THE UNINTENDED EFFECT OF GROUP IDENTITY: AN EXPERIMENTAL INVESTIGATION OF BENEFIT ASYMMETRY AND EMPLOYEES' COOPERATION

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Hui Xu

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THE UNINTENDED EFFECT OF GROUP IDENTITY: AN EXPERIMENTAL INVESTIGATION OF BENEFIT ASYMMETRY AND EMPLOYEES' COOPERATION

Approved by:

Dr. Bryan K. Church, Co-Chair
College of Business
Georgia Institute of Technology

Dr. Jason Kuang, Co-Chair
College of Business
Georgia Institute of Technology

Dr. Jeffery Hales
College of Business
Georgia Institute of Technology

Dr. Ivo D. Tafkov
School of Accountancy
Georgia State University

Dr. Adam Vitalis
College of Business
Georgia Institute of Technology

Date Approved: June 23, 2014

Dedicated to My Husband, Ming, and my sons, Daniel and Jacob
Who always love and believe in me

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SUMMARY

The primary purpose of this study is to investigate whether the effect of group identity on individuals' willingness to cooperate is moderated by benefit asymmetry (i.e., mutual cooperation may benefit some group members more than others). I conduct an experiment in which participants act as group members for a hypothetical company. Consistent with expectations, I find that a strong group identity promotes employees' cooperation rates, but *only* in situations in which benefits resulting from mutual cooperation are symmetric. When the benefits are asymmetric, employees' willingness to cooperate depends on whether they are disadvantaged or advantaged as well as the level of group identity. Specifically, the disadvantaged employees are less likely to cooperate when group identity is high. In contrast, the advantaged ones' willingness to cooperate is unaffected by the level of group identity. Results of my study suggest that, in situations of benefit asymmetry, inducing a high level of group identity may have unintended negative consequences on group performance as well as organizational productivity.

CHAPTER 1

INTRODUCTION

Teams and groups have become increasingly common in organizational practice because, in today's business world, the accomplishment of technological projects often requires cross-functional collaboration (Anderson & Sedatole 2003). Research finds that the use of teams and groups increases employee participation and involvement, which, in turn, increases job satisfaction and reduces employee turnover (Wellins, Byham, & Dixon 1994). However, the success of group projects rests heavily on cooperation among group members, and conventional economic theory suggests that cooperation can be difficult to achieve if group members' personal interests are not properly aligned with group interests.

Traditional management control systems utilize formal controls, which often rely on reward-based incentive systems or punishment-based sanctioning systems to align the interests of the principal and agents, to promote group cooperation. However, formal controls are often costly. In addition, prior research suggests that the mere presence of a control system may lead decision makers to view the collaborative environment as non-cooperative, which in turn, decreases individuals' willingness to cooperate (Malhotra & Murnighan 2002; Tenbrunsel & Messick 1999). Recently, a growing number of studies begin to examine whether social control mechanisms, such as culture, honesty, fairness, and group identity, play a role in mitigating agency problems (Evans III, Hannan, Krishnan, & Moser 2001; Kachelmeier & Shehata 1997; Rowe 2004; Towry 2003; Zhang 2008). Notably, several studies find that social ties, such as group identity, which play no role in standard economic analysis, have positive effects on group members' cooperation (De Cremer & Van Vugt 1999; Karau & Williams 1997; Rowe 2004; Towry 2003).

Most prior studies investigating the effect of group identity on cooperation assume that benefits resulting from cooperation are equally distributed among group members. Yet in naturally occurring organizational settings, cooperation may benefit some group members more than others (hereafter referred to as benefit asymmetry): for instance, group members may put different levels of effort into a project but receive the same reward, or put in the same level of effort but receive different rewards due to noisy performance signals or the supervisor's favoritism. The primary purpose of this study is to investigate whether and how benefit asymmetry moderates the effect of group identity on individuals' willingness to cooperate.

Psychological theory suggests that an individual evaluates the fairness or equity of an outcome by comparing the output-to-input (O/I) ratio between self and others (Adams, 1965), and the comparison person's ratio provides a social referent for an individual to determine the acceptability of rewards. When the O/I ratio of the individual is not equal to that of the comparison person and the unequal O/I ratios cannot be justified, s/he is likely to experience a perception of inequity. In addition, social comparison theory posits that individuals have a drive to compare themselves to others in order to gain accurate self-evaluations (Festinger 1954) and are more likely to compare themselves with a close other (a person that is psychologically close) (Campbell & Tesser 1985; Tesser 1988).

For the purpose of this study, if benefits from cooperation are symmetric, the outcome appears to be equitable for all employees and high group identity may increase employees' other-regarding preferences, thereby leading to more cooperation. However, if benefits are asymmetric, the outcome appears to be inequitable, especially for disadvantaged employees. I define a disadvantaged employee as one whose output-to-input ratio is lower than that of his/her peers and an advantaged employee as one whose output-to-input ratio is higher than that of his/her peers. Disadvantaged employees working in a high identity group are more likely to consider their peers to be

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psychologically close, and therefore more likely to compare their outcomes to those of their peers than employees working in a low identity group. As a result, disadvantaged employees will be more likely to perceive the outcome to be more inequitable and, hence, less likely to cooperate when group identity is high than when group identity is low. Anticipating this behavior, advantaged employees may strategically respond by cooperating less.

A laboratory experiment is conducted to test these predictions. Participants are randomly assigned to a dyad that represents a group working on a project. The primary responsibility of both participants in the group is to choose the level of effort s/he would commit to the production process. The experiment has a 2 x 2 between-participants design: the first manipulated variable is group identity (high versus low) and the second is benefit asymmetry (symmetric versus asymmetric).[1]

Experimental results indicate that high group identity increases cooperation under the symmetric benefits condition. However, when benefits are asymmetric, the impact of group identity on cooperation depends on whether participants are disadvantaged or advantaged. Specifically, disadvantaged participants are more likely to feel that they are treated unfairly and, therefore, are less likely to cooperate when group identity is high. By comparison, advantaged participants' willingness to cooperate is not affected by the level of group identity. Thus, with disadvantaged and advantaged participants combined, the overall effect of asymmetric benefits on cooperation is negative.

My study makes several contribution to the literature. First, my study has important practical implications for managers who aim to maximize the effectiveness of work groups. Group cooperation is often deemed to be a key component to improve

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[1] Even though many forms of benefit asymmetry can be found in practice, for ease of experimental implementation, I ask participants to choose whether or not to cooperate with the paired counterpart, but vary the distribution of the benefits resulting from mutual cooperation when achieving organizational goals. Future research could investigate whether other forms of benefit asymmetry have different impacts on employees' cooperation.

group performance and overall productivity. Hence, means to improve group cooperation always are of interest to managers. In the workplace, an employer's distribution of benefits and rewards among employees is not always the same, and the process for rewarding them is not always apparent to employees. If employees do not understand why benefits resulting from mutual cooperation are not equal, some employees are likely to feel that they are treated unfairly.[2] Such perceived inequity can be detrimental to group success and overall productivity. The findings of this study are important in that group-based incentives are widely used in practice and are believed to have a positive and significant impact on organizational outcomes (Hollensbe & Guthrie 2000). Because benefit asymmetry could undermine the effectiveness of group-based incentives in motivating group performance, firms need to carefully consider the implications of perceived inequity on employees' behavior when implementing reward systems specifically designed for the workgroup environment.

Second, my study also contributes to the management control literature. Despite the prevalence of incentive plans in management controls, formal controls are often costly and therefore the growing literature considers the tradeoffs between formal and informal control mechanisms (Kachelmeier & Shehata 1997; Rowe 2004; Towry 2003). Drawing on both the economics and psychology literature, my study examines whether informal control mechanisms, such as group identity, can alleviate agency problems. My study also investigates whether situational variables interacting with group identity affect its effectiveness in mitigating the free-rider problem. Understanding the interactive effects of situational variables and informal controls on cooperation are important. It extends the management control literature by investigating how personal, task, and environmental variables interact with informal controls to influence performance in a collaborative setting (Bonner & Sprinkle 2002).

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[2] Future study could investigate whether employees are likely to accept why they are disadvantaged, when the employer provides an explanation to them.

Furthermore, my study calls into question the effectiveness of group identity in promoting cooperation. The findings of my study demonstrate that the effectiveness of group identity in promoting cooperation can be limited under certain circumstances. Although some managers may expect to use group identity (e.g., the use of team building) to enhance employees' attachment to their work groups and, thereby, increase group cooperation, my findings suggest that group identity may affect group cooperation negatively, especially under conditions that mutual cooperation benefits some members more than others. Specifically, a high level of group identity can reduce psychological distance among group members and lead to increased comparability between group members. When benefits resulting from mutual cooperation are not equally distributed, it is difficult for disadvantaged employees to justify why benefit asymmetry occurs, and in turn, they are more likely to feel that they are treated unfairly. The inequity introduced by benefit asymmetry may prevent employees from contributing effort to work groups. The results suggest that organizations need to be cautious when they attempt to use group identity to resolve cooperation problems in situations of benefit asymmetry.

The remainder of my dissertation is organized as follows. Chapter 2 discusses formal and informal control mechanisms and reviews the relevant literature. Chapter 3 provides background information on benefit asymmetry as well as potential problems introduced by benefit asymmetry. Chapter 4 develops hypotheses. The preliminary study is introduced in Chapter 5, followed by the main study in Chapter 6. Finally, Chapter 7 offers concluding remarks.

CHAPTER 2

BACKGROUND AND LITERATURE REVIEW

This chapter provides background information on the growing use of work groups in the workplace, cooperation issues in collaborative environments, and how to use formal and informal control mechanisms to promote group cooperation. It is organized as follows: Section 2.1 discusses the growing use of work groups in the workplace and cooperation issues in collaborative environments. And Section 2.2 synthesizes the extant literature on the use of formal and informal control mechanisms to promote group cooperation.

2.1 Cooperation issues in Collaborative Environments

Over the past several decades, the use of teams and work groups has become increasingly popular in U.S. organizations to improve productivity and work flexibility. According to Training Magazine (1995), 78 percent of U.S. companies organize some of their employees into teams or work groups. Similarly, in the 1999 Practice Analysis, the Institute of Management Accountants indicates that more than 70 percent of survey respondents work in companies where some management accountants work on cross-functional teams (Institute of Management Accountants, 1999). In addition, over the years, teams and work groups have become more diverse and different types have been used in organizations, such as cross-functional teams, joint ventures, and strategic supply chains (Anderson & Sedatole 2003; Van Knippenberg 2000). Many organizations view teams and work groups as a key to establish or maintain competitive advantages in a rapidly changing market environment.

Although organizations value the merits of teams and work groups, they also face challenges when using teams and work groups in the workplace. A growing body of recent research suggests that teams and work groups may not be as effective as most managers and academics believed (Arya, Fellingham, & Glover 1997; Barron & Gjerde 1997). When working in groups, success depends heavily on whether employees can work effectively and efficiently with others (e.g., the cooperation among group members). As Tyler and Blader (1993, p. 23) state, "When the people within groups engage in more cooperative behaviors, the groups to which they belong become more efficient, effective, and viable."

Effective and efficient organizational outcomes often require employees to work in a non-selfish fashion: for example, to share information with others, to provide effort even if it is not rewarded, and/or to sanction selfish behavior even when it is costly to do so. However, in group settings, a potential problem is the conflict between individual and group incentives. When people are compensated based on group outputs, but individual members' inputs are not observable, conventional economic theory predicts that each agent will try to free ride on others and not contribute to the group. Hence, group cooperation is not always easy to establish or maintain, especially when individuals' desire to cooperate for the benefits of the group is at odds with the desire to maximize personal welfare.

Although conventional economic theory argues that people are rational and act to maximize their utilities, results from examination of the data in the prisoner's dilemma game and public goods environments are not consistent with the economic predictions. Specifically, individuals behave neither fully rational nor fully altruistic. As Dawes and Thaler (1988, p. 196) state: "It is certainly true that there is a "free rider problem". … On the other hand, the strong free rider prediction is clearly wrong—not everyone free rides all of the time." This is the case because individuals are not solely motivated by monetary incentives, many social motives, including altruism, reciprocity, trust, norm compliance,

culture, and ethical and fairness concerns, can also influence people's cooperative behavior. For example, Fehr and Gachter (2000) argue that the world is made up of people with self-interested type and reciprocal type. They show that when individual opportunities to punish others are available, the reciprocal types vigorously punish free riders even if the punishment is costly. As a result, a high level of cooperation can be achieved. Therefore, to motivate cooperation in groups, management accounting needs to consider the effects of both economic and social motives on individuals' decision making.

2.2 Motivating Cooperative Behavior

Two distinct strategies of promoting cooperative behaviors are discussed in the accounting literature: a formal control strategy and an informal control strategy. Formal control strategies rely on the firm's ability to create incentive compatible rewards or punishments to promote cooperative behavior, because people expect rewards for cooperation and fear punishment if they fail to cooperate. Informal control strategies, on the other hand, rely on the firm's ability to induce social control mechanisms to motivate desirable behaviors by shaping what people feel they ought to do, without regard to external incentives.

2.2.1 Formal control mechanisms

Agency theory suggests that agents will act in their own self-interest at the expense of the principal when they possess private information about the firm and have the potential for personal gain (Baiman 1990). Monetary incentives and effective monitoring are essential components of a good management control system (Kaplan & Atkinson 1998). To solve the free-rider problem, the principal can use reward-based incentive systems or punishment-based sanctioning systems to align the interests of the

principal and agents. Formal control mechanisms are expected to be an effective means to motivate people to engage in cooperative behavior under the assumption that people believe cooperative behavior is likely to be rewarded by the group. In addition, people refrain from rule breaking when they believe that they will be caught and punished for non-cooperative behavior. In the following, I discuss the potential benefits and limitations when using reward-based incentive systems or punishment-based sanctioning systems to promote cooperation.

2.2.1.1 Reward-Based Incentive Systems

Strategies for encouraging desired cooperative behavior are typically linked to the use of reward-based incentive systems: for example, organizations can provide bonuses and promotion to those who engage in cooperative behaviors. Monetary incentive is often deemed to be one of the most important factors affecting individuals' behavior and frequently used as a means for motivating and improving the performance in organizations (Bonner & Sprinkle 2002). Multiple theories, such as expectancy theory, agency theory, and goal setting theory, explain the effects of incentives on individuals' performance. I first introduce several theories separately, and then discuss the potential limitations of the use of reward-based incentives in motivating cooperation.

Expectancy theory (Vroom 1964) proposes that individuals behave or act in ways that maximize expected satisfaction with outcomes. According to Vroom's expectancy theory, motivation is a multiplicative function of three constructs: (1) expectancy, an individual's belief that a particular degree of effort will be followed by a particular level of performance, (2) instrumentality, an individual's belief that a particular outcome is contingent on accomplishing a specific level of performance, and (3) valence, the attractiveness of outcomes. When working in groups, group incentives are often tied to organizational outcomes (e.g., organizational profit, organizational productivity, and so on). Groups are rewarded when the organization achieves a certain organizational

outcomes. Since monetary incentives can increase expectancy about the effort-outcome relationship (Jorgenson & Dunnette 1973) as well as the attractiveness of outcomes, group performance is likely to be higher under reward-based incentives contracts.

Goal setting theory (Locke & Latham 1990) suggests that goals are primary determinants of effort. Working toward a goal is a major source of motivation, which, in turn, improves performance. Monetary incentives can affect effort via goal setting in three possible ways. First, monetary incentives can lead individuals to set goals when they would not otherwise. Second, monetary incentives can cause individuals to set more challenging goals; these goals in turn result in higher effort. Finally, monetary incentives can lead to higher goal commitment and greater effort relative to no monetary incentives (Bonner & Sprinkle 2002). Therefore, monetary incentives can improve individuals' performance through goal setting.

While these theories suggest a positive association between monetary incentives and individuals' effort, using reward-based incentives systems to solve the free-rider problem in group settings might be inefficient, costly, or problematic. First, a potential negative effect of monetary incentives on cooperative behavior is that the use of extrinsic rewards can diminish individuals' intrinsic motivations for cooperating (Kohn 1993). In the workplace, organizations that attempt to shape employees' behavior through monetary incentives might inadvertently communicate to their employees that cooperating with other group members is not enjoyable. This would lead individuals to be less willing to cooperate because extrinsic incentives can undermine their internal drive to cooperate. For example, Atkinson and Reitman (1956) find that incentives positively affect the performance of individuals with low need-for-achievement, whereas negatively affect the performance of those with high need-for-achievement. Hence, under certain circumstances, providing monetary incentives can negatively affect individuals' willingness to cooperate.

Second, reward-based incentive systems may change the relationship among group members and thus influence their effectiveness (Kohn 1993,1999). Incentives can cause competition among group members, which cause group members to view each other as obstacles to their own success and therefore impede cooperation with other group members. In addition, competition leads to there being winners and losers. The feeling of having lost is negative for motivating cooperative behavior. Therefore, the use of rewards can erode social relations among group members as well as group cooperation.

Lastly, reward-based incentive systems could be inadequate to affect the behavior of group members over time. If organizations reward agents for specified behavior, agents might stop performing such behavior once the rewards are removed. As a result, companies must continually maintain the reward system to motivate agents' behavior, which may be costly for the principal. In addition, the motivational effect of the same rewards may become lost over time. Empirical evidence suggests that people often habituate to monetary incentives (Csikszentmihalyi 1999), therefore, greater levels of rewards are needed in order to maintain the same level of motivation.

In sum, despite a number of arguments against the use of reward-based incentive systems to motivate group performance, incentive systems still remain attractive in practice, in part because such reward systems are easy to implement and often result in short-terms success.

2.2.1.2 Sanction-Based Incentive Systems

Strategies to discourage undesired behavior are often tied to threatening or punishing people who engage in such behaviors. Because agents are motivated to conceal undesired behavior from the principal, the effectiveness of punishment-based sanctioning systems requires extensive surveillance of the behavior of group members. In the following, I introduce several economic models of monitoring discussed in the literature.

The first approach of monitoring is the principal-agent monitoring. Alchian and Demsetz (1972) provide the first standard model of the principal-agent monitoring. According to Alchian and Demsetz (1972), in a team setting, when agents' inputs are difficult to observe, they have incentives to shirk. One solution is to appoint an individual to monitor team production. In order to ensure a proper incentive to monitor other members of the team, the individual who monitors the input of team members should receive the residual rewards of the firm. The monitor could be the principal or a third party specialist who is hired by the principal to verify agents' behavior. However, monitoring by a principal or specialist can be costly. As monitoring becomes less effective, the principal should rely more on providing the proper incentive contracts to remove the free-rider problem.

The second approach is the peer monitoring among agents. Incentive contracting schemes that incorporate peer observations are useful to direct employees' efforts toward management's goals. Compared to the principal, agents often possess much better information about group members' inputs. Therefore, the principal can utilize the ability of group members to observe each other's actions to encourage cooperative behavior. Two forms of peer monitoring control systems are discussed in the literature: vertical mutual monitoring and horizontal mutual monitoring. Vertical mutual monitoring relies on vertical communication from agents to the principal in a multi-agent setting (Arya & Glover 1996; Demski & Sappington 1984; Ma 1988). The general model of vertical mutual monitoring is that each agent observes the other agent's action and reports observations of his/her peer's effort to the principal. In addition, each agent's payoff is contingent on the other agent's report on his/her effort choice.

Even though vertical monitoring allows the principal to utilize agents' knowledge about others to enforce truthful reporting, the effectiveness of such monitoring depends heavily on whether agents truthfully report (Towry 2003). For example, communication can lead to collusive agreement between agents and produce counterproductive

behaviors. To ensure truthful reporting, the principal can provide additional incentives (e.g., reporting bonus/penalty) to agents for whistleblowing. For instance, firms can employ an auditor to verify negative reports when one agent accuses the other of shirking. If the auditor determines that the accusation is truthful (false), the accusing agent is then rewarded (penalized) for the truthful (false) accusation.[3]

Irrespective of its effectiveness, under vertical mutual monitoring, agents are essentially whistle-blowers, who pass along any information they gather about their coworkers to the principal. Such behavior is considered immoral by some cultures and may impose costs into the utility function of agents, which in turn, influences the effectiveness of the vertical mutual monitoring.

Unlike vertical mutual monitoring, horizontal mutual monitoring does not involve reporting to the principal. Instead, horizontal monitoring induces agents to agree to take actions desired by the principal and to enforce these agreements through the use of formal sanctions, peer pressure, or enforceable side-contracting (Arya et al. 1997; Barron & Gjerde 1997; Itoh 1993).

Arya et al. (1997) design a two-period model to explain how horizontal monitoring can benefit the principal. In the first period, the principal offers group incentives in which each agent's pay is tied to group outputs. Even though the group-based incentives provide an opportunity for social loafing, agents can monitor each other's efforts and punish one another for shirking in the second period. The credible threat of being punished in the second period provides an implicit incentive for each agent to exert a high level of effort in the first period. The Pareto optimal outcome for both agents is to work each period and to enforce the agreement through a tit-for-tat strategy. [4]

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[3] Because verification processes are costly, the optimal approach for the principal is to verify only negative reports.

[4] Tit-for-tat is an effective strategy in game theory for the iterated prisoner's dilemma. An agent using this strategy will first cooperate, then subsequently replicate the other agent's previous action. Specifically, if

Horizontal mutual monitoring is common in practice. However, the success of such monitoring requires agents to have perfect information about others agents' actions, which is rarely the case. In addition, mutual monitoring systems can create peer pressure among group members. Even though agents can achieve their desired actions through playing the tit-for-tat or other punishment strategies, peer pressure introduced by monitoring may cause agents to fail to coordinate with others and everyone (both the principal and agents) suffers. Furthermore, mutual monitoring systems also create difficulties in the social climate of groups. The use of mutual monitoring implies distrust, which can diminish individuals' feeling about themselves and the groups to which they belong (Kramer & Tyler 1996). Such negative feelings can produce social costs, which are ultimately borne by the principal.

To sum up, formal control mechanisms can be effective, but they also create a number of difficulties and costs that lead them to be non-optimal strategies to solve the free-rider problem in groups. In the following, I introduce several alternative models of social controls that might alleviate the problem of cooperation.

2.2.2 Informal Control Mechanism

Informal control strategies primarily rely on the role of value and attitudes in shaping individuals' behavior (Birnberg & Snodgrass 1988; Sunder 2002). Examining individuals' attitudes and values is important because these variables can lead people to voluntarily cooperate with others. A growing body of literature demonstrates that social control mechanisms, such as culture, fairness, honesty, trust, and group identity, can play an important role in mitigating agency problems (Evans III et al. 2001; Kachelmeier &

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the other agent previously was cooperative, the agent is cooperative. Conversely, if the other agent was not cooperative, the agent is not. Notably, tit-for-tat is generally considered to be both the simplest and the most successful strategy (Axelrod 1980).

Shehata 1997; Towry 2003). Below, I introduce several social motives that affect individuals' willingness to cooperate.

2.2.2.1 Altruism and Reciprocity

In the experimental economics literature, altruism and reciprocity are often used to explain why people cooperate. Social scientists classify altruism into two categories: pure altruism and impure altruism. The former indicates that people are motivated by taking pleasure in others' pleasure, and the latter suggests that people are motivated to "do the right thing." The latter type of altruism is generally described as the satisfaction of conscience or non-instrumental ethical mandates (Andreoni 1995; Andreoni & Miller 1993; Dawes & Thaler 1988). Empirical evidence suggests that a great portion of individuals understand free-riding but choose to cooperate due to some form of kindness (Andreoni 1995). Altruism also can be observed even when reputation building is not allowed (Andreoni & Miller 1993; Cooper, DeJong, Forsythe, & Ross 1996).

Like altruism, reciprocity is categorized into two types in the experimental economics literature: strong reciprocity and weak reciprocity. Strong reciprocity suggests that people are willing to cooperate with others and punish those who do not cooperate, even when this behavior cannot be justified in terms of helping those they are related to (extended kinship), cooperating with those they will interact with again (direct reciprocity), or cooperating to better their reputation with others (indirect reciprocity) (Gintis 2000; Guala 2012). Weak reciprocity claims that individuals are willing to cooperate only when reciprocal strategies are profitable for agents. Examples of weak reciprocity include market exchange and cooperation enforced by tit-for-tat behavior.

A variety of studies in the experimental economics literature provide evidence for strong reciprocity. The first component of strong reciprocity is that people are willing to cooperate with others. Trust games are often used to demonstrate individuals' strong

reciprocity preferences.[5] For example, Johnson and Mislin (2008) perform a meta-analysis of 84 trust game studies and reveal that on average the proportion of the endowment that participants pass to their counterparts is 51 percent and that the amount returned to the sender as a proportion of money available is 37 percent.

The second component of strong reciprocity is that people are willing to punish those who fail to cooperate, even when punishment is costly. There are two types of punishment: second party and third party punishment. Second party punishment is that an individual who was hurt by another party's failure to cooperate has the opportunity to punish the non-cooperator, whereas third party punishment is that an irrelevant third party has the opportunity to punish the non-cooperator.

A common game used to measure the willingness to engage in second party punishment is the ultimatum game.[6] Even though the economic prediction for the ultimatum game is that the proposer offers as close to zero as possible and the responder accepts any offer, when the punishment opportunity is available, the responder is willing to reject the offer and take nothing in order for the proposer to get nothing. As a result, the proposer would not offer as small an amount as possible. A meta-analysis of 37 papers with 75 results from ultimatum game experiments indicates that the proposer usually offers 40 percent of the pie to the responder, and on average is rejected by the recipient 16 percent of the time. In addition, responders are more likely to reject low offers than high offers (Oosterbeek, Sloof, & Van De Kuilen 2004).

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[5] The trust game is an extension of the dictator game. In the trust game, the proposer determines an allocation of the endowment between himself/herself and the responder. The amount that the proposer gives to the responder is multiplied by some value greater than one. And then the responder decides to give some amount back to the proposer. If individuals are rational and aim to maximize their payoff, the Nash equilibrium is that the responder should give nothing back to the proposer, and that the proposer should assign nothing to the responder.

[6] The ultimatum game is very similar to the dictator game in which a proposer divides a sum of money between himself/herself and a responder. In the ultimatum game, the responder has the choice to either accept the offer or reject it, resulting in both players receiving nothing. If the responder is a payoff maximizer, the Nash equilibrium for both players is that the proposer offers as close to zero as possible and the responder accepts any offer.

Experiments using the modified dictator game and prisoner's dilemma provide strong evidence for the willingness to engage in costly third party punishment.[7] For instance, Fehr and Fischbacher (2004) examine the strength of third party punishment in a series of experiments. They find that a large percentage of participants punished the violation of cooperation norms, even though they incur costs to engage in sanctions and even though they are not directly harmed by the norm violation. Their findings demonstrate the important evidence of strong reciprocity.

2.2.2.2 Trust

Trust is an important informal social device for eliciting cooperation. The trust literature does not provide a universally accepted definition of trust. For instance, Mayer, Davis, and Schoorman (1995) define trust as "the willingness to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party " (p. 712). Rousseau, Sitkin, Burt, and Camerer (1998) define trust as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (p. 395). Even though these definitions vary, they all conceptualize trust as two components: positive expectation in another party and the willingness to make oneself vulnerable to another party.

Positive expectation in another party is related to individuals' attributions about another party's motives and intentions underlying behavior (Smith & Barclay 1997). These attributions influence beliefs about the treatment an individual will receive, which in turn, affects willingness to engage in cooperative behavior (Gambetta 1988; Kramer & Tyler 1996). With regard to the other component of trust – "The willingness to be vulnerable," risk is central and encompasses the perceived probability of loss by the

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[7] In the dictator game, the proposer determines an allocation of some endowment, such as a cash prize. The responder simply receives the remainder of the endowment left by the proposer. The responder's role is entirely passive and s/he has no strategic input into the outcome of the game.

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trustor (Mayer et al. 1995). As Lewis and Weigert (1985) argue, risk is a prerequisite in the choice to trust. If actions could be undertaken without any uncertainty, trust would not be needed.

Individuals are willing to trust for different reasons. First, trust can come from the calculation of benefits of alternative behaviors. Calculus-based trust arises when the trustor attempts to anticipate the behavior of the trustee and determines which level of trust will be given to trustee based on that anticipation and calculation (Barber 1983). Second, trust can also result from deterrence. Deterrence-based trust can be formed under circumstances that individuals will do whatever others expect them to do, because they are afraid that costly sanctions in place for breach of trust exceed any potential benefits from opportunistic behavior (Ring & Van de Ven 1992). Lastly, trust can arise from interpersonal relationship. Relational trust is a sense of reliability and dependability, deriving from repeated interactions over time between the trustor and trustee (McAllister 1995).

Numerous researchers from various disciplines demonstrate that trust can lead to cooperative behavior among individuals, groups and organizations (Axelrod 2006; Gambetta 1988; Mayer et al. 1995; McAllister 1995). A number of studies suggest that a higher level of trust in a work partner increases the likelihood that one will take a risk with a partner. This risk-taking behavior is expected to lead to positive outcomes, such as reciprocity and cooperation (Jones & George 1998; McLeish & Oxoby 2007).

2.2.2.3 Group Identity

In recent years, many researchers propose group identity as a means to positively influence individuals' behavior in groups (De Cremer & Van Vugt 1998; Wit & Wilke 1992). Group identity is an individual's perception of belongingness to a social group (Turner, Hogg, Oakes, Reicher, & Wetherell 1987). According to social identity theory, an individual self-categorizes as an in-group member based on common characteristics

that are shared by other group members. When an individual cognitively associates with the group to which s/he belongs, s/he tends to view himself/herself as a representative of the group rather than a unique person (i.e., the individual acts as if s/he aims to maximize group interests instead of individual interests) (Turner et al. 1987).

The traditional explanation of the group identity effect suggests that group identity increases cooperation because it reduces individuals' tendency to draw distinctions between their own welfare and the welfare of other group members. As Kramer and Brewer (1984, p. 1045) argue, group identity leads individuals to "attach greater weight to collective outcomes than they do to individual outcomes alone. Inclusion within a common social boundary reduces social distance among group members, making it less likely that individuals will make sharp distinctions between their own and others' welfare." As collective identity increases, there is an increase in individuals' mindset that "the shared and mutual perception by in-group members of their interests as interchangeable" (Turner et al. 1987, p. 65). Once those interests are interchangeable, group members are more likely to engage in cooperative behaviors since those behaviors help to maximize group interests.

Alternatively, Yamagishi and Kiyonari (2000) suggest that a higher level of group identity increases individuals' expectations from other group members. When group identity increases, people anticipate increased cooperation from other group members. Accordingly, they are more likely to act cooperatively because they are afraid of the negative consequences of the betrayal of other group members.

Prior experimental economics research primarily uses either natural or induced identity to examine the effect of group identity on individuals' behavior. Studies used natural identities, particularly in gender, and find mixed results. For example, some studies find gender does not significantly impact participants' willingness to contribute in laboratory public goods settings (Brown-Kruse & Hummels 1993; Cadsby & Maynes 1998), whereas others find gender significantly influences the level of contribution

(Croson, Marks, & Snyder 2008; Solow & Kirkwood 2002). Croson, Marks, and Snyder (2008) examines how gender and group identity affect group coordination and efficiency in a threshold social-dilemma game. They find that coordination and efficiency increases for women who interact with members of a naturally-occurring group, while coordination and efficiency decreases for men who interact with members of a naturally-occurring group. Similarly, a number of studies use real social groups, such as platoons in the Swiss Army (Goette, Huffman, & Meier 2006), native groups in Papua New Guinea (Bernhard, Fehr, & Fischbacher 2006), and ethnic groups in Vietnamese village communities (Tanaka & Camerer 2009), and demonstrate that individuals show strong in-group favoritism and behave more cooperatively when they are matched with an in-group member.

In contrast to studies using natural identity, research using induced identity gives experimenters more control over the process of group identity formation (Chen & Li 2009). However, the extent to which induced identity can impact individuals' behavior is contingent on the strength of group identity. As Eckel and Grossman (2005, pp. 384, 385) state, "just being identified with a team is, alone, insufficient to overcome self-interest… actions designed to enhance team identification contribute to higher levels of team cooperation." Similarly, Charness, Rigotti, and Rustichini (2007) examine the effect of group membership on individual behavior in a series of experimental games (e.g., prisoner's dilemma and battle-of-the-sexes games). They find that simply putting people into groups does not help to increase cooperation rates. When groups become more salient (e.g., by letting a participant's own group observe as a passive audience when decisions are made, and by making some portion of the compensation common for members of the group), group membership significantly improves cooperation. Several methods are used to reinforce group identity in the literature by emphasizing common interests and goals (Rousseau 1998) as well as shared outcome (Ashforth & Mael 1989), increasing in-group interaction (Eckel & Grossman 2005; Orbell, van de Kragt, & Dawes

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1988), introducing same-team settings (Eckel & Grossman 2005; Towry 2003), and creating in-group/out-group conflict (Eckel & Grossman 2005; McLeish & Oxoby 2007).

To sum up, two motivational forces can shape individuals' cooperative behavior in groups. The first motivational force arises from people's extrinsic motivation, in which people decide whether or not to engage in cooperative behavior by comparing the costs and benefits associated with such behavior. The second motivational force stems from individuals' intrinsic motivation, in which people engage in cooperative behavior because they feel that they should do, without expecting external rewards. Formal control is built on influencing extrinsic motivation to achieve individuals' cooperative efforts, for example, common goals are defined, goal attainment is monitored by the principal, and agents are rewarded or sanctioned depending on their compliance. Formal control is effective when individuals' behavior can be perfectly monitored or performance outcomes can be accurately attributed to agent' behavior (Eisenhardt 1985). However, when performance measurement errors exist, formal control mechanisms using monitoring and rewarding fall short in inducing individuals' cooperative behavior. Under such circumstances, social controls that utilize employees' intrinsic motivation to cooperate is the more effective way to resolve the cooperation problems.

In this study, I am particularly interested in the motivational effect of group identity on individuals' willingness to cooperate. Despite prior studies suggest that group identity can lead to increased cooperation, it ignores that some situational factors also can impact individuals' willingness to cooperate. For example, most prior research assumes that benefits from mutual cooperation are approximately equal across individual group members. However, mutual cooperation often benefits some employees more than others in practice. I refer to this phenomenon as benefit asymmetry. Benefit asymmetry can introduce psychological concerns, such as perceived inequity, which in turn, decreases individuals' willingness to cooperate. If this is the case, the effectiveness of group

identity on individuals' cooperation can be limited. In the next chapter, I will discuss the effect of benefit asymmetry on individuals' decision making in more detail.

CHAPTER 3

BENEFIT ASYMMETRY

As discussed in the previous chapter, benefit asymmetry can undermine the effectiveness of social controls, such as group identity, on individuals' cooperation. In this chapter, I provide background information on benefit asymmetry in the workplace as well as the effect of benefit asymmetry on individuals' decision making. It is organized as follows: Section 3.1 reviews the evidence of benefit asymmetry in the workplace. Section 3.2 discusses the potential problems introduced by benefit asymmetry (e.g., perception of inequity). Lastly, Section 3.3 synthesizes the extant literature on the effect of fairness concerns on individuals' decision making.

3.1 Benefit Asymmetry in the Workplace

Benefit asymmetry is a common phenomenon in the workplace. Many forms of benefit asymmetry can be found in practice. For instance, group members may put different levels of effort into a project but share the reward equally, or put in the same level of effort but receive different rewards. One potential cause of benefit asymmetry could be noisy performance measurement systems, so that the principal cannot receive accurate signals regarding individuals' effort level. Benefit asymmetry could also occur due to supervisor's favoritism, where superiors reward some subordinates more than others based on their personal preferences rather than subordinates' actual performance (Prendergast & Taper 1996). A survey that polled senior business executives at large U.S. corporations shows that 92 percent of the respondents have seen favoritism in employee promotions, and 84 percent of the respondents have witnessed favoritism at their own companies. In addition, about a quarter of the polled executives admit to practicing

favoritism themselves, and 96 percent report that the employees who are promoted are pre-determined (Fisher 2011).

Favoritism is found to play a role in a variety of accounting contexts, such as subjective performance evaluation (Ittner, Larcker, & Meyer 2003; Moers 2005) and CEO annual bonus contracts (Hoppe & Moers 2011). For example, Ittner, Larcker, and Meyer (2003) conduct a field study examining different types of performance measures weighted in a subjective balanced scorecard bonus plan in the U.S. retail banking operations of Global Financial Services. They find that many branch managers complain about favoritism in bonus rewards because of the high level of subjectivity in the balanced scorecard plan. The balanced scorecard was ultimately eliminated in the banks. Other evidence suggests that the phenomenon of favoritism exists across different countries (Du, Tang, & Young 2012).

Another well-documented example of asymmetric benefits is pay dispersion, which is defined as the degree of wage inequality across employees within similar jobs (Bloom 1999). A variety of reasons other than differences in ability can cause pay differentials. For instance, abundant evidence suggests that gender or race discrimination creates a wage gap (Blau & Kahn 1992; Browne & Misra 2003). In addition, a number of studies show that better-looking workers earn more than others (Hamermesh & Biddle 1994), even after controlling for confidence (Mobius & Rosenblat 2006). Similarly, several studies find there is a wage premium for taller employees and a wage penalty for overweight workers (Han, Norton, & Stearns 2009; Persico, Postlewaite, & Silverman 2004).

3.2 Benefit Asymmetry and Perceptions of Inequity

Benefit asymmetry in the workplace can erode organizational performance by introducing perception of fairness and, in turn, preventing people from engaging in cooperative behavior. Consider a joint project conducted by employees from different

divisions. The success of the project may result in different benefits for project group members. For example, some may get a promotion, whereas others may just receive a small bonus. It is possible that the promotion decision was indeed based on considerations of many other factors and that the success of the project is just a "trigger." These considerations, however, may not be apparent to other group members. If employees do not understand why benefits resulting from mutual cooperation are not equal, some employees are likely to feel that they are unfairly treated, especially when the "over-paid" group members seem to be the favorites.

Equity theory, first developed by J. Stacey Adams, describes the fundamental process of how perception of equity is formed and how it can influence employees' attitudes and workplace behavior. According to the theory, individuals form beliefs of equity based on two factors: inputs (I) and outcomes (O). Inputs include education, training, experience and effort, while outcomes may take the form of wages, promotion, and career opportunities. An agent evaluates the fairness or equity of an outcome by comparing his outcome-to-input (O/I) ratio with another agent's ratio (Adams 1965). The comparison agent's ratio provides a social reference for an individual to determine the acceptability of the rewards. When the O/I ratio of the individual is not equal to that of the comparison agent (e.g., benefit asymmetry) and the unequal O/I ratios cannot be justified, individuals are likely to experience a perception of inequity.[8] The perceived inequity, resulting from job effort-reward discrepancies, can make individuals demotivated. To eliminate the distress, individuals who perceive that they are in an inequitable relationship may alter their workplace behavior (e.g., decrease inputs by reducing their effort) based on their relative standing.

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[8] Both equity and distributive justice theory suggest that rewarding systems are likely to induce the perception of inequity when rewards are not allocated on a fair or just basis. However, one potential problem is that it is subject to an individual's interpretation as to what is fair or just (Greenberg 1982).

Equity theory also suggests that individuals who perceive themselves as either under-compensated or over-compensated may become distressed in different ways. Specifically, people who perceive they are underpaid may feel angry or humiliated, while those who believe they are overpaid may feel guilt or shame (Adams 1965). Even though the theory suggests that people seek to maintain equity between the inputs they bring to a job and the outcomes they receive from it, empirical evidence demonstrates that people have a lower threshold for under-compensation and a much higher threshold for over-compensation (Sweeney 1990).

3.3 Empirical Evidence on Fairness Concerns

There is considerable evidence suggesting that perceptions of fairness can play an important role in buyer-supplier negotiation, the principal-agent problem, transfer pricing and other management accounting related decisions (Luft 1997). For example, Drake and Haka (2008) demonstrate that inequity aversion affects the value of fine cost accounting information in buyer-supplier negotiations. Specifically, compared to coarse information, fine information provides buyers and suppliers with better opportunities to identify Pareto-optimal equilibrium, and therefore has the potential to increase the common surplus from the trade. However, bargainers with fine information are less likely to share their private information because they are concerned that, if doing so, the other party would force the price nearer to their reservation prices and therefore result in inequitable outcomes. Similarly, Zhang (2008) provides evidence that agents' perception regarding to the fairness of the principal and inter-agent communication can affect agents' actions under a peer reporting system. Analytical models show that the peer reporting system with a verification mechanism and a reward for truthful whistleblowing can induce agents to report honestly and thereby alleviate the agency problem. However, the findings of her study show that when the principal is perceived as unfair, agents are more likely to

communicate with others and to engage in collusive behaviors, which in turn, decreasing the effectiveness of peer reporting systems.

In addition, several studies document that fairness concerns affect individuals' expectation about negotiated transfer pricing (Chang, Cheng, & Trotman 2008; Luft & Libby 1997). Furthermore, Pfeffer and Langton (1993) provide evidence that the greater the degree of wage dispersion within academic departments, the less likely that faculty members will collaborate on research. Other empirical evidence also shows that more pay dispersion is associated with lower individual performance (Bloom 1999; Pfeffer & Langton 1993), higher turnover (Bloom & Michel 2002), and lower satisfaction (Pfeffer & Langton 1993).

In summary, individuals frequently compare their payoffs to others' payoffs in order to gain a better understanding of their performance as well as to evaluate the fairness or equity of their actual or proposed outcomes. When people get different payoffs from others and unequal payoffs cannot be justified, they tend to become inequity averse and would not necessarily act in the principal's best interests. Understanding how individuals value such non-monetary motives is very important for us to understand individuals' decision making. In the next chapter, I predict how perception of inequity introduced by benefit asymmetry interacting with group identity influences cooperation in work groups.

CHAPTER 4

HYPOTHESES DEVELOPMENT

Social identity theory suggests that individuals define themselves in terms of group membership. Group identification leads individuals to perceive themselves in terms of the common characteristics that are shared by other group members. When an individual self-categorizes as an in-group member and cognitively associates with the group to which s/he belongs, the individual is more willing to make personal sacrifices for the good of the group and engage in cooperative behavior (Turner et al. 1987).

Group identity is expected to enhance individual's cooperation through two processes. First, group identity can facilitate cooperation by increasing norm compliance, the belief held by group members that other members will behave in a cooperative fashion. Group norms generally dictate that cooperation is more appropriate than being self-interested when the group faces a dilemma. If individuals expect other group members to cooperate, they are likely to respond cooperatively because they want to do the "right thing" and/or get social approval or acceptance, even though it may not be individually rational to do so. Several studies demonstrate that people are more likely to engage in cooperative behavior when they believe others are going to do so in one-shot social dilemma games (Tanghe, Wisse, & Van Der Flier 2010; Van Lange & Liebrand 1989).

Second, group identity can enhance individuals' concern for the group as a whole, which in turn leads to increased cooperation. Social identity theory suggests that people define themselves through the groups to which they belong. And groups serve as important sources of positive identity information for their members. To bolster the positive image of their group identity, people follow group rules and help the group to achieve the success (e.g., engage in cooperative behavior). Accordingly, the egoistic

desire to maximize personal gains would give way to the desire to make cooperative choices that benefit the group. In other words, the stronger an individual's attachment to the group, the more likely s/he commits to engage in cooperative behavior that maximizes group interests (Turner et al. 1987).

Much empirical evidence shows that a high level of group identity can promote individuals' cooperation when benefits resulting from mutual cooperation are symmetric. For example, Towry (2003) experimentally examines the impact of social ties on the effectiveness of two financial incentive systems proposed in the literature. She finds that high group identity leads to greater coordination between agents. Similarly, Goette et al. (2008) find that group membership increases individuals' willingness to enforce a norm of cooperative behavior toward fellow group members. To replicate the findings of prior research, the first hypothesis is as follows.

H1: *When the benefits from mutual cooperation are equally distributed among group members, a higher level of group identity leads to increased willingness to cooperate.*

Although prior studies suggest that group identity can lead to increased cooperation, they fail to recognize that individuals' benefits from mutual cooperation might not be equally distributed among group members. In situations where benefits resulting from mutual cooperation are asymmetric, the impact of group identity on individuals' willingness to cooperate is expected to differ. Employees' willingness to cooperate depends not only on the level of group identity, but also on employees' type (e.g., whether they are the disadvantaged or advantaged). Below, I discuss how employees respond to inequity differently under different levels of group identity.

According to equity theory, when individuals contribute equally to the group but are rewarded differently, benefit asymmetry is likely to introduce the perception of inequity. Even though individuals who perceive themselves as either under-rewarded or over-rewarded may become distressed, the disadvantaged are much more sensitive to

inequity and more likely to feel dissatisfied. By comparison, the advantaged are less likely to respond to inequity because they either feel that it is justified or are not bothered by asymmetric payoffs. Empirical evidence also suggests that inequity has a bigger effect on under-rewarded individuals than over-rewarded individuals. For example, Sweeney (1990) presents the results of three field studies and shows that people have a lower threshold for under-compensation inequity, but a much higher threshold for over-compensation inequity. Similarly, Gergen, Morse, and Bode (1974) provide evidence that compared to equitably rewarded individuals, over-rewarded individuals increase their perception of task difficulty and their estimate of a fair return.

Meanwhile, social comparison theory and self-evaluation maintenance theory posit that individuals have a drive to compare themselves with others in order to gain accurate self-evaluation (Festinger 1954), and self-evaluation is influenced by relationships with others. People are more likely to compare themselves to someone psychologically close to them (Tesser 1988). When individuals learn that another's performance is better than their own and s/he is psychologically close, such a situation would evoke comparison processes and threaten self-evaluation (Campbell & Tesser 1985). When group identity is high, a group identification process reduces psychological distance among group members. As a result, individuals are likely to perceive that they are psychologically close to their peers and then will start to compare with their peers. If different rewards among group members cannot be attributed to different contribution to the group, there is little room for disadvantaged employees to justify why benefit asymmetry occurs. Hence, disadvantaged employees are more likely to feel that they are treated unfairly.

By comparison, when group identity is low, the disadvantaged employees are less likely to feel that they are psychologically close to other group members and, therefore less likely to compare themselves with others. If they do not compare their rewards to those of non-psychologically close peers, they are less likely to feel that they are treated

unfairly. To summarize, I expect that individuals are most likely to perceive inequity when they are disadvantaged and when group identity is high. Because the perception of inequity strongly affects individuals' willingness to cooperate, I posit that disadvantaged employees are less willing to cooperate when group identity is high than low.[9]

> **H2a**: *When individuals' benefits from mutual cooperation are not equally distributed, disadvantaged employees are less willing to cooperate when group identity is high than low.*

In terms of advantaged agents' willingness to cooperate, when group identity is high, on the one hand, high group identity positively affects their willingness to cooperate; on the other hand, high identity reduces psychological distance among group members. As a result, advantaged agents are more likely to anticipate that other group members do not want to behave cooperatively due to inequity consideration. Thus, they may strategically choose not to cooperate. Because I am not able to unambiguously predict which of these two offsetting effects dominates ex ante, I state the hypothesis in the null form. Based on the above discussion, I posit the following.

> **H2b**: *When individuals' benefits from mutual cooperation are not equally distributed, the level of group identity will not influence advantaged employees' willingness to cooperate.*

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[9] Some people may argue that, by holding effort constant, benefit asymmetry should not be problematic if it is determined by individual differences in knowledge and/or ability. One potential problem with this argument is that people typically overestimate own abilities on many tasks (Moore & Healy 2008). Because of such cognitive bias, when individual differences in ability are not very apparent, those who get less feel that they are evaluated unfavorably for reasons that are not fair and, therefore, deserve more. Such "deservedness" would diminish the willingness of group members to cooperate.

CHAPTER 5

PRELIMINARY STUDY

5.1 Study Overview

The primary objective of the preliminary study is to show the positive effect of group identity on individuals' willingness to cooperate when benefits resulting from mutual cooperation are symmetric. It also investigates whether the proposed manipulation approach is sufficient to induce a higher level of group identity in the laboratory.

The preliminary study entails two tasks. The first task aims to induce different levels of group identity under different experimental conditions. The extant literature demonstrates that several factors can reinforce the level of group identification, such as the perception of common interests and goals (Rousseau 1998), increased in-group/out-group conflicts (Eckel & Grossman 2005; McLeish & Oxoby 2007), and the same-team settings (Towry 2003). In the preliminary study, I manipulate group identity by using different color groups as well as by creating an in-group/out-group conflict, because prior studies suggest that these means are effective ways to enhance the strength of group identity.

In the first task, participants are randomly assigned to a color group. After color group assignment, they are asked to work with their group members to complete a Sudoku puzzle game. Two groups compete with each other to determine their payoff for the first task. Group competition is a means to create an in-group/out-group conflict. After completing the first task, participants are randomly paired in a dyad based on experimental conditions. In the low group identity condition, each participant is randomly paired with an individual from a different color group. By comparison, in the high group

identity condition, each individual is randomly paired with a person from the same color group. The second task examines whether individuals' willingness to cooperate is different under different levels of group identity. In the second task, participants are required to complete a one-shot prisoner's dilemma game. Participants make a binary choice deciding whether to cooperate.

5.2 Payoff Matrices

I begin with a discussion of the incentive system payoff matrix used in the preliminary study. The symmetric benefit game, modified from Towry (2003), is shown in Figure 1. The underlying structure of the game is similar to a public goods setting and can be interpreted as follows. Suppose each agent has an initial endowment of 8 points of a productive resource that can be only withheld or contributed to a group outcome. In all conditions, the value of withholding the endowment is 8 points. If an agent chooses to contribute to the group good, s/he incurs a loss of 8 points (e.g. the cost of contributing or the cost of endowment). In addition, each contribution to the group good would yield a marginal benefit to both agents.

In the symmetric benefit game, if both agents contribute, each agent receives 20 points from the principal, resulting in a net profit of 12 points (20 points contribution pay minus 8 points cost of endowment). If only one agent contributes, each agent receives 14 points. After taking the cost of endowment into account, the one who contributes receives 6 points (14 points contribution pay minus 8 points cost of endowment) and the one who withholds would receive 14 points. If both agents withhold, each agent receives 0 point from the principal, but s/he can keep 8 points the endowment. In the symmetric benefit game, the dominated strategy for each agent is to contribute (cooperate). The game demonstrates a tension between individual rationality and social welfare. Specifically, even though each agent is better off if both choose to contribute (cooperate) rather than if

both of them choose to withhold, it is individually rational for each agent to withhold. The unique Nash Equilibrium in the game is to withhold (defect) for both agents.

FIGURE 1
Incentive System

Normal Form Representation of Symmetric Benefit Matrix[a]

		Agent 2	
Agent 1		W	S
W*		12, 12 **	6, 14
S		14, 6	8, 8

* Represents contribution choice (W =work, S = shirk)
** Represents the payoff to Agent 1 and Agent 2, respectively.
[a] The payoff matrix is essentially a prisoner's dilemma game, in that the unique Nash Equilibrium is for each agent to shirk, but the Pareto optimal outcome is for each agent to work.

5.3 Participants and Procedures

Forty-six students (predominantly undergraduates) enrolled in various majors at a medium-sized public university were recruited to participate in the experiment. The average age of the participants is 21 years and 58 percent are male. The experiment is conducted in a behavioral research laboratory. Upon arrival, the participants were randomly assigned to two conditions (low versus high group identity). All participants received the same payoff when mutual cooperation achieves.

Participants were required to complete two tasks. In the first task, participants were randomly assigned to a color group (red or green). After color group assignment, they were asked to work with their group members and to complete a Sudoku puzzle game. Two groups compete with each other to determine the payoff for each group.

Participants get immediate feedback after completing the task. Those in the winning groups each receive $6 and those in the losing group receive $4.

In the second task, after the instructions are read and reviewed, participants are randomly paired in a dyad based on experimental conditions and instructed to play a one-shot prisoner's dilemma game. Participants are asked to be a group member of a hypothetical company. The company produces a product and requires them to provide resources for production. The task for each participant is to choose the level of resources (high or low) to provide (e.g., to work or shirk).[10]

Participants make a one-time decision privately and simultaneously. At the end of the experiment, participants are paid based on both their decision and that of their paired counterpart. Under both conditions, they neither know the identity of their paired counterpart nor are they allowed any contact with their paired other. No feedback is provided after participants play the one-shot prisoner's dilemma game. Upon completion, a post-experiment questionnaire is administered.

5.4 Results

5.4.1 Manipulation Checks

To assess the effectiveness of the group identity manipulation, I asked participants to indicate on a 9-point Likert scale (1 = "Definitely Not a teammate," 9 = "Definitely a teammate"), "To what extent did you perceive yourself to be a teammate of the person you were paired with?" Participants' response on this question indicate how strongly they feel attachment to the groups they belong. Results (untabulated) suggest that there is no significant difference in perceived group identity under two conditions (mean = 4.82 vs.

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[10] In the experimental materials, I used "high resources" or "low resources" rather than "work" or "shirk," to avoid social desirability bias. Even though agents' compensation is increasing in group output (e.g., higher level of resources provided, higher level of group output achieves), providing high resources is more costly to an agent individually than providing low resources. Therefore, choosing high or low resources are used interchangeably with the terms "work" or "shirk" in my study.

5.48 for high and low group identity conditions, respectively; F = 5.378, p = 0.444 two-tailed). Based on the results, the experimental manipulation is not considered successful.

5.4.2 Test of Hypothesis

I predict that a higher level of group identity will increase employees' cooperation when benefits of individual members from mutual cooperation are equal. Results (untabulated) show that, under the symmetric benefit condition, 55 percent of participants choose to cooperate when group identity is high, whereas 50 percent chose to cooperate when group identity is low. Results (untabulated) suggest that there is no significant difference in participants' actual cooperation rates under the two conditions ($\chi^2 = 0.095$, p = 0.758 one-tailed). Therefore, my prediction is not supported.

5.5 Discussion

The preliminary results show that the group identity manipulation is not successful and, as a result, there is no difference in individuals' cooperation between high identity and low identity conditions. In order to gain a better understanding as to why the group identity manipulation failed, I further break down the data based on the competition outcomes in the first task. The results show that, under the high identity condition, 70% of participants choose to cooperate when they won the puzzle game, whereas 30% of them choose to cooperate when they lost the puzzle game. By comparison, under the low identity condition, 58% of participants who won choose to cooperate and 42% of people who lost choose to cooperate. The above results suggest that the outcome of competition (whether people won or lost the puzzle game) plays a significant role in determining individuals' actual cooperation. The group identity manipulation, by creating an in-group/out-group conflict, introduces a confound. Thus, an alternative method should be considered to manipulate group identity and, in turn, to test my hypothesis.

CHAPTER 6

MAIN STUDY

6.1 Study Overview

To investigate whether the effect of group identity on individuals' willingness to cooperate is moderated by benefit asymmetry, I conduct a 2 x 2 between-participants factorial design experiment. The first manipulated variable is group identity (high versus low), which varies the strength of an individual's attachment to his/her group. The second manipulated variable is the distribution of benefits resulting from mutual cooperation (symmetric versus asymmetric), which determines whether employees are rewarded equally when they achieve mutual cooperation. The primary dependent variable is individuals' willingness to cooperate: that is, behavior consistent with mutual cooperation.

Color groups (Towry 2003) and an individual/group task (Eckel & Grossman 2005) were used to induce different levels of group identity.[11] Each participant was randomly assigned to a color group. All participants were asked to list the top ten causes of death in the U.S. in 2009 (Kelly, Jackson, & Hutson-Comeaux 1997). In the low group identity condition, each participant was required to complete the task independently within 10 minutes. After completing the task, s/he was randomly paired with an individual from a different color group. In the high group identity condition, participants were required to work together with members in their color group and complete the task

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[11] Both color groups and individual/group task were used to manipulate group identity. According to social identity theory, group identity has three major components: categorization, identification, and comparison. Color groups enable individuals to put themselves into categories. Under high identity condition, a group task is used to increase interaction among group members, and, in turn, facilitating participants to identify themselves with the groups to which they belong. By comparison, under low identity condition, an individual task is used to avoid potential noise in the experimental design.

within 10 minutes. After completing the group task, each individual was randomly paired with a person from the same color group.

To manipulate the distribution of benefits resulting from mutual cooperation, two incentive systems and the payoff function for employees are shown in Figure 2, Panel A and B (discussed in more detail later). Agents ostensibly choose an action that indicates the level of effort that they are committing to the production process, which in turn impacts agents' payoffs. Under the symmetric benefit condition, the payoff to both agents is identical when mutual cooperation is achieved. To ensure comparability, under the asymmetric benefit condition, the payoff to each agent is the same as that under the symmetric benefit condition, except that one agent gets more than the other if both agents choose to cooperate.

6.2 Payoff Matrices under Symmetric/Asymmetric Benefits

The following is a discussion of the two incentive system payoff matrices used in the experiment. The two games (Symmetric versus Asymmetric), modified from Towry (2003), are shown in Figure 2.[12] In both games, agents are compensated based on group output: individual agents' compensation is increasing in group output and each agent prefers both agents working to both shirking. In the symmetric benefit game, if both agents work, each receives 50 points from the principal, resulting in a net profit of 20 points (50 points effort pay minus 30 points effort cost). If only one agent works, each receives 35 points. After taking the cost of effort into account, the one who works receives 5 points (35 points effort pay minus 30 points effort cost), and the one who shirks receives 35 points. If both agents shirk, each receives 10 points. The symmetric benefit game is represented in Panel A. In the asymmetric benefit game, agents' payoff function is the same as that under symmetric benefit condition, except that one agent

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[12] I use a simple abstract setting to control for a number of confounding variables associated with other task attributes, such as skill levels, knowledge, age, and experience, which may lead people to justify asymmetric pay.

receives 55 points and the other receives 45 points if both agents work.[13] The asymmetric

benefit game is represented in Panel B.

The two payoff matrices are essentially prisoner's dilemma games. In both games,

the dominated strategy for each agent is working. Both games demonstrate a similar

tension between individual rationality and social welfare. Specifically, even though each

agent is better off if both are working (rather than both shirking), it is individually

rational for each agent to shirk. Thus, both games have a unique Nash Equilibrium: both

agents shirk.

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[13] The only difference between the two payoff matrices is whether benefits are equally distributed when mutual cooperation is achieved: the advantaged gets extra bonus relative to the disadvantaged under asymmetric benefits condition, whereas both agents get the same amount under symmetric condition. I made this design choice in order to ensure comparability between two conditions. In addition, in my study, if no one chooses to cooperate, each agent only can keep his/her initial endowment, which is the same. In practice, if a project fails, no one is likely to receive rewards, even in situations of benefit asymmetry. Future research could investigate how asymmetric benefits affect individuals' willingness to cooperate, if one consistently benefits more than the other, even when a project fails.

FIGURE 2
Incentive System

Panel A: Normal Form Representation of Symmetric Benefit Matrix[a]

Agent 1	Agent 2	
	W	S
W*	20, 20 **	5, 35
S	35, 5	10, 10

Panel B: Normal Form Representation of Asymmetric Benefit Matrix[a]

Agent 1	Agent 2	
	W	S
W*	25, 15 **	5, 35
S	35, 5	10, 10

* Represents contribution choice (W =work, S = shirk)

** Represents the payoff to Agent 1 and Agent 2, respectively.

[a] The payoff matrix in Panels A and B is essentially a prisoner's dilemma game, in that the unique Nash Equilibrium is for each agent to shirk, but the Pareto optimal outcome is for each agent to work.

6.3 Participants and Procedures

One hundred and twenty-five students (predominantly undergraduates) enrolled in various majors at a medium-sized public university were recruited to participate in the experiment. The average age of the participants is 21 years and 60 percent are male. The experiment is conducted in a behavioral research laboratory. Upon arrival, the participants are randomly assigned to two conditions (symmetric benefit versus asymmetric benefit). The participants in each condition are further divided into two additional conditions (low versus high group identity). Thus, there are a total four different conditions in the experiment. Participants receive the same payoff when mutual

cooperation achieves under the symmetric benefit condition, whereas they receive

different payoff when mutual cooperation achieves under the asymmetric benefit

condition: half of them are advantaged and half disadvantaged. In order to obtain

statistical power, more participants are assigned into the asymmetric benefit condition.

Overall, 40 participants are recruited in the symmetric benefit condition and 85 in the

asymmetric benefit condition.[14]

      Participants are required to complete two tasks. In the first task, they are assigned

a color group and asked to complete an individual/ group task, as discussed earlier. In the

second task, after the instructions are read and reviewed, they are randomly paired in a

dyad based on conditions and instructed to play a series of games: three games are played

in the experiment, with only two being relevant to this study. There is an optimal strategy

for players in the third game (i.e., the one not relevant for this study). The purpose of the

third game is used to assess whether participants fully understand the payoff function.[15]

Participants are asked to be a group member of a hypothetical company. The company

produces a product and requires them to provide resources for production. The task for

each participant is to choose the level of resources (high or low) to provide (e.g., to

contribute or not).[16]

      Participants are informed that they would maintain their roles throughout the

experiment, but new dyads would be formed randomly each period. Further, at the end of

the experiment, one period is selected randomly as the payment period and the

experimental points are converted to dollars at a pre-determined rate. Participants make

decision privately and simultaneously. Under all conditions, they neither know the

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[14] There are eight to twelve participants in each experimental session. An odd number of participants
participated in one session, therefore one player was paired twice. However, I do not expect it to affect
participants' decision making because they were randomly paired with another person and not informed
who their partner was. In addition, no feedback was provided throughout the experiment.
[15] Eleven participants did not choose the optimal strategy in the third game. My results are robust when
excluding them from the analysis.
[16] As discussed previously, I used "high resources" or "low resources" rather than "contribute" or "not
contribute," to avoid social desirability bias.

identity of their paired counterpart nor are they allowed any contact with their paired other. No feedback is provided throughout the experiment.

Upon completion, participants are required to complete a post-experiment questionnaire, including questions related to their decision processes, risk attitude, and demographic information. Specifically, participants are asked to answer questions regarding to decision processes which elicit participants' desire to cooperate, concerns about their own payment relative to that of their paired counterpart, and the perceived level of group identity. Participants are also asked to provide demographic questions such as their gender, age, education, and work experience.

6.4 Results

6.4.1 Manipulation Checks

To ensure that participants properly attended to their respective groups, I asked them in the post-experimental questionnaire to recall the color of the group to which they belonged. All participants correctly answered this question. I also asked participants to recall the color group of their paired counterparts. Ninety-six percent of participants (120 of 125) correctly answered this question. To ensure that participants properly attended to their compensation plan relative to their peers' under benefit asymmetry condition, I asked them to recall whether they are the high pay or low pay player. All participants correctly answer this question.

To assess the effectiveness of the group identification level manipulation, I asked participants to indicate on a 9-point Likert scale (1 = "not at all," 9 = "very strongly"), "How strongly do you feel you identify with the Yellow group?" I then asked the same question regarding the Blue group. Participants in yellow group indicated they identified significantly more with their own group than with the other group (means = 4.93 and 2.67 for the same and other group, respectively; paired $t = 6.84$, $p < 0.01$). Similarly, the

participants in blue group also indicated they identified significantly more with their own group than with the other group (means = 5.79 and 2.11 for the same and other group, respectively; paired t = 8.92, p < 0.01).[17] Based on these results, the experimental manipulations were considered successful.

6.4.2 Psychological Closeness

As discussed earlier, in situations that benefits resulting from mutual cooperation are asymmetric, disadvantaged employees need to justify why benefit asymmetry occurs. When group identity is high, the disadvantaged employees are likely to perceive that they are psychologically close to their peers and, therefore, less able to justify why benefit asymmetry occurs. By comparison, when group identity is low, the disadvantaged employees do not feel that they are psychologically close to other group members. Although they are rewarded differently from their peers, they might perceive that they are not comparable to other group members (e.g., the psychological distance prevents them from comparing themselves with their peers).

In social psychology, closeness is defined as psychological proximity between two people. To the extent that an individual consider another person to have some relation with the self, the other is psychologically close (Tesser 1988). Several factors serve to create psychological bonds of closeness, for example, similarity of various characteristics such as race, national origin, and family background, common role, and group membership (Heider 2013). To measure participants' perceived psychological closeness to their paired counterpart, in the post-experimental questionnaire, I asked participants to indicate "To what extent did you perceive yourself to be a teammate of the person you were paired with?" on a 9-point Likert scale (1 = "not at all," 9 = "very strongly"). Participants' response on this question is indicative of perceived

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[17] The reported analyses use all 125 observations. Excluding observations with a failed manipulation check only strengthens the reported results.

psychological closeness to their paired counterpart. Consistent with my expectation, results (untabulated) suggest that participants under high identity conditions are more likely to perceive themselves to be a teammate of the person with whom they are paired, relative to those under low identity conditions (mean = 3.91 vs. 2.68 for high and low group identity conditions, respectively; t = 2.495, p = 0.015 two-tailed).

6.4.3 Test of Hypothesis

My first hypothesis predicts that a higher level of group identity will increase employees' cooperation when benefits of individual members from mutual cooperation are equal. Table 1 displays the percentage of participants' cooperation rates under the symmetric and asymmetric benefit condition and statistical tests for treatment comparisons. As shown in Table 1, under the symmetric benefit condition, only 19 percent of participants chose to cooperate when group identity is low, whereas 55 percent chose to cooperate when group identity is high. In contrast, under the asymmetric benefit condition, 30 percent of participants chose to cooperate when group identity is low versus 26 percent when group identity is high. The observed cooperation rates under symmetric/asymmetric conditions are depicted in Figure 3.

TABLE 1

The Effects of Benefit Asymmetry and Group Identity on Employees' Cooperation

Panel A: Means [Standard Deviations] of Employees' Cooperation[a]

	Symmetric Benefit	Asymmetric Benefit	Total
Low Identity	0.19[b]	0.30	0.27
	[.30]	[.45]	[.41]
	N=18	N=41	N=59
High Identity	0.55	0.26	0.36
	[.43]	[.37]	[.41]
	N=22	N=44	N=66
Total	0.39	0.28	0.33
	[.42]	[.40]	[.41]
	N=40	N=85	N=125

Panel B: Multinomial Logistic Regression of Employees' Cooperation Under Symmetric/Asymmetric Benefits[c]

Factor	Symmetric Benefit			Asymmetric Benefit		
	df	Chi-Square	p-Value	Df	Chi-Square	p-Value
Group Identity[d]	2	8.383	.015[e]	2	6.247	.044

[a] Employees' cooperation is a binary variable, which equals 1 if the participants choose to cooperate, and 0 otherwise.

[b] This table contains the mean and standard deviation of participants' actual cooperation rates for each of the treatment conditions. Participants were asked to play two games in the experiment, and the reported results are based on participants' decision in the two games.

[c] There are three possible responses from participants (0, 1, 2 times cooperate). Because the primary dependent variable is categorical, I use multinomial logistic regression to examine how the distribution of benefits and group identity impact participants' willingness to cooperate.

[d] Group Identity is manipulated between participants at two levels. There were two color groups in the study: Yellow and Blue. Low identity groups were formed from one member of each color group (i.e., paired players have different color groups). High identity group were formed from two members of the same color group (i.e., paired players have the same color group).

[e] All p-values are one-tailed.

FIGURE 3

The Observed Effect of the Distribution of Benefits and Group Identity on Employees'
Cooperation
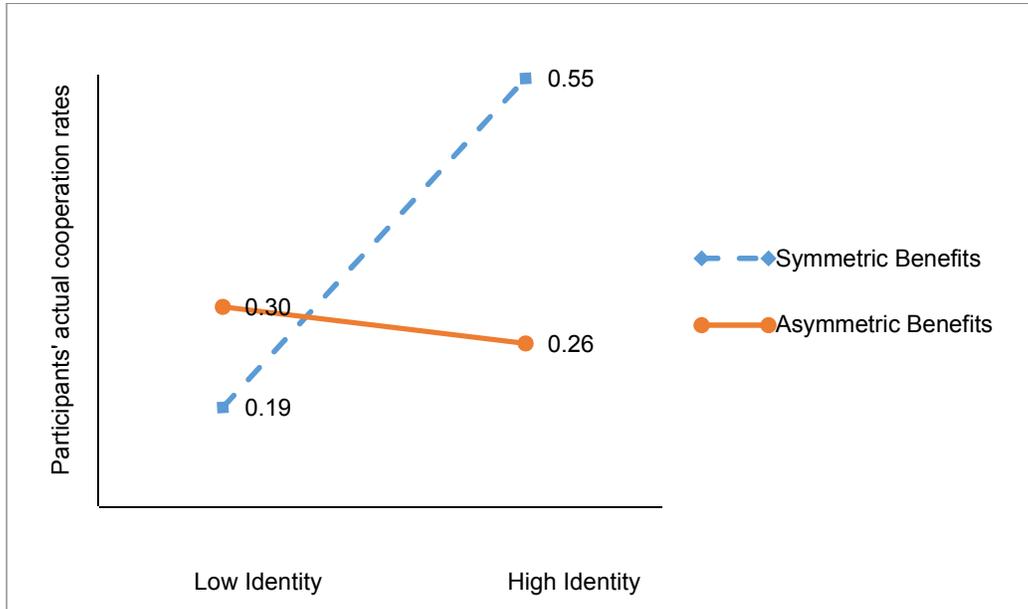
Figure 3 depicts the observed pattern of cell means of participants' actual cooperation rates (see Table 1).
This pattern is tested using the multinomial logistic regression presented in Panel B of Table 1.

I use multinomial logistic regression to examine how group identity impacts
employees' willingness to cooperate under the symmetric benefits condition. The
multinomial tests in Panel B, Table 1 show that, when benefits resulting from mutual
cooperation are symmetric, participants' willingness to cooperate is significantly different
between the high and low group identity condition ($\chi^2 = 8.383$, p = 0.015 one-tailed),
indicating that high identity groups cooperate more often than low identity groups. The
result is supportive of H1.

My second set of hypotheses predicts that, when employees' benefits resulting
from mutual cooperation are asymmetric, their willingness to cooperate depends on the
level of group identity and whether they are advantaged or disadvantaged. Specifically,
the disadvantaged employees are less likely to cooperate when group identity is high than

low (H2a). In contrast, the advantaged employees' willingness to cooperate is not affected by the level of group identity (H2b).

To test H2a and H2b, I further breakdown the data for the asymmetric benefit condition by taking the employee type into account. Table 2 displays the percentage of advantaged/disadvantaged participants' actual cooperation rates under different levels of group identity and statistical tests for treatment comparisons. As shown in Panel A, 33 percent of disadvantaged participants chose to cooperate when group identity is low, whereas only 12 percent chose to cooperate when group identity is high. The multinomial tests in Panel B, Table 2 show a statistically significant effect of group identity on disadvantaged participants' cooperation (χ^2= 9.957, p = 0.007 one-tailed), indicating that disadvantaged employees are less likely to cooperate when group identity is high rather than low. Therefore, my findings are supportive of H2a. By comparison, 28 percent of advantaged participants chose to cooperate when group identity is low and 39 percent chose to cooperate when group identity is high. The multinomial tests in Panel B, Table 2 show that the difference in advantaged participants' cooperation rates between the high and low group identity condition is not statistically significant (χ^2= 4.205, p = 0.122). In other words, advantaged employees' cooperation is not affected by the level of group identity. My findings are consistent with H2b, as I am unable to reject the null.

TABLE 2

The Effects of Employee Type and Group Identity on Employees' Cooperation

Panel A: Means [Standard Deviations] of Employees' Cooperation[a]

	Disadvantaged Employees	Advantaged Employees	Total
Low Identity	0.33 [.46] N=21	0.28[b] [.44] N=20	0.30 [.45] N=41
High Identity	0.12 [.22] N=21	0.39 [.43] N=23	0.26 [.37] N=44
Total	0.23 [.37] N=42	0.34 [.43] N=43	0.28 [.40] N=85

Panel B: Multinomial Logistic Regression of Employees' Cooperation for Advantaged and Disadvantaged Employees[c]

Factor	Disadvantaged Employees			Advantaged Employees		
	df	Chi-Square	p-Value	df	Chi-Square	p-Value
Group Identity[d]	2	9.957	.007[e]	2	4.205	.122

[a] Employees' cooperation is a binary variable, which equals 1 if the participants choose to cooperate, and 0 otherwise.

[b] This table contains the mean and standard deviation of participants' actual cooperation rates for each of the treatment conditions. Participants were asked to play two games in the experiment and the reported results are based on participants' decision in the two games.

[c] There are three possible responses from participants (0, 1, 2 times cooperate). Because the primary dependent variable is categorical, I use multinomial logistic regression to examine how employee type and group identity impact employees' willingness to cooperate.

[d] Group Identity is manipulated between participants at two levels. There were two color groups in the study: Yellow and Blue. Low identity groups were formed from one member of each color group (i.e., paired players have different color groups). High identity group were formed from two members of the same color group (i.e., paired players have the same color group).

[e] All p-values are one-tailed.

FIGURE 4
The Effect of Group Identity and Employee Type on Employees' Cooperation

Panel A: Predicted Effects
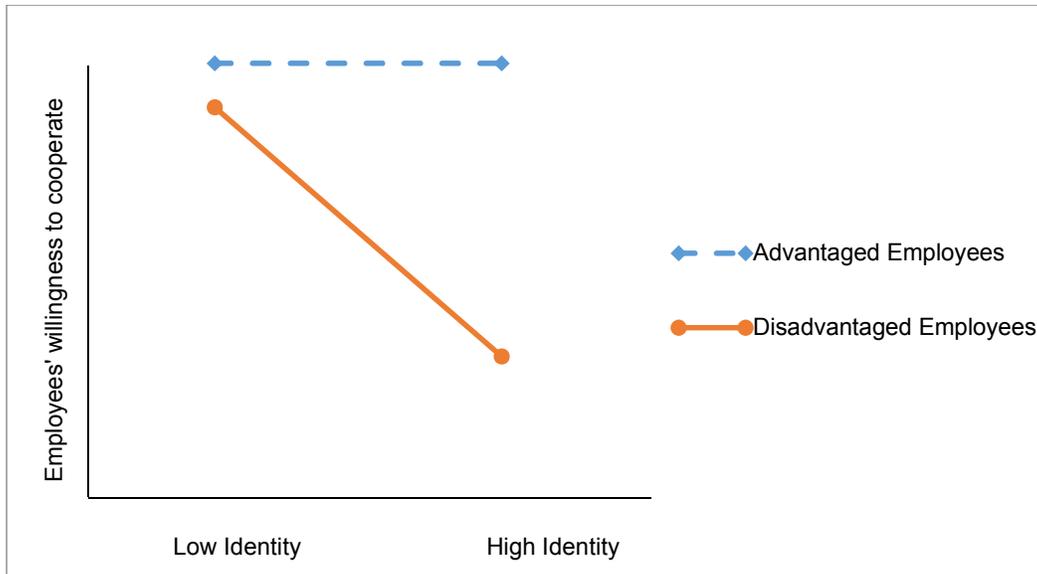
Panel B: Observed Effects
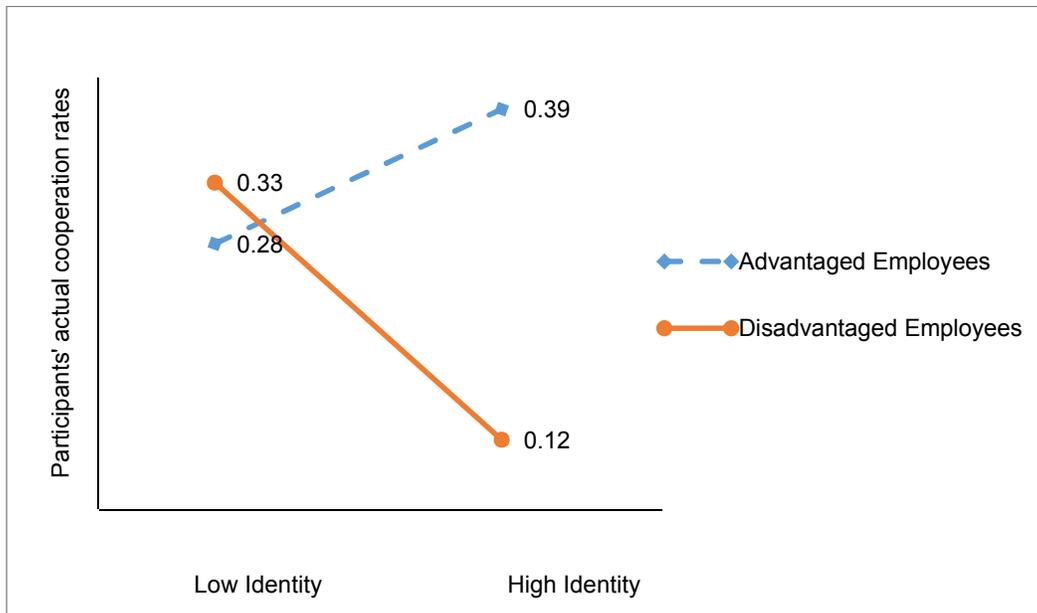
Panel A depicts the pattern consistent with the hypothesized interactive effects of *the level of group identity* and *employee type* on employees' willingness to cooperate (H2a and H2b). Panel B depicts the observed pattern of cell means of participants' actual cooperation rates (see Table 2). This pattern is tested using the multinomial logistic regression presented in Panel B of Table 2.

6.4.4 Supplementary Analysis of Hypothesis 2

The primary analysis of H2a and H2b focuses on employees' willingness to cooperate when benefits from mutual cooperation are asymmetric. To gain a better understanding of individuals' decision, I perform additional tests to provide insight into the psychological processes through which these levels of cooperation were achieved.

6.4.4.1 Perceived Inequity

The psychology literature indicates that individuals' willingness to cooperate is affected by their perception of inequity. The stronger the feelings of inequity that individuals experience, the less likely they are to cooperate. I therefore examine whether the level of group identity and employee type affect individuals' perception of inequity. I ask participants to indicate the extent to which they experience unfairness based on their compensation plan relative to the other player's on a 9-point Likert scale (1 = "not at all," 9 = "very strongly"). The analysis shows a statistically significant main effect of employee type ($F = 5.378$, $p = 0.023$ two-tailed) and a marginally significant interaction of group identity and employee type ($F = 3.829$, $p = 0.054$ two-tailed). Because the theory suggests an ordinal interaction (i.e., a particular pattern of results), the analysis is most appropriately tested with planned comparisons, rather than the traditional ANOVA which relies on the overall effects (Wickens & Keppel 2004). These comparisons are reported in table 3, panel C. Consistent with my theoretical argument, disadvantaged participants deemed their compensation plan less fair when group identity is high than low ($F = 7.383$, $p = 0.008$ two-tailed), but advantaged participants' perception of fairness is unaffected by the level of group identity ($F = 0.006$, $p = 0.993$ two-tailed). Overall, the results suggest that employee type and group identity jointly affect employees' perception of inequity.

TABLE 3
Supplementary Analysis -- ANOVA on Employees' Perceived Inequity under Asymmetric Benefits Condition

Panel A: Means [Standard Deviations] of Employees' Perceived Inequity[a]

	Disadvantaged Employees	Advantaged Employees	Total
Low Identity	2.38 [1.96] N=21	2.22[b] [2.10] N=18	2.31 [2.00] N=39
High Identity	4.05 [2.31] N=21	2.17 [1.56] N=23	3.07 [2.15] N=44
Total	3.21 [2.28] N=42	2.20 [1.79] N=41	2.71 [2.10] N=83

Panel B: ANOVA Results

Source	df	Mean Square	F-statistic	p-Value
Group Identity (GI)	1	13.482	3.410	0.069[c]
Employee Type (ET)	1	21.263	5.378	0.023
GI x ET	1	15.139	3.829	0.054
Error	79	3.953		

Panel C: Related Contrasts

Test	Prediction	F-statistic	P-value
Effect of group identity when employees are disadvantaged	$\mu_{Disadv,Low} < \mu_{Disadv,High}$	7.383	.008
Effect of group identity when employees are advantaged	$\mu_{Adv,Low} = \mu_{Adv,High}$	.006	.939

[a] To capture employees' perception of inequity, I asked participants to indicate the extent to which they experience unfairness based on their compensation plan relative to the other player's using a 9-point Likert scale with "1" label "not at all" and "9" labeled "very strongly."
[b] This table contains the mean and standard deviation of participants' perceived inequity for each of the treatment conditions.
[c] All p-values are two-tailed.

6.4.4.2 Mediation Analyses

I investigate whether perceived inequity mediates the effects of group identity and employee type on individuals' willingness to cooperate. I conduct a mediation analysis following the four-step procedure specified in Baron and Kenny (1986).[18] Figure 5 provides summary results of the mediation analyses. Step 1 shows a statistically significant interaction of group identity and employee type on participants' willingness to cooperate ($p = 0.021$, one-tailed). Step 2 again shows group identity is marginally associated with participants' willingness to cooperate ($p = 0.069$, two-tailed) and employee type is statistically significantly associated with participants' willingness to cooperate ($p = 0.023$, two-tailed). Step 3 confirms that perceived inequity is significantly associated with participants' willingness to cooperate, after controlling for group identity and employee type ($p = 0.03$, one-tailed). Finally, when controlling for the perceived inequity, the interactive effect of group identity and employee type on participants' willingness to cooperate becomes marginally significant ($p = 0.055$, one-tailed). These results show that the perceived inequity partially mediates the joint effects of group identity and employee type on participants' willingness to cooperate.

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[18] For detailed discussion on how to do a medication analysis, please visit David A. Kenny's mediation website (http://davidakenny.net/cm/mediate.htm).

FIGURE 5 MEDIATION ANALYSES
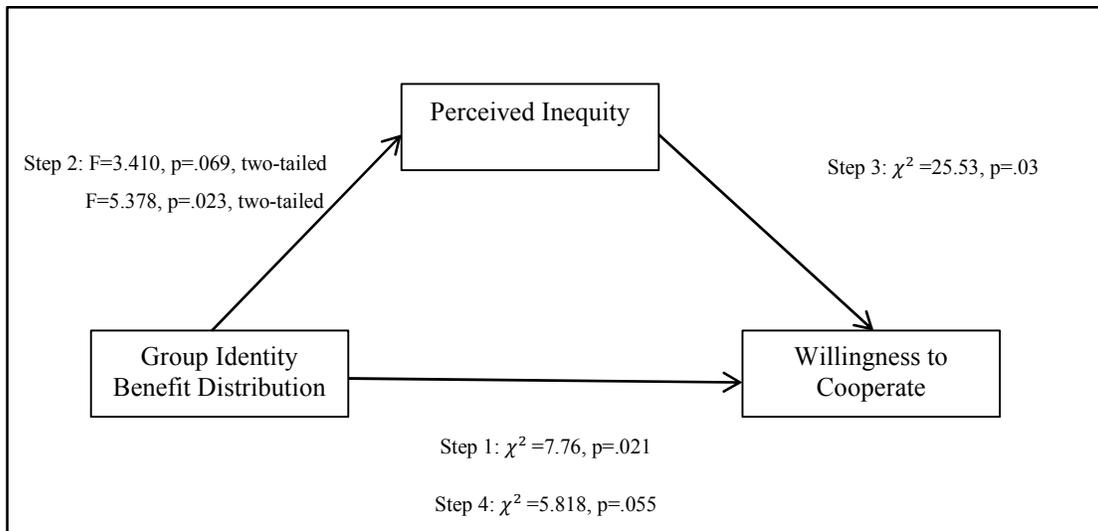
FIG. 5.—Mediation analyses for testing the role of perceived inequity in joint effects of group identity and employee type on participants' willingness to cooperate. Participants are asked to indicate the extent to which they experience unfairness based on their compensation plan relative to the other player's on a 9-point Likert scale (1 = "not at all," 9 = "very strongly"). Participants' response on this question is used as the mediator. The analyses show that the mediator partially mediates the joint effects of group identity and employee type on participants' willingness to cooperate. All reported p-values are one-tailed unless specified otherwise.

CHAPTER 7

SUMMARY AND CONCLUSION

In summary, this study investigates whether an informal control mechanism, group identity, is an effective means to motivate group cooperation in a collaborative environment, especially when benefits resulting from mutual cooperation are asymmetric among group members. Although much evidence demonstrates the positive effect of group identity on individuals' willingness to cooperate, I argue that a higher level of group identity reduces the psychological closeness among people, which in turn, triggers individuals' desire to compare themselves to those who are psychologically close. When people working in the same group get asymmetric benefits and different payoffs cannot be justified, disadvantaged ones in the high identity groups are more likely to compare their payoffs with those of their peers. If this is the case, they are more likely to feel that they are unfairly treated. Since perceived inequity significantly decreases individuals' willingness to cooperate, I predict that the disadvantaged are less likely to cooperate when group identity is high than low.

I conduct an experiment to examine my research question. The results of the experiment present evidence that the effectiveness of social ties, such as group identity, can be beneficial or detrimental to group performance, depending on whether the benefits resulting from mutual cooperation are symmetric or asymmetric. Consistent with my predictions, high group identity increases the level of cooperation among agents, but only when benefits resulting from mutual cooperation are equally distributed. When employees put roughly equal contribution into a group but are rewarded differently, high group identity reduces employees' willingness to cooperate. This negative effect occurs because disadvantaged employees are more likely to feel that they are treated unfairly and, therefore, less willing to cooperate when group identity is high. My findings suggest

that organizations need to be cautious when they attempt to induce a strong group identity to enhance group cooperation.

My study provides useful insights for both theory and practice. From a practical standpoint, my study has important implications for managers who aim to maximize group performance. This study discusses a common phenomenon, benefit asymmetry, in the workplace, and provides evidence on how it negatively influences group performance. Although group-based incentives are often believed to have a positive impact on organizational outcomes (Hollensbe & Guthrie 2000), the findings of this study suggest that benefit asymmetry can undermine the effectiveness of group-based incentive systems. This study demonstrates why fairness plays an important role in business-related decisions. It also helps to explain why firms need to carefully consider the implications of perceived inequity on employees' behavior when implementing reward systems, especially in a collaborative environment.

My study also has important practical implications for designing management control systems in organizations. Despite the prevalence of incentive plans in management controls, the growing literature considers the tradeoffs between formal and informal control mechanisms (Kachelmeier & Shehata 1997; Towry 2003). In this study, I identify situational variables interacting with informal controls and investigate their influences in promoting group cooperation. Understanding the interactive effects of situational variables and informal controls on cooperation are important. It extends the management control literature by investigating how environmental variables interact with informal controls to affect performance in a collaborative setting (Bonner & Sprinkle 2002). My study also provides insight into conditions under which the effectiveness of social control mechanisms is limited.

From a theoretical standpoint, my study suggests that the effect of group identity in promoting cooperation do not apply uniformly. Many times, managers attempt to use social ties (e.g., in the form of team building) to enhance employees' attachments to their

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work groups and, thereby, increase group cooperation. But the results of this study suggest that a strong group identity can be detrimental to group success under certain circumstances, most notably, in situations of benefit asymmetry. By focusing on the effect of group identity on cooperation, this study aids in understanding the causal linkages among monetary incentives, group characteristics, and group performance.

My study is subject to certain limitations, which provide opportunities for future research. First, this study focuses only on one type of benefit asymmetry: in which participants' inputs are held constant but the compensation they receive varies. However, many forms of benefit asymmetry exist in practice and different forms of benefit asymmetry may induce different levels of perceived inequity. For example, individuals might be less or more sensitive to such type of benefit asymmetry in which they put unequal levels of contribution to the group but receive the same level of outcome from the principal, relative to the one examined in this study. Future research could focus on other types of benefit asymmetry and examines their relative strengths in introducing perceived inequity as well their effects on group cooperation.

Second, the principal does not play a role in this study. And benefit asymmetry is exogenously imposed, as a manipulated treatment factor implies, rather than endogenously determined, when the principal is allowed to choose whether to equally distribute the rewards among group members. I choose exogenous manipulation of benefit asymmetry to control the number of people who get asymmetric payoffs and therefore to get the clean design. However, endogenous determination of this accounting variable is also helpful for examining related questions. Specifically, if the principal is allowed to make strategic choices, on the one hand, the principal may be reluctant to allocate rewards differently when s/he anticipates the potential negative consequences introduced by benefit asymmetry. For example, Bailey, Hecht, and Towry (2011) demonstrate that managers are more likely to anchor on an equal spit to allocate bonus pools when they have partial discretion in evaluation and compensation decisions. On the

other hand, if the principal intentionally or unintentionally distributes rewards unequally among agents, they may react more strongly. If this is the case, my design choice is likely to undermine the extent of inequity individuals perceive. Future research could explore whether the principal considers the potential effect of benefit asymmetry on agents' choices when allocating rewards among them, whether agents are aware of the principal's motives in the case of benefit asymmetry, and how the principal's strategic choices affects agents' decision making.

Third, no feedback is provided in the study. However, performance feedback is an important managerial accounting information and shown to have both learning and motivating effects (Sprinkle 2000). Feedback enables individuals to revise their beliefs and therefore to make better-informed decisions. In this study, when feedback is provided, on the one hand, it can facilitate cooperation, as individuals know their choices will be observed by their peers, and non-cooperating may damage their positive social identity. This motivational effect can be strong, especially under high identity conditions. On the other hand, feedback can undermine cooperation when it signals undesirable outcomes. For example, if mutual cooperation fails, the person who cooperates initially is likely to punish the other party by not cooperating subsequently. Future research could explore the feedback effect on cooperation in this setting.

Fourth, certain parameter values are selected to proxy for symmetric and asymmetric benefits when mutual cooperation is achieved. My study does not examine how sensitive the experimental findings are if certain changes are made in the parameters selected. In addition, my experimental results are subject to specific design choices made in this experiment. The reader needs to exercise caution when generalizing the experimental results to groups that were not included in the study. Future research could investigate whether parameters and certain design choices play a role in determining individuals' willingness to cooperate.

Finally, it should be noted that there is an alternative explanation of my experimental results. Specifically, a high level of group identity potentially increases individuals' propensity to think about the payoff of the other party. Under asymmetric benefits condition, when group identity is high, individuals are motivated to act in a way that would lead to fair outcome for both parties (e.g., the only condition that results in fair outcome for both parties is Defect-Defect in my setting). As a result, participants are less likely to cooperate when group identity is high rather than low. Future research could explore whether individuals engage in strategic thinking when group identity is high. In addition, future research could examine other conditions under which group identity may negatively affect individuals' decision making.

APPENDIX A

EXPERIMENTAL INSTUCTIONS (PRELIMINARY STUDY)

Thank you for participating in this experiment! This experiment includes two tasks. No special skills are required and the instructions that follow should provide all the information you need. You can make money by completing each task. After the tasks, you are required to complete a post-experimental questionnaire. You will be paid privately in cash at the end of this experiment.

Task I

You will be assigned to a color group. In this task, you are required to find your color group and solve a Sudoku puzzle with your group members. Sudoku is a popular logical game with easy rules. In this game you will be given a grid of numbers and you should finish the grid by putting numbers into it. The object is to insert the numbers in the boxes to satisfy only one condition: each row, column and 3x3 box must contain the digits 1 through 9 exactly once.

Your group has 10 minutes to solve a Sudoku puzzle. Each member of the group that solves the puzzle first will make $6. For another color group, each group member will only make $4. If both groups are not able to solve the puzzle within the time limit, each person will make $5.

Any questions?

Task II

General

Thank you for participating in this experiment! During the experiment, please do not talk or communicate with other participants. If you have a question, please raise your hand and an experimenter will assist you.

Background and Overview of the Task

You will be randomly assigned a role: player X or player Y. Whether you are player X or player Y will be announced after the instructions have been completed. In the experiment, a player X will be randomly paired with a player Y, and neither player will be told the identity of the other player at any time during or after the experiment. The decision you made will be completely anonymous, and you will be paid privately in cash at the end of the experiment. In addition, you were assigned to a color group when you arrived. Each of you will be paired with a member of either your color group (who will be referred to as "your teammate") or the other color group (who will be referred to as "the other participant").

Assume that you and your teammate/the other participant are two managers working for Company XYZ. The company produces one product, and both of you participate in the production of that product. You will be asked to make a one-time decision and you will earn points based on the decision made by both you and your teammate/the other participant. At the end of the task, your points will be converted to real cash at a rate of $1.00 per 1 point (For example, if your balance was 10 at the end of the task, you would receive $10.00). The following instructions show how you earn points.

Providing Labor

Your services for Company XYZ require you to provide labor, which you can think of as work effort. Because effort is costly, providing a high level of effort is more costly to you individually than providing a low level of effort. You must choose between two alternatives, with the following consequences:

- High Effort – If you choose to provide a high level of effort to the firm, your division's productivity will be high but you will incur a personal cost of 8 points.
- Low Effort – If you choose to provide a low level of effort to the firm, your division's productivity will be low but you will not incur any personal cost.

Your teammate/the other participant will be asked to make the same decision for his/her service. After independently making the decision, your compensation will be determined.

Compensation

You and your teammate/the other participant will receive the same compensation, and it will depend on the level of effort you both provide. The compensation plan is as follows,

- If both you and your teammate/the other participant provide a high level of effort, you will each receive 20 points.
- If either you or your teammate/the other participant (but not both of you) provides a high level of effort, you will each receive 14 points.
- If neither you nor your teammate/the other participant provides a high level of effort, you will each receive 8 points.

*Remember: If you choose to provide a high level of effort to the firm, you will incur a person cost of **8 points**. For example, if both you and your teammate provide a high level of effort, after taking your personal cost into account, you will each receive 12 points (20 points – 8 points).*

The procedures of the experiment are summarized in the following diagram:

Any questions?

```
                    ┌─────────────────────┐
                    │  Player X's Choice  │
                    └─────────────────────┘
            High    /                      \    Low
                   /                        \
        ┌─────────────────────┐      ┌─────────────────────┐
        │  Player Y's Choice  │      │  Player Y's Choice  │
        └─────────────────────┘      └─────────────────────┘
     High  /        \  Low        High  /        \  Low
          /          \                 /          \
   ┌──────────┐  ┌──────────┐   ┌──────────┐  ┌──────────┐
   │ X: $12   │  │ X: $6    │   │ X: $14   │  │ X: $8    │
   │ Y: $12   │  │ Y: $14   │   │ Y: $6    │  │ Y: $8    │
   └──────────┘  └──────────┘   └──────────┘  └──────────┘
```
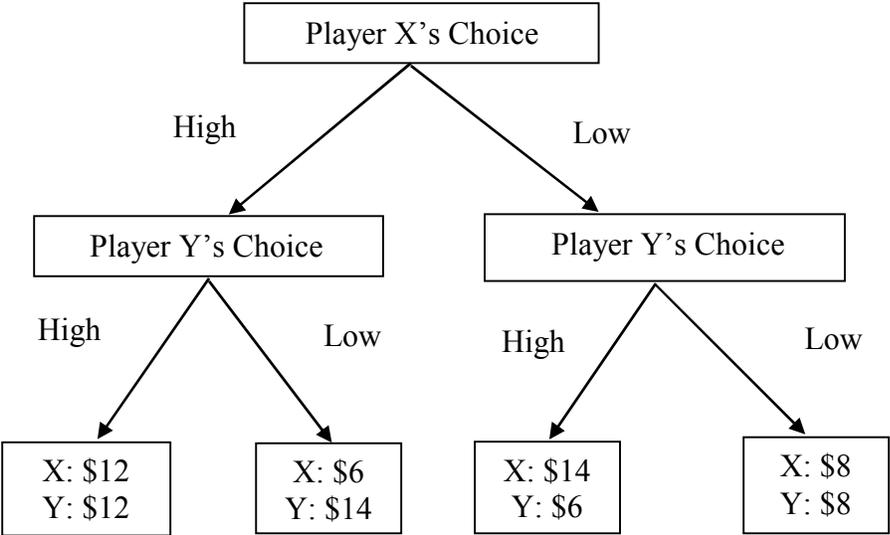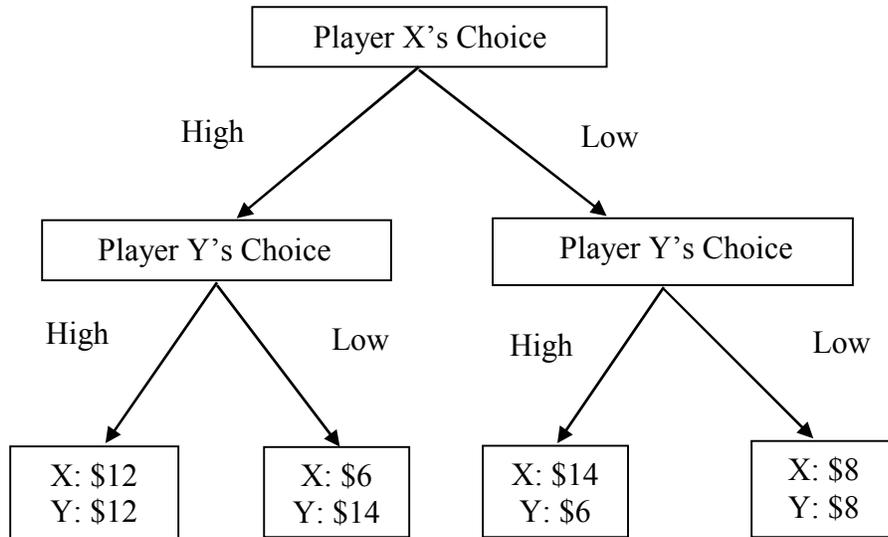
Record Sheet

Participant ID: _____

I choose to provide: (circle one)

High Effort   Low Effort

SUDOKU PUZZLE USED IN THE EXPERIMENT

	6			9	2		3	8
	8			4	6	2		9
2	1			8				6
1				6				3
6	5	8				1	9	7
9				1				2
4				3			7	5
5		3	2	7			8	
8	7		6	5			2	

APPENDIX C

EXPERIMENTAL INSTUCTIONS (MAIN STUDY)

Thank you for participating in this experiment! This experiment includes two tasks. No special skills are required and the instructions that follow should provide all the information you need. You can make money by completing each task. After the tasks, you are required to complete a post-experimental questionnaire. You will be paid privately in cash at the end of this experiment.

Task I

There are two color groups in the experiment (Yellow and Blue). You will be informed which color group you are assigned. In this task, you are required to find your color group and solve a group task with your group members. You are required to list top ten causes of death in the USA in 2009. Your group has 10 minutes to complete the task. If your group is able to list five or more causes correctly, each member of that group will earn $5. Otherwise, each member of the group earns $4.

Any questions?

Task II

General

Thank you for participating in this experiment! During the experiment, please do not talk or communicate with other participants. If you have a question, please raise your hand and an experimenter will assist you.

Background and Overview of the Task

There are two color-coded groups in the study (Yellow and Blue). You were assigned to a color group when you arrived. Each of you will be paired with a member of your color group (who will be referred to as "your teammate"). Assume that you and your teammate are two managers working for Company XYZ. The company produces one product called ABC, and both of you participate in the production of ABC.

You will be asked to make decisions for a number of periods, and your compensation will be based on the decisions made by both you and your teammate. In each period, you will be randomly paired with another person in your color group. At the end of the experiment, one period will be randomly selected and you will be paid in cash at an exchange rate in that period (For example, if your balance was 20 points in period t and the exchange rate in period t is 0.5, you would receive $10.00). You will not learn the exact exchange rate in each period at this time; however, the rates have been predetermined and will not change, and the average dollar payment will be about $20, regardless of which period is selected. The following instructions show how you earn points.

Providing Resources and Compensation

Your services for Company XYZ require you to provide resources to produce product ABC. You can provide either high resources or low resources into the production of ABC. Your teammate will be asked to make the same decision for his/her service.

66

You and your teammate will earn the same compensation. Your compensation will depend on the level of resources you both provide. The compensation plan is as follows,

- If both you and your teammate provide high resources, you will each earn 50 points.

- If either you or your teammate (but not both of you) provides high resources, you will each earn 35 points.

- If neither you nor your teammate provides high resources, you will each earn 10 points.

Providing Resources and Personal Cost

Providing high resources is more costly to you individually than providing low resources. If you choose to provide high resources to the production of ABC, you might earn higher compensation; however, you will incur a personal cost of 30 points. Alternatively, if you choose to provide low resources to the production, you might earn lower compensation, but you will not incur any personal cost. Regardless of how much compensation you earned, your personal cost of providing high resources will be the same.

Your total earnings earned in this study will be your compensation less your personal cost.

The procedures of the experiment and your four possible total earnings are summarized in the following diagram: diagram:

```
                    ┌─────────────────────┐
                    │   Player X's Choice  │
                    └─────────────────────┘
              High   ╱                    ╲   Low
                    ╱                      ╲
    ┌─────────────────────┐      ┌─────────────────────┐
    │   Player Y's Choice  │      │   Player Y's Choice  │
    └─────────────────────┘      └─────────────────────┘
   High  ╱        ╲  Low        High  ╱        ╲  Low
        ╱          ╲                 ╱          ╲
 ┌──────────┐  ┌──────────┐   ┌──────────┐  ┌──────────┐
 │  X: 20   │  │  X: 5    │   │  X: 35   │  │  X: 10   │
 │  Y: 20   │  │  Y: 35   │   │  Y: 5    │  │  Y: 10   │
 └──────────┘  └──────────┘   └──────────┘  └──────────┘
```

You are required to make decision for a number of periods. In each period, your compensation and personal costs of providing high resources are different.

Any questions?

In this period, your four possible total earnings are summarized in the following diagram:

```
                    ┌─────────────────────┐
                    │  Player X's Choice  │
                    └─────────────────────┘
            High      /                \     Low
                     /                  \
      ┌─────────────────────┐    ┌─────────────────────┐
      │  Player Y's Choice  │    │  Player Y's Choice  │
      └─────────────────────┘    └─────────────────────┘
     High   /        \  Low      High  /        \  Low
          /            \              /            \
   ┌─────────┐   ┌─────────┐   ┌─────────┐   ┌─────────┐
   │ X: 20   │   │ X: 5    │   │ X: 35   │   │ X: 10   │
   │ Y: 20   │   │ Y: 35   │   │ Y: 5    │   │ Y: 10   │
   └─────────┘   └─────────┘   └─────────┘   └─────────┘
```

Record Sheet

Participant ID: _____

I choose to provide: (circle one)

High Resources   Low Resources

In this period, your four possible total earnings are summarized in the following diagram:

```
                        ┌─────────────────────┐
                        │  Player X's Choice  │
                        └─────────────────────┘
            High        ╱                       ╲        Low
                       ╱                         ╲
         ┌─────────────────────┐       ┌─────────────────────┐
         │  Player Y's Choice  │       │  Player Y's Choice  │
         └─────────────────────┘       └─────────────────────┘
    High    ╱           ╲  Low      High  ╱          ╲  Low
           ╱             ╲               ╱            ╲
    ┌──────────┐   ┌──────────┐   ┌──────────┐  ┌──────────┐
    │  X: 10   │   │  X: 5    │   │  X: 20   │  │  X: 10   │
    │  Y: 10   │   │  Y: 20   │   │  Y: 5    │  │  Y: 10   │
    └──────────┘   └──────────┘   └──────────┘  └──────────┘
```

Record Sheet

Participant ID: _____

I choose to provide: (circle one)

High Resources   Low Resources

In this period, your four possible total earnings are summarized in the following diagram:

```
                        ┌─────────────────────┐
                        │  Player X's Choice  │
                        └─────────────────────┘
                    High                        Low
             ┌────────────────────┐      ┌────────────────────┐
             │ Player Y's Choice  │      │ Player Y's Choice  │
             └────────────────────┘      └────────────────────┘
          High            Low          High              Low
      ┌────────┐      ┌────────┐    ┌────────┐        ┌────────┐
      │ X: 50  │      │ X: 20  │    │ X: 80  │        │ X: 30  │
      │ Y: 50  │      │ Y: 80  │    │ Y: 20  │        │ Y: 30  │
      └────────┘      └────────┘    └────────┘        └────────┘
```

Record Sheet

Participant ID: _____

I choose to provide: (circle one)

High Resources   Low Resources

Instructions

Thank you for participating in this experiment! This experiment includes two tasks. No special skills are required and the instructions that follow should provide all the information you need. You can make money by completing each task. After the tasks, you are required to complete a post-experimental questionnaire. You will be paid privately in cash at the end of this experiment.

Task I

There are two color groups in the experiment (Yellow and Blue). You will be informed which color group you are assigned. In this task, you are required to complete a task independently. You are required to list top ten causes of death in the USA in 2009. You have 10 minutes to complete the task. If you can list four or more causes correctly, you will earn $5. Otherwise, you will earn $4.

Any questions?

Task II

General

Thank you for participating in this experiment! During the experiment, please do not talk or communicate with other participants. If you have a question, please raise your hand and an experimenter will assist you.

Background and Overview of the Task

There are two color-coded groups in the study (Yellow and Blue). You were assigned to a color group when you arrived. Each of you will be randomly paired with a member of the other color group (who will be referred to as "the other person"). Assume that you and the other person are two managers working for Company XYZ. The company produces one product called ABC, and both of you participate in the production of ABC.

You will be asked to make decisions for a number of periods, and your compensation will be based on the decisions made by both you and the other person. In each period, you will be randomly paired with another person in this room. At the end of the session, one period will be randomly selected and you will be paid in cash at an exchange rate in that period (For example, if your balance was 20 points in period t and the exchange rate in period t is 0.5, you would receive $10.00). You will not learn the exact exchange rate in each period at this time; however, the rates have been predetermined and will not change, and the average dollar payment will be about $20, regardless of which period is selected. The following instructions show how you earn points.

Providing Resources and Compensation

Your services for Company XYZ require you to provide resources to produce product ABC. You can provide either high resources or low resources into the production of ABC. The other person will be asked to make the same decision for his/her service.

You and the other person will earn the same compensation. Your compensation will depend on the level of resources you both provide. The compensation plan is as follows,

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- If either you or the other person (but not both of you) provides high resources, you will each earn 35 points.

- If neither you nor the other person provides high resources, you will each earn 10 points.

Providing Resources and Personal Cost

Providing high resources is more costly to you individually than providing low resources. If you choose to provide high resources to the production of ABC, you might earn higher compensation; however, you will incur a personal cost of 30 points. Alternatively, if you choose to provide low resources to the production, you might earn lower compensation, but you will not incur any personal cost. Regardless of how much compensation you earned, your personal cost of providing high resources will be the same.

Your total earnings earned in this study will be your compensation less your personal cost.

The procedures of the experiment and your four possible total earnings are summarized in the following diagram: diagram:

Player X's Choice

High — Player Y's Choice
Low — Player Y's Choice

Player Y's Choice (left): High → X: 20, Y: 20; Low → X: 5, Y: 35

Player Y's Choice (right): High → X: 35, Y: 5; Low → X: 10, Y: 10

You are required to make decision for a number of periods. In each period, your compensation and personal costs of providing high resources are different.

Any questions?

In this period, your four possible total earnings are summarized in the following diagram:

```
                         ┌─────────────────────┐
                         │  Player X's Choice  │
                         └─────────────────────┘
                  High    ╱                    ╲    Low
                        ╱                        ╲
          ┌─────────────────────┐      ┌─────────────────────┐
          │  Player Y's Choice  │      │  Player Y's Choice  │
          └─────────────────────┘      └─────────────────────┘
       High   ╱          ╲   Low     High  ╱          ╲   Low
            ╱              ╲              ╱              ╲
      ┌─────────┐    ┌─────────┐   ┌─────────┐    ┌─────────┐
      │ X: 20   │    │ X: 5    │   │ X: 35   │    │ X: 10   │
      │ Y: 20   │    │ Y: 35   │   │ Y: 5    │    │ Y: 10   │
      └─────────┘    └─────────┘   └─────────┘    └─────────┘
```

Record Sheet

Participant ID: _____

I choose to provide: (circle one)

High Resources   Low Resources

In this period, your four possible total earnings are summarized in the following diagram:

```
                        ┌──────────────────────┐
                        │   Player X's Choice   │
                        └──────────────────────┘
                   High                         Low
          ┌──────────────────────┐    ┌──────────────────────┐
          │   Player Y's Choice   │    │   Player Y's Choice   │
          └──────────────────────┘    └──────────────────────┘
       High              Low       High              Low

   ┌─────────┐     ┌─────────┐  ┌─────────┐     ┌─────────┐
   │ X: 10   │     │ X: 5    │  │ X: 20   │     │ X: 10   │
   │ Y: 10   │     │ Y: 20   │  │ Y: 5    │     │ Y: 10   │
   └─────────┘     └─────────┘  └─────────┘     └─────────┘
```
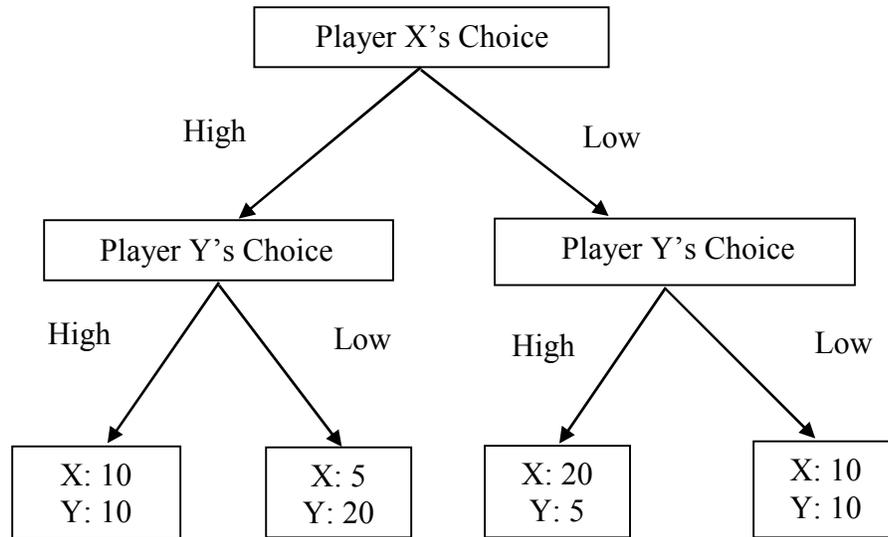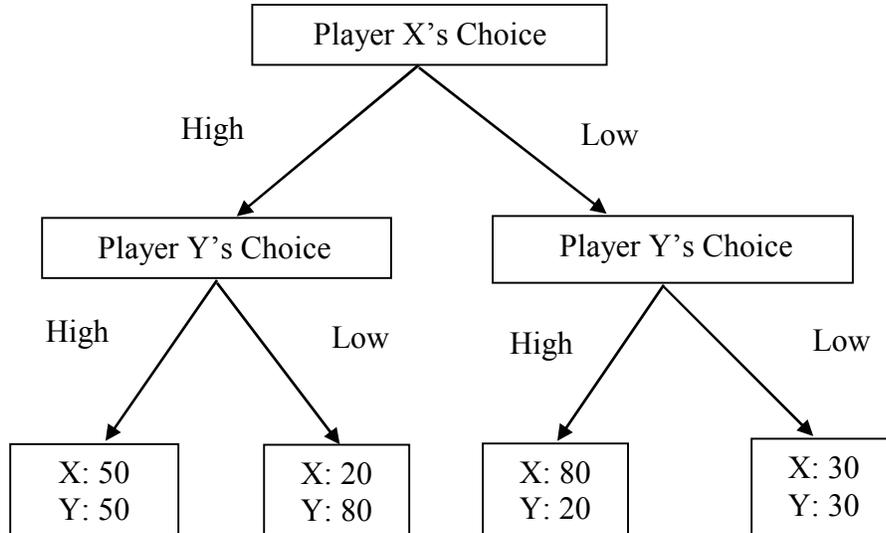
Record Sheet

Participant ID: _____

I choose to provide: (circle one)

High Resources   Low Resources

In this period, your four possible total earnings are summarized in the following diagram:

```
                    ┌─────────────────────┐
                    │  Player X's Choice  │
                    └─────────────────────┘
                High    ╱             ╲    Low
                       ╱               ╲
        ┌─────────────────────┐   ┌─────────────────────┐
        │  Player Y's Choice  │   │  Player Y's Choice  │
        └─────────────────────┘   └─────────────────────┘
      High  ╱        ╲  Low      High  ╱        ╲  Low
           ╱          ╲               ╱          ╲
    ┌─────────┐  ┌─────────┐   ┌─────────┐  ┌─────────┐
    │ X: 50   │  │ X: 20   │   │ X: 80   │  │ X: 30   │
    │ Y: 50   │  │ Y: 80   │   │ Y: 20   │  │ Y: 30   │
    └─────────┘  └─────────┘   └─────────┘  └─────────┘
```

Record Sheet

Participant ID: _____

I choose to provide: (circle one)

High Resources   Low Resources

Instructions

Thank you for participating in this experiment! This experiment includes two tasks. No special skills are required and the instructions that follow should provide all the information you need. You can make money by completing each task. After the tasks, you are required to complete a post-experimental questionnaire. You will be paid privately in cash at the end of this experiment.

Task I

There are two color groups in the experiment (Yellow and Blue). You will be informed which color group you are assigned. In this task, you are required to find your color group and solve a group task with your group members. You are required to list top ten causes of death in the USA in 2009. Your group has 10 minutes to complete the task. If your group is able to list five or more causes correctly, each member of that group will earn $5. Otherwise, each member of the group earns $4.

Any questions?

Task II

General

Thank you for participating in this experiment! During the experiment, please do not talk or communicate with other participants. If you have a question, please raise your hand and an experimenter will assist you.

Background and Overview of the Task

There are two color-coded groups in the study (Yellow and Blue). You were assigned to a color group when you arrived. Each of you will be paired with a member of your color group (who will be referred to as "your teammate"). Assume that you and your teammate are two managers working for Company XYZ. The company produces one product called ABC, and both of you participate in the production of ABC.

You will be asked to make decisions for a number of periods, and your compensation will be based on the decisions made by both you and your teammate. In each period, you will be randomly paired with another person in your color group. At the end of the experiment, one period will be randomly selected and you will be paid in cash at an exchange rate in that period (For example, if your balance was 20 points in period t and the exchange rate in period t is 0.5, you would receive $10.00). You will not learn the exact exchange rate in each period at this time; however, the rates have been predetermined and will not change, and the average dollar payment will be about $20, regardless of which period is selected. The following instructions show how you earn points.

Providing Resources and Compensation

Your services for Company XYZ require you to provide resources to produce product ABC. You can provide either high resources or low resources into the production of ABC. Your teammate will be asked to make the same decision for his/her service.

You and your teammate will receive different compensations. You will be randomly selected to be either high pay player or low pay player. Your compensation will depend on the level of resources you both provide. The compensation plan is as follows,

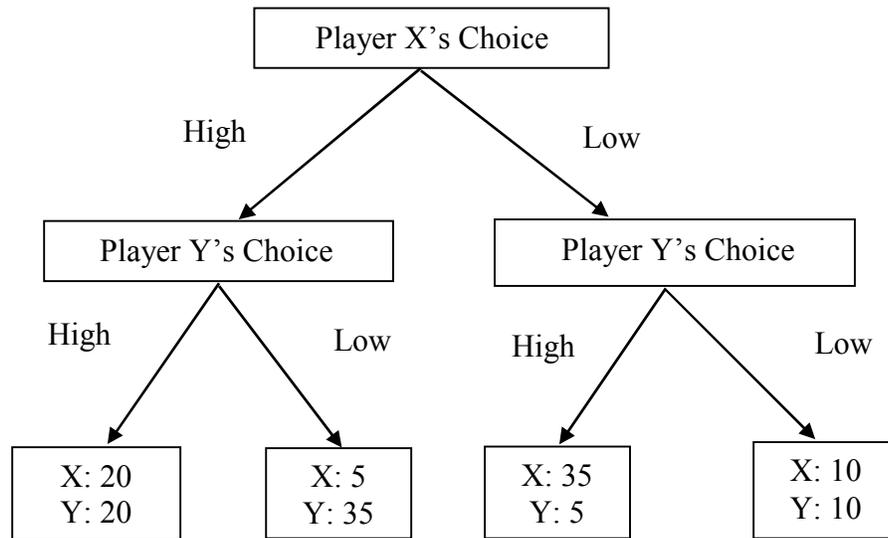- If both you and your teammate provide high resources, high pay player will earn 55 points and low pay player will earn 45 points.

- If either you or your teammate (but not both of you) provides high resources, you will each earn 35 points.

- If neither you nor your teammate provides high resources, you will each earn 10 points.

Providing Resources and Personal Cost

Providing high resources is more costly to you individually than providing low resources. If you choose to provide high resources to the production of ABC, you might earn higher compensation; however, you will incur a personal cost of 30 points. Alternatively, if you choose to provide low resources to the production, you might earn lower compensation, but you will not incur any personal cost. Regardless of how much compensation you earned, your personal cost of providing high resources will be the same.

Your total earnings earned in this study will be your compensation less your personal cost.
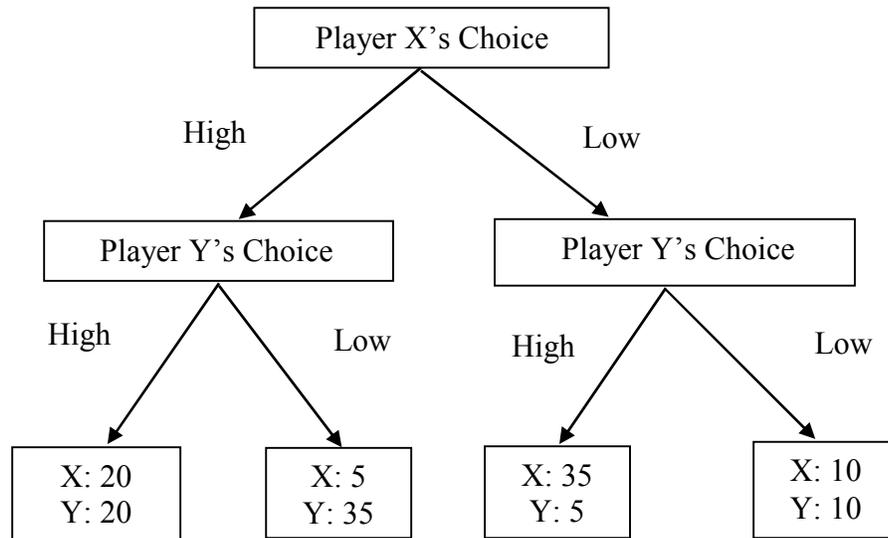
The procedures of the experiment and your four possible total earnings are summarized in the following diagram: diagram:

```
                    ┌─────────────────────┐
                    │   Player X's Choice  │
                    └─────────────────────┘
              High   ╱                    ╲   Low
                    ╱                      ╲
     ┌─────────────────────┐      ┌─────────────────────┐
     │  Player Y's Choice   │      │  Player Y's Choice   │
     └─────────────────────┘      └─────────────────────┘
    High ╱          ╲ Low       High ╱          ╲ Low
        ╱            ╲              ╱            ╲
  ┌────────┐   ┌────────┐    ┌────────┐   ┌────────┐
  │ X: 25  │   │ X: 5   │    │ X: 35  │   │ X: 10  │
  │ Y: 15  │   │ Y: 35  │    │ Y: 5   │   │ Y: 10  │
  └────────┘   └────────┘    └────────┘   └────────┘
```

You are required to make decision for a number of periods. In each period, your compensation and personal costs of providing high resources are different.

Any questions?

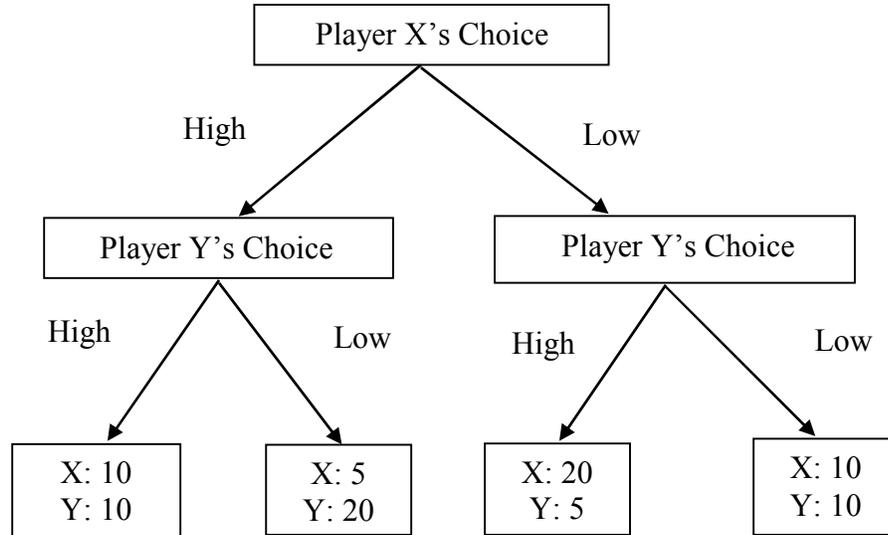In this period, your four possible total earnings are summarized in the following diagram:

```
                         ┌────────────────────┐
                         │  Player X's Choice │
                         └────────────────────┘
              High        ╱                  ╲        Low
                         ╱                    ╲
        ┌────────────────────┐         ┌────────────────────┐
        │  Player Y's Choice │         │  Player Y's Choice │
        └────────────────────┘         └────────────────────┘
     High    ╱          ╲   Low     High   ╱          ╲   Low
           ╱             ╲               ╱             ╲
   ┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐
   │ X: 25    │   │ X: 5     │   │ X: 35    │   │ X: 10    │
   │ Y: 15    │   │ Y: 35    │   │ Y: 5     │   │ Y: 10    │
   └──────────┘   └──────────┘   └──────────┘   └──────────┘
```

Record Sheet

Player ____ (enter your participant number)

I am assigned to be: (circle one)

High Pay player   Low Pay Player

I choose to provide: (circle one)

High Resources   Low Resources

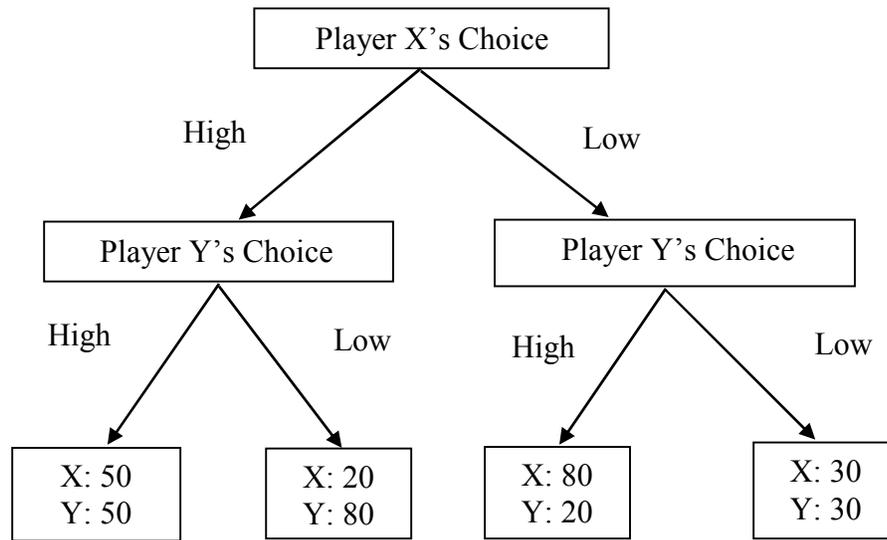In this period, your four possible total earnings are summarized in the following diagram:

```
                        ┌─────────────────────┐
                        │  Player X's Choice  │
                        └─────────────────────┘
                 High      ╱              ╲     Low
                          ╱                ╲
          ┌─────────────────────┐    ┌─────────────────────┐
          │  Player Y's Choice  │    │  Player Y's Choice  │
          └─────────────────────┘    └─────────────────────┘
        High  ╱          ╲  Low      High ╱          ╲  Low
             ╱            ╲               ╱            ╲
     ┌─────────┐   ┌─────────┐    ┌─────────┐   ┌─────────┐
     │ X: 12   │   │ X: 5    │    │ X: 20   │   │ X: 10   │
     │ Y: 8    │   │ Y: 20   │    │ Y: 5    │   │ Y: 10   │
     └─────────┘   └─────────┘    └─────────┘   └─────────┘
```

Record Sheet

Player _____ (enter your participant number)

I am assigned to be: (circle one)

High Pay player   Low Pay Player

I choose to provide: (circle one)

High Resources   Low Resources

In this period, your four possible total earnings are summarized in the following diagram:

```
                        ┌─────────────────────┐
                        │  Player X's Choice   │
                        └─────────────────────┘
                   High  ╱                    ╲  Low
                        ╱                      ╲
        ┌─────────────────────┐      ┌─────────────────────┐
        │  Player Y's Choice   │      │  Player Y's Choice   │
        └─────────────────────┘      └─────────────────────┘
       High ╱          ╲ Low        High ╱          ╲ Low
           ╱            ╲                ╱            ╲
    ┌──────────┐  ┌──────────┐   ┌──────────┐  ┌──────────┐
    │ X: 60    │  │ X: 20    │   │ X: 80    │  │ X: 30    │
    │ Y: 40    │  │ Y: 80    │   │ Y: 20    │  │ Y: 30    │
    └──────────┘  └──────────┘   └──────────┘  └──────────┘
```

Record Sheet

Player ____ (enter your participant number)

I am assigned to be: (circle one)

High Pay player   Low Pay Player

I choose to provide: (circle one)

High Resources   Low Resources

Instructions

Thank you for participating in this experiment! This experiment includes two tasks. No special skills are required and the instructions that follow should provide all the information you need. You can make money by completing each task. After the tasks, you are required to complete a post-experimental questionnaire. You will be paid privately in cash at the end of this experiment.

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Any questions?

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You will be asked to make decisions for a number of periods, and your compensation will be based on the decisions made by both you and the other person. In each period, you will be randomly paired with another person in this room. At the end of the session, one period will be randomly selected and you will be paid in cash at an exchange rate in that period (For example, if your balance was 20 points in period t and the exchange rate in period t is 0.5, you would receive $10.00). You will not learn the exact exchange rate in each period at this time; however, the rates have been predetermined and will not change, and the average dollar payment will be about $20, regardless of which period is selected. The following instructions show how you earn points.

Providing Resources and Compensation

Your services for Company XYZ require you to provide resources to produce product ABC. You can provide either high resources or low resources into the production of ABC. The other person will be asked to make the same decision for his/her service.

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Providing Resources and Personal Cost

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The procedures of the experiment and your four possible total earnings are summarized in the following diagram: diagram:

```
                    ┌─────────────────────┐
                    │  Player X's Choice  │
                    └─────────────────────┘
               High  ╱                    ╲  Low
                    ╱                      ╲
    ┌─────────────────────┐      ┌─────────────────────┐
    │  Player Y's Choice  │      │  Player Y's Choice  │
    └─────────────────────┘      └─────────────────────┘
    High ╱          ╲ Low        High ╱          ╲ Low
        ╱            ╲               ╱            ╲
 ┌──────────┐  ┌──────────┐  ┌──────────┐  ┌──────────┐
 │  X: 25   │  │  X: 5    │  │  X: 35   │  │  X: 10   │
 │  Y: 15   │  │  Y: 35   │  │  Y: 5    │  │  Y: 10   │
 └──────────┘  └──────────┘  └──────────┘  └──────────┘
```

You are required to make decision for a number of periods. In each period, your compensation and personal costs of providing high resources are different.

Any questions?

In this period, your four possible total earnings are summarized in the following diagram:

```
                        ┌─────────────────────┐
                        │   Player X's Choice  │
                        └─────────────────────┘
                     High                    Low
             ┌──────────────────┐    ┌──────────────────┐
             │ Player Y's Choice │    │ Player Y's Choice │
             └──────────────────┘    └──────────────────┘
          High          Low        High           Low
      ┌─────────┐  ┌─────────┐  ┌─────────┐  ┌─────────┐
      │ X: 25   │  │ X: 5    │  │ X: 35   │  │ X: 10   │
      │ Y: 15   │  │ Y: 35   │  │ Y: 5    │  │ Y: 10   │
      └─────────┘  └─────────┘  └─────────┘  └─────────┘
```

Record Sheet

Player _____ (enter your participant number)

I am assigned to be: (circle one)

High Pay player   Low Pay Player

I choose to provide: (circle one)

High Resources   Low Resources

In this period, your four possible total earnings are summarized in the following diagram:

```
                          ┌─────────────────────┐
                          │   Player X's Choice  │
                          └─────────────────────┘
                     High  ╱                      ╲  Low
                          ╱                        ╲
          ┌─────────────────────┐          ┌─────────────────────┐
          │   Player Y's Choice  │          │   Player Y's Choice  │
          └─────────────────────┘          └─────────────────────┘
       High ╱           ╲ Low            High ╱            ╲ Low
           ╱             ╲                   ╱              ╲
    ┌──────────┐   ┌──────────┐      ┌──────────┐   ┌──────────┐
    │  X: 12   │   │  X: 5    │      │  X: 20   │   │  X: 10   │
    │  Y: 8    │   │  Y: 20   │      │  Y: 5    │   │  Y: 10   │
    └──────────┘   └──────────┘      └──────────┘   └──────────┘
```

Record Sheet

Player _____ (enter your participant number)

I am assigned to be: (circle one)

High Pay player   Low Pay Player

I choose to provide: (circle one)

High Resources   Low Resources

In this period, your four possible total earnings are summarized in the following diagram:

```
                        ┌─────────────────────┐
                        │  Player X's Choice  │
                        └─────────────────────┘
                High    ╱                     ╲    Low
                       ╱                       ╲
          ┌─────────────────────┐       ┌─────────────────────┐
          │  Player Y's Choice  │       │  Player Y's Choice  │
          └─────────────────────┘       └─────────────────────┘
         High  ╱         ╲  Low        High ╱          ╲  Low
              ╱           ╲                ╱            ╲
       ┌──────────┐  ┌──────────┐   ┌──────────┐  ┌──────────┐
       │  X: 60   │  │  X: 20   │   │  X: 80   │  │  X: 30   │
       │  Y: 40   │  │  Y: 80   │   │  Y: 20   │  │  Y: 30   │
       └──────────┘  └──────────┘   └──────────┘  └──────────┘
```

Record Sheet
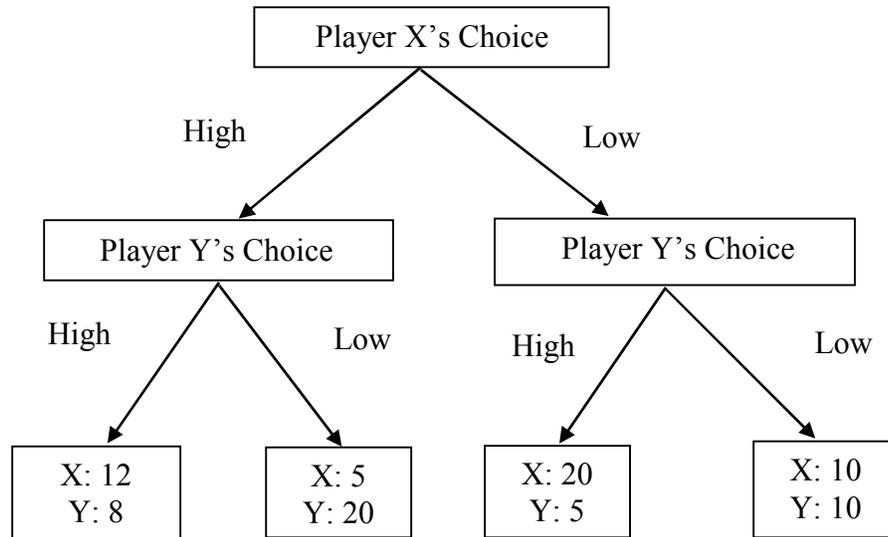
Player _____ (enter your participant number)

I am assigned to be: (circle one)

High Pay player   Low Pay Player

I choose to provide: (circle one)

High Resources   Low Resources

APPENDIX D

TOP TEN CAUSES OF DEATH IN THE USA IN 2009

The following is the list of the top ten causes of death in the USA in 2009,

No. 1   Heart disease
No. 2   Malignant neoplasms (tumors)
No. 3   Chronic lower respiratory diseases (lung disease)
No. 4   Cerebrovascular diseases (brain disease)
No. 5   Accidents (unintentional injuries)
No. 6   Alzheimer's disease
No. 7   Diabetes mellitus
No. 8   Flu and pneumonia
No. 9   Nephritis, nephrotic syndrome, and nephrosis (kidney disease)
No. 10 Suicide

Source

http://www.businessinsider.com/top-causes-of-death-united-states-2011-11?op=1

APPENDIX E

POST-EXPERIMENTAL QUESTIONNAIRE (PRELIMINARY STUDY)

Participant ID _____

This questionnaire is designed to collect general information. Such information may help us better understand differences found between participants in this experiment.

1. What year are you in university (e.g., 2nd, 3rd, 4th)? _____

2. What is your major area of concentration (e.g., accounting, finance)? _____

3. What is your gender? (check one) male _____   female _____

4. What is your age? _____ years

5. Are you a native English speaker? (check one) Yes___ No___

6. How many months of work experience (internships or post-undergraduate) do you have? _____

For the following questions, please circle the numbers that correspond to your answer.

7. To what extent did you perceive yourself to be a **teammate** of the person you were paired with?

Definitely   Definitely
Not a teammate   1-----2-----3-----4-----5------6-----7----8----9   a teammate

8. If you were to participate in a similar study in the future, to what extent would you like to be paired with the same person again?

Definitely   Definitely
would Not like   would like
to be paired with   to be paired with
the same person   1-----2-----3-----4-----5------6-----7----8----9   the same person

9. When you were considering your choices, were you more concerned with maximizing your own profit or maximizing the total profit to you and the person you were paired with?

1---------2---------3---------4---------5----------6---------7--------8--------9

| Only interested | Interested in both | Only interested |
| in my own profit | my own profit and the total profit | in the total profit |

10. To what extent did you feel that *your* productivity was influenced by the effort of the person you were paired with?

1---------2---------3---------4---------5----------6---------7--------8--------9

| Not At All | Moderately | Heavily |
| Influenced | Influenced | Influenced |

11. Please indicate the importance of each factor below in making your choice among the available options (in each case circle the appropriate number).

a. Your payment

| Not Important | | Very |
| At All | 1-----2-----3-----4-----5------6-----7-----8-----9 | Important |

b. The other participant's payment

| Not Important | | Very |
| At All | 1-----2-----3-----4-----5------6-----7-----8-----9 | Important |

c. Making the choice that is the best for everyone (for you and the other student)

| Not Important | | Very |
| At All | 1-----2-----3-----4-----5------6-----7-----8-----9 | Important |

d. A desire to cooperate.

| Not Important | | Very |
| At All | 1-----2-----3-----4-----5------6-----7-----8-----9 | Important |

e. Being fair

| Not Important | | Very |
| At All | 1-----2-----3-----4-----5------6-----7-----8-----9 | Important |

f. What the other participant thinks of you

Not Important   Very
At All   1-----2-----3-----4-----5------6-----7-----8-----9   Important

g. Not wanting to feel guilty about your choice

Not Important   Very
At All   1-----2-----3-----4-----5------6-----7-----8-----9   Important

12. How would you characterize the extent to which you experienced the following feelings throughout the course of the experiment? (circle the appropriate number)

a.   Anger

Did Not   Strongly
Experience   1-----2-----3-----4-----5-----6-----7-----8-----9   Experienced

b.   Guilt

Did Not   Strongly
Experience   1-----2-----3-----4-----5-----6-----7-----8-----9   Experienced

c.   Unfair

Did Not   Strongly
Experience   1-----2-----3-----4-----5-----6-----7-----8-----9   Experienced

d.   Envy

Did Not   Strongly
Experience   1-----2-----3-----4-----5-----6-----7-----8-----9   Experienced

e.   Joy

Did Not   Strongly
Experience   1-----2-----3-----4-----5-----6-----7-----8-----9   Experienced

f.   Distress

Did Not   Strongly
Experience   1-----2-----3-----4-----5-----6-----7-----8-----9   Experienced

13. Briefly describe how you make your decisions.

_____

_____

_____

_____

_____

14. The following table has ten rows. **In each row**, there are two alternatives (Alternative 1 and Alternative 2), and you will choose one. **In each row**, please check the alternative you prefer. In total, you will make ten choices. (The payoffs are hypothetical and will not be paid in cash.)

Alternative 1	Alternative 2
_____ 10% chance to earn $40 and 90% chance to earn $32.	_____ 10% chance to earn $77 and 90% chance to earn $2.
_____ 20% chance to earn $40 and 80% chance to earn $32.	_____ 20% chance to earn $77 and 80% chance to earn $2.
_____ 30% chance to earn $40 and 70% chance to earn $32.	_____ 30% chance to earn $77 and 70% chance to earn $2.
_____ 40% chance to earn $40 and 60% chance to earn $32.	_____ 40% chance to earn $77 and 60% chance to earn $2.
_____ 50% chance to earn $40 and 50% chance to earn $32.	_____ 50% chance to earn $77 and 50% chance to earn $2.
_____ 60% chance to earn $40 and 40% chance to earn $32.	_____ 60% chance to earn $77 and 40% chance to earn $2.
_____ 70% chance to earn $40 and 30% chance to earn $32.	_____ 70% chance to earn $77 and 30% chance to earn $2.
_____ 80% chance to earn $40 and 20% chance to earn $32.	_____ 80% chance to earn $77 and 20% chance to earn $2.
_____ 90% chance to earn $40 and 10% chance to earn $32.	_____ 90% chance to earn $77 and 10% chance to earn $2.
_____ 100% chance to earn $40.	_____ 100% chance to earn $77.

APPENDIX F

POST-EXPERIMENTAL QUESTIONNAIRE (MAIN STUDY)

Participant ID _____

This questionnaire is designed to collect general information, which may help us better understand differences found between participants in this experiment.

1. What year are you in university (e.g., 2nd, 3rd, 4th)? _____

2. What is your major area of concentration (e.g., accounting, finance)? _____

3. What is your gender? (check one) male _____   female _____

4. What is your age? _____ years

5. Are you a native English speaker? (check one) Yes___ No___

6. How many months of work experience (e.g., internships or post-undergraduate) do you have? _____

7. To which group do you belong in this study? (check one) Yellow _____   Blue _____

8. To which group does the person you were paired with belong in this study? (check one) Yellow _____   Blue _____

For the following questions, please circle the numbers that correspond to your answer.

9. How strongly do you feel you identify with the **Yellow Group**?

Not at All   1-----2-----3-----4-----5-----6-----7-----8-----9   Very Strongly

10. How strongly do you feel you identify with the **Blue Group**?

Not at All   1-----2-----3-----4-----5-----6-----7-----8-----9   Very Strongly

11. How similar do you feel to the person you were paired with in this study?

Not at All   1-----2-----3-----4-----5-----6-----7-----8-----9   Very Strongly

12. To what extent did you perceive yourself to be a **teammate** of the person you were paired with?

Definitely <u>Not</u> a   Definitely
teammate   1-----2-----3-----4-----5-----6-----7-----8-----9   a teammate

For the following questions, please only consider <u>Task II</u> you completed and circle the numbers that correspond to your answer.

13. When you were considering your choices, were you more concerned with maximizing your own profit or maximizing the total profit to you and the person you were paired with?

            1---------2---------3---------4---------5---------6---------7---------8---------9
Only interested   Interested in both   Only interested
my own profit   my own profit and the total profit   in the total profit

14. To what extent did you feel that *your* productivity was influenced by the effort of the person you were paired with?

            1---------2---------3---------4---------5---------6---------7---------8---------9
Not At All   Moderately   Heavily
Influenced   Influenced   Influenced

15. Think about the person you were paired with during the Task II, to what extent did you feel that he or she is likely to contribute high resources to the production of ABC?

Very Unlikely   1-----2-----3-----4-----5-----6-----7-----8-----9   Very Likely

16. Please indicate the importance of each factor below in making your choice among the available options (in each case circle the appropriate number).

a. Your payment

Not Important   Very
At All   1-----2-----3-----4-----5-----6-----7-----8-----9   Important

b. The other participant's payment

Not Important   Very
At All   1-----2-----3-----4-----5-----6-----7-----8-----9   Important

c. Making the choice that is the best for everyone (for you and the other student)

Not Important   Very
At All   1-----2-----3-----4-----5-----6-----7-----8-----9   Important

d. A desire to cooperate.

Not Important   Very
At All   1-----2-----3-----4-----5-----6-----7-----8-----9   Important

e. Being fair to the person you were paired with

Not Important   Very
At All   1-----2-----3-----4-----5-----6-----7-----8-----9   Important

f. What the other participant thinks of you

Not Important   Very
At All   1-----2-----3-----4-----5-----6-----7-----8-----9   Important

g. Not wanting to feel guilty about your choice

Not Important   Very
At All   1-----2-----3-----4-----5-----6-----7-----8-----9   Important

17. Based on your compensation plan relative to the other player's **in Task II**, how would you characterize the extent to which you experienced the following feelings? (circle the appropriate number)

a.   Anger

Did Not   Strongly
Experience   1-----2-----3-----4-----5-----6-----7-----8-----9   Experienced

b.   Unfair

Did Not   Strongly
Experience   1-----2-----3-----4-----5-----6-----7-----8-----9   Experienced

c.   Guilt

Did Not   Strongly
Experience   1-----2-----3-----4-----5-----6-----7-----8-----9   Experienced

d.   Envy

Did Not   Strongly
Experience   1-----2-----3-----4-----5-----6-----7-----8-----9   Experienced

e.   Joy

Did Not   Strongly
Experience   1-----2-----3-----4-----5-----6-----7-----8-----9   Experienced

f.   Distress

Did Not   Strongly
Experience   1-----2-----3-----4-----5-----6-----7-----8-----9   Experienced

18. Briefly describe how you made your decisions.

_____

_____

_____

_____

_____

_____

19. Have you used different strategies to make your decision in different rounds? If so, why?

_____

_____

_____

_____

_____

_____

_____

_____

20. The following table has ten rows. **In each row**, there are two alternative lotteries (Alternative 1 and Alternative 2). **In each row**, please check the alternative you prefer. In total, you will make ten choices. (The payoffs are hypothetical and will not be paid in cash.)

Alternative 1	Alternative 2
_____ 10% chance to earn $40 and 90% chance to earn $32.	_____ 10% chance to earn $77 and 90% chance to earn $2.
_____ 20% chance to earn $40 and 80% chance to earn $32.	_____ 20% chance to earn $77 and 80% chance to earn $2.
_____ 30% chance to earn $40 and 70% chance to earn $32.	_____ 30% chance to earn $77 and 70% chance to earn $2.
_____ 40% chance to earn $40 and 60% chance to earn $32.	_____ 40% chance to earn $77 and 60% chance to earn $2.
_____ 50% chance to earn $40 and 50% chance to earn $32.	_____ 50% chance to earn $77 and 50% chance to earn $2.
_____ 60% chance to earn $40 and 40% chance to earn $32.	_____ 60% chance to earn $77 and 40% chance to earn $2.
_____ 70% chance to earn $40 and 30% chance to earn $32.	_____ 70% chance to earn $77 and 30% chance to earn $2.
_____ 80% chance to earn $40 and 20% chance to earn $32.	_____ 80% chance to earn $77 and 20% chance to earn $2.
_____ 90% chance to earn $40 and 10% chance to earn $32.	_____ 90% chance to earn $77 and 10% chance to earn $2.
_____ 100% chance to earn $40.	_____ 100% chance to earn $77.

REFERENCES

Adams, J. S. (1965). Inequity in Social Exchange. *Advances in Experimental Social Psychology, 2*(267-299).

Alchian, A. A., & Demsetz, H. (1972). Production, Information Costs, and Economic Organization. *American Economic Review*, 777-795.

Anderson, S. W., & Sedatole, K. L. (2003). Management Accounting for the Extended Enterprise: Performance Management for Strategic Alliances and Networked Partners. *Management Accounting in the Digital Economy*.

Andreoni, J. (1995). Cooperation in Public-Goods Experiments: Kindness or Confusion? *American Economic Review, 85*(4), 891-904.

Andreoni, J., & Miller, J. H. (1993). Rational Cooperation in the Finitely Repeated Prisoner's Dilemma: Experimental Evidence. *Economic Journal, 103*(418), 570-585.

Arya, A., Fellingham, J., & Glover, J. (1997). Teams, Repeated Tasks, and Implicit Incentives. *Journal of Accounting and Economics, 23*(1), 7-30.

Arya, A., & Glover, J. (1996). Verification of Historical Cost Reports. *The Accounting Review*, 255-269.

Ashforth, B. E., & Mael, F. (1989). Social Identity Theory and the Organization. *Academy of Management Review, 14*(1), 20-39.

Atkinson, J. W., & Reitman, W. R. (1956). Performance as a Function of Motive Strength and Expectancy of Goal-Attainment. *Journal of Abnormal and Social Psychology, 53*(3), 361.

Axelrod, R. M. (1980). More Effective Choice in the Prisoner's Dilemma. *Journal of Conflict Resolution, 24*(3), 379-403.

Axelrod, R. M. (2006). *The Evolution of Cooperation*: Basic books.

Bailey, W. J., Hecht, G., & Towry, K. L. (2011). Dividing the Pie: The Influence of Managerial Discretion Extent on Bonus Pool Allocation. *Contemporary Accounting Research, 28*(5), 1562-1584.

Baiman, S. (1990). Agency Research in Managerial Accounting: A Second Look. *Accounting, Organizations and Society, 15*(4), 341-371.

Barber, B. (1983). *The Logic and Limits of Trust*: New Brunswick, NJ: Rutgers University Press.

Baron, R. M., & Kenny, D. A. (1986). The Moderator Mediator Variable Distinction in Social Psychological Research - Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Barron, J. M., & Gjerde, K. P. (1997). Peer Pressure in an Agency Relationship. *Journal of Labor Economics, 15*(2), 234-254.

Bernhard, H., Fehr, E., & Fischbacher, U. (2006). Group Affiliation and Altruistic Norm Enforcement. *American Economic Review*, 217-221.

Birnberg, J. G., & Snodgrass, C. (1988). Culture and Control: A Field Study. *Accounting, Organizations and Society, 13*(5), 447-464.

Blau, F. D., & Kahn, L. M. (1992). The Gender Earnings Gap: Learning from International Comparisons. *American Economic Review*, 533-538.

Bloom, M. (1999). The Performance Effects of Pay Dispersion on Individuals and Organizations. *Academy of Management Journal, 42*(1), 25-40.

Bloom, M., & Michel, J. G. (2002). The Relationships among Organizational Context, Pay Dispersion, and Managerial Turnover. *Academy of Management Journal*, 33-42.

Bonner, S. E., & Sprinkle, G. B. (2002). The Effects of Monetary Incentives on Effort and Task Performance: Theories, Evidence, and a Framework for Research. *Accounting, Organizations and Society, 27*(4), 303-345.

Brown-Kruse, J., & Hummels, D. (1993). Gender Effects in Laboratory Public Goods Contribution: Do Individuals Put Their Money Where Their Mouth Is? *Journal of Economic Behavior & Organization, 22*(3), 255-267.

Browne, I., & Misra, J. (2003). The Intersection of Gender and Race in the Labor Market. *Annual Review of Sociology*, 487-513.

Cadsby, C. B., & Maynes, E. (1998). Gender and Free Riding in a Threshold Public Goods Game: Experimental Evidence. *Journal of Economic Behavior & Organization, 34*(4), 603-620.

Campbell, J. D., & Tesser, A. (1985). Self-Evaluation Maintenance Processes in Relationships *Personal Relationships* (Vol. 1). In S.W. Duck & D. Perlman (Eds.), London: Sage.

Chang, L., Cheng, M., & Trotman, K. T. (2008). The Effect of Framing and Negotiation Partner's Objective on Judgments About Negotiated Transfer Prices. *Accounting, Organizations and Society, 33*(7), 704-717.

Charness, G., Rigotti, L., & Rustichini, A. (2007). Individual Behavior and Group Membership. *American Economic Review, 97*(4), 1340-1352.

Chen, Y., & Li, S. X. (2009). Group Identity and Social Preferences. *American Economic Review*, 431-457.

Cooper, R., DeJong, D. V., Forsythe, R., & Ross, T. W. (1996). Cooperation without Reputation: Experimental Evidence from Prisoner's Dilemma Games. *Games and Economic Behavior, 12*(2), 187-218.

Croson, R., Marks, M., & Snyder, J. (2008). Groups Work for Women: Gender and Group Identity in Social Dilemmas. *Negotiation Journal, 24*(4), 411-427.

Csikszentmihalyi, M. (1999). If We Are So Rich, Why Aren't We Happy? *American Psychologist, 54*(10), 821.

Dawes, R. M., & Thaler, R. H. (1988). Anomalies: Cooperation. *Journal of Economic Perspectives*, 187-197.

De Cremer, D., & Van Vugt, M. (1998). Collective Identity and Cooperation in a Public Goods Dilemma: A Matter of Trust or Self-Efficacy. *Current Research in Social Psychology, 3*(1), 1-11.

De Cremer, D., & Van Vugt, M. (1999). Social Identification Effects in Social Dilemmas: A Transformation of Motives. *European Journal of Social Psychology, 29*(7), 871-893.

Demski, J. S., & Sappington, D. (1984). Optimal Incentive Contracts with Multiple Agents. *Journal of Economic Theory, 33*(1), 152-171.

Drake, A. R., & Haka, S. F. (2008). Does Abc Information Exacerbate Hold-up Problems in Buyer-Supplier Negotiations? *The Accounting Review, 83*(1), 29-60.

Du, F., Tang, G., & Young, S. M. (2012). Influence Activities and Favoritism in Subjective Performance Evaluation: Evidence from Chinese State-Owned Enterprises. *The Accounting Review, 87*(5), 1555-1588.

Eckel, C. C., & Grossman, P. J. (2005). Managing Diversity by Creating Team Identity. *Journal of Economic Behavior & Organization, 58*(3), 371-392.

Eisenhardt, K. M. (1985). Control: Organizational and Economic Approaches. *Management Science, 31*(2), 134-149.

Evans III, J. H., Hannan, R. L., Krishnan, R., & Moser, D. V. (2001). Honesty in Managerial Reporting. *The Accounting Review, 76*(4), 537-559.

Fehr, E., & Fischbacher, U. (2004). Third-Party Punishment and Social Norms. *Evolution and Human Behavior, 25*(2), 63-87.

Fehr, E., & Gachter, S. (2000). Fairness and Retaliation: The Economics of Reciprocity. *Journal of Economic Perspectives*, 159-181.

Festinger, L. (1954). A Theory of Social Comparison Processes. *Human Relations, 7*(2), 117-140.

Fisher, A. (2011). Merit Alone May Not Get You That Promotion, from http://management.fortune.cnn.com/2011/08/24/merit-alone-may-not-get-you-that-promotion/?section=magazines_fortune

Gambetta, D. (1988). *Trust: Making and Breaking Cooperative Relations*: Basil Blackwell, New York.

Gergen, K. J., Morse, S. J., & Bode, K. A. (1974). Overpaid or Overworked? Cognitive and Behavioral Reactions to Inequitable Rewards1. *Journal of Applied Social Psychology, 4*(3), 259-274.

Gintis, H. (2000). Strong Reciprocity and Human Sociality. *Journal of Theoretical Biology, 206*(2), 169-179.

Goette, L., Huffman, D., & Meier, S. (2006). The Impact of Group Membership on Cooperation and Norm Enforcement: Evidence Using Random Assignment to Real Social Groups. *American Economic Review*, 212-216.

Greenberg, J. (1982). Approaching Equity and Avoiding Inequity in Groups and Organizations. *Equity and Justice in Social Behavior*, 389-435.

Guala, F. (2012). Reciprocity: Weak or Strong? What Punishment Experiments Do (and Do Not) Demonstrate. *Behavioral and Brain Sciences, 35*(01), 1-15.

Hamermesh, D. S., & Biddle, J. E. (1994). Beauty and the Labor Market. *American Economic Review, 84*(5), 1174-1194.

Han, E., Norton, E. C., & Stearns, S. C. (2009). Weight and Wages: Fat Versus Lean Paychecks. *Health Economics, 18*(5), 535-548.

Heider, F. (2013). *The Psychology of Interpersonal Relations*: Psychology Press.

Hollensbe, E. C., & Guthrie, J. P. (2000). Group Pay-for-Performance Plans: The Role of Spontaneous Goal Setting. *Academy of Management Review, 25*(4), 864-872.

Hoppe, F., & Moers, F. (2011). The Choice of Different Types of Subjectivity in Ceo Annual Bonus Contracts. *The Accounting Review, 86*(6), 2023-2046.

Itoh, H. (1993). Coalitions, Incentives, and Risk Sharing. *Journal of Economic Theory, 60*(2), 410-427.

Ittner, C. D., Larcker, D. F., & Meyer, M. W. (2003). Subjectivity and the Weighting of Performance Measures: Evidence from a Balanced Scorecard. *The Accounting Review, 78*(3), 725-758.

Johnson, N. D., & Mislin, A. (2008). Cultures of Kindness: A Meta-Analysis of Trust Game Experiments. *Working Paper*.

Jones, G. R., & George, J. M. (1998). The Experience and Evolution of Trust: Implications for Cooperation and Teamwork. *Academy of Management Review, 23*(3), 531-546.

Jorgenson, D. O., & Dunnette, M. D. (1973). Effects of the Manipulation of a Performance-Reward Contingency on Behavior in a Simulated Work Setting. *Journal of Applied Psychology, 57*(3), 271.

Kachelmeier, S. J., & Shehata, M. (1997). Internal Auditing and Voluntary Cooperation in Firms: A Cross-Cultural Experiment. *The Accounting Review*, 407-431.

Kaplan, R. S., & Atkinson, A. A. (1998). *Advanced Management Accounting*. Englewood Cliffs, NJ: Prentice Hall

Karau, S. J., & Williams, K. D. (1997). The Effects of Group Cohesiveness on Social Loafing and Social Compensation. *Group Dynamics: Theory, Research, and Practice, 1*(2), 156-168.

Kelly, J. R., Jackson, J. W., & Hutson-Comeaux, S. L. (1997). The Effects of Time Pressure and Task Differences on Influence Modes and Accuracy in Decision-Making Groups. *Personality and Social Psychology Bulletin, 23*(1), 10-22.

Kohn, A. (1993). Why Incentive Plans Cannot Work. *Harvard Business Review, 71*(5), 54-&.

Kohn, A. (1999). *Punished by Rewards: The Trouble with Gold Stars, Incentive Plans, A's, Praise, and Other Bribes*: Houghton Mifflin Harcourt.

Kramer, R. M., & Brewer, M. B. (1984). Effects of Group Identity on Resource Use in a Simulated Commons Dilemma. *Journal of Personality and Social Psychology, 46*(5), 1044.

Kramer, R. M., & Tyler, T. R. (1996). *Trust in Organizations: Frontiers of Theory and Research*: Sage.

Lewis, J. D., & Weigert, A. (1985). Trust as a Social Reality. *Social Forces, 63*(4), 967-985.

Locke, E. A., & Latham, G. P. (1990). *A Theory of Goal Setting & Task Performance*: Prentice-Hall, Inc.

Luft, J. L. (1997). Fairness, Ethics and the Effect of Management Accounting on Transaction Costs. *Journal of Management Accounting Research, 9*, 199-216.

Luft, J. L., & Libby, R. (1997). Profit Comparisons, Market Prices and Managers' Judgments About Negotiated Transfer Prices. *The Accounting Review*, 217-229.

Ma, C. (1988). Unique Implementation of Incentive Contracts with Many Agents. *Review of Economic Studies, 55*(4), 555-572.

Malhotra, D., & Murnighan, J. K. (2002). The Effects of Contracts on Interpersonal Trust. *Administrative Science Quarterly, 47*(3), 534-559.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An Integrative Model of Organizational Trust. *Academy of Management Review, 20*(3), 709-734.

McAllister, D. J. (1995). Affect-and Cognition-Based Trust as Foundations for Interpersonal Cooperation in Organizations. *Academy of Management Journal, 38*(1), 24-59.

McLeish, K. N., & Oxoby, R. J. (2007). Identity, Cooperation, and Punishment: Working paper.

Mobius, M. M., & Rosenblat, T. S. (2006). Why Beauty Matters. *American Economic Review*, 222-235.

Moers, F. (2005). Discretion and Bias in Performance Evaluation: The Impact of Diversity and Subjectivity. *Accounting, Organizations and Society, 30*(1), 67-80.

Moore, D. A., & Healy, P. J. (2008). The Trouble with Overconfidence. *Psychological Review, 115*(2), 502.

Oosterbeek, H., Sloof, R., & Van De Kuilen, G. (2004). Cultural Differences in Ultimatum Game Experiments: Evidence from a Meta-Analysis. *Experimental Economics, 7*(2), 171-188.

Orbell, J. M., van de Kragt, A. J. C., & Dawes, R. M. (1988). Explaining Discussion-Induced Cooperation. *Journal of Personality and Social Psychology, 54*(5), 811-811.

Persico, N., Postlewaite, A., & Silverman, D. (2004). The Effect of Adolescent Experience on Labor Market Outcomes: The Case of Height. *Journal of Political Economy, 112*(5), 1019-1053.

Pfeffer, J., & Langton, N. (1993). The Effect of Wage Dispersion on Satisfaction, Productivity, and Working Collaboratively: Evidence from College and University Faculty. *Administrative Science Quarterly*, 382-407.

Prendergast, C., & Taper, R. H. (1996). Favoritism in Organizations. *Journal of Political Economy, 104*(5), 958-978.

Ring, P. S., & Van de Ven, A. H. (1992). Structuring Cooperative Relationships between Organizations. *Strategic Management Journal, 13*(7), 483-498.

Rousseau, D. M. (1998). Why Workers Still Identify with Organizations. *Journal of Organizational Behavior, 19*(3), 217-233.

Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not So Different after All: A Cross-Discipline View of Trust. *Academy of Management Review, 23*(3), 393-404.

Rowe, C. (2004). The Effect of Accounting Report Structure and Team Structure on Performance in Cross-Functional Teams. *The Accounting Review, 79*(4), 1153-1180.

Smith, J. B., & Barclay, D. W. (1997). The Effects of Organizational Differences and Trust on the Effectiveness of Selling Partner Relationships. *Journal of Marketing*, 3-21.

Solow, J. L., & Kirkwood, N. (2002). Group Identity and Gender in Public Goods Experiments. *Journal of Economic Behavior & Organization, 48*(4), 403-412.

Sprinkle, G. B. (2000). The Effect of Incentive Contracts on Learning and Performance. *The Accounting Review, 75*(3), 299-326.

Sunder, S. (2002). Management Control, Expectations, Common Knowledge, and Culture. *Journal of Management Accounting Research, 14*(1), 173-187.

Sweeney, P. D. (1990). Distributive Justice and Pay Satisfaction: A Field Test of an Equity Theory Prediction. *Journal of Business and Psychology, 4*(3), 329-341.

Tanaka, T., & Camerer, C. F. (2009). Status and Ethnicity in Vietnam: Evidence from Experimental Games *Social Computing and Behavioral Modeling* (pp. 1-2): Springer.

Tanghe, J., Wisse, B., & Van Der Flier, H. (2010). The Role of Group Member Affect in the Relationship between Trust and Cooperation. *British Journal of Management, 21*(2), 359-374.

Tenbrunsel, A. E., & Messick, D. M. (1999). Sanctioning Systems, Decision Frames, and Cooperation. *Administrative Science Quarterly, 44*(4), 684-707.

Tesser, A. (1988). Toward a Self-Evaluation Maintenance Model of Social Behavior. *Advances in Experimental Social Psychology, 21*(181-228).

Towry, K. L. (2003). Control in a Teamwork Environment - the Impact of Social Ties on the Effectiveness of Mutual Monitoring Contracts. *The Accounting Review, 78*(4), 1069-1095.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the Social Group: A Self-Categorization Theory*: Basil Blackwell.

Van Knippenberg, D. (2000). Work Motivation and Performance: A Social Identity Perspective. *Applied Psychology, 49*(3), 357-371.

Van Lange, P. A., & Liebrand, W. B. (1989). On Perceiving Morality and Potency: Social Values and the Effects of Person Perception in a Give-Some Dilemma. *European Journal of Personality, 3*(3), 209-225.

Vroom, V. H. (1964). Work and Motivation, 1964. *NY: John Wiley &sons*, 47-51.

Wellins, R. S., Byham, W. C., & Dixon, G. R. (1994). *Inside Teams: How 20 World-Class Organizations Are Winning through Teamwork*. San Francisco, CA: Jossey-Bass.

Wickens, T. D., & Keppel, G. (2004). *Design and Analysis: A Researcher's Handbook*: Englewood Cliffs, NJ: Prentice-Hall.

Wit, A. P., & Wilke, H. A. (1992). The Effect of Social Categorization on Cooperation in Three Types of Social Dilemmas. *Journal of Economic Psychology, 13*(1), 135-151.

Yamagishi, T., & Kiyonari, T. (2000). The Group as the Container of Generalized Reciprocity. *Social Psychology Quarterly, 63*(2), 116-132.

Zhang, Y. (2008). The Effects of Perceived Fairness and Communication on Honesty and Collusion in a Multi-Agent Setting. *The Accounting Review, 83*(4), 1125-1146.

VITA

HUI XU

XU was born in Youyi, Heilongjiang, China. She attended public schools in Hongxinglong, Heilongjiang, received a B.A. in Accounting from Harbin University of Science and Technology, Harbin, Heilongjiang, in 2001 and a M.A. in Accountancy from University of Alabama, Tuscaloosa, Alabama in 2008 before coming to Georgia Tech to pursue a doctorate in Accounting. When she is not working on her research, Ms. Xu enjoys cooking, music, and Zumba.