Thus, while actors may initially oppose the use of punishment, repeated exposure to free riding has the effect of eliminating this particular aversion (Ertan et al. 2008). And, as Sefton, Shupp, and Walker (2007) note:

> Proposition 8: Actors who contribute at above average levels are the ones who are most likely to make use of any available sanctioning mechanisms.

According to Casari and Luini (2009), actors are able to solve this secondary social dilemma of costly punishment because they do not view punishment as a second order good. In their study of alternative punishment institutions, the authors examine differences in contributions and punishment when decisions are sequential, simultaneous, and/or consensual. Results demonstrate that there is no difference in the frequency or degree to which actors punish noncontributors in the sequential and simultaneous decision conditions. Actors, in other words, are uninterested in coordinating the punishment of noncontributors because they derive utility from the act of punishing in and of itself. One potential source of this utility is the positive reputational benefits actors can accrue from punishing noncontributors (Brandt, Hauert, and Sigmund 2003; Fessler and Haley 2003; Barclay 2006; dos Santos, Rankin, and Wedekind 2013). For Casari and Luini

(2009), on the other hand, this utility is believed to be a derivative of the individual actor's emotional response to free riding.

Because free riders threaten the sustainability of public goods and violate prosocial preferences, actors often respond to free riding with feelings of anger, frustration, annoyance, and disgust (Fehr and Gächter 2000; Feinberg et al. 2012; Kamei and Putterman 2018). Evidence from Feinberg and colleagues' (2012) study on the effects of reputational information sharing on cooperation and punishment suggests that this emotional reaction may be what motivates actors to spread negative reputational information about noncontributors. Results from their study demonstrate that while prosocial goals inspire actors to help other group members, it is the frustration relief that actors experience when they engage in negative reputational information sharing that truly pushes actors into action. Whatever the underlying motivation, it is clear that the degree to which free riders are punished is correlated with their contributions. The more an actor's contributions negatively deviate from the average level of contributions within a group, the more punishment they will face (Ostrom et al. 1992; Fehr and Gächter 2000; Fehr and Gächter 2002; Sefton et al. 2007; Casari and Lunini 2009; Feinberg et al. 2014).

5. SOCIAL IDENTITY THEORY & PUNISHMENT

Social identity theory argues that identities are composed of two dimensions – the personal and the social. Personal identities are based on traits that distinguish the individual from others, and social identities are based on social categorizations and group memberships (Howard 2000; Stets and Burke 2000). Social identities can even develop as a result of the mere division of individuals into arbitrary groups. Research has demonstrated, for instance, that the minimal group paradigm produces in-group favoritism, a type of intergroup bias in which individuals discriminate against members of the out-group by favoring members of the in-group (Tajfel 1970; Billig and Tafjel 1973; Yamagishi, Jin, and Kiyonari 1999). Within public goods games, this phenomenon has been shown to translate as follows:

> Proposition 9: Contributions to public goods are significantly higher when social – rather than personal – identities are salient (Brewer and Kramer 1986).

Social identities are organized by their salience within any given context. As the salience of a given identity increases, so too does its effect on perception and behavior (Stets and Burke 2000). According to Sell (1997), the salience of a social identity is dependent upon its ability to evoke a sense of common fate between group members. When individuals believe that their own personal outcomes are tied to the outcome of the group, in other words, the group identity becomes more salient (Sell and Love 2009).

While social identities often trigger in-group favoritism, this bias does not necessarily imply out-group derogation or hate (Brewer 2007). Within exchange settings, for example, research has shown that free riders are often treated differently depending upon their group membership. As Shinada, Yamagishi, and Ohmura (2004) note:

> Proposition 10: In-group members are punished more harshly than out-group members for free riding.

When free riders are members of one's in-group, they also evoke feelings of anger and unfairness, and these negative emotions are positively correlated with the level of punishment they receive. When free riders are members of an out-group, on the other hand, the level of punishment directed towards them is not correlated with the same feelings of anger and unfairness. For Shinada and colleagues (2004), these findings are evidence that actors who punish out-group members for free riding are motivated by something other than negative emotion.

6. SPECIFYING HOW STATUS SHAPES PUNISHMENT

While previous research has demonstrated how status beliefs increase cooperation, very little work has examined how status impacts the punishment of noncooperators. To address this gap in the literature, I examine how the presentation of status information affects the degree to which actors punish free riders, and I derive several competing views.

In a public goods game, an actor's contributions are akin to performance outputs, and their evaluations of these outputs can be communicated with the use of punishment. Because actors with higher status characteristics are generally expected to use their influence to achieve task success, higher status actors within public goods games are expected to initiate cooperation by contributing to the good (Sell 1997). Lower status actors, on the other hand, are only expected to follow their lead. As a result, when higher status actors choose to free ride, they violate group expectations. Because such a violation of expectations should lead to punishment, I expect:

> Derivation 1: Actors will punish free riders that occupy higher status positions
> more harshly than those who occupy lower status positions regardless of their
> own status position (from propositions 1, 4, and 5).

Though some may question whether lower status actors would have the fortitude to punish their status superiors, research suggests that they do. In their study on cooperation in organizations, for example, Eckel and colleagues (2010) used a network structured, repeated public goods game

to examine the effect of status on cooperation. The network shape the authors employed was a star. Each group contained a single, commonly observed central player and three peripheral players who were only observed by the central player. Players' scores on a trivia quiz determined their status. In the high status condition, the central position was given to the player who scored the highest on the quiz. In the low status condition, the central position was given to the player who scored the lowest on the quiz. Results from their study demonstrated that lower status actors actually punish more than higher status actors regardless of their position (i.e., central or peripheral) within the network. According to Eckel and colleagues (2010), these findings suggest that lower status actors may need to use punishment to influence others' behavioral decisions. Higher status actors, on the other hand, do not need to punish because they already command positive power and prestige.

Within SCES, performance expectations often refer to abilities or skills perceived to be relevant to task-specific competence. As Lawler, Ridgeway, and Markovsky (1993) note, however, this is a somewhat narrow interpretation of Berger and colleagues (1974) original conception of the term. Performance expectations, in the more general sense, refer to anticipations about an individual's ability to contribute to the task at hand. In the standard public goods game, an actor's ability to contribute to the good is dependent upon the resources they possess. Because all actors begin with the same amount of resources, their actual abilities to contribute to the good are equal. According to double standards theory, however, actors evaluate the contributions of higher and lower status actors differently (Foschi 2000). Therefore, when an inference about free riding is made within a public goods game, lower status actors should be held to a stricter standard than higher status actors, and lower status actors should have their contributions

evaluated more negatively than higher status actors (Simpson et al. 2012). Drawing on this line

of work, I posit:

> Derivation 2: Actors will punish free riders who occupy lower status positions
>
> more harshly than those who occupy higher status positions regardless of their
>
> own status positions (from propositions 2, 6, and 7).

Both derivations 1 and 2 assume that the status positions of free riders have an independent

effect on actors' punishment decisions. A status position, however, typically refers to an actor's

relative standing within a group (Simpson and Willer 2015). According to SCES, when the

presentation of status information equates actors, such information is viewed as irrelevant

differentiation. Equating information, in other words, is equivalent to no information, and as a

result, there should be no difference in the degree to which actors in status equal groups punish

free riders. Drawing on this logic, I expect:

> Derivation 3: There will be no difference in the degree to which higher status
>
> actors punish higher status free riders and lower status actors punish lower status
>
> free riders (from proposition 3).

Although these three derivations may appear exhaustive, there is an additional possibility raised

within social identity theory. According to this framework, expectations for reciprocity lead

actors to contribute at higher rates when interacting with in-group than out-group members.

When expectations for reciprocity are violated, actors punish free riders from their own in-group more harshly than free riders from an out-group. Consequently, when status characteristics serve as a source of social identity, I posit:

> Derivation 4: Actors in status equal groups will punish free riders more harshly
>
> than actors in mixed status groups (from proposition 8, 9, 10).

Because status characteristics are more likely to evoke a sense of common fate for members of disadvantaged than advantaged groups, however, higher status actors may be less likely than lower status actors to identify with the differentiating characteristic (Sell and Love 2009).

All free riders are at risk of punishment, but the severity of the punishment they receive may depend upon the degree to which their behavior violates group expectations. When higher status actors, for example, choose to contribute to a good and lower status actors fail to contribute, the lower status actors violate expectations for deference and cooperation. When lower status actors, on the other hand, choose to contribute to a good and higher status actors fail to contribute, the higher status actors violate expectations for proactivity and leadership. Because expectations are violated in both of these conditions, it is difficult to posit which will yield the highest punishment.

7. SCOPE CONDITIONS

Because this study draws on various propositions within SCES, it also adheres to the traditional scope conditions of group interaction in task-oriented situations. These conditions include: (a) task-orientation, (b) collective-orientation, (c) no history of interaction between actors, and (d) status differentiation along a single dimension. In addition to these conditions, the scope of the study is also limited to the experimental paradigm of the public goods setting. Although the condition of collective orientation may seem at odds with such a mixed-motive setting, previous research using expectation states in public goods games has shown that public goods settings fall in line with this condition (Sell 1997; Simpson et al. 2012). Consequently, this study will also be limited to collectively oriented, small group interactions in which (e) there exists a single free rider; (f) information about the nature of decision-making is common knowledge; (g) actors are unaware of the option to punish until after all contribution periods have ended; (h) ceteris paribus.

8. RESEARCH DESIGN

This study used a standardized public goods experimental design with a 2x2 (status of participant x status of free rider) factorial design to investigate the effect of status on the punishment of free riders in small groups. I examine whether the status of the free rider, the status of the punisher, and/or the interaction between the two affects the degree to which actors punish free riders. Status differences were instantiated by constructing a manager/employee relationship between participants.

8.1 Participants

A total of 66 undergraduate students were recruited to participate in this study from large introductory classes at a southern university. Research assistants presented information about the study and collected contact information from students interested in participating. All students who signed-up for this study were asked to provide some basic demographic information about themselves as well as details about their educational background and previous job experience. To limit influences from the presence of other status characteristics (e.g., race/ethnicity, gender, age, educational attainment, etc.), eligibility for this study was restricted to non-Hispanic, white, undergraduate women between 18 to 22 years of age.

8.2 Independent Variable

The independent variable in this study is the participant's status relation to the free rider. Status differences were instantiated by creating a manager-employee relationship between participants

and other group members. This relationship was established with the use of a cover story about a second study on problem solving in different organizational settings. To highlight the difference between the managerial (high status) and employee (low status) positions, participants were given detailed information about each role at the beginning of the study.[1] The managers, they were told, would be responsible for completing a series of complex tasks, while employees would be charged with more mundane assignments. Managers would also have access to certain privileged information and would be required to evaluate the performance of their employees at the end of the study. Because of the difference in their respective responsibilities, managers would also receive a higher pay than employees. Although participants were led to believe that their specific role assignment was based on the background information and work experience they provided when signing up for the study, all participants were randomly assigned to one of the four experimental conditions listed in Table 1 below.

Table 1. Experimental Conditions

Condition	Participant's Status	Free Rider's Status	High Contributor's Status
1	Employee	Employee	Unknown
2	Employee	Manager	Unknown
3	Manager	Manager	Unknown
4	Manager	Employee	Unknown

---

[1] The types of information provided to participants was based on previous work in which the status positions of participants were manipulated by Johnson (1993) and Love and Davis (2014)

8.3 Dependent Variable

The dependent variable in this study is punishment. It was measured using the number of tokens participants paid to punish other actors (Bowles and Gintis 2004).

8.4 Covariates

Within public goods settings, punishment is correlated with the contributions of the punisher, the contributions of the punished, and the average contributions of the group. The larger the disparity between the contributions of the punisher and any given group member, the more the group member will be punished. As such, group members whose contributions fall farther below the average contribution level of the group are also punished more heavily overall (Fehr and Gächter 2000; Fehr and Gächter 2002; Masclet et al. 2003). Because the only contributions that vary within this study are the contributions of the participant, I only control for the total number of tokens participants contributed to the group fund.

8.5 Procedure

Experimental sessions took place throughout the day and lasted approximately 75 minutes from start to finish. At the time of their individually scheduled sessions, participants entered the university laboratory to find a confederate – acting as another participant – already waiting. The confederate, like the participant, was always another non-Hispanic white, undergraduate woman. A research assistant was there to greet them both and check them in. While the participant and confederate signed in, the research assistant informed them that they would be participating in two separate studies. In the first study, they would be identified by an ID number (e.g., 1, 2, or

3), and in the second study, they would be identified by their role within the group (e.g., manager or employee). In reality, there was only one study. The information provided about the second study was a cover story designed to manipulate the participant's status relative to the free rider within their group.

Once the participant and confederate finished signing in, the research assistant provided them each with a blank name tag, asked them to write in their respective ID numbers and role assignments, and then led them into two separate rooms. The participant was seated in a small room with a single table and chair, and once she was seated, the research assistant proceeded to give her a brief overview of each of the two studies. The first study, which was the public goods game, was explained in the following manner:

> In the first study, you will be working in a group with 2 other individuals located
> in separate rooms within the building, and you will be asked to make a series of
> decisions in an online game. Everyone in your group will be making the same
> kinds of decisions, and these decisions will be communicated electronically.
> Earnings in studies like these typically vary between $5 and $20, but the amount
> of money you make will depend upon your decisions as well as the decisions of
> your group members throughout the game.

Although participants were led to believe that they would be working with two other participants to complete the study, in reality, there were no other participants. The decisions of the other

players were preprogrammed and relayed to the participant through the computer. One player was programmed to consistently contribute a high proportion of their resources to the group, and the other (i.e., the free rider) was programmed to consistently contribute a low proportion of their resources to the group.[2] The ID number of the low contributor or free rider was always the same ID number assigned to the confederate at the beginning of the study.

After briefly describing the first study, the research assistant then provided the following description of the second study:

> You and your team members will be assigned to complete a series of tasks. The tasks that you will be responsible for will depend upon your role within the group as either a manager or employee. Some group members will be assigned to work as managers, and others will be assigned to work as employees. Because we are interested in how different organizational configurations affect your ability to solve problems, your group may contain all employees, all managers, or a mixture of the two.

> The managers in each group will be responsible for completing more complex tasks than the employees, and as a result their earnings will be higher. (Base earnings are $7.50 for employees and $12 for managers, but groups can earn a

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[2] The high contributor always invested a total of 880 tokens, and the low contributor or free rider only invested a total of 93 tokens in the group fund over the course of the game.

bonus of $5 to $10 depending upon how well they do.) All role assignments will

be based on the background, work history, and educational experiences provided

when you originally signed up to participate in this study.

Despite what participants were led to believe, all role assignments were randomly assigned, and

there was no second study. This information was part of a cover story designed to convey the

status positions of the participant and free rider (i.e., the confederate). Managerial roles

represented the higher status position, and employee roles represented the lower status position.

After hearing this overview, participants reviewed a separate consent form for each study. Once

they were finished, the research assistant collected the signed forms and began the first study.

Participants were reminded that they would be working with two other individuals to complete a

series of decisions. During each decision-making period, they would be given an endowment of

100 tokens. Participants would then decide how many of those tokens to invest in a group fund

and how many to keep in their own private fund. Each token invested in the group fund would be

multiplied by 2.25 and then evenly distributed amongst the group – making the marginal per

capita return (MPCR) equivalent to 0.75. Each token kept in the participant's private fund, on the

other hand, would retain its original value. At the end of each period, participants' earnings were

calculated by adding the number of tokens kept in their private fund and the number of tokens

collected from the group fund. The total earnings and decisions of each group member were

listed for the participant at the end of each decision-making period.

To ensure participants understood the decision they were being asked to make, the research assistant and participant completed several practice problems together – by hand and on the computer. Once the participant was comfortable with the parameters of the game, the research assistant left the room, and the participant began the first decision-making round. Although participants did not know how long the game would last, all sessions included ten decision-making periods. After the tenth period, participants were given an opportunity to pay to punish either of their partners. Punishment decisions were anonymous, and the punishment ratio was 1:3 – meaning that every token a participant pays reduces the earnings of another by 3 tokens. If, for example, a participant paid 100 tokens during the punishment period, 100 tokens would be subtracted from the total earnings of the participant and 300 tokens would be subtracted from the total earnings of a partner of their choosing.

At the end of the study, the research assistant reentered the room and administered an exit survey. The survey included several manipulation checks as well as questions about the participants' affective responses to their group and the study as a whole. The manipulation checks included questions about whether or not participants understood the structure of the game, the punishment ratio, their role assignment and ID number, the role assignment and ID number of the confederate, and so forth. As soon as the participant finished the survey, the research assistant thanked, debriefed, and paid them for their time.[3]

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[3] Participants earned an average of $15.64 for taking part in this study.

9. PREDICTIONS

Based on the derivations listed above, I developed several alternative hypotheses predicting the impact of status on punishment. Predictions 1 and 2 both posit that the status of the free rider will have a significant effect on the degree to which they are punished.

Prediction 1: Actors will punish free riders that occupy higher status positions more harshly than those who occupy lower status positions regardless of their own status position (from derivation 1).

Prediction 2: Actors will punish free riders who occupy lower status positions more harshly than those who occupy higher status positions regardless of their own status positions (from derivation 2).

Predictions 3 and 4, on the other hand, predict that the status of the free rider will interact with the status of the punisher to affect punishment decisions.

Prediction 3: There will be no difference in the degree to which actors in higher status positions punish higher status free riders and actors in lower status positions punish lower status free riders (from derivation 3).

Prediction 4: Actors in status equal groups will punish free riders more harshly than actors in mixed status groups.

10.1 Aggregate Descriptive Statistics

To date, a total of 66 participants have taken part in this study. Responses from four participants, however, had to be dropped. Three participants failed one or more manipulation checks, and one participant had a technical difficulty that resulted in the loss of some of their data. Summary statistics from the remaining 62 respondents are illustrated in the figures below.
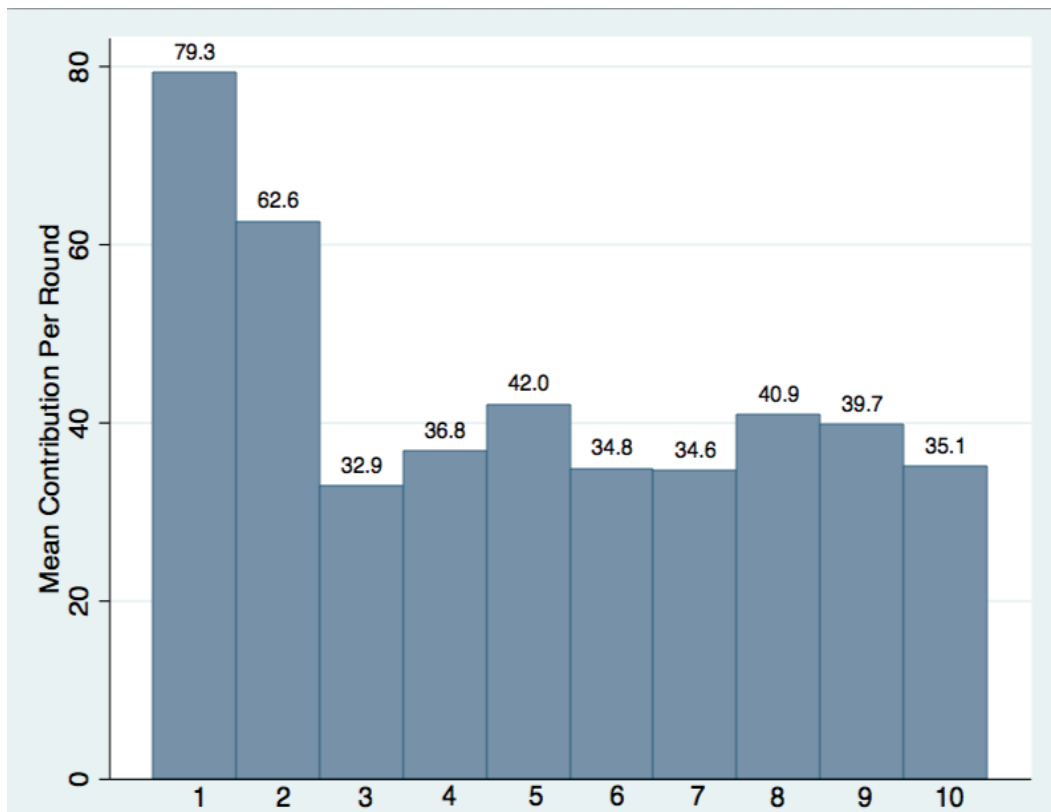
Figure 1. Mean Contribution to the Group Fund per Round

On average, participants invested 44 (out of 100) tokens per round. As expected, most participants began the game by contributing a relatively high proportion of their allotment (m = 79.3) to the group fund. Nevertheless, the size of their contributions declined sharply and remained relatively low for the remainder of the game (see Figure 1). Participants' total contributions across all 10 rounds of the public goods game ranged from 0 to 815, and they contributed an average of 440 (out of a potential 1000) tokens.

During the final round of the game, when given the opportunity to pay to punish either of their partners, participants spent a significantly higher proportion of their total earnings on reducing the earnings of the uncooperative partner (i.e., free rider) than the cooperative partner. This trend is illustrated in Figure 2 below. In fact, most participants did not actually spend any tokens on punishing the cooperative partner. As a result, the average number of tokens spent on reducing the earnings of the cooperative partner was less than 1 (m = 0.92, sd = 2.92), and with a punishment ratio of 1:3, this meant that participants reduced the final earnings of the cooperative partner by an average of just 3 cents.

Over half of participants, on the other hand, paid to punish the free rider in their group. The average number of tokens participants spent on punishing the free rider was approximately 55 (m = 55.45, sd = 91.74), and with a punishment ratio of 1:3, this meant that, on average, participants paid to reduce the final earnings of the free rider by $1.76.
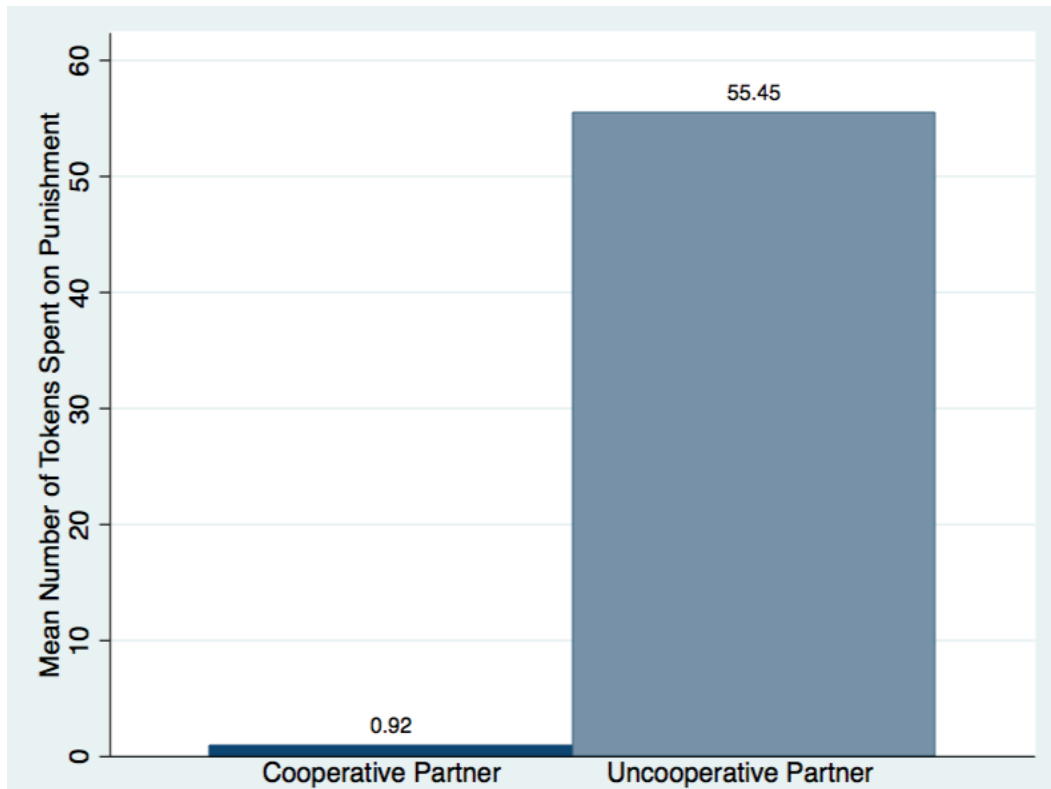
Figure 2. Mean Number of Tokens Spent on Punishing Each Partner

10.2 Descriptive Statistics by Experimental Condition

When broken down by experimental condition, as illustrated in Figures 3 and 4 below,

participants' mean contributions and punishment decisions appear to differ to some degree. On

average, participants in condition 3 contributed the most to the group fund (m = 502).

Participants in conditions 1 (m = 430) and 2 (m = 466) followed, and participants in condition 4

contributed the least to the group fund (m = 355). When it came to punishment, on the other

hand, participants in condition 4 spent the most (on average) on punishing the free rider (m =

76.1). Participants in conditions 2 (m = 42.3) and 3 (m = 66.5) followed, and participants in

condition 1 spent the least on punishing the free rider (m = 37.1).
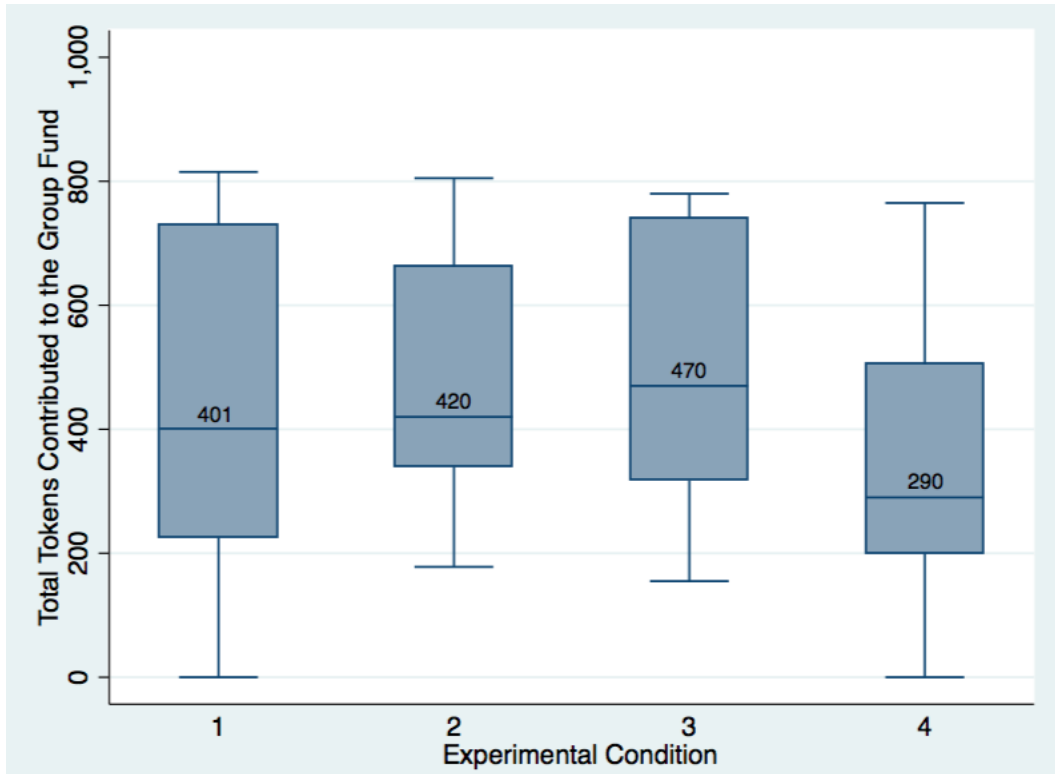
Figure 3. Total Contributions to the Group Fund by Condition
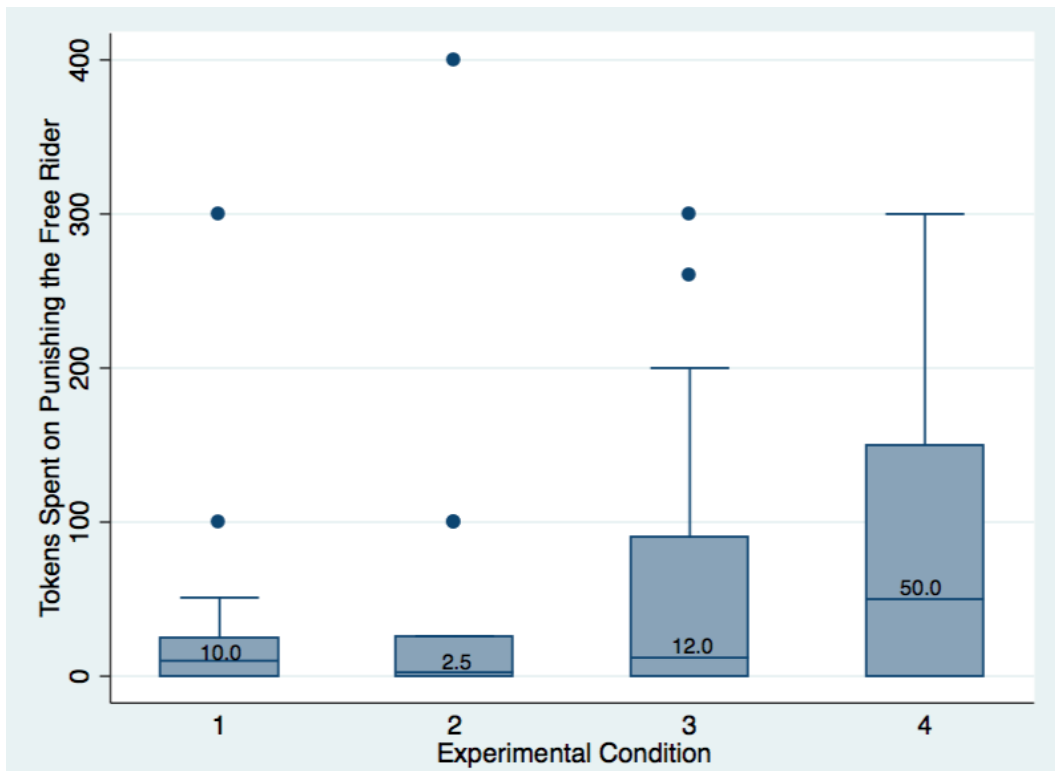
Figure 4. Tokens Spent on Punishing the Free Rider by Condition

As the box plot in Figure 4 demonstrates, it is clear that there were a couple of outliers in

conditions 1, 2, and 3. Because these outliers could potentially skew the results of any further

analyses, I dropped them from the dataset. Table 2 summarizes the descriptive statistics of

participants' punishment decisions after these 7 outliers were removed from the sample, and

Figures 5 through 8 illustrate the distribution of punishment decisions within each group

graphically.

Within each condition, the distribution of punishment decisions is clearly nonnormal. The

skewness in all four groups exceeds 0.80, and results from a skewness and kurtosis test for

normality verify that the data within each condition is slightly skewed to the right ($p < 0.05$). To

reduce this skewness and produce a distribution that more closely approximates the normal

curve, I transformed the data for this particular variable by taking its square root. The hypothesis

tests below use the transformed data as the dependent variable.

Table 2. Descriptive Statistics for Punishment of Free Rider without Outliers

Condition	Participant's Status	Free Rider's Status	N	Mean	SD	Skewness	Kurtosis
1	Employee	Employee	13	12.1	15.4	1.25	3.97
2	Employee	Manager	13	5.8	9.5	1.39	3.44
3	Manager	Manager	14	36.0	57.9	1.81	5.58
4	Manager	Employee	15	76.1	89.3	1.19	3.60
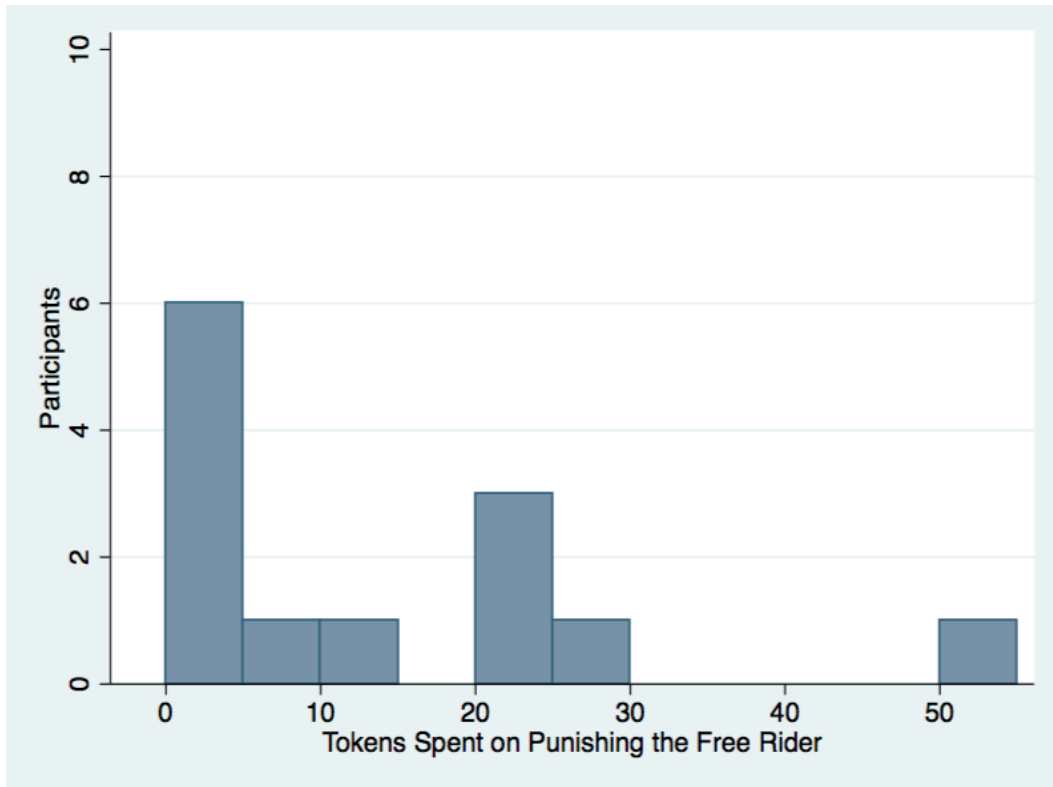
Figure 5. Distribution of Punishment Decisions within Condition 1
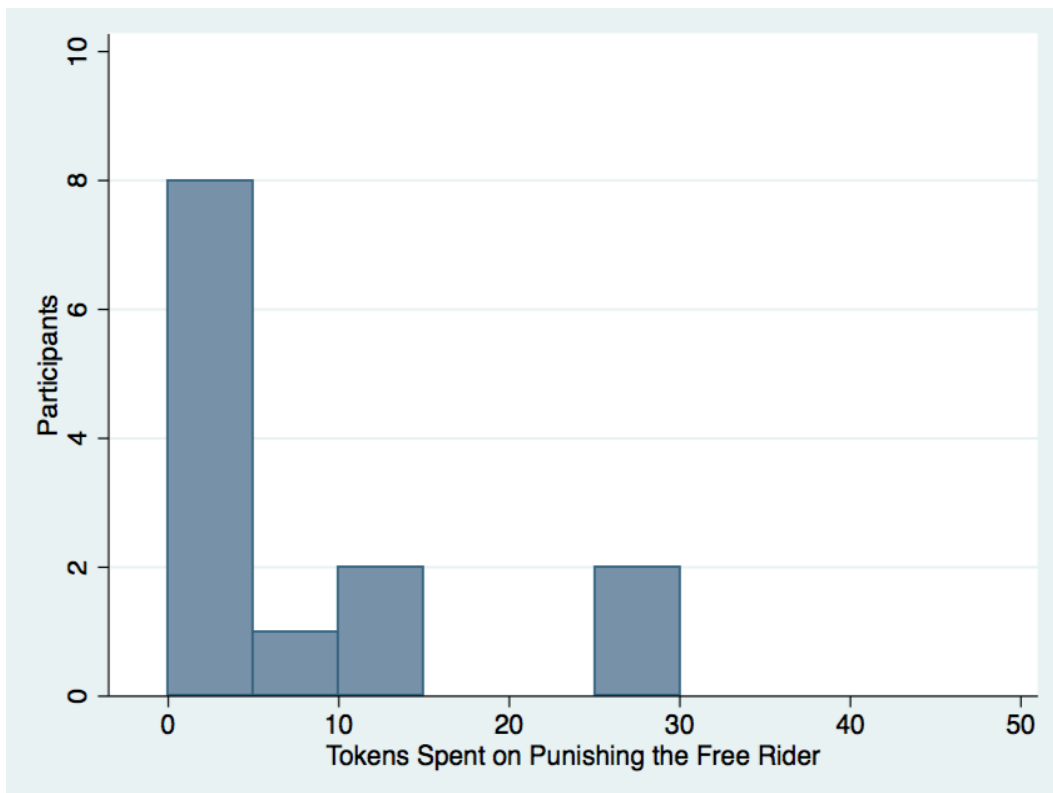
Figure 6. Distribution of Punishment Decisions within Condition 2
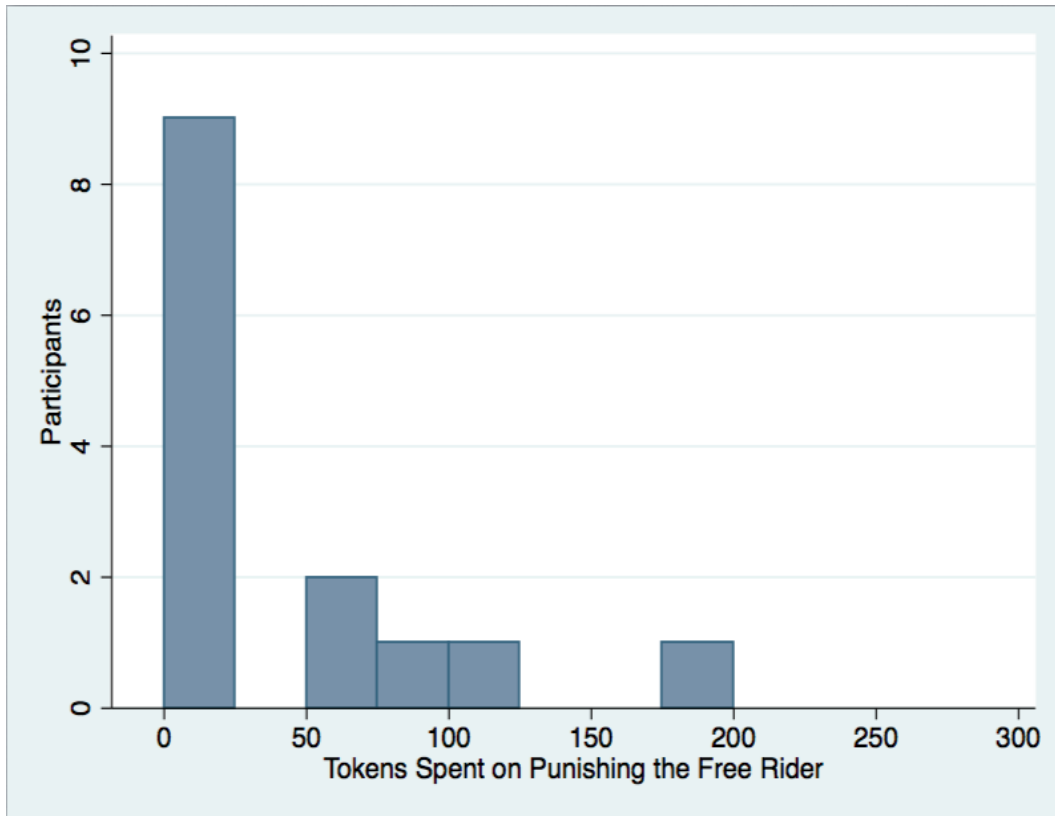
Figure 7. Distribution of Punishment Decisions within Condition 3
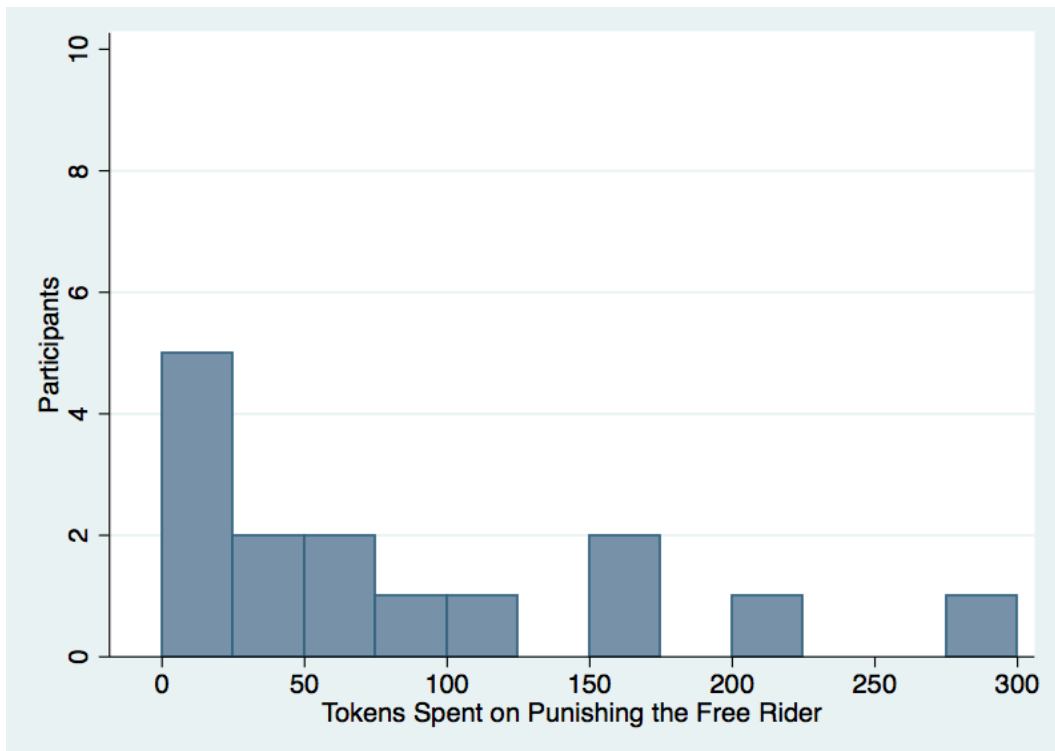
Figure 8. Distribution of Punishment Decisions within Condition 4

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10.3 Hypotheses Tests

A 2x2 factorial (ANOVA) with planned comparisons was used to examine the effects of the status of the participant, the status of the free rider, and the interaction between the two on punishment behavior. Results from Bartlett's test for equal variances indicate that the assumption of homogeneity is not met therefore the findings reported below should be interpreted with caution.[4] According to the global model, shown in Table 3 below, at least one factor had a statistically significant effect on participants' punishment decisions, and these factors collectively explain approximately 20 percent of the variance in punishment decisions overall ($F = 4.31$, $p < 0.01$).[5]

Table 3. Analysis of Variance Modeling Punishment as a Function of Status Relations ($N = 55$)

	Partial Sum of Squares	Degrees of Freedom	Mean Squared	F-Statistic
Model	224.63	3	74.88	4.31***
Free Rider Status	6.64	1	6.64	0.38
Participant Status	127.47	1	127.47	7.34***
Interaction	11.69	1	11.69	0.67
Residual	885.85	51	17.37	
Total	1110.49	54	20.56	

Note: *p<.05; **p0.01; ***p<.001

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[4]As Glass, Peckham, and Sanders (1972) note, the ANOVA is relatively impervious to violations of normality. As a result, concerns about the effects of this particular violation can be relaxed.

[5] Surprisingly, there was no correlation between participant's contributions and the degree which they punished free riders (PR = –0.07, p = 0.58). The average contributions of participants did not significantly differ by condition, (F(3, 58) = 1.22, p = 0.31). And, somewhat surprisingly, neither the status of the participant (t = 0.31, p = 0.75) nor the status of the free rider (t = –1.63, p = 0.10) had a statistically significant effect on the size of participants' contributions to the group fund. As a result, there was no need to run an ANCOVA.

Contrary to the predictions listed above, however, results show that only the status of the participant had a statistically significant effect on punishment decisions ($\eta^2 = 0.13$). Higher status participants gave up significantly more tokens (m = 47.8) than lower status participants in order to reduce the final earnings of the free rider in their group. Neither the status of the free rider ($\eta^2 = 0.01$) nor the interaction between the status of the free rider and the status of the participant ($\eta^2 = 0.01$) had a statistically significant effect on participants' punishment decisions. Consequently, these results fail to support predictions 1, 2, 3, and 4.[6]

To confirm the findings reported above, I then tested each hypothesis again individually. Prediction 1 specified that actors would pay more to punish free riders occupying higher status positions than those occupying lower status positions regardless of their own status position. To support this prediction, participants in conditions 2 and 3 would have needed to spend significantly more tokens than participants in conditions 1 and 4. Results from a left-tailed, two-sample t-test with unequal variances, however, fail to support this prediction (t = 1.71, p > 0.05). Participants did not spend significantly more on punishing higher status free riders (m = 21.5, sd = 44.2) than lower status free riders (m = 46.4.5, sd = 72.8).

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[6] Within the economic literature, there is an argument that people can be categorized into types. Some people are willing punishers and others are not. As a result, these two types of actors should be analyzed separately within certain contexts. Within this data set, as previously discussed, there were a relatively high number of participants who chose not to punish either partner at all (n = 25). As a result, I ran an additional, post-hoc analysis using only the willing punishers as the sample population. Results from a 2x2 factorial (ANOVA) confirmed findings from the preceding analyses (F (3, 30) = 3.25, p< 0.05). Only the status of the participant had a statistically significant effect on participants' punishment decisions. Higher status participants paid significantly more than lower status participants to punish free riders.

Prediction 2, on the other hand, specified that individuals would punish free riders occupying

lower status positions more harshly than those occupying higher status positions regardless of

their own status positions. To support this prediction, participants in conditions 1 and 4 would

have had to pay significantly more than participants in conditions 2 and 3. In contrast to results

from the ANOVA reported above, results from a right-tailed, two-sample t-test with unequal

variances support this prediction (t = 1.71, p < 0.05).[7] Participants spent significantly more of

their earnings on punishing lower status free riders (m = 46.5, sd = 72.8) than higher status free

riders (m = 21.5, sd = 44.2).[8]

Unlike Predictions 1 and 2, which focus on the status of the free rider, Predictions 3 and 4

examine the status of the punisher as well as the status of the punished. Prediction 3 specified

that there would be no difference in the degree to which individuals in higher status positions

punished higher status free riders and individuals in lower status positions punished lower status

free riders. To support this prediction, participants in conditions 1 and 3 would have needed to

spend an approximately equal number of tokens on punishing the free rider in their group.

Results from a TOST (mean equivalence t-test) with unequal variances fail to support this

prediction (t_1 = 1.55, p = 0.07 & t_2 = –1.428, p = 0.91). The amounts of money higher status

participants paid to punish higher status free riders (m = 36.0, sd = 57.8) and lower status

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[7] The discrepancy between these findings and those reported in the ANOVA above are most likely due to the different thresholds for significance used by the one-tailed t-test and two-tailed analysis of variance.
[8] Because the distribution of punishment decisions within this sample was skewed, I also ran a Mann-Whitney-Wilcoxon test as an additional check on the validity of the findings reported above. Results confirm that the null hypothesis for both predictions 1 and 2 cannot be rejected. There was no statistically significant difference in the degree to which higher status free riders and lower status free riders were punished (z= 1.68, p = 0.09).

participants paid to punish lower status free riders (m = 12.1, sd = 15.4) cannot be concluded to be statistically equivalent.

Prediction 4 specified that actors in status equal groups would punish free riders more harshly than actors in mixed status groups. To support this prediction, participants in conditions 1 and 3 would have needed to spend significantly more of their total earnings on the punishment of the free rider than participants in conditions 2 and 4. Results from a one-tailed, two-sample t-test with unequal variances fail to support this prediction (t = 0.89, p = 0.81). There was no significant difference between the amount of money participants in status equal groups (m = 24.5, sd = 44.0) and participants in mixed status groups paid to punish free riders (m = 43.5, sd = 73.8).[9]

To summarize, then, the 2x2 factorial indicates that only the status of the participant has a significant effect on punishment decisions. While results from the one-tailed t-test indicate that the status of the free rider might also have a significant effect, results from the more powerful ANOVA do not permit the same conclusion.

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[9] Results from a Mann-Whitney-Wilcoxon test confirm these results. There was no statistically significant difference in the degree to which participants in status equal and mixed status groups punished free riders (z = 0.72, p = 0.47).

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11. DISCUSSION

Previous research demonstrates that status creates expectations for cooperation that decrease free riding. Prior research also shows that the possibility of punishment decreases free riding as well. Very little work examines how these two mechanisms interact. This study investigates how status relationships between group members within a public goods setting affect the degree to which individuals punish free riders. In this study, I ask the following: Does the status of the group member punishing the free rider have a direct effect on the punishment of the free rider? Does the status of the free rider have a direct effect on the degree to which they are punished? Does the interaction between the status of the free rider and the actor punishing the free rider have a direct effect on the punishment of the free rider?

These questions were investigated within the context of the Theory of Status Characteristics and Expectations States (SCES), which offers competing views about this relationship. Some literature within this theoretical research program suggests that higher status actors are held to a higher standard and therefore should be punished more than lower status actors. Other literature suggests that lower status actors face a double standard and therefore should be punished more than higher status actors. Beyond this work, there is also some work that suggests that status information should have no effect on actors' behavior when the status positions of interactants are equivalent to one another. This study sought to arbitrate between these views using a laboratory experiment designed specifically to test these propositions.

Results demonstrate that the status of the free rider does not have a direct, statistically significant effect on actors' punishment decisions. In general, there is no significant difference in the degree to which actors punish higher and lower status free riders.

Results also show that the interaction between the status of the actor and the status of the free rider had no effect on actors' punishment decisions. Contrary to prediction 3, we cannot conclude that punishments made by higher status actors towards higher status free riders were statistically equivalent to punishments made by lower status actors towards lower status free riders. As a result, these findings fail to support the generalization of the equating principle – as proposed by Berger, Cohen, and Zelditch (1972) and validated by Martin and Sell (1985) – to punishment behavior, at least in these public goods settings.

One potential explanation for this finding is that the equating principle is more relevant to some types of power and prestige behaviors than others. For Berger and colleagues (1972) and Martin and Sell (1985), this principle was applied and tested with measures of influence. And, although an actor could theoretically be influenced to use punishment by observing another actor punish, in this study, there was only one punishment round. Punishment, in this case, was a direct chastisement of the performance of the free rider, and for this reason, it is more characteristic of a reward action (or perhaps even a performance output) than influence.

In contrast to prediction 4, there was also no difference in the degree to which actors in status equal groups and actors in mixed status groups punished free riders. Thus, these results cannot validate Shinada, Yamagishi, and Ohuma's (2004) finding that in-group members are punished

more harshly than out-group members for free riding. Because every person in this study knew their own status position as well as the status position of the free rider, it may be that the status position of the free rider was not as important as the free riding itself. Participants may not have viewed their particular roles as a social identity that created an important demarcation between group members — making any argument about in-group or out-group behavior suspect.

Although findings from this study fail to support the predictions derived from the Theory of Status Characteristics and Expectation States (SCES) and Social Identity Theory (SIT), results do confirm that status still matters. It is the status of the punisher, however, not the status of the participant, which has a statistically significant effect on punishment decisions. In this particular study, higher status actors paid significantly more to punish free riders than did lower status actors. This suggests that higher status participants may have experienced a kind of noblesse oblige and inferred that it was their responsibility to demarcate (via their use of punishment) what is appropriate or normative. It also suggests that lower status participants may have felt that they did not have the right or luxury to exert power over their fellow group members (via their use of punishment). By acting in accordance with these beliefs, both higher and lower status participants also served to reproduce their own status positions within their group.

These findings, however, appear to contradict those reported by Eckel, Fatas, and Wilson (2010). Results from their work on cooperation and status in organizations suggested that actors occupying lower status positions punish more those occupying higher status positions. Nevertheless, unlike this study, their study used a network-structured, repeated public goods game. Each group in their study contained a single, commonly observed central player and three

peripheral players who were only observed by the central player. Using this design, they found

that lower status participants were significantly more likely to use punishment than higher status

participants regardless of their position (i.e., central or peripheral) within the network.

Punishment within their study, however, was restricted by the network structure of the game, and

players were only able to punish those occupying different network positions. In this study, on

the other hand, punishment power was equal; all group members could pay to punish any other

group member of their choosing. Power differences resulting from these structural designs may

partially explain why results from this study do not align with those reported by Eckel and

colleagues (2010). The fact that this study was also not a repeated public goods game likely

contributes to this difference as well – as this particular characteristic affects many of the

dynamics involved in interpersonal interaction.

11.1 Design and Measures

Although the 2x2 factorial design is generally viewed as robust, there are several limitations to

this study that should be mentioned. First, the study involved quite a bit of experimenter

interaction, and there were multiple experimenters involved. We controlled for the demographic

characteristics of the experimenters, and results from an ANOVA indicate that there were no

significant differences between the punishment decisions of participants based on the research

assistant or confederate with whom they interacted ($F = 0.09$, $p > 0.05$).

The biggest limitation, to date, is the sample size of this study. The discrepancy found between

the results of the full factorial and the one-tailed t-test regarding the significance of the effect of

the status of the participant on punishment decisions, for example, would most likely be resolved

with a larger sample size. If there were more participants, the ANOVA may show a significant

direct effect for the status of the free rider (like the one-tailed t-test). However, it is equally

possible that more participants would produce results that show no effect in both a t-test and

ANOVA. Ideally, I would have liked to run between 100 to 120 experimental sessions (25 or 30

participants per cell). Because of the threat of the coronavirus 2019 to public health, however, all

research using human subjects was suspended mid-semester. Although some university

laboratories have resumed activity at this point in time, it is unlikely that this study will resume

in the near future due to the close quarters in which the study originally took place. Even if social

distancing within such a small space were possible, the implementation of such procedures

would likely have an effect on participants' behavior and influence the final results of the study.

As a result, pausing data collection for this study was the only viable option. Fortunately, even

amongst these challenges, the factorial design is still a powerful one. Results from a retrospective

power analysis show that this study had a power of 0.84 ($d = 0.05$, $\alpha = 0.05$) meaning that there

is only a 16 percent chance that a Type II error has been committed in the findings reported

herein[10].

One other limitation is that the results of this study cannot be easily compared to the results of

other research on punishment. Previous studies have used a wide variety of measures to examine

punishment behavior. Within the public goods domain, for example, several studies use

punishment points. In some studies, each punishment point reduces the total earnings of another

by 10 percent (Fehr and Gächter 2000; Fehr and Gächter 2002; Eckel et al. 2010). In others, each

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[10] Power analyses should always be conducted apriori. However, because these data are incomplete, we conducted an additional analysis using the available data.

point reduces the total earnings of another by a fixed rate (Masclet et al. 2013). In both cases, the total number of punishment points a participant can spend on any given player is limited to 10 points. As a result, the range of participants' punishment decisions is restricted to discrete integers between 0 to 10. Even among studies that do not use a 10-point scale, however, the cost associated with punishment varies. Some, like this study, use a ratio of 1:3 (Kamei and Putterman 2015), while others use a ratio of 1:4 (Cinyabuguma, Page, and Putterman 2006; Ones and Putterman 2007). In order to make meaningful comparisons within and between disciplines, it would be extremely beneficial if researchers developed one or two standard measures of punishment.

12. CONCLUSIONS

This study used an experimental design to arbitrate between competing, theoretical propositions about the effect of status on punishment within public goods settings. Results demonstrate that the status of free riders has no effect (either directly or via an interaction with the status of the punisher) on actors' punishment decisions. The status of the punisher, on the other hand, does have a significant effect.

Although these results fail to support the predictions proposed in this study, additional work is needed to unpack how such status differentiation affects punishment decisions. Future research, for example, should investigate how power affects the impact of status on punishment decisions. Can the difference between the results of this study and the results reported by Eckel, Fatas, and Wilson (2010) be explained by the power structures (equal or unequal) of each respective public goods game? Do power and status interact? Future research should also consider how additional status information affects punishment decisions. So, for instance, in this study, the other partner (whose status was not revealed) was a cooperative group member. Does the status of other cooperative partners within a public goods setting also affect the degree to which actors punish free riders? Does the status of the cooperative partner interact with the status of the punisher or the punished?

This study examined status and punishment within the context of a public goods game. The results indicate that the status of the punisher matters. Higher status participants punish free

riders significantly more than do lower status participants, and in doing so, higher status

participants also reproduce their high status positions.

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Good [**morning/afternoon**] everyone,

My name is [**recruiter**]. I am a [**professor** / **graduate student**] in the Department of Sociology and assisting me is [assistant(**s**)]. I am here to tell you about some studies that my department is involved with in the hopes that you become interested and would like to participate.

Now, I can't say specifically which studies you would be participating in because we recruit for several at a time. I can give you a brief description about some of our studies. Some of our research uses studies that involve working with people and making decisions, while other types of research look at how face-to-face communication differs from communication over the computer. I can also tell you that participants are paid for their time, and the payment range falls somewhere between $10 and $30, depending on the study.

The forms being passed around ask for some basic demographic information like your name and telephone number. There are some additional questions including an area where you will list the times you find most convenient for participating in the studies. If you decide to sign up, we will use these sheets to register you with our online recruitment system, SONA. After we enter your contact information into the system, you will get an email sent to your TAMU account. That email will contain log-in information and a temporary password that you will use to access our department's SONA system.

The SONA system is the main way we provide information about studies that are available, and it allows you to schedule you'd like to participate. Sometimes, we will use the information in the forms to call you directly. When we speak with you, we can tell you more about the details of a study like the time, location, etc. Then, you can let us know whether you would like to participate and when is best to schedule your participation.

Some of you may be familiar with studies from past experiments that caused negative side effects for the participants. One of the most famous is the Milgram studies where participants thought they were shocking other people to the point of hurting them. They weren't really shocking others, but they thought they were. The Milgram study, however fascinating, did unfortunately cause psychological trauma to some of the participants. I can assure you that we do not do these types of studies. And given the ethical problems behind studies like the Milgram studies, federal guidelines were developed for any studies that use human subjects. Here at A&M, all of our studies using human subjects go through the institutional review board (IRB). If you feel uncomfortable while in ANY study, you should just leave.

One last thing I want to make sure you understand is that you are not obligated in any way to sign up. Your participation has absolutely nothing to do with this class. Your professor and classmates won't know if you come or don't come, and there's no course credit for participating. So, just because I show up and ask for your help, please don't feel obligated to sign up. If you

ARE interested and would like to earn some money, fill out the form and pass it to the end of your row for one of us to collect. If you are not interested, just leave the form blank.

My colleagues and I appreciate your help. Are there any questions?

TAMU SOCIOLOGY RESEARCH RECRUITMENT FORM

Name: _____ **Sex**: _____

Race/Ethnicity. Please check the response(s) that best represents how you think of yourself.
    ☐ Hispanic or Latino/a
        ☐ Mexican American
        ☐ Other (please specify):_____
    ☐ African American or Black
    ☐ Asian American or Asian (please specify): _____
    ☐ White
    ☐ International or Non-US Category
    ☐ Other (please specify): _____

University Classification (e.g., freshman): _____ **Age**: _____

Phone #: (_____) _____ - _____ **University Email**: _____@tamu.edu

Have you ever been in a social science research study? ☐ No ☐ Yes ☐ Unsure

If *Yes* or *Unsure*, please briefly describe:

_____

_____

_____

Please mark what blocks of time are most convenient for you to participate. If there are specific times, please indicate. If possible, write in specific times that are best.

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Morning					
Afternoon					
Evening					

Thank you! If you have any questions about TAMU Sociology Research studies, please feel free to contact Dr. Jane Sell, Sociology Department (979.845.6120).

DECISION MAKING IN SMALL GROUPS – CONSENT FORM

Introduction
You are invited to take part in a research study being conducted by Dr. Jane Sell, a researcher from Texas A&M University.

The purpose of this form is to provide you information that may affect your decision as to whether or not to participate in this research study. If you decide to participate in this study, this form will also be used to record your consent.

You have been asked to participate in a research project studying how individuals make decisions over several periods of time. The purpose of this study is to learn about individual decision making. You were selected to be a possible participant because you signed up to be considered for this study.

What will I be asked to do?
If you agree to participate in this study, you will be working on different kinds of individual decisions. This study will take between 30 to 45 minutes depending upon how many decisions you make.

How many people will be asked to be in this study?
There will be around 120 people in this study.

What are the risks involved in this study?
The risks associated with this study are minimal, and are not greater than risks ordinarily encountered in daily life. You do not have to answer any questions that you do not wish to. You will receive no direct benefit from participating in this study; however, your interaction may help us explain why some individuals are more successful at decision making than others.

Do I have to participate?
No. Your participation is voluntary. You may decide not to participate or to withdraw at any time without your current or future relations with Texas A&M University being affected.

Will I be compensated?
The amount of money that you will make depends upon your decisions as well as the decisions of the other members of your group. So, the amount of money that you will earn can vary between $5 and $20. You may stop participation at any time and can keep the amount of money you have earned up until the time you stop.

No class credit is involved in these studies.

Are there any costs to me?
Aside from your time, there are no costs to you.

Who will know about my participation in this research study?
This study is confidential. The records of this study will be kept private. No identifiers linking you to this study will be included in any sort of report that might be published. Research records will be stored securely and only I will have access to the records.

Whom do I contact with questions about the research?
If you have questions regarding this study, you may contact Katie McDougal at mkmcd628@tamu.edu or Dr. Jane Sell j-sell@tamu.

Whom do I contact about my rights as a research participant?
For questions about your rights as a research participant; or if you have questions, complaints, or concerns about the research, you may call the Texas A&M University Human Subjects Protection Program office at (979) 458-4067 or irb@tamu.edu.

Statement of Consent
I agree to be in this study and know that I am not giving up any legal rights by signing this form. The procedures, risks, and benefits have been explained to me, and my questions have been answered. I know that new information about this research study will be provided to me as it becomes available and that the researcher will tell me if I must be removed from the study. I can ask more questions if I want. A copy of this entire consent form will be given to me.

_____   _____
Participant's Signature   Date

_____   _____
Printed Name   Date

INVESTIGATOR'S AFFIDAVIT:
Either I have or my agent has carefully explained lo the participant the nature of the above project. I hereby certify that to the best of my knowledge the person who signed this consent form was informed of the nature, demands, benefits, and risks involved in his/her participation.

_____   _____
Signature of Presenter   Date

_____   _____
Printed Name   Date

PROBLEM SOLVING IN ORGANIZATIONS– CONSENT FORM

Introduction
You are invited to take part in a research study being conducted by Dr. Jane Sell, a researcher from Texas A&M University.

The purpose of this form is to provide you information that may affect your decision as to whether or not to participate in this research study. If you decide to participate in this study, this form will also be used to record your consent.

You have been asked to participate in a research project studying how individuals solve complex problems in organizational settings. The purpose of this study is to learn about problem solving in small groups. You were selected to be a possible participant because you signed up to be considered for this study.

What will I be asked to do?
If you agree to participate in this study, you will be working on solving a complex problem with the help of several other participants. This study will take between 15 to 30 minutes depending upon how quickly your organizational team comes up with a solution.

How many people will be asked to be in this study?
There will be around 250 people in this study.

What are the risks involved in this study?
The risks associated with this study are minimal, and are not greater than risks ordinarily encountered in daily life. You do not have to answer any questions that you do not wish to. You will receive no direct benefit from participating in this study; however, your interaction may help us understand why some hierarchical, organizational configurations are more successful at problem solving than others.

Do I have to participate?
No. Your participation is voluntary. You may decide not to participate or to withdraw at any time without your current or future relations with Texas A&M University being affected.

Will I be compensated?
The amount of money that you will make depends upon your role assignment and how well your team performs. Base earnings are $7.50 for employees and $12 for managers, but groups can earn a bonus of $5 to $10 depending upon how well they do. As a result, the amount of money that you will earn can vary between $7.50 and $22. You may stop participation at any time and can keep the amount of money you have earned up until the time you stop.

No class credit is involved in these studies.

Are there any costs to me?
Aside from your time, there are no costs to you.

Who will know about my participation in this research study?
This study is confidential. The records of this study will be kept private. No identifiers linking you to this study will be included in any sort of report that might be published. Research records will be stored securely and only I will have access to the records.

Whom do I contact with questions about the research?
If you have questions regarding this study, you may contact Katie McDougal at mkmcd628@tamu.edu or Dr. Jane Sell j-sell@tamu.

Whom do I contact about my rights as a research participant?
For questions about your rights as a research participant; or if you have questions, complaints, or concerns about the research, you may call the Texas A&M University Human Subjects Protection Program office at (979) 458-4067 or irb@tamu.edu.

Statement of Consent
I agree to be in this study and know that I am not giving up any legal rights by signing this form. The procedures, risks, and benefits have been explained to me, and my questions have been answered. I know that new information about this research study will be provided to me as it becomes available and that the researcher will tell me if I must be removed from the study. I can ask more questions if I want. A copy of this entire consent form will be given to me.

_____   _____
Participant's Signature   Date

_____   _____
Printed Name   Date

INVESTIGATOR'S AFFIDAVIT:
Either I have or my agent has carefully explained lo the participant the nature of the above project. I hereby certify that to the best of my knowledge the person who signed this consent form was informed of the nature, demands, benefits, and risks involved in his/her participation.

_____   _____
Signature of Presenter   Date

_____   _____
Printed Name   Date

APPENDIX E

EXPERIMENTAL SCRIPT

Hello and thank you for signing up to participate. Today, we are doing a series of studies on how people interact in task groups, and we would like to ask you to partake in <u>two</u> such studies.

The purpose of the first study is to investigate how people make decisions when they are unable to interact or communicate with one another face-to-face, and the purpose of the second study is to investigate how people working within different organizational configurations use face-to-face communication to solve complex problems. Neither study should take very long to complete, so you should be finished by the end of the hour. However, **you are free to discontinue either study and leave at any time** if you so choose.

Before you decide if you would like to continue, I want to provide a brief overview of the 2 studies in which you will be participating. In the first study, you will be working in a group with 2 other individuals located in separate rooms within the building, and you will be asked to make a series of decisions in an online game. Everyone in your group will be making the same kinds of decisions, and these decisions will be communicated electronically. Earnings in studies like these typically vary between $5 and $20, but the amount of money you make will depend upon your decisions as well as the decisions of your group members throughout the game.

When the first study is over, we will bring you and 2 to 7 other participants into the larger room located across the hall for the second study. Once everyone is situated, you and your team members will be assigned to complete a series of tasks. The tasks that you will be responsible for will depend upon your role within the group as either a manager or employee. Your role within your group will depend upon the background, work history, and educational experiences you provided when you signed up for this study.

Some group members will be assigned to work as managers, and others will be assigned to work as employees. So, for example, you have been assigned to be a _____ , and the other participant who entered the lab at the same time as you was assigned to be a _____.

While you and the participant who entered the lab at the same time as you will be working together in the first study, you will not necessarily be working in the same group during the next study.

Because we are interested in how different organizational configurations affect your ability to solve problems, your group may contain all employees, all managers, or a mixture of the two.

The managers in each group will be responsible for completing more complex tasks than the employees, and as a result their earnings will be higher. (Base earnings are $7.50 for employees and $12 for managers, but groups can earn a bonus of $5 to $10 depending upon how well they do.) All role assignments will be based on the background, work history, and educational experiences provided when you originally signed up to participate in this study.

Now, please take a few minutes to read over the forms in front of you. There are 2 copies of **2 different consent forms** — 1 form for each study.

Please read and sign 1 copy of each consent form, so that I can collect them for our records. The other 2 copies are for you to keep. Both consent forms are double sided, and by signing them, you are agreeing to participate in today's studies.

After you have signed the consent forms, please also take another minute or so to look over and fill out the role assignment sheet we have provided as you will need this information during the second study.

I will be right outside, so when you are finished or if you have any questions, just let me know.

For the remainder of the study, please follow along on your computer screen as I read.

Notice of Confidentiality

The study in which you are participating concerns how people in groups make decisions.

It will be conducted privately and confidentially. Participants will be identified **only** by their ID number within their group. There is no communication among participants, and we ask that you refrain from using your cell phones during this time.

Instructions

The study in which you are participating concerns how people in groups make decisions. You are one member of a group of **three** people. Everyone in the group will be making the same kinds of decisions, and these decisions will be conveyed to you electronically. You will not be able to speak to the other two members of your group because we are interested in how people interact in environments in which they cannot see each other or interact face-to-face.

Each member will make a number of decisions and record them on the record sheet we have provided for you. At the end of the study you will be paid, in private, the amount that you have earned throughout these trials.

The decisions that you will be making concern what to do with 100 tokens that will be put into a PRIVATE FUND for every decision.

You will be working with the same group members for all of the decisions in this study. At the beginning of each decision period, 100 tokens will be put into your private fund. Then, you will have 2 choices about what to do with the tokens in your private fund.

The first choice involves INVESTING tokens in the group fund. Each token invested in the group fund is worth **2.25 cents** and each token in this fund is evenly divided among all members of the group—no matter how much they invest in the group fund. That is, regardless of what you do as an individual, you always receive **⅓ share** of the group fund.

The second choice involves KEEPING tokens in the private fund. Every token put in your private fund is worth **1 cent**. This is added directly to your earnings—it is not shared with other group members.

For every decision period, you may invest up to **100** tokens in the group fund or keep up to **100** tokens in your private fund.

Do you have any questions?

Now that we have reviewed the types of decisions that you will be making, lets run through some examples so that it is clear how you make a decision and how the outcomes of the decision are determined.

Example 1:

Suppose during one decision you invest no tokens in the group fund and instead keep all **100** tokens in your private fund.

After you and your partners have each made a decision, the computer will generate the results and send them back to you. You will find out how many tokens are in which funds, and consequently what everyone will earn.

Continuing with this example. Suppose the other 2 members of your group invest a total of **80** tokens in the group fund and you kept all 100 tokens in your private fund. How much would you earn?

To figure this out, take the 100 tokens you kept in the private fund and multiply that by **1 cent**. This equals $1.00. Then take the **80** tokens in the group fund and multiply that by **2.25 cents**. This equals $1.80 or 180 cents. Since all group members receive an equal share of this, every member's share is 180/3 or 60. So, for this decision, you would earn $1.00 + $0.60 which equals $1.60.

Shown again in a format that is broken down:
Private Fund Earnings: 100 x 1 = 100 tokens or $1.00
Group Fund Earnings: 80 x 2.25 = 180 tokens or $1.80/3 =$0.60
Total Earnings: Private Fund Earnings + Group Fund Earnings = $1.00 + $0.60 = $1.60

Questions?

Example 2:

As a second example, suppose you decide to invest 80 of your tokens in the group fund and keep 20 tokens in your private fund.

Now, suppose that the other group members invest another 140 tokens to the group fund. Thus the group fund equals 220 tokens. The 220 tokens in the group fund are multiplied by 2.25 cents to equal $4.95 or 495 cents. Since all group members receive an equal share of this, your share is 495/3, which equals 165 or $1.65. So, for this decision you earn $0.20 (from your private fund) and $1.65 in the group fund, which equals $1.85.

Shown again in a format that is broken down:
Private Fund Earnings: 20 x 1= 20 tokens or $0.20
Group Fund Earnings: 220 x 2.25 = 495 tokens or $4.95/3 =$1.65
Total Earnings: Private Fund Earnings + Group Fund Earnings = $0.20 + $1.65 = $1.85

Do you have any questions?

Now, just to make sure that you understand the different types of investments, we are going to have you work through a few practice problems. First, you will work through these problems on your own using the PRACTICE WORKSHEET we have provided. After you complete the practice worksheet, I will demonstrate how you should record the information from those practice problems using your RECORD SHEET. Once you have filled out the record sheet, we will run through them again on the computer.

Record Sheet Instructions: Part I

Now that you have completed these two practice problems, I am going to show you how to record your calculations on the RECORD SHEET we have provided.

The first column labeled **"# of Tokens Invested in the Group Fund"** refers to the number of tokens each group member chooses to invest in the group fund. This will be multiplied by 2.25 cents and divided among all of the group members. Because you and your fellow group members each invested 100 tokens in the group fund, you should enter 100 in this column for all three participants.

The next column labeled "**# Tokens Kept in the Private Fund**" refers to the number of tokens each group member chooses to keep in their private fund. The number of tokens in this column will be multiplied by 1 cent and belongs solely to the owner of the private fund. Because you and each of your group members invested all 100 of your tokens in the group fund, you should enter 0 in this column for ID numbers 1, 2, and 3.

The column labeled "**Earnings from the Group Fund**" refers to the number of tokens each participant earned at the end of the decision-making period. This number will be calculated by multiplying the total number of tokens invested in the group fund by 2.25 and then dividing the sum by 3. Because you and your fellow group members invested a total of 300 tokens in the group fund, you will each earn 225 tokens. Therefore, you should enter $2.25 in this column.

The column labeled **"Total Earnings for this Period"** refers to the amount of money each group member earned during that decision making period, and it is calculated by adding their earnings from the group fund and their own private fund. Because neither you nor your partners chose to keep any tokens in your private fund, your total earnings will be equivalent to your earnings from the group fund. Therefore, you should enter $2.25 in this column for ID numbers 1, 2, and 3.

Finally, the column labeled **"Cumulative Earnings"** provides a running tally of how much each group member has earned within the study and is calculated by adding the total earnings from each period together. Because this is the first round, your cumulative earnings are equivalent to your total earnings for this period. Therefore, you should again enter $2.25 in this column for all three participants.

Decision Making Round	Participant ID	# Tokens Kept in the Private Fund	# Tokens Invested in the Group Fund	Earnings from the Group Fund	Total Earnings for this Period	Cumulative Earnings
Practice Problem 1	ID 1	0	100		$2.25	$2.25
	ID 2	0	100	$2.25	$2.25	$2.25
	ID 3	0	100		$2.25	$2.25
Practice Problem 2	ID 1	40	60		$1.75	$4.00
	ID 2	40	60	$1.35	$1.75	$4.00
	ID 3	40	60		$1.75	$4.00

Let's move on to the second practice problem.

Record Sheet Instructions: Part II

Because you and your partners had the same practice problems on your worksheet, you will all make the same amount of money during these first two rounds. When it comes time for you all to make these decisions on your own, however, your decisions may vary from those of your partners. As a result, it is important to keep track of each members decisions using the record sheet we have provided. The information that you record on this sheet will also be used to pay you, so please be thorough.

In this example, you and your partners were each asked to invest 60 tokens in the group fund and keep 40 tokens in your respective private funds. As a result, you should enter the number 60 next to each ID number in the column labeled **"# of Tokens Invested in the Group Fund"** and the number 40 next to all three ID numbers in the column labeled "# **Tokens Kept in the Private Fund"**.

Based on your previous calculations, you should know that your earnings from the group fund are 135 cents. As a result, you should enter $1.35 in the column labeled **"Earnings from the Group Fund"**.

Because you and your partners each kept 40 tokens in your private funds, your total earnings should equivalent to your earnings from the group fund plus 40 cents. Therefore, you should enter $1.75 in the column labeled **"Total Earnings for this Period"** for ID numbers 1, 2, and 3.

To calculate each group members' cumulative earnings, simply add their total earnings from practice problem 1 to their total earnings from practice problem 2. Because your total earnings were $2.25 in the first round and $1.75 in the second round, you should enter $4.00 in the second row of the column labeled **"Cumulative Earnings"** for all three participants.

Practice Problem #1

Now that you understand the nature of the decision we are asking you to make as well as how to record your answers using the RECORD SHEET, we will run through the same problems on the computer.

Note: In this decision making round, you are being asked to indicate how many tokens you would like to INVEST in the GROUP FUND. The amount of tokens that you keep in your private fund will be calculated by subtracting the number of tokens you invested from 100.

Following the example on your worksheet, please **invest all of your tokens in the group fund** by entering 100 in text box on your screen.

Before you submit your decision, remember that by choosing to invest 100 tokens, you have also chosen to keep 0 tokens for yourself.

Once everyone in your group has confirmed their decision, your computer should provide you with an overview of the decisions each member of your group made as well as your total earnings for this round, and your cumulative earnings in the game. The rows and columns of the feedback table should mirror those listed on your RECORD SHEET.

If you do not have any questions, you may move on to the next practice problem.

Practice Problem #2:

Following the same procedure outlined in the first round, please invest 60 tokens in the group fund by entering the number 60 in the text box on your screen.

Before you submit your decision, remember that by choosing to invest 60 tokens, you have also chosen to keep 40 tokens for yourself.

Once your entire group has confirmed their decision for this round, you should see both on your screen and on your record sheet that your total earnings for these two rounds is equivalent to 400 tokens or $4.00.

Please remember that the decisions of all group members were the same during this round because we specifically asked you all to contribute the same amount of tokens to the group fund.

Once we begin the game, your decisions may vary from those of your partners, so you will not be able to calculate your total earnings for each round until after the other two members of your group have made their decisions.

If you have no other questions and are ready to continue, you may begin Round 1. I will be just outside, so if you have any questions just let me know. You will know that the study has come to an end when a small dialog box with a message in German appears on your screen.

APPENDIX F

ROLE ASSIGNMENT SHEET

ID Number: _____   **Role Assignment:** _____

Position	Manager	Employee
Pay	$12.00/hour (with potential for a $5-10 bonus)	$7.50/hour (with potential for a $5-10 bonus)
Responsibilities	Directing employees in a variety of tasks Inspecting employee performance Grading the quality of employees' work Reviewing profit margins and inventories Determining product placement, selection, and clearance	Folding flyers Addressing flyers to customers Restocking and organizing shelves Creating signs for sale items

PRACTICE WORKSHEET

Decision Summary: Every token put in your private fund is worth **1 cent**. This is added directly to your earnings—it is not shared with other group members. Each token invested in the group fund is worth **2.25 cents** and each token in this fund is evenly divided among all members of the group. As indicated in the formula below, the amount of money you earn will be equivalent to the sum of earnings collected from your private fund and the group fund.

Earnings Formula:
1¢(Tokens Kept in your Private Fund) + [2.25¢(Tokens Everyone Invested in the Group Fund)]/3

Practice Problem #1: Suppose you invest all 100 of your tokens in the group fund. By doing so, you have also chosen to keep 0 tokens for yourself. If your two partners choose to do the same — invest 100 tokens and keep 0 tokens — how much money will you earn during this round?

Practice Problem #2: Now, suppose in the next round you invest 60 of your tokens in the group fund. By doing so, you have also chosen to keep 40 tokens for yourself. If your two partners choose to do the same — invest 60 tokens and keep 40 tokens — how much money will you earn during this round?

APPENDIX H: SAMPLE RECORD SHEET

Decision Making Round	Participant ID	# Tokens Kept in the Private Fund	# Tokens Invested in the Group Fund	Earnings from the Group Fund	Total Earnings for this Period	Cumulative Earnings
Round 1	ID 1					
	ID 2					
	ID 3					
Round 2	ID 1					
	ID 2					
	ID 3					
Round 3	ID 1					
	ID 2					
	ID 3					
Round 4	ID 1					
	ID 2					
	ID 3					

APPENDIX I

POST-TEST QUESTIONNAIRE

The list of statements below refers to the task that you just completed. Please take care in considering your answers to each question. Please select the response that best matches your opinion.

The words below reflect a possible range of feelings. Please choose the number that best approximates your feelings about the decisions during the study.										
Very Displeased					Neutral					Very Pleased
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Unsatisfied					Neutral					Very Satisfied
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Not Joyful					Neutral					Very Joyful
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Bored					Neutral					Very Excited
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Unmotivated					Neutral					Very Motivated
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Unhappy					Neutral					Very happy
−5	−4	−3	−2	−1	0	1	2	3	4	5

Very Discontented					Neutral					Very Contented
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Unenthusiastic					Neutral					Very Enthusiastic
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Tired					Neutral					Very Energetic
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Not Interested					Neutral					Very Interested
−5	−4	−3	−2	−1	0	1	2	3	4	5

The words below reflect the final outcome of your group's effort. Please select the number that reflects how you would best describe the final outcome of your group's effort.										
Very Unsuccessful					Neutral					Very Successful
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Unproductive					Neutral					Very Productive
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Not Rewarding					Neutral					Very Rewarding
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Uncooperative					Neutral					Very Cooperative
−5	−4	−3	−2	−1	0	1	2	3	4	5

The words below reflect the final outcome of your group's behavior. Please select the number that reflects how you would best describe the final outcome of your group's behavior.										
Very Unhelpful					Neutral					Very Helpful
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Uncooperative					Neutral					Very Cooperative
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Self Oriented					Neutral					Very Team Oriented
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Unsupportive					Neutral					Very Supportive
−5	−4	−3	−2	−1	0	1	2	3	4	5
Very Unjust					Neutral					Very Just
−5	−4	−3	−2	−1	0	1	2	3	4	5

Below is a list of statements. For each statement, please indicate the degree to which you agree/disagree.							
	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
1. I identify with this group	−3	−2	−1	0	1	2	3
2. I am glad to belong to this group	−3	−2	−1	0	1	2	3
3. I feel held back by this group	−3	−2	−1	0	1	2	3
4. I think this group worked well together	−3	−2	−1	0	1	2	3

5. **I see myself as an important part of this group**	−3	−2	−1	0	1	2	3
6. **I do not fit in well with the other members of this group**	−3	−2	−1	0	1	2	3
7. **I do not consider the group to be important**	−3	−2	−1	0	1	2	3
8. **I feel uneasy with the members of this group**	−3	−2	−1	0	1	2	3
9. **I feel strong ties to this group**	−3	−2	−1	0	1	2	3

Below is a list of statements. For each statement, please indicate the degree to which you agree/disagree.					
	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
1. **In the future, I would be willing to work with my group again.**	1	2	3	4	5
2. **In the future, I would choose to work with <u>another group</u> before working with the same group I worked with today.**	1	2	3	4	5
3. **The outcome of the decision-making matters to me very little.**	1	2	3	4	5

The words below reflect a possible range of feelings. Please choose the number that best approximates your feelings about the group you participated with during the study.										
Distant					Neutral					Close
−5	−4	−3	−2	−1	0	1	2	3	4	5
Coming Apart					Neutral					Coming Together
−5	−4	−3	−2	−1	0	1	2	3	4	5

Fragile					Neutral					Solid
−5	−4	−3	−2	−1	0	1	2	3	4	5
Divisive					Neutral					Cohesive
−5	−4	−3	−2	−1	0	1	2	3	4	5
Diverging					Neutral					Converging
−5	−4	−3	−2	−1	0	1	2	3	4	5

The words below reflect your feelings directed at yourself. Please select the number that reflects how you would best describe your feelings towards yourself.										
Not Proud					Neutral					Proud
−5	−4	−3	−2	−1	0	1	2	3	4	5
Shameful					Neutral					Shameless
−5	−4	−3	−2	−1	0	1	2	3	4	5
The words below reflect your feelings directed at others in your group. Please select the number that reflects how you would best describe your feelings towards others in your group.										
Not Grateful					Neutral					Grateful
−5	−4	−3	−2	−1	0	1	2	3	4	5
Not Angry					Neutral					Angry
−5	−4	−3	−2	−1	0	1	2	3	4	5

Please select the statement that best describes your primary motivation during the study.				
What was your primary motivation during the study?	Earning as much money as I could	Equalizing the amount earned by myself and the other group members	Earning more money than the other group members	Other

The words below reflect how you feel about your relationship to the group. Please select the number that reflects how you would best describe your feelings about your relationship to the group.										
Bad					Neutral					Good
−5	−4	−3	−2	−1	0	1	2	3	4	5
Detached					Neutral					Attached
−5	−4	−3	−2	−1	0	1	2	3	4	5
Disloyal					Neutral					Loyal
−5	−4	−3	−2	−1	0	1	2	3	4	5
Disconnected					Neutral					Connected
−5	−4	−3	−2	−1	0	1	2	3	4	5
Negative					Neutral					Positive
−5	−4	−3	−2	−1	0	1	2	3	4	5

When satisfactory results were produced in the decision-making, to what extent did you and the others share joint responsibility?										
Not at all					Neutral					Very Much
−5	−4	−3	−2	−1	0	1	2	3	4	5

Please answer the following questions to the best of your ability.				
Who contributed the most to your group?	ID 1	ID 2	ID 3	Not sure
Who contributed the least to your group?	ID 1	ID 2	ID 3	Not sure
What was your ID number in your group?	ID 1	ID 2	ID 3	Not sure
Which role was ID 1 assigned?	Manager	Employee	Unknown	
Which role was ID 2 assigned?	Manager	Employee	Unknown	
Which role was ID 3 assigned?	Manager	Employee	Unknown	
Will you be working with either of your partners from this study in the next study?	Yes	No	I Don't Know	
What are these role assignments – as manager/employee – based on?				

DEBRIEFING SHEET

Now that you have finished the game, we ask that you please complete the Qualtrics exit survey. To access the survey, you must first exit the game. To do so, please hold down ALT + TAB and click the "x" in the upper right hand of the dialog box that appears on your screen. Once you have exited the game, click the internet explorer icon to pull up the webpage. Once you have finished the survey, just let me know. I will be just outside.

We want to thank you for participating today and to let you know that your participation is no longer needed for the second study. After we pay you for your participation in this study, however, we would like to debrief you.

The study, in which you participated, is one version of what is known as a social dilemma. Social dilemmas are particular kinds of instances in which there is a competition of incentives. That is, what is in a particular individual's interest competes with the group's interest. So, for example, in today's study, what do you think would have made you the very most money for yourself personally?

Right, but what is the problem with that strategy?

The best possible strategy would be for you to keep everything in your private fund and for others to contribute all their tokens to the group fund. But, if everyone is thinking the same thing, then nobody will contribute.

The characteristics of this study match many different kinds of decisions we see in the real world. Public radio and public television, for example, work on a very similar principle. You can always turn on a public radio station and hear it, even if you did not pay to support it. This is similar to the group fund – where you got the benefit even if you didn't contribute to it. Under these conditions, the dilemma is that if nobody contributes, the radio station will not survive.

In the real world, we know that people can solve social dilemmas, but there are many different factors involved in everyday life that make it difficult to identify the direct effects of these factors. Laboratory experiments such as this one are designed to isolate the effects of a particular factor so that we can better understand its effects on decision making.

In today's study, what did you know about the members of your group?

Right. You knew very little about each other. The only information you may have gathered about your partners was the information listed on the sign-in sheet. Did you, for example, see or hear the name, ID number, or role assignment of the other participant who entered the lab at the same time as you?

Even if you did notice, that is not a whole lot of information. We intentionally limited the amount of information that you had about the other members of your group so that we could determine how the information that we did provide (i.e., information about your role assignment and the study) affected your decisions.

In fact, the second study we told you about is not real and your partners in the first study were not really other students. The woman who entered the lab at the same time as you is actually a member of our research team, and she had no control over the contributions of either of your partners. The decisions of your partners were pre-programmed and relayed to you through the computer, and we did this because we needed to have complete control over their contributions.

Do you have any questions? *(Give participants some time to ask for more details about the cover story for study 2 and the confederate's role in study 1. Once they are satisfied and seem comfortable with the way the study has concluded, continue reading…)*

We would like to ask you not to talk about the details of today's study for a few months. When people know exactly what we study, it can affect how they behave. Knowing the nature of social dilemmas, for example, could affect how you think about your decisions.

On that note, we hope that some of you will participate in more studies like this one in the future. And, we would like to thank you again for your participation today.

APPENDIX K

ACKNOWLEDGEMENT OF PAYMENT FORM

I, _____, acknowledge that I received $_____ from Dr. Jane Sell for participation in a study of decision making in small groups.

Name: _____   **Signature:**_____

Date: _____