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I am submitting herewith a dissertation written by Jacquelyn Suzanne DeMatteo entitled "Rewarding the Team: An Investigation of the Direct and Indirect Effects of Team-Based Reward Practices on Team Cooperation and Performance." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Industrial/Organizational Psychology.

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**REWARDING THE TEAM:
AN INVESTIGATION OF THE DIRECT AND INDIRECT EFFECTS OF
TEAM-BASED REWARD PRACTICES ON TEAM COOPERATION AND
PERFORMANCE**

A Dissertation
Presented for the
Doctor of Philosophy Degree
The University of Tennessee, Knoxville

Jacquelyn Suzanne DeMatteo

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DEDICATION

This dissertation is dedicated to my parents

Joseph and Claudia DeMatteo

for their love and support over the years

and

Gregory H. Dobbins

for the influential role he played

in my personal and professional development during graduate school.

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ABSTRACT

The movement toward team-based approaches to organizing work has resulted in experimentation with alternative human resource practices. Rewards contingent upon team, rather than individual, performance represent one such practice. The primary purpose of the present study was to extend current research on team rewards by examining the direct and indirect effects of several reward characteristics (reward size, frequency of reward payout, allocation method) on team behavior and performance. Secondly, affective reactions to team rewards, as well as determinants of those reactions, were explored in an attempt to explain additional variance in team cooperation. These issues were investigated in a field study involving 330 employees and 46 team leaders representing 57 teams from 10 different organizational units. Multiple data sources were utilized to provide a more methodologically rigorous test of the proposed hypotheses. Analyzing data at the team level, several significant predictors of satisfaction with team rewards were identified, including perceived outcome interdependence and justice perceptions. Frequency of reward payout was significantly related to perceived outcome interdependence among team members. In addition, reward size was directly related to team performance. No support for the mediating role of perceived outcome interdependence or affective reactions was found. Results are discussed for their theoretical and applied significance.

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CHAPTER I

INTRODUCTION

Today's organizations are increasingly using groups and teams as primary work units (Dumaine, 1994; Guzzo & Shea, 1992). In a 1990 survey of Fortune 1,000 companies, for example, 51% reported having more than 20% of employees in teams (Lawler, Mohrman, & Ledford, 1992). Similarly, in a 1992 survey of U.S. companies, 82% indicated that at least some employees belonged to working groups identified as teams (Gordon, 1992). We use the term work groups, work teams, and small groups to mean "interdependent collections of individual who share responsibility for specific outcomes for their organization" (Sundstrom, DeMeuse, & Futrell, 1990). The shift toward work teams comes during a larger paradigm change concerning the design of organizations and the properties of systems for managing performance (Hammer, 1990; Mohrman, Mohrman & Lawler, 1992), including innovative reward systems. Specifically, the growing prevalence of teams has encouraged organizations to experiment with alternative reward systems that will support this new way of organizing work. Among other new practices, organizations are adopting *team reward systems* in which group members' pay is at least partly contingent on measurable group performance. These systems are developing particularly in environments where interdependence among jobs makes it difficult to separate the contributions of individual workers (Nickel & O'Neal, 1990). A survey of 1,598 organizations by the American Productivity Center found that 14.8% had small group bonus systems to reward natural work groups or autonomous teams (O'Dell, 1987). Another survey found 12% of organizations applying gainsharing incentives to work units smaller than the organization (Bialkowski, 1991).

Small group and team-based incentives have been described as one of the "newest and fastest growing reward strategies" (Nickel & O'Neal, 1990, p.23). Work team and small group incentives include any arrangement for a group of employees to receive a variable award based on measured performance against a target (Gross, 1993). Under work group or team incentive systems, bonuses or other financial compensation are tied to short-term or long-term work group performance (Lawler et al., 1992). In the following discussion, the terms incentives and rewards are used interchangeably, although it is recognized that they have slightly different meanings in practice (i.e., incentives are intended to cause rather than merely reward or reinforce desired outcomes, Patten, 1977).

There is a growing body of literature examining the effectiveness of this emerging alternative reward strategy. A 1987 study by the American Productivity Center has revealed that 75% of organizations using small group incentives indicate that the overall performance impact of this non-traditional reward practice has been positive or very positive (O'Dell, 1987). Similarly, Lawler et al. (1992) reported that work group or team incentives were rated as successful or very successful by 61% of the organizations using them. In addition to their perceived effectiveness, there is also evidence of increasing use. Specifically, Lawler et al. (1992) reported that 66% of the organizations surveyed in 1990 indicated an intent to increase the use of work group or team incentives. Follow-up data indicates that, while the use of gainsharing plans demonstrated rapid growth between 1987 and 1990, it appears to have plateaued, while the use of team-based incentives continues to increase (Lawler, Mohrman & Ledford, 1995).

In designing team reward systems, practitioners can draw on several decades of empirical research on groups (e.g., Guzzo & Shea, 1992). Unfortunately, the vast majority of this research provides often indirect and inconclusive guidance. Most research has been conducted in laboratories, under artificial conditions (see Johnson et al, 1981; Rosenbaum et al., 1980). While these lab-based studies offer critical insight, they suffer in

terms of generalizability to organizational settings. The typical lab conditions (e.g., the use of "tower building" tasks) are far removed from team conditions in organizations where complex and important tasks are undertaken, sometimes over prolonged periods of time. Moreover, team tasks in organizations usually have a substantial impact on team members, financially and professionally. Consequently, it is difficult to draw definitive conclusions from existing literature regarding the effectiveness of team rewards in organizations.

A few empirical field-based studies have directly assessed the impact of group reward systems on team effectiveness (e.g., Pritchard, Jones, Roth, Stuebing, & Ekeberg, 1988; Wageman, 1995), but these comprise only a small fraction of the huge research literature on groups (Bettenhausen, 1991) and have produced inconclusive findings. Despite the dearth of field-based research, organizations have begun to incorporate team- or group-level incentives in their reward systems (Lawler et al., 1992; Nickel & O'Neal, 1990; O'Dell, 1987) and recent evidence indicates that this trend is increasing (Ledford et al, 1995). In effect, current practice regarding team reward systems has perhaps moved ahead of its basis in empirical research. This situation has prompted the need to understand whether or not team incentives are effective and the factors that impact their effectiveness.

The implicit assumption when implementing a team-based reward or pay system is that it will change employee behavior in a way that will improve team and, ultimately, organizational performance (Lawler & Jenkins, 1992). Specifically, it is believed that under conditions of task interdependence, a group-level reward will foster teamwork, increase cooperation among team members, and enhance the group's performance. Despite the intuitive appeal of these arguments, researchers know very little about the mechanisms through which small group-based rewards operate to affect the behavior of individuals in team settings. Moreover, several factors may attenuate the ability of group-based rewards to enhance group effectiveness. For example, high performers may feel inequitably treated when rewarded at the same level as poorer performers in the same group (Lawler &

Jenkins, 1992). In addition, employees may not have a thorough understanding of the procedures used to allocate rewards. As a result, both procedural and distributive justice may be sacrificed when using team based rewards. Finally, team-based rewards may not lead to favorable group outcomes if team members perceive that their team has insufficient ability to reach its goals and, hence, receive a bonus.

An important question that remains unanswered concerns the effectiveness of using team-based rewards in team-based organizational environments. While there is extensive research on individual incentives and rewards, the research on group-based incentives is sparse. Moreover, large scale survey data exists regarding the effectiveness of team based incentives at the organizational level (e.g., O'Dell, 1987), but there are virtually no studies examining effectiveness at the group level. Specifically, there is little research conducted in organizational settings that has examined the mechanism through which group bonuses influence behavior, attitudes, and performance. The literature on team-based rewards suggests two alternative, but not mutually exclusive, models of the effects of team-based rewards on group outcomes. Reward system characteristics may have a direct effect on group-level outcomes. Alternatively, reward systems may impact group outcomes through the creation of the psychological experience of "outcome" interdependence or through affective reactions to characteristics of the reward system (e.g., Tjosvold, 1986).

To gain a more thorough understanding of these issues, a field-based study was conducted. This study represents an attempt to investigate the dynamics of team-based rewards in the context of relevant theoretical models. A framework is presented which integrates the literature that bears on the relationships between reward and team characteristics, reactions to team-based pay, cooperation in teams, and team performance. This work serves two major purposes. First, it seeks to empirically examine theoretical predictions regarding the effects of various team-based reward practices in an organizational context. Secondly, it extends previous research by examining specific

characteristics of the reward system and the mechanisms through which team-based rewards influence cooperation and performance.

Three objectives are pursued to increase our understanding of team-based rewards. First, the direct and indirect effects of reward characteristics on group outcomes are investigated to determine the process by which team-level rewards influence team cooperation and performance. Second, differences in the implementation of team-based rewards are examined to determine whether these differences influence the effectiveness of team rewards on multiple criteria. Third, the determinants of perceived outcome interdependence and satisfaction with team-based rewards are explored.

CHAPTER II

REVIEW OF THE LITERATURE

INTRODUCTION

The importance of cooperative behavior for organizational effectiveness is increasingly recognized by researchers and practitioners (Shamir, 1990). Studies of "high commitment" (Walton, 1980) and "high involvement" (Lawler, 1982) organizations emphasize the importance of teams and recent evidence suggests that the use of teams in organizations shows no signs of decline (Ledford et al., 1995; Shamir, 1990). The continued growth of team-based approaches to organizing work has highlighted the need to identify methods to foster and reinforce teamwork among members and to support a team-based organizational culture.

Several theoretical models have identified reward systems as a critical contextual antecedent of positive group outcomes, yet we still know very little about the specific type, form, or size of rewards that maximizes effectiveness in work groups (Magjuka & Baldwin, 1991). One type of reward strategy that has gained popularity is the use of team-based rewards in which group members' pay is at least partly contingent on measurable group performance. Organizations have begun to incorporate team- and small group-level incentives in their reward systems, particularly in environments where interdependence among jobs makes it difficult to separate the contributions of individual workers (Lawler et al., 1992; Nickel & O'Neal, 1990; O'Dell, 1987). For example, a survey of 1,598 firms reported that 14.8% used small-group bonus systems to reward natural work group or autonomous teams. Moreover, the use of work team incentives has continued to increase (Lawler et al., 1995). The most recent evidence to date indicates that 70% of Fortune 1000 firms use some form of team bonus, with 17% of those organizations applying these bonuses to at least 40% of their work force (Ledford et al., 1995). Despite the rapid

growth in the implementation of team-based reward and incentive systems, there is little empirical research examining their effectiveness in work organizations. In essence, current practice regarding team-based rewards has moved beyond its basis in empirical literature. This situation underscores the need to understand whether or not team-based incentives will deliver their intended effects and under what conditions are they most effective.

The Role of Rewards

Compensation strategy is the "deliberate utilization of the pay system as an essential integrating mechanism through which the efforts of various sub-units and individuals are directed toward the achievement of an organization's strategic objectives" (Gomez-Mejia & Balkin, 1992, p. 35). Reward systems in particular are key management tools that can contribute to a firm's effectiveness and influence individual and group behavior in organizations (Lawler, 1981). The vast majority of literature on individual motivation supports the view that extrinsic rewards such as pay can have a significant impact on performance (Lawler, 1981; Lawler, 1990; Vroom, 1964). Moreover, performance-contingent pay has been advocated as a way to engender high workplace productivity. Evidence accumulated from research on pay practices (e.g., Fein, 1973), reinforcement theory (e.g., Yukl & Latham, 1975), expectancy theory (e.g., Cammann & Lawler, 1973), and goal setting (e.g., Pritchard & Curtis, 1973) has consistently shown that performance-contingent rewards influence productivity more than noncontingent rewards (i.e., hourly wages) (see Wagner, Rubin, & Callahan, 1988 for a review). Moreover, research has demonstrated that an effective pay system can increase the motivation of individuals to perform by as much as 40% (Nalbantian, 1987; Kerr, 1975; Blinder, 1990). The potential impact of rewards on group behavior is underscored by their inclusion in most current models of work group effectiveness (e.g., Campion, et al, 1993; Gladstein, 1984; Hackman, 1990; Shea & Guzzo, 1987b; Sundstrom, DeMuse, & Futrell, 1990).

Despite the fact that individual pay systems *can* be an important motivator of performance, in many cases they are not, especially in team-based organizations (Lawler, 1981). Organizations are finding that individually-based reward systems are not appropriate in today's team-based organizational environments (Geber, 1995; Levine, 1994). As a result, firms are experimenting with alternative methods of rewarding team members with the hope of finding a way to sustain a motivated and committed work force (O'Dell, 1989). One practice that is gaining popularity is the use of team-based rewards and incentives. Team-based rewards include any arrangement for a group of employees to receive a variable award based on increased performance against a target (Gross, 1993).

Reasons for Adopting Team-based Rewards

Several factors have contributed to the growing popularity of team-based reward systems. One of the primary reasons is the growing interdependence between jobs (Johnson, 1993; Mohrman et al., 1992). Changes in the way work is organized, the flattening of organizations, and changing technology have created unprecedented interdependencies between jobs and tasks (Patten, 1977). This interdependence typically makes it difficult to separate the contributions and performance of individual workers (Nickel & O'Neal, 1990). Research in the field of performance appraisal suggests that in some cases, performance can be more accurately assessed by measuring the performance of larger units within an organization, rather than individual performance (e.g., Landy & Farr, 1983). Research has also shown that it is often difficult for a supervisor to evaluate an employee's performance without being influenced by other employees within the group (Dobbins, Cardy & Carson, 1991) and high levels of interdependence make it difficult to separate the contributions of individual team members (Liden & Mitchell, 1983). Collectively, these findings suggest that when tasks are interdependent, performance may be more accurately and reliably measured at the team level (Gomez-Mejia & Balkin, 1992).

The increasing use of teams has also highlighted the need to foster cooperative team environments and provide a mechanism to influence the collective motivation of team members (Shamir, 1990). Reward contingencies have the potential to encourage either a cooperative or a competitive work environment, a critical distinction in today's team-based environments. It has been argued that the structure and allocation of rewards can impact the interdependence and coordination within groups (Tjosvold, 1986), the motivation of individuals to contribute to the group's goals (Lawler, 1981; Wagner, Rubin & Callahan, 1988), and the quality of the group process that develops among team members (Shea & Guzzo, 1987a). In essence, different reward contingencies can either encourage a group of individuals to work cooperatively as a team or as a collection of individual competing against each other (Kelly & Thibault, 1969). Focusing on individual rather than team outcomes may "undermine the social foundations needed to succeed in a cooperative setting" (Gomez-Mejia & Balkin, 1992, p. 262). Moreover, a fundamental proposition underlying team rewards is that if incentives are tied to group performance, employees will be motivated to assist the group in achieving high performance in order to maximize their personal gain (Cooke, 1994).

Theoretical and Empirical Evidence

Several lines of research have emerged which support the current movement toward the use of team-based rewards. The roots of this research can be traced to the pioneering work of Deutsch (1949a; 1949b). Deutsch (1949a) proposed a theory of cooperation and competition in small groups in which the perceived compatibility of goals was believed to influence the social interaction among group members. Specifically, when outcomes contingent on team performance are distributed to team members equally (i.e., cooperatively), each team member has an incentive to work cooperatively and to engage in behaviors which contribute to the accomplishment of the group's goals (Deutsch, 1949b). Conversely, when outcomes are distributed to team members based on individual effort (i.e., competitively), each member has an incentive to excel beyond the level of performance of fellow group

members in order to obtain a larger share of the competitively-distributed reward. In this situation, goals are achieved though the occurrence of "blocking" behaviors (i.e., withholding resources, failing to help others, sabotage). Based on this reasoning, Deutsch (1949b) suggested that for team members to work together effectively, their goals must be interdependent and compatible. Rewards play an important role in establishing a group's goal structure which can, in turn, influence group outcomes. According to Kelley and Thibault (1969), the manner in which rewards are distributed motivate individuals to behave cooperatively, competitively, or individualistically. Rewards can enhance team cooperation and performance if they produce a "win-win" situation among team members in which all team members benefit if the team is successful (Deutsch, 1949b).

The hypotheses set forth by Deutsch and others (e.g., Kelley & Thibault, 1969) led to a large number of laboratory-based studies investigating cooperative versus competitive goal structures on team behavior. These studies sometimes produced conflicting results. For example, several studies found greater productivity under competitive reward conditions than under cooperative reward conditions (e.g., Scott & Cherrington, 1974; Weinstein & Holtzback, 1972), while others reported greater productivity under cooperative reward conditions (e.g., Deutsch, 1949b; Grossack, 1954). These early, predominantly laboratory-based studies were reviewed by Miller and Hamblin (1963), Johnson et al. (1981) and Cotton and Cook (1982).

In the first review of this research, Miller and Hamblin (1963) examined the role of reward allocation procedures (e.g., competitively versus cooperatively distributed outcomes) on group performance in 24 studies. They concluded that the strength and direction of the effect of reward allocation procedures on group performance was influenced by the level of task interdependence among group members. When task interdependence was high, rewards distributed equally resulted in greater productivity than when rewards were distributed competitively. In a later review of 122 studies, Johnson et

al. (1981) found cooperative goals structures were superior to competitive goal structures in promoting productivity in groups. In a re-analysis of the same studies, Cotton and Cook (1982) concluded that neither cooperative nor competitive rewards are necessarily superior in promoting productivity; rather, situational characteristics such as task interdependence moderate the effect of group rewards on group effectiveness (e.g., Rosenbaum, Moore, Cotton, Cook, Hiester, Shovar, & Gray, 1980). Taken together, these studies provide evidence that under conditions of task interdependence, rewards based on group rather than individual performance, are associated with higher levels of productivity.

Recent laboratory research has continued to examine these issues, although much less frequently, and has yielded somewhat different conclusions. For example, Stoneman and Dickinson (1989) examined the effects of small-group incentive plans on performance of a simple assembly task in a simulated work environment and found no significant changes in individual performance as a result of group incentives. In a lab study utilizing a tower building task, Konovsky and Podsakoff (1993) found that incentives had no effect on productivity when the task was independent but, when the task was interdependent, individual incentives lowered group productivity. While individual incentives led to a greater number of blocks being handled by the team, individual incentives also led to a decrease in task efficiency and resulted in a greater number of blocks being dropped. Interestingly, whether or not group incentives were present had almost no effect on productivity, satisfaction, total number of blocks handled, or efficiency¹. However, group incentives did influence the turn-taking measure. Regardless of task interdependence, turn-taking occurred more frequently when the group incentive was present and the individual incentive was absent. Hofmann and Salter (1995) examined perceptions of distributive justice as a function of task interdependence, reward interdependence, and the ability of

¹ Note: This was possible because three conditions were used in the Konovsky & Podsakoff (1993) study resulting in 8 different experimental conditions: Task Interdependence (independent vs. interdependent), Individual Incentive (present or not present), Group Incentives (present or not present).

one's team-mates. Results of this laboratory study supported a complex, three-way interaction such that whether or not reward and task interdependence resulted in perceptions of fairness was contingent on the perceived ability of the other members of the team. For example, when the task was independent and the team received a group-based bonus, perceptions of fairness were highest when the individuals were paired with comparably skilled members. In concert, these studies suggest that the use of team-based rewards may not have the intended effects on group performance. Moreover, the results of the research of Hofmann & Salter (1995) suggest that reactions to team pay are complex and may be a function of a variety of factors, including perceptions of the team's ability.

Together, these lab-based studies offer critical insight into the effects of cooperative versus competitive reward allocation procedures. However, contextual factors operating in organizations make it difficult to generalize from lab research where conclusions are based on artificial tasks (e.g., adding numbers, tower building with blocks) in contrived settings, over short time periods. Clearly, laboratory conditions such as these are far removed from team conditions in organizations where complex and important tasks are undertaken, often over prolonged periods of time, with significant consequences for the organizational members. Consequently, conclusions drawn from this literature regarding the effectiveness of team rewards in organizations must be viewed as tentative.

Recognizing the need for research in organization, several studies have examined similar research hypotheses in field settings. Gomez-Mejia and Balkin (1989) compared individual and aggregate compensation strategies for research and development employees and found that individually-based rewards were less effective than aggregate plans. Specifically, team-based bonus policies led to higher levels of pay satisfaction, higher ratings of project and individual performance, and reduced withdrawal cognitions. Using an interrupted time series design, Wagner, Rubin, and Callahan (1988) found significant increases in productivity after the introduction of a group incentive system in a non-

managerial, unionized sample. In a large-scale field study of 80 service teams, Campion, Medsker, and Higgs (1993) found that perceptions of interdependent feedback and rewards were positively related to team-member satisfaction and manager's judgments of the satisfaction of team members. In a recent replication using 60 teams, Campion, Pepper, and Medsker (1995) again found significant positive relationships between perceptions of interdependent feedback and rewards and team member satisfaction, team effectiveness ratings, and managerial ratings of team effectiveness at two time periods, although no relationship was found with actual performance evaluations. Moreover, perceptions of interdependent feedback and rewards was consistently related to, among other variables, several group process measures (potency, social support, workload sharing, and communication/cooperation within the team). Unfortunately, the subjects in these studies by Campion and his colleagues did not involve employees covered under team-based reward systems, making it difficult to generalize these findings to situations in which an employee's pay is truly contingent on group performance measures.

Somewhat different conclusions have been reached by other field researchers. For example, Pritchard et al., (1988) demonstrated that the addition of group incentives to a system that already included performance feedback and goal-setting, increased performance by only one percent. In a qualitative field study of 39 health care workers, Tjosvold (1988) found that perceptions of rewards for group success was cited as a primary reason for the development of goal interdependence among team members by only 13% of subjects. In contrast, a sense of shared purpose and common tasks were cited as primary reasons for the development of goal interdependence by 41% and 26% of subjects, respectively. Gladstein (1984) found that rewarding teams for high sales did not increase their performance although team rewards did impact the teams internal performance management system. Likewise, team-based financial rewards did not explain unique variance in perceived effectiveness of team-based employee involvement programs over and above

access to information, team heterogeneity, and team size (Magjuka & Baldwin, 1991). In a recent field experiment, Wageman (1995) found that the degree of task interdependence among group members was positively related to cooperation, helping, job satisfaction, and the quality of the group's process, while the type of reward system used (individual rewards, group rewards, or a combination of the two) exerted no independent effects on these dependent variables. These findings challenge the assumption that team rewards foster cooperative behavior in teams. Moreover, teams receiving individually-based rewards exhibited stronger norms promoting effort and higher internal work motivation than did groups receiving team-based or hybrid (i.e., team plus individual) rewards. Finally, no significant performance differences were detected between teams receiving individual versus group rewards. In concert, the results of these field studies provide mixed support for the effectiveness of team rewards, as compared to individually-based practices and underscore the need to further examine the use of team-based rewards in organizational settings.

Overall, empirical studies raise more questions than answers regarding the effects of team-based rewards on group and organizational effectiveness. Despite the intuitive appeal of the assumption that team-based rewards can foster team performance, the field-based empirical evidence is limited and inconclusive. Moreover, the majority of the early empirical data has come from the laboratory. As a result, the validity of the underlying assumption that individuals who work in groups and receive group-level, rather than individually-based, rewards will be more cooperative and more productive, remains equivocal. In addition, the studies that have been conducted have overwhelmingly adopted a simplistic view of team rewards. Specifically, most studies have examined the use of team- versus individually-based rewards without considering differences in implementation that may influence the effectiveness of team rewards (e.g., How frequently should rewards

be distributed?; What is the optimal reward size?). This omission has left the practitioner with little guidance to aid in the design of team-based reward systems.

Considering the growing prevalence of team-based approaches to organizing work and the increased use of team-based rewards, the limited amount of field-based research is disturbing. While there is extensive research on individual incentives and rewards, the research on team-based incentives in organizational settings is sparse. Moreover, little attention has been given to questions of how and why team-level rewards should affect group functioning and under what circumstances they will be most effective. In the following section, a process by which group-based rewards may lead to enhanced group performance is articulated.

A Framework of the Proposed Relationships Among the Study Variables

In Figure 2.1, a framework is presented to illustrate the proposed relationships among the variables investigated in this study. This framework is an initial attempt to integrate the diverse literature's that bear on the relationship between reward system characteristics, group and task characteristics, and group effectiveness. As can be seen, the core of the model includes the basic tenets of goal linkage theory (Tjosvold, 1984; 1986; 1988). Specifically, reward and task interdependence are believed to be related to perceptions of outcome interdependence, the subjective experience of shared contingencies among team members. Perceptions of outcome interdependence are hypothesized to be related to a group-level interaction pattern characterized by cooperative team behavior (information sharing and helping behavior; Tjosvold, 1986) which, in turn, is hypothesized to account for a significant amount of variance in team performance. Outcome interdependence is hypothesized to be influenced by reward characteristics (reward size, frequency of payout, and allocation method) and perceived task interdependence. Reward characteristics are also hypothesized to have direct effects on group behavior and performance, consistent with the literature on job design (e.g., Thompson, 1967; Van de

Ven, Delbecq, & Koenig, 1976) and pay practices (Lawler, 1981). Several moderated relationships are hypothesized. For instance, group size is postulated to moderate the relationship between indicators of reward intensity (size of reward and frequency of payout) and perceived outcome interdependence. In addition, reward allocation practices (equal vs. equitable) are expected to moderate the relationship between reward intensity and cooperative team behavior such that increases in reward intensity (larger or more frequent rewards) will only lead to cooperation if rewards are allocated according to an equality principle, rather than an equity principle (see Figure 2.1).

Given the number of organizations that have been unsuccessful in their experimentation with team rewards (Dumaine, 1994), it is evident that the use of structural arrangements alone (i.e., changes in the reward system) do not guarantee effective group performance. Consequently, several additional variables expected to be involved in the relationship between reward characteristics and team cooperation and performance are included in this investigation. It is proposed that an understanding of the team's affective reaction to team-based rewards is critical to understanding cooperation and performance in teams receiving rewards based on group rather than individual performance. As a result, Figure 2.1 also depicts a direct relationship between satisfaction with team rewards and cooperative team behavior. In addition, satisfaction with team-based rewards is believed to mediate the relationship between team characteristics and team cooperation.

This research also seeks to identify predictors of satisfaction with team rewards. While there is little research exploring factors that influence satisfaction with team-based rewards, the literature on equity theory and expectancy theory of motivation was used to generate predictions regarding correlates of satisfaction with team rewards. Drawing from this literature, it is proposed that reward characteristics and task interdependence as well as perceptions of collective efficacy and perceived fairness in reward allocation procedures will have direct effects on satisfaction with team-based rewards.

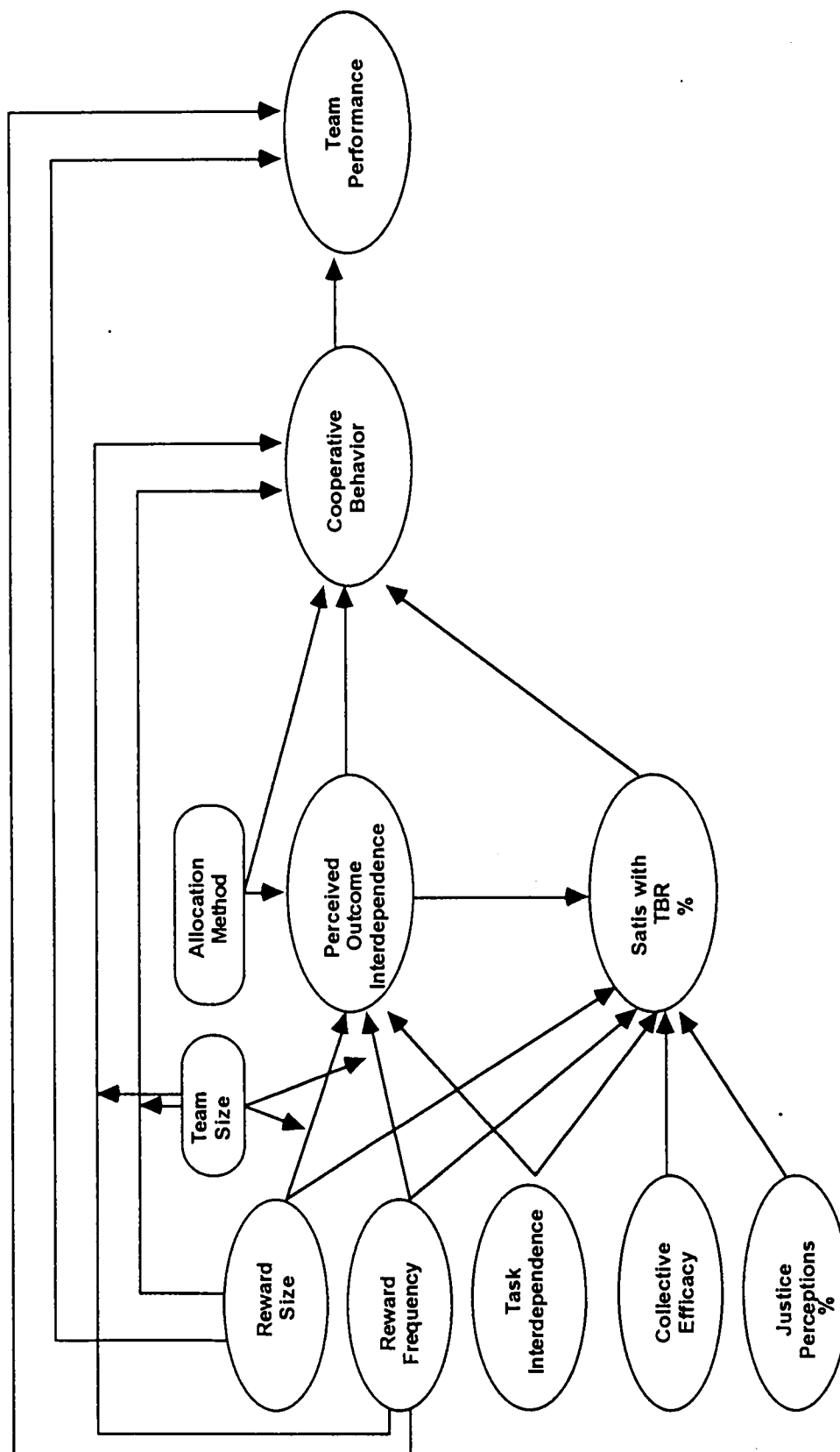


FIGURE 2.1

Framework of Proposed Relationships Among Study Variables

Merits of the Research

This research represents the first attempt to integrate and test the predictions from diverse theoretical models such as goal linkage theory (Tjosvold, 1984; 1988), Shea and Guzzo's (1987) model of work team effectiveness, and motivation theory (e.g., Vroom, 1964) with respect to the antecedents and consequences of reactions to team-based pay systems. The framework presented in Figure 2.1 represents a synthesis of these theoretical perspectives, with the addition of relevant moderator variables. Current theoretical developments in the study of collective work motivation (e.g., Karau & Williams, 1993) are also integrated to explain how collective efficacy may be related to reactions to team-based reward practices. An understanding of task and reward interdependence is extended (e.g., Cotton & Cook, 1982; Hofmann & Salter, 1995) by examining these variables in an organizational setting and by allowing for a test of the mediating role of outcome interdependence in understanding cooperative group behavior (Wageman 1995). In addition, research on organizational citizenship behavior (OCB; Organ, 1988b) is extended by examining the effects of team-based reward practices on OCB within teams. Examining reactions of the recipients of team-based rewards extends previous field-based research which has tended to adopt an organization-level focus and has relied on the opinions of others (e.g., Human Resources Directors) to derive conclusions about the effectiveness of team reward practices (e.g., O'Dell, 1987; Lawler et al., 1992; Ledford et al., 1995; for an exception, see Wageman, 1995). Finally, the hypotheses were tested using field-based data from employees representing 57 different teams across 10 organizational units. In the next section, the criteria of effectiveness investigated in the present study will be described.

Team Effectiveness: Cooperative Behavior and Performance in Groups

Proponents of the use of team-based incentives point to improved group functioning as a primary reason for their use. In the present study, several aspects of group functioning are empirically examined. Specifically, team-based rewards are

hypothesized to result in an interaction pattern characterized by cooperative behavior among team members, including information sharing and helping behavior among team mates. Team-based rewards are also expected to impact the level of performance achieved within the group. These criteria of effectiveness were selected based on the extensive literature on group functioning (e.g., Bettenhausen, 1991; Campion et al, 1993; Stevens & Campion, 1994; Wageman, 1995), predictions from expectancy theory (Vroom, 1964; Lawler, 1982), and research on organizational citizenship and pro-social behavior (Manogran & Conlon, 1995; Organ, 1988b; Smith, Organ, & Near, 1983). Each criteria of effectiveness will be briefly reviewed to demonstrate their relevance for the present research.

Information Sharing. Information sharing has been identified by a number of researchers as a critical component of effective group functioning (e.g., Barnard & Rush, 1995; Campion et al., 1993; Stevens & Campion, 1994). One of the primary reasons for establishing teams is to facilitate communication and information exchange among employees with the expectation that pooled information and shared resources will result in higher levels of group, and ultimately, organizational effectiveness (Barnard & Rush, 1995). Moreover, previous research has shown that reward systems can have a significant impact on the extent to which team members exchange resources and information (e.g., Johnson et al., 1981; Tjosvold, 1986). Given that in organizations utilizing team-based rewards, a component of one's total compensation is dependent on the extent to which one's team reaches its goals, it is instrumental for team members to work together and share information, rather than exhibiting competitive behavior. As a result, the extent to which team-based pay practices influence information-sharing among team members is an important concern.

Helping Behavior. Current research on organizational citizenship behavior and pro-social organizational behavior point to the potential effects of reward characteristics on helping behavior among team-mates. For example, Smith et al. (1983) suggested that

characteristics of a team's environment could affect the extent to which citizenship behavior among team members would occur. Specifically, Smith et al. (1983) hypothesized that teams characterized by reciprocal interdependence would exhibit higher levels of citizenship behavior than teams characterized by sequential or independent task interdependence, possibly by fostering norms of cooperation, helping and sensitivity to others. Similarly, Anderson and Williams (1996) have argued that task interdependence may directly affect individuals helping behavior by increasing the opportunity for interaction and cooperation, as well as stimulating a recognition of the need for coordination of effort to solve problems. Interestingly, despite a sound theoretical basis for these predictions, most studies have not found empirical support for the relationship between task interdependence and helping behavior (e.g., Anderson & Williams, 1996; Settoon, Kidwell, & Bennett, 1994; Smith et al, 1983; see Wageman, 1995 for an exception). It may be that in a team-based environment, task interdependence is not enough to trigger helping behavior among team members. Perhaps outcomes contingent on the group's performance coupled with interdependent tasks are needed to foster team-level helping behavior (cf. Saavedra et al., 1994). That is, it is reasonable to assume that organizational arrangements such as team-based rewards create an awareness of the need for supportive and cooperative group behavior within the group while also signaling the instrumental value of helping among team members.

Team Performance. The ultimate criteria when examining the effectiveness of human resources practices is the extent to which these practices contribute to significant increases in performance. Accordingly, the direct and indirect effects of team-based incentive system characteristics are explored for their role in augmenting team performance.

In summary, the direct effects of team-based pay practices on cooperative team-behavior (e.g., information sharing and helping behavior) and team performance are explored. Although there are many other outcomes that may be affected by allocating

rewards based on team performance (e.g., participation, workload sharing), a consideration of all potential outcome variables is beyond the scope of this research. The criteria of effectiveness selected for investigation were expected to be the ones most directly related to team-based reward systems based on previous theoretical and empirical work in this area. In the next section, specific reward practices will be examined for their role in contributing to team behavior and performance.

Effects of Team-Based Rewards on Perceived Outcome Interdependence

Although considerable evidence exists demonstrating the positive benefits of group rewards, what remains unclear is the mechanism through which team-based rewards influence favorable group-level outcomes such as cooperative team behavior and enhanced team performance. The literature on team-based rewards suggests two alternative, but not mutually exclusive, models of the effects of team rewards on group outcomes: Reward system characteristics may have a direct effect on group-level outcomes; Alternatively, reward systems may impact group outcomes through the creation of the psychological experience of "outcome" interdependence. Each of these models is discussed below.

Direct Effects of Team Rewards. Predictions regarding the direct effects of team rewards arise largely from the literature on individual pay practices and the model of group effectiveness proposed by Shea and Guzzo (1987a). Evidence accumulated over the past three decades have consistently shown that pay practices directly affect individual level outcomes. Despite the large body of literature on the effects of individual pay practices on individual outcomes, there is very little research examining the effects of group rewards on group outcomes. Nevertheless, Shea and Guzzo (1987a) proposed a model of group effectiveness in which they hypothesized that the presence of contingent outcomes (i.e., shared rewards) is necessary to cause members to apply themselves as a group. In the absence of incentives to work as a team, groups may dissolve to mere aggregations of individual members. They further argue that the greater the number and importance of the

consequences shared by group members resulting from team performance, the greater the group's effectiveness. Based on this literature, it could be argued that reward system characteristics may have direct effects on the functioning of team members.

Indirect, Mediated Effects of Team Rewards. An alternative hypothesis is that contingent, group-level rewards, by creating contingencies between team members and directing attention to the consequences of the group's collective performance, may increase perceptions of outcome interdependence among team members. As a result, the effects of the reward characteristics on group level outcomes may also operate indirectly through subjective perceptions of outcome interdependence, created by these shared contingencies.

Predictions regarding the mediating role of perceived outcome interdependence are drawn primarily from the work of Tjosvold. One of the most promising theoretical developments since the seminal work by Deutsch (1949a, 1949b) on cooperation and competition in groups is Tjosvold's development of Goal Linkage Theory (Tjosvold, 1984; 1986; 1988). According to this theory, formal and informal factors in the workplace produce three possible types of goal linkage between team members: cooperative goal linkage, competitive goal linkage, and independent goal linkage. Specifically, goal linkage develops as an outgrowth of both objective interdependence (independent or cooperative task design and individual or group-based reward structures within the group) and subjective interdependence (perceptions of positive or negative interdependence or independence). The subjective experience of the group's interdependence leads to predictable interaction patterns (e.g., fair distribution of work and rewards, sharing of resources, and effective conflict management), attitudes (e.g., perceptions of supportive relationships), and values (e.g., shared vision). For example, cooperative goal linkage develops when individuals have shared assignments, joint responsibility for task completion, and group-level rewards. Competitive goal linkage (negative interdependence) is produced when individuals are given individual tasks which are incompatible with the

assignments of others and are individually rewarded. Finally, independent goal linkage arises when individuals are given separate responsibilities, individual tasks, and are rewarded for their own performance.

Tjosvold (1986; 1988) argued that the type of goal interdependence that develops between individuals affects task accomplishment, work efficiency, relationships and feelings between people, and expectations for success. For example, positive (cooperative) interdependence is hypothesized to result in equitable division of labor, resource exchange, and other behaviors that promote group effectiveness (Tjosvold, 1986). As such, methods to alter the extent to which cooperative interdependence exists in teams hold great potential for those interested in structuring cooperative work settings.

According to Tjosvold (1984), reward practices are the most direct way of establishing a group's goal structure and, hence, serve as a method of altering the interdependence and working relationships among team members. The use of rewards contingent on individual versus group performance sends a signal to team members about the importance of individual versus cooperative behavior. Specifically, team-based rewards are believed to have the potential to foster teamwork, increase cooperation among team members, and reduce competition between team members (Geber, 1995).

Collectively, these findings suggest that team rewards do something qualitatively different than individual rewards. Specifically, while the use of individual rewards has been shown to motivate and reinforce individual performance, team-based rewards may serve these purposes as well as trigger the occurrence of cooperative group-level behavior through the contingencies created among team members. These group-level behaviors are believed to be critical to the smooth functioning of the group as well as ultimately lead to organizational effectiveness (Deutsch, 1949; Tjosvold, 1986; Geber, 1995).

According to the work by Tjosvold (1984), the subjective perception of outcome interdependence is a critical variable in understanding the role of team-based rewards and

other organizational arrangements (i.e., task structure) in creating a positive group climate and supportive interaction patterns. This literature, as well as the work by Saavedra et al. (1993) and related literature on employee stock ownership plans (Pierce, Rubenfeld, & Morgan, 1991) suggests that team-based rewards are unlikely to operate directly or independently on group and individual-level outcomes. That is, there appear to be a number of psychological processes that are affected by the reward system itself and mediate the consequences of the rewards (see Campion et al., 1993). This literature suggests that a critical difference between the use of individual and team-based pay is that team-based pay results in the creation of subjective perceptions of shared consequences between group members, which has been referred to as outcome interdependence (Tjosvold, 1986). It is important to note that outcome interdependence typically refers to the psychological perception of shared contingencies among group members, as opposed to objective conditions in the workplace. This distinction is made to allow for the possibility that the presence of group-level rewards may not always result in perceptions of outcome interdependence and that other contextual conditions may also influence the creation of perceived outcome interdependence (e.g., task interdependence). The mediated model, thus, suggests that team rewards lead to team cooperation and performance by creating perceived outcome interdependence among team members.

While the direct model and mediated models propose a different process through which team-based rewards exert their effects, they both assume that favorable group outcomes will result from the use of team rewards. Moreover, these two perspectives are not necessarily incompatible in that they may serve complementary roles in understanding the outcomes of team rewards. As a result, the first objective of the present study was to examine these alternative predictions to determine whether it is the direct effects of team-based reward practices (i.e., reward size, frequency of reward payout) or the effects of team reward practices on subjectively perceived outcome interdependence that results in

positive group behavior. Given the theoretical basis for both models and the limited research on team reward systems in organizational settings from which to base predictions, it was expected that reward characteristics (e.g., size of the team reward) will account for significant variance in cooperative team behavior. Moreover, it was hypothesized that perceived outcome interdependence will add to the prediction of cooperative team behavior over and beyond the effects of reward characteristics and task interdependence.

Hypothesis 1: Perceived outcome interdependence will account for a significant amount of incremental variance in helping and information sharing beyond the effects of reward characteristics and task interdependence.

Effects of Reward System Characteristics

The implementation of team reward systems vary widely. For example, while some organizations place a large amount of income contingent on the group's performance, others may only provide a small bonus to team members upon successfully reaching a group goal. As noted, little research has examined the characteristics of team-based rewards that impact the ability of team rewards to enhance team process and performance. Previous research suggests three primary characteristics of team-based pay plans that may impact the strength of the perceived consequences shared by group members. These include the size of the group-based bonus received, the frequency of reward payout, and the allocation rules used to distribute team-based rewards among team members.

Size of the Reward. Research on individually-based rewards has shown that reward size is correlated with pay satisfaction and motivation (Wagner, Rubin, & Callahan, 1988). Despite the rapid increase in the use of team-based compensation strategies (e.g., Lawler et al., 1992), there is surprisingly little research exploring optimal reward size under team conditions. According to the American Productivity Center (O'Dell, 1987), the bonus amount in small-group incentive systems is typically higher than that under gainsharing plans. Between 1981 and 1985, the size of bonus's ranged from 10.3 - 12.2%

of base pay across both goods and service sectors. Interestingly, some authors have suggested that individual incentive plans are thought to have motivational pull only if they enable an employee to earn around 30-35% over base pay (e.g., Patten, 1977).

What is clearly needed is research to determine whether the size of the reward is an important variable impacting the effectiveness of group-based rewards. It is hypothesized that the larger the amount of pay contingent on group performance, the greater the ability of the reward system to create outcome interdependence among team members and favorable group outcomes. With larger amounts of pay contingent on the group's performance, it is in the group's interest to work cooperatively together to achieve higher financial gains. High levels of group-contingent pay also may increase the salience of the importance of the team's performance (as opposed to individual performance) in achieving outcomes, resulting in higher perceived outcome interdependence. This prediction is consistent with the work of Zenger (1995) on gainsharing plans. Drawing on agency theory (e.g., Milgrom & Roberts, 1992) and work by Leventhal (1976), Zenger (1995) argued that the greater the incentive strength of a group-based pay plan (i.e., the amount of pay contingent on performance) the greater the amount of effort brought to bear on task completion. In a study of 665 gainsharing plans, he found that the incentive intensity of the plan was positively related to group performance. Thus, it is hypothesized that larger rewards (relative to base pay) contingent on group performance will be associated with higher levels of perceived outcome interdependence, team cooperation, and team performance.

Hypothesis 2a: Reward size (relative to base pay) will be positively related to perceived outcome interdependence.

Hypothesis 2b: Reward size will be positively related to cooperative team behavior (helping and information sharing).

Hypothesis 2c: Reward size will be positively related to team performance.

Frequency of Reward Payout. Another reward characteristic believed to be critical to the creation of outcome interdependence among team members and, ultimately, the success of team rewards, is the frequency with which rewards are distributed. The importance of the temporal link between performance and outcomes has been a dominant theme in the literature on motivation (Vroom, 1964), reinforcement theory (Opsahl & Dunnette, 1976), and the effectiveness of pay systems (Lawler, 1981). It is widely accepted that the stronger and more consistent the link between pay and performance, the more motivational the rewards and the more the desired behavior is reinforced (Goodman & Dean, 1990; Lawler, 1981). Despite the apparent need for a close temporal relationship between the team's behavior and the rewards they receive, estimates by the American Productivity Center indicate that rewards are typically distributed once a year to managerial, professional, and technical employees, with non-technical and non-managerial employees receiving more frequent payouts (O'Dell, 1987). It seems evident that if team rewards continue to be used in organizations, research is needed to examine the effects of varying payout frequencies on team performance (DeMatteo, Eby, & Sundstrom, in press).

It is proposed that the more frequently rewards based on group performance are distributed, the more outcome interdependence will be created between team members and the more positive will be the groups interaction process. Also, team-based rewards allocated frequently will be positively associated with team performance.

- Hypothesis 3a: Frequency of reward payout will be positively related to perceived outcome interdependence.
- Hypothesis 3b: Frequency of reward payout will be positively related to cooperative team behavior (helping and information sharing).
- Hypothesis 3c: Frequency of reward payout will be positively related to team performance.

Allocation Method: Equality- Versus Equity-Based Distribution. Another critical reward characteristic is the allocation rule used to distribute rewards. Leventhal and his associates studied the conditions under which people proactively employ various justice norms (Greenberg & Leventhal, 1976) and identified two distinct allocation rules that may be used to distribute rewards: the equality norm (dividing rewards equally regardless of possible differential contributions among recipients) and the equity norm (distributing rewards proportional to the contributions of the individuals). According to Leventhal's (1976) justice judgment model, individuals attempt to make fair allocation decisions by applying these allocation rules to the situations they confront. The choice of a preferred allocation strategy is often dictated by situational factors (Deutsch, 1975; Leventhal, 1976) with different norms of justice followed under different circumstances. For example, it has been found that people believe social harmony is maintained through the use of equal reward allocation procedures, whereas performance is maximized by systems that allocate outcomes equitably (i.e., in proportion to relative performance) (Deutsch, 1985; Scott & Cherrington, 1974). In other words, when maintaining solidarity between group members is critical, the allocation procedure viewed as "fair" by group members is the use of an equality norm. Taken together, this literature suggests that rewards distributed equally among team members will promote perceived outcome interdependence among team members and cooperative team behavior.

- Hypothesis 4a: Rewards allocated equally as opposed to equitably among team members will be associated with greater levels of perceived outcome interdependence.
- Hypothesis 4b: Rewards allocated equally as opposed to equitably among team members will be associated with greater levels of within-team helping and information sharing.

The Moderating Role of Team Size.

The level of aggregation at which performance is evaluated and rewarded (i.e., team size) has also been identified as a critical variable in understanding reactions to team-based plans (Wilson, 1990; Lawler, 1981). Specifically, team size can affect the degree to which individuals feel that their pay is based on performance. According to expectancy-based theories of motivation, rewards hold more motivational potential at lower levels of aggregation because of a more direct relationship between effort and reward-producing outcomes (Vroom, 1964). As group size increases, individual performance is further removed from the amount of the reward, diminishing the line of sight between pay and performance. Thus, attaching incentives to the performance of smaller teams may increase perceptions of individual control over performance and hence, rewards (Zenger, 1995). Conversely, rewards attached to the performance of larger teams may result in decreased motivation because the line of sight between performance and outcomes is blurred (Lawler & Cohen, 1993).

In addition, individuals in a team environment under team-reward systems may feel that their contributions are more identifiable at lower levels of aggregation, which may enhance perceptions of outcome interdependence. Small groups may be characterized by greater levels of "monitoring" by team members in which employees regulate the behavior of each other which, again, may enhance perceptions of outcome interdependence (Cooke, 1994) and provoke higher levels of cooperation among team members. Zenger (1995) noted that "social pressures compound the advantages of small group size in group incentive plans...rewards attached to the performance of small groups yield stronger social pressures to perform than similar rewards attached to larger groups" (p. 8). Thus, team size appears to play an integral role in understanding the relationship between reward characteristics and outcomes such as perceived outcome interdependence and within-team cooperation by augmenting the effectiveness of team-based rewards.

Based on this literature, it was hypothesized that group size would moderate the relationship between reward characteristics (reward size and frequency of payout) and subjective perceptions of outcome interdependence. More specifically, it was predicted that the relationship between reward characteristics and subjective perceptions of outcome interdependence will be heightened at lower levels of aggregation (i.e., smaller group size). Similarly, the effects of reward size and frequency of payout on team cooperation will be moderated by team size. In other words, while increases in reward size and frequency of payout may be associated with perceived outcome interdependence and cooperative team behavior, these relationships will be intensified as team size decreases.

- Hypothesis 5a: The relationship between reward size and perceived outcome interdependence will vary as a function of team size such that reward size will exhibit a stronger relationship with perceived outcome interdependence as team size decreases.
- Hypothesis 5b: The relationship between frequency of reward payout and perceived outcome interdependence will vary as a function of team size such that rewards allocated more frequently will exhibit a stronger relationship with perceived outcome interdependence as team size decreases.
- Hypothesis 6a: The relationship between reward size and cooperative team behavior will vary as a function of team size such that reward size will exhibit a stronger relationship with cooperative team behavior as team size decreases.
- Hypothesis 6b: The relationship between frequency of payout and cooperative team behavior will vary as a function of team size such that rewards allocated more frequently will exhibit a stronger relationship with cooperative team behavior as team size decreases.

Effects of Task Interdependence on Perceived Outcome Interdependence

As mentioned previously, Goal Linkage Theory predicts that task interdependence, as well as reward interdependence, jointly influence subjective perceptions of outcome interdependence among team members and, ultimately the formation of interaction patterns

characterized by cooperative team behavior. In the following section, the effects of task interdependence on perceptions of outcome interdependence are explored.

Task interdependence is the degree of task-driven interaction among group members and is believed to play a critical role in determining the quality of the interaction that develops among team members. Task interdependence has been operationally defined several ways in the literature over the years. Early definitions of task interdependence centered around the characteristics of the work flow between members of a work team (Thompson, 1967; Van de Ven et al, 1976). Specifically, these authors place organizational arrangements on a continuum from independent work flow, to sequential work flow, to reciprocal work flow, and finally to team work flow. In other words, task independence is operationalized as an objective condition in the workplace which reflects the degree to which workers transfer resources to achieve task accomplishment (Shea & Guzzo, 1987a). Similarly, Shaw (1973) has defined task interdependence in terms of "cooperation requirements" - requirements for the integrated effort of team members. Steiner (1972) defined task interdependence as the degree to which task completion depends on joint versus individual actions among group members.

Another body of literature has investigated task interdependence as a motivational property of jobs rather than just an organizational arrangement. Specifically, Kiggunda (1981) defined task interdependence as involving both initiated and received interdependence and provided evidence that initiated interdependence creates feelings of responsibility for work outcomes whereas received interdependence is unrelated to motivation. Finally, task interdependence has been defined as a perceptual or psychological phenomenon. Perceptual measures of task interdependence represent the extent to which group members interact and depend on each other to accomplish their work (Campion et al., 1993). In the following discussion, task interdependence is

operationalized as the psychological experience of shared task-related interaction among team members.

Meta-analytic results have consistently pointed to task interdependence as a critical contextual variable in understanding the effects of reward allocation procedures (Cotton & Cook, 1982; Rosenbaum et al., 1980). In addition, previous research has highlighted the independent effects of task interdependence on group interaction. For instance, Johnson (1973) has shown that higher levels of task interdependence are associated with more helping behavior, information sharing, and communication. Similarly, Wageman (1995) demonstrated that task design (i.e., interdependent, independent, or hybrid) influenced cooperation, helping, and learning in teams, regardless of reward system design.

However, it was also shown that task design strongly influenced members' *experienced* interdependence such that members of teams with interdependent tasks reported greater levels of experienced outcome interdependence than did those in a hybrid situation or in an independent task condition, regardless of their actual outcomes. In other words, teams with higher task interdependence experienced their outcomes as more interdependent than did those whose tasks required less interdependence (Wageman, 1995). This suggests that task interdependence plays a critical role in understanding the nature of perceived outcome interdependence in teams receiving group-based rewards. In another recent study, Pearce and Gregersen (1991) tested a model in which felt responsibility was hypothesized to mediate the relationship between task interdependence and extra role behavior. As predicted, perceived task interdependence was associated with extra role behavior only through the mediation of felt responsibility for work outcomes.

Taken together, this literature suggests that perceived task interdependence influences team cooperation through the creation of outcome interdependence. While, task interdependence may exert direct effects on group team cooperation and performance, research by Wageman (1995) suggests that task interdependence also influences the way

team-based rewards are experienced by group members by promoting perceived outcome interdependence among team members. As a result, task interdependence is expected to directly influence the degree to which team members perceive outcome interdependence such that greater levels of task interdependence will be associated with greater levels of perceived outcome interdependence.

Hypothesis 7: Perceived task interdependence will be positively associated with perceived outcome interdependence.

Hypothesis 8: Perceived task interdependence will be positively associated with within-team helping and information sharing.

The Role of Affect: Understanding Satisfaction with Group-Based Rewards in Teams

Goal Linkage Theory suggests that cooperative team behavior can be explained by the occurrence of perceived outcome interdependence among team members which is a direct outcome of formal organizational arrangements (i.e., task interdependence and group-level outcomes such as team rewards). While some research has supported these relationships, there is no reason to believe that the limited number of variables included in Goal Linkage Theory account for all of the variance in cooperative team behavior. Given the conflicting research evidence on the effectiveness of team-based rewards (e.g., Wageman, 1995), it is clear that research needs to continue to explore additional variables which may contribute to the effectiveness of team rewards. While perceived outcome interdependence may contribute to cooperative interaction patterns among team members, Goal Linkage theory fails to consider a host of other factors that may mediate the relationship between outcome interdependence and team outcomes. Whether or not rewards based on team performance reinforce team cooperation may depend on whether team members are satisfied with team-based rewards. In addition, team members who are satisfied with organizational practices such as team rewards may be more likely to engage in cooperative behavior. Based on this logic, it is hypothesized that additional variance in

cooperative team behavior can be explained by considering the team's affective reactions to team-based reward practices. Specifically, the proportion of members on a team who express satisfaction with team-based reward practices is hypothesized to be positively related to helping behavior and information sharing among team members. In addition, the relationship between perceived outcome interdependence and cooperative behavior will be partially mediated by satisfaction with team-based rewards.

Hypothesis 9: Satisfaction with team based rewards will account for a significant amount of incremental variance in cooperative behavior among team members beyond the effects of reward characteristics, task interdependence, and perceived outcome interdependence.

Hypothesis 10: Perceived outcome interdependence will be associated with satisfaction with team rewards.

Hypothesis 11: Satisfaction with team-based rewards will partially mediate the relationship between perceived outcome interdependence and cooperative team behavior.

While there is little research exploring factors that influence the effectiveness of team-based rewards, theoretical predictions from motivation theory suggest situations in which team-based rewards may not have the intended effects. Specifically, the literature on equity theory and expectancy theory are used to generate predictions regarding conditions that must be present for team-based rewards to be satisfying to team members. Drawing from this literature, it is proposed that reward intensity (reward size and frequency of payout) and task interdependence as well as perceptions of collective efficacy and perceived fairness in reward allocation procedures will have direct effects on satisfaction with team-based rewards (see Figure 2.1). The relationships among these variables will be elaborated in the sections that follow.

Satisfaction with Team-Based Rewards and Reward Characteristics

Perhaps the most important variables in understanding affective reactions to team-based rewards are the characteristics of the reward system itself. As discussed previously,

research on individually-based reward practices and merit pay has shown that pay level (i.e., amount of salary) has demonstrated consistent relationships with pay satisfaction (Heneman, 1992; Wagner, Rubin, & Callahan, 1988). According to Heneman (1985), the relationship between pay level and pay satisfaction is probably the most robust finding in the literature on compensation. Extending this research to the present context, reward size is expected to be directly related to satisfaction with team-based rewards. Another predictor of pay satisfaction that has been well-documented is pay-for-performance perceptions (e.g., Heneman, Greenberger, & Strasser, 1988, Miceli, Jung, Near, & Greenberger, 1991). As discussed previously, close temporal proximity between pay and performance leads to higher levels of satisfaction. As a result, it was hypothesized that frequency of reward payout would also be positively associated with satisfaction with team based rewards.

Hypothesis 12: Reward size will be positively related to satisfaction with team-based rewards.

Hypothesis 13: Frequency of reward payout will be positively related to satisfaction with team-based rewards.

Additional Factors Influencing Satisfaction with Team-Based Rewards

While the structure of the pay plan itself (i.e., the frequency of reward payout) can be expected to affect subjective reactions to team-based rewards, there are theoretical reasons to expect that characteristics of the pay plan itself are not enough to explain differential reactions to team pay. Assumptions underlying this research are that employees will not be satisfied with team-based rewards if they perceive they are not allocated in a "fair" manner, if they perceive the group does not have sufficient ability to achieve its goals, and/or if the group's task is not interdependent. Under these conditions, employees may be more satisfied with individually-based rewards, rather than group-based reward

plans. In the following section, the theoretical support for these predictions will be articulated and specific hypotheses regarding the role of these variables will be presented.

The Role of Justice

Although satisfaction with pay is largely explained by the amount of one's wages, several other variables have been identified that influence attitudes toward pay. One of the most frequently discussed of these variables is related to standards of justice or fairness (Berkowitz, Fraser, Treasure, & Cochran, 1987). Research has consistently shown that individuals respond negatively through reduced effort, withdrawal, or even sabotage, to perceptions of unfairness in pay. It is reasonable to assume that perceived unfairness in group-based situations will also produce behavioral effects that will negatively effect cooperative team behavior and, ultimately, team performance.

Many studies have examined perceptions of distributive and procedural justice as a function of individual pay contingencies (e.g., see Greenberg, 1990); however, considerations of justice have been virtually unexplored in the literature on team rewards. More commonly, it is cited that team-based rewards will reinforce cooperative team behavior with little consideration of the possibility that employees may not perceive group-based bonus allocations as fair. When fairness issues are addressed, they are addressed in a narrow manner. Specifically, concerns of internal and external equity are considered without addressing procedural justice issues (Hofmann & Salter, 1995).

Virtually no research has examined justice in small-group and team-based pay plans, although several authors have suggested that perceptions of fairness are critical to the successful implementation of group-based pay plans (e.g., Ost, 1990). In one of the few studies conducted, Hofmann and Salter (1995) examined the role of contextual variables on distributive justice perceptions in a team-based, laboratory setting. Results supported a complex three-way interaction between task interdependence, reward interdependence, and perceptions regarding group member's ability. It was reported that when there was high or

moderate congruence between task and reward interdependence (i.e., interdependent task and group-based bonus), distributive justice was highest when individuals perceived that their group members had comparable levels of ability. In purely independent conditions (independent task and individually-based rewards), distributive justice perceptions were highest when individuals perceived that their team member had lower ability. These findings, as well as the recommendations of other researchers (Ost, 1990), suggest the importance of justice perceptions in understanding reactions to team based rewards.

In the present research, justice perceptions are hypothesized to be associated with satisfaction with team-based rewards (Greenberg, 1990). Specifically, the extent to which team members believe that the rewards the team receive (i.e., distributive justice) and the procedures for allocating rewards (i.e., procedural justice) are fair will contribute to satisfaction with team-based rewards. These hypotheses will be elaborated in the next section.

Distributive Justice. Inequity problems related to distributive justice occur when employees feel they are not being fairly compensated for the work they are doing (Greenberg, 1990). Allocating pay based on the team's productivity or performance may increase perceptions of injustice for several reasons. Most importantly, under a team-based reward system, an individual's performance is based on his/her individual effort whereas the outcomes an individual receives are based on the performance of the individual as well as the group as a whole. The lack of direct correspondence between one's performance and the size of the outcomes they receive introduces the possibility that individuals may feel that their outcomes (i.e., rewards) are not commensurate with their contributions to the performance of the group. According to equity theory, individuals compare the ratio of their inputs to their outcomes when arriving at a judgment of fairness (Adams, 1965). Consequently, unfairness will be perceived when the ratio of one's inputs to outcomes is not equal to the ratio of the referent other. In a team-based situation, there are two proximal

referents: one's team mates and members of other teams. In most team-reward situations, rewards are distributed equally among team members (i.e., all team members receive the same dollar amount or the same percentage of base pay). As a result, if an individual perceives that the inputs of his/her team mates vary, yet bonuses are equal, injustice will be perceived. Moreover, since the rewards obtained will vary across teams with differences in performance, an individual may perceive a lack of distributive justice if their team receives fewer outcomes than members of other teams but perceive similar levels of inputs. The injustice may be compounded when these two situations occur simultaneously. For example, a high performing employee in an "average" team may receive a smaller bonus than a low performing employee who belongs to a different team with higher overall performance and may receive a bonus equal to that of his/her lower-performing team mates.

These arguments are based on the assumption that inputs will not always be perceived as equal in a team setting. Simply stated, all team members will not always contribute equally to the group's task and free-riders may exist. Free-riders are those who provide low inputs to a group task and receive the same rewards as other group members (Albanese & VanFleet, 1985). The free-rider or shirking tendency may be especially problematic under group-based pay systems in which individuals can take advantage of group-based performance gains and rewards by failing to contribute equally to the team's output (Cooke, 1994). As a result, high ability team members may perceive that they are carrying the weight of less able members (Albanese & VanFleet, 1985). Free-riders are likely to have a negative influence on group productivity and may cause conflict between team members (Gomez-Mejia & Balkin, 1992), but may also create perceptions of injustice in a team-based reward situation, negatively impacting satisfaction with these plans. While free-riding may occur in a team setting without the use of team-based rewards, perceptions of inequity may be magnified under team plans because rewards contingent upon the team's performance may be believed to be unequally distributed among team members. In

summary, individuals who believe they contribute significantly greater inputs than others may be dissatisfied when they share equal outputs with team members (Heneman & von Hippel, 1995). The greater the proportion of team members who perceive injustice, the more the team will be dissatisfied with the team-based rewards they receive.

It should also be noted that perceptions of injustice may arise from actual difference in performance (a true state of inequity) as well as from perceived differences in performance (Adams, 1956). According to social comparison theory (Festinger, 1954; see also Saavedra & Kwun, 1993 for a review), team members gauge their performance relative to perceptions of their own ability. Given that individuals consistently overestimate their ability and rate their performance higher than others rate them (e.g., peers or supervisors, Harris & Schaubroeck, 1988), it is likely that team members will perceive that the rewards they receive are too small. The same process may lead individuals to believe that their teams are insufficiently rewarded. Simply put, whether the basis is in "truth" or a perceptual phenomenon (Adams, 1965), inequity will be perceived when one believes the ratio of their team's outcomes to inputs is not equivalent to that of other teams used as referents.

In concert, these findings suggest that individuals may perceive team rewards as unfair leading to low levels of satisfaction with team-based rewards. The major cause of this perceived inequity may be the lack of correspondence between perceived performance (inputs) and the group's outcomes. Research has suggested that a lack of distributive justice is a significant contributor to conflict among team members (for a review, see Kabanoff, 1991) and may result in lower levels of citizenship behavior (Organ, 1988a). According to Organ (1988b), altering one's level of citizenship behavior is a viable response to inequity because citizenship behavior is discretionary and lies outside formal role requirements. In support of this suggestion, Scholl, Cooper, and McKenna (1987) reported that perceptions of pay inequity were significantly correlated with extra-role

behavior. Based on this literature, it was expected that perceptions of injustice will cause team members to be dissatisfied with team-based rewards which will, ultimately, lead to lower levels of within-team cooperative behavior. The following hypothesis is posed:

Hypothesis 14: Perceptions of distributive justice will be positively related to satisfaction with team-based rewards.

Procedural Justice. Research has demonstrated that distributive justice is not the only criteria by which employees arrive at an evaluation of the fairness of the exchange between their labor and the compensation they receive (Jones, Scarpello, & Rockmore, 1992). The fairness of the procedures used to arrive at pay decisions is also a primary concern (Greenberg, 1986). As mentioned, procedural justice refers to the perceived fairness of the procedures used to allocate pay. Research on individual pay practices has consistently found relationships between perceptions about how pay is administered and pay satisfaction (Heneman, 1985). In fact, Dyer and Theriault (1976) found that inclusion of pay system administration explained additional variance in pay satisfaction beyond that accounted for by factors such as pay level.

There are several reasons to expect that procedural justice will be sacrificed under groups based plans. First, unclear allocation rules and insufficient knowledge of procedures may produce dissatisfaction with team-based plans. In addition, the procedures used to allocate team rewards may be perceived as unfair because the relationship between one's individual productivity and the groups outcomes may be ambiguous under team-based plans. In a recent study, Schappe (1993) found that procedural justice judgments mediated the relationship between knowledge of organizational procedures and outcomes (ratings of supervisors, job satisfaction, and organizational commitment). In other words, having greater knowledge of procedures contributed to positive employee evaluations of supervisors, higher job satisfaction, and greater organizational commitment when

procedures used to allocate pay were believed to be fair. These types of concerns would seem to be especially salient under team-based reward systems where the procedures used to allocate pay may not be clear.

The influence of procedural justice on satisfaction with team rewards and team cooperation can be understood in light of the Group Value model (Lind & Tyler, 1988). According to this theoretical perspective, people value within-group relationships and expect organizations to use procedures that, over time, will foster the belief that all group members will fairly benefit from being a member of the group (Tyler, 1989). As a result, the more members on a team who believe that the procedures used to allocate team-based rewards are fair, the more satisfied members will be with the organization's use of team-based rewards and the more likely it is that team members will engage in discretionary team behaviors such as citizenship behavior and information sharing.

Empirical support for a relationship between perceptions of procedural justice and citizenship behavior exists. For instance, Konovsky and Folger (1991) reported preliminary evidence for a relationship between procedural justice and altruism which was confirmed in a separate study by Moorman (1991) in which perceptions of procedural justice was associated with four out of the five dimensions of citizenship behavior. Moreover, recent meta-analytic results have confirmed the critical role of procedural justice perceptions in understanding the correlates of organizational citizenship behavior. Manogran and Conlan (1995) reported that procedural justice perceptions had the highest true score correlation with organizational citizenship behavior, as compared with other frequently studied antecedents such as job satisfaction, organizational commitment, distributive justice and conscientiousness.

Using the same logic presented for the role of distributive justice, it was expected that perceptions of procedural justice will influence satisfaction with team-based rewards which will, in turn, influence the extent to which team members engage in cooperative team

behavior (helping and information sharing). That is, the greater the proportion of members on a team who believe that the procedures used to allocate team-based rewards are fair, the higher the team's level of satisfaction with team-based rewards.

Hypothesis 15: Perceptions of procedural justice will be positively related to satisfaction with team-based rewards.

Collective Efficacy

The assumption that the use of team-based rewards will be perceived favorably is based on the assumption that team members perceive that participating in the group will be instrumental to their individual goal attainment. Group-based rewards should be satisfying and lead to favorable group outcomes only when team members perceive that positive outcomes will result from group performance and that the group is instrumental to receiving those valued outcomes. Based on this logic, collective efficacy (confidence in the perceived ability of one's group to achieve its goals) may be a critical factor affecting whether one is satisfied with the use of team rewards. From an instrumental perspective, this argues that team rewards may not lead to the intended outcomes if team members believe the team will be unable to reach its goals and, hence, obtain a financial bonus.

According to expectancy theory, performance-contingent rewards are believed to foster the subjectively perceived relationship between performance and the receipt of job-related outcomes (Vroom, 1964; Wagner, Rubin & Callahan 1988). Under group-based reward systems, outcomes are a function of both individual and team performance. Consequently, the use of expectancy theory to understand motivation in teams requires an examination of the variables that affect the contingencies between individual performance, group performance, group outcomes, and individual outcomes. According to the calculative perspective taken by Lawler (1982), the motivation to contribute to a collective effort is contingent upon a perceived relationship between individual rewards and organizational or group performance. Similarly, Karau and Williams (1993) propose that

individual-level expectancy models can be extended to collective contexts by specifying how working in a group influences individual perceptions of the relationship between individual effort and expected outcomes.

Taken together, Lawler (1982) and Karau and Williams (1993) provide an expectancy-based explanation of the process through which team rewards motivate individuals to contribute to the collective good of the group. These theoretical perspectives support the assumption that people will be motivated to contribute to the group's success because it is in their economic interests to do so. Consequently, individuals will be satisfied with rewards based on team, rather than individual, performance if it is perceived that the team has the ability to achieve its goals and, hence receive a bonus. In other words, satisfaction with team-based rewards may vary as a function of the extent to which individuals believe that their team has the capability to be effective and, as a result, is instrumental to achieving one's individual goals.

Collective efficacy is the theoretical extension of individual self-efficacy to the group level of analysis (Bandura, 1986) and represents the perceived probability that collective effort will result in collective performance (Shamir, 1990). Collective efficacy reflects the fact that groups often have collective expectations for success which may influence the tasks they choose to perform, how much effort they exert, and their level of persistence in the face of difficulty (Bandura, 1986). In the case of group-based rewards, collective efficacy is especially important given that extrinsic rewards for any individual team member are contingent upon the group's performance. In other words, the belief that one's team is instrumental to achieving valued outcomes may depend on one's confidence in the skills and abilities of the group.

Recent studies have found positive relationships between collective efficacy and group performance (Spink, Feltz, Albrecht, & Corcoran, 1988; Feltz, Corcoran, & Lirgg, 1989). For example, Spink (1990) examined the relationship between team cohesion,

collective efficacy, and team success and found that individual perceptions of group cohesion are positively related to collective efficacy and teams with high collective efficacy finished higher in a competitive tournament than low collective efficacy teams. Using an experimental design in which group efficacy was manipulated, Whitney (1994) found that group efficacy increased performance quality such that groups with high efficacy performed better than did groups with lower efficacy. The author is aware of no research that has examined the effects of collective efficacy on team outcomes when individuals receive team-based bonuses; however, Hofmann and Salter (1995) reported that perceptions of the ability of one's team members play a critical role in understanding reactions to team-based rewards. Taken together, these findings and the theoretical predictions by Lawler (1982) and Karau and Williams (1993) suggest that perceptions of collective efficacy will contribute to satisfaction with group-based rewards due to the perception that group membership will be instrumental to team members. As a result, the following hypothesis is offered.

Hypothesis 16: Collective efficacy will be positively related to satisfaction with team-based rewards.

Task Interdependence

The level of task interdependence between team members has been identified as a critical variable that has implications for reactions to team-based reward practices. An understanding of task interdependence is particularly important when considering satisfaction with team-based rewards because of the influence of the amount of task interdependence on the appropriateness of alternative reward strategies. Specifically, as the complexity of work flow increases (i.e., from sequential to reciprocal interdependence), contributions of individual team members become more intertwined, making it difficult to separate the accomplishments of individual team members. Moreover, team-based rewards may be perceived of as "congruent" or supportive of a task environment characterized by

high levels of interdependence (cf. Saavedra et al., 1993). As a result, the use of team-based incentives will be perceived as more satisfying than individual incentives under conditions of high task interdependence because the contributions of individual team members are more difficult to separate.

Hypothesis 17: Perceived task interdependence will be positively related to satisfaction with team-based rewards.

Relationship Between Cooperation and Team Performance

Finally, it is expected that within-team helping and information sharing will explain a significant amount of variance in team performance. In addition, perceived outcome interdependence and satisfaction with team-based rewards are believed to influence team performance by increasing within-team information sharing and helping behavior.

Hypothesis 18: Within-team helping behavior and information sharing will be associated with team performance.

Hypothesis 19: Cooperative behavior will mediate the relationship between perceived outcome interdependence and team performance.

Hypothesis 20: Cooperative behavior will mediate the relationship between satisfaction with team-based rewards and team performance.

Level of Analysis

The use of data from several different sources representing multiple levels of analysis provide potentially important information regarding the determinants of cooperation among team members and team performance. Individual attitudes and personality characteristics may be important predictors; team characteristics may be important; organizational characteristics may also be important. Interest in these different levels of analysis arise from a concern with the context of organizational behavior and how characteristics of the environment may shape individual behavior (Rousseau, 1978). While there is growing recognition of the need to consider multiple levels of analysis when studying individuals in organizational and team settings (e.g., Klein, Dansereau, & Hall,

1994), it still unclear how these many levels are interrelated. For individuals nested within multiple levels (e.g., team and organization), there is some evidence that the link between contextual characteristics and individual behavior lies in the perception of these contextual factors (George & James, 1994).

While there is considerable controversy regarding the appropriate level of analysis for research on teams, recent studies have been conducted using both individual and group levels of analysis. For example, some argue that individual perceptions of team process are most likely to drive his or her own behavior. As described by Podsakoff and Tudor (1985), "several social scientists (e.g., Blau, 1964, Thibaut & Kelley, 1959) have explicitly assumed that group-level processes are an extension of many of the principles which have been derived from the analysis of individual behavior" (p. 62). According to this perspective, team cohesion, for example, is believed to develop from the interpersonal attraction to the group as described by individual team members (for further discussion, see Podsakoff & Tudor, 1985, p. 62). Moreover, authors have pointed to theoretical and conceptual reasons for examining group-type variables (e.g., team cohesion) at the individual level (e.g., Podsakoff & Tudor, 1985; Riggs & Knight, 1994). Another group of researchers have made a strong case for group level of analysis. Specifically, recent research has argued on theoretical and conceptual grounds that team-level variables should only be measured at the team level (e.g., Campion, et al, 1993; Eby & Dobbins, 1995). For example, research on shared mental models (Klimoski & Mohammed, 1994), implicitly assumes that understanding teams requires examining constructs at the aggregate level. In fact, many variables are defined at the group level and reflect inherently group-level variables. For example, collective efficacy refers to a group's collective expectations for success which may influence the tasks they choose to perform, how much effort they exert, and their level of persistence in the face of difficulty (Bandura, 1986).

The difference in perspectives notwithstanding, it is theoretically worthwhile to examine the group level of analysis when the individuals who make up the sample are part of larger social contexts that may influence their attitudes, reactions, and behavior. Moreover, the emphasis in the present study on understanding how factors such as reward characteristics and team characteristics influence team functioning and performance suggest that the team is the more appropriate levels of analysis. Specifically, examining the effects of team-based reward practices in which the team is the focal unit of rewards (i.e., rewards are based on team rather than individual performance) necessitates a consideration of how team-level variables influence reactions to these rewards and subsequent team-level outcomes such as helping behavior. In addition, although some of the variables included in this study focus on traditionally individual-level, psychological variables (e.g., justice, affective reactions), there is theoretical support for examining reactions to contextual conditions at the group level. For example, according to James (1993), justice norms sometimes tend to develop at the level of work units, which differ from those at the organization-wide level. Discussing in-group salience and responses to organizational justice, James (1993) proposed that individuals' perceptions of events may be viewed through the "lens" of group norms, goals, and outcomes, or the "lens" of personal expectations, values, goals or outcomes. Thus, the use of team-based practices such as allocating individual bonuses based on team productivity may induce team members to view these procedures through the lens of group outcomes, making it meaningful to view the reactions of the group as the unit of analysis. In addition, the recent interest in cognition as a social phenomenon (e.g., Levine, Resnick, & Higgins, 1993), the emergence of group-level constructs and phenomena such as group pro-social behavior (George & Bettenhausen, 1990) and collective efficacy (Bandura, 1986), and a resurgence in interest in the group as a meaningful unit of analysis (for a review, see Klimoski & Mohammed, 1994) provide support for the decision to examine the relationships depicted

in Figure 2.1 at the group level. Finally, the use of team level data is consistent with current research in this area (e.g., Campion et al, 1995; George, 1990). Consistent with these theoretical perspectives and trends in the empirical literature, the variables in the present study and the hypotheses presented are examined at the group level.

Overview and Summary of Hypotheses

Prior research suggests that team-level pay may result in favorable group outcomes, especially under conditions of high task interdependence, but most studies have been conducted in laboratory settings under controlled conditions. Little theoretical development has occurred to aid the researcher interested in factors that influence the effectiveness of team-based rewards or the mechanisms through which these rewards have their intended effects on group effectiveness. These issues are of considerable applied importance given organizational trends toward greater use of team-based compensation strategies. Moreover, attempts to extend individually-based models of pay satisfaction to collective contexts have theoretical significance. The present study represents an attempt to explore the dynamics of team-based pay in the context of relevant theoretical models. Specifically, the purpose of the study is to examine the nature of the relationships presented in Figure 2.1 in a field setting with group-level data from a wide variety of teams across several organizations. The hypotheses which will be tested are presented below in Figure 2.2. The following chapter describes the research methods used to test the proposed model.

Hypothesis 1:	Perceived outcome interdependence will account for a significant amount of incremental variance in helping and information sharing beyond the effects of reward characteristics and task interdependence.
Hypothesis 2a:	Reward size (relative to base pay) will be positively related to perceived outcome interdependence.
Hypothesis 2b:	Reward size will be positively related to cooperative team behavior (helping and information sharing).
Hypothesis 2c:	Reward size will be positively related to team performance.
Hypothesis 3a:	Frequency of reward payout will be positively related to perceived outcome interdependence.
Hypothesis 3b:	Frequency of reward payout will be positively related to cooperative team behavior (helping and information sharing).
Hypothesis 3c:	Frequency of reward payout will be positively related to team performance.
Hypothesis 4a:	Rewards allocated equally as opposed to equitably among team members will be associated with greater levels of perceived outcome interdependence.
Hypothesis 4b:	Rewards allocated equally as opposed to equitably among team members will be associated with greater levels of within-team helping and information sharing.
Hypothesis 5a:	The relationship between reward size and perceived outcome interdependence will vary as a function of team size such that reward size will exhibit a stronger relationship with perceived outcome interdependence as team size decreases.
Hypothesis 5b:	The relationship between frequency of reward payout and perceived outcome interdependence will vary as a function of team size such that rewards allocated more frequently will exhibit a stronger relationship with perceived outcome interdependence as team size decreases.
Hypothesis 6a:	The relationship between reward size and cooperative team behavior will vary as a function of team size such that reward size will exhibit a stronger relationship with cooperative team behavior as team size decreases.
Hypothesis 6b:	The relationship between frequency of payout and cooperative team behavior will vary as a function of team size such that rewards allocated more frequently will exhibit a stronger relationship with cooperative team behavior as team size decreases.

FIGURE 2.2

Summary Of Hypotheses

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|----------------|--|
| Hypothesis 7: | Perceived task interdependence will be positively associated with perceived outcome interdependence. |
| Hypothesis 8: | Perceived task interdependence will be positively associated with within-team helping and information sharing. |
| Hypothesis 9: | Satisfaction with team based rewards will account for a significant amount of incremental variance in cooperative behavior among team members beyond the effects of reward characteristics, task interdependence, and perceived outcome interdependence. |
| Hypothesis 10: | Perceived outcome interdependence will be associated with satisfaction with team rewards. |
| Hypothesis 11: | Satisfaction with team-based rewards will partially mediate the relationship between perceived outcome interdependence and cooperative team behavior. |
| Hypothesis 12: | Reward size will be positively related to satisfaction with team rewards. |
| Hypothesis 13: | Frequency of reward payout will be positively related to satisfaction with team rewards. |
| Hypothesis 14: | Perceptions of distributive justice will be positively related to satisfaction with team-based rewards. |
| Hypothesis 15: | Perceptions of procedural justice will be positively related to satisfaction with team-based rewards. |
| Hypothesis 16: | Collective efficacy will be positively related to satisfaction with team-based rewards. |
| Hypothesis 17: | Perceived task interdependence will be positively related to satisfaction with team-based rewards. |
| Hypothesis 18: | Within-team helping behavior and information sharing will be associated with team performance. |
| Hypothesis 19: | Cooperative behavior will mediate the relationship between perceived outcome interdependence and team performance. |
| Hypothesis 20: | Cooperative behavior will mediate the relationship between satisfaction with team-based rewards and team performance. |
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FIGURE 2.2 (continued)

Summary Of Hypotheses

CHAPTER III

METHODOLOGY

PROCEDURE

The proposed hypotheses were examined with data from a cross-sectional, multi-organization survey. An "organization" was defined as either a total organization or as a distinguishable operating unit (e.g., plant, department, division, regional office) within an organization. Three steps were used to identify organizations who were currently using team-based rewards. First, the membership roster of the American Compensation Association was used to identify organizations using team-based rewards, incentives, or pay. This resulted in the identification of 54 potential organizations. Second, a review of the literature was also undertaken to identify organizations utilizing team-based rewards, resulting in the identification of an additional 5 organizations. Seventy-five percent of the potential organizations identified through the first two steps were directly contacted to solicit participation. Finally, an announcement was placed in the October/November issue of the American Compensation Association News to solicit participation, resulting in an additional eight potential organizations.

Organizations expressing interest in participating in the research were sent an introductory packet which included a letter from the principal researcher, a memo describing the project and the benefits of participating (see Appendix B), a sample cover letter (see Appendix D), and a copy of the team member survey (see Appendix F). Follow-up phone calls were made to all organizations who received an introductory packet.

Several criteria were established for participation in the study. First, participants had to be currently working in a team in their organization. A team was loosely defined as an interdependent group composed of more than two but less than 35 individuals who work together in the organization to accomplish their work objectives. Although a team is

conventionally defined as somewhat smaller, a team was operationally defined in the present study to include groups of up to 35 members to allow the examination of the effects of group size. That is, small as well as large groups were included to insure adequate variance on the team size variable. Second, participants had to receive a bonus, reward, or incentive contingent upon the team's performance. In order to be classified as a team-based reward, it was necessary that the performing unit upon which rewards were based was the work group or team, rather than the individual. Rewards were defined to include only monetary awards; cash equivalents (e.g., time off) and non-monetary, recognition-based awards (e.g., feedback, plaques) were not included. Finally, organizations using gainsharing-type plans were not eligible to participate unless calculation of the bonus payout was allocated to a working unit identified as a team which included less than 35 members. The majority of potential organizations initially contacted failed to meet one of the above criteria. Several other organizations contacted chose not to participate for a variety of reasons including survey length, poor timing (e.g., the organization had recently surveyed employees and/or employees had completed too many other surveys), and an inability to be responsive to employee comments.

For those acceptable organizations, a contact person within the organization was sent an instruction letter (see Appendix C), a memo describing the recommended survey distribution method (see Appendix C), and the team member and team leader surveys, pre-bundled into teams. The contact person was asked to complete an organizational background inventory describing various characteristics of the organization (i.e., number of employees, industry type), the compensation plan, and the teams selected for participation in the study. Survey bundles were then distributed by the contact person to a random sample of teams within the organization². Each bundle contained a Team Leader survey and a pre-determined number of Team Member surveys, depending on the size of

²In some organizations, all teams receiving team-based rewards were surveyed.

the teams in the particular organization. The team leader was asked to complete the "Team Leader" survey and distribute the "Team Member" survey to all members of his or her team. Figure 3.1 presents a pictorial representation of the survey distribution method.

Team Leader and the Team Member surveys were accompanied by a cover letter prepared by the principal researcher (see sample in Appendix D) and, in some cases, an additional cover letter prepared by the participating organization. Pre-addressed, stamped envelopes were attached to the surveys for return of the completed survey. All surveys were mailed directly to the principal researcher at the University of Tennessee. Respondents were assured anonymity and confidentiality. Surveys were assigned a two part code number for the purpose of matching surveys. The first number indicated the organization and the second indicated the team. The purpose of the code number was explained in the cover letter to assure team members of the confidential nature of their responses. Upon receipt of completed surveys, surveys were matched by team within organization.

SAMPLE

Characteristics of Participating Organizations

Eleven of the acceptable organizations initially agreed to participate; however, one organization decided not to participate after receiving the survey packets. This resulted in a final sample of ten organizations. These organizations ranged in type (30% non-profit, 20% public, 50% private), size (800 employees worldwide to 22,000 employees worldwide), annual corporate revenue (250 million to 15 billion), and geographic location (60% Northeastern United States; 30% Midwestern United States; 10% Southern United States). Seventy percent were non-union and the remaining 30% were unionized. Ninety percent of organizations were classified as service providers and the remaining 10% were manufacturing-based. As can be seen in Table 3.1 organizations were largely in the insurance industry, although other industry groups were represented (e.g., Utilities).

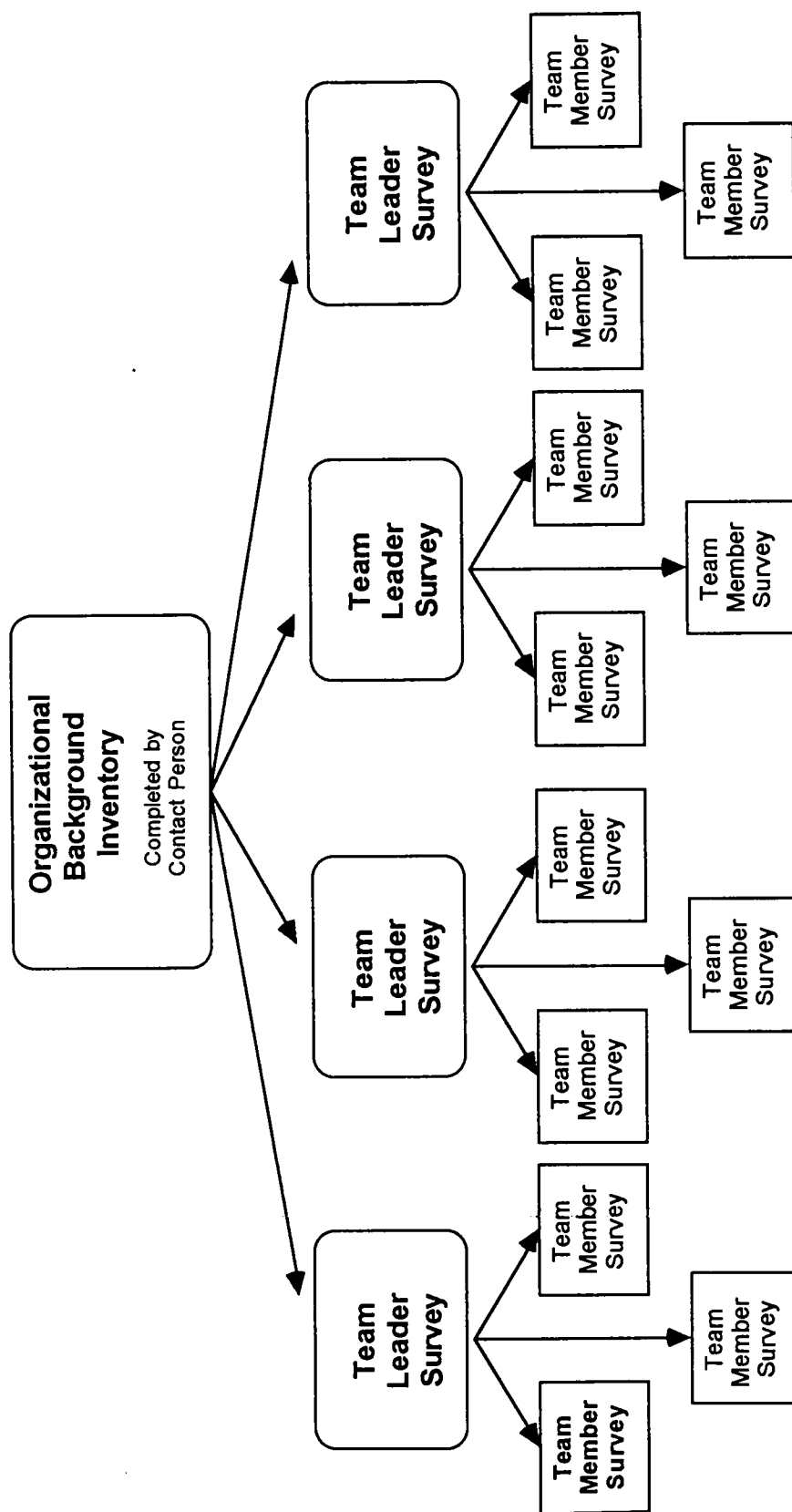


FIGURE 3.1
Survey Distribution Method and Data Sources

Table 3.1Characteristics of Organizations from Which the Total Sample was Drawn

Characteristic	Percent
Type of Organization	
Public	20%
Private	50%
Non-profit	30%
Government	0%
Industry Type	
Service	90%
Manufacturing	10%
Specific Industry	
Insurance/Financial Services	80%
Utilities/Sanitation	10%
Other Manufacturing	10%
Union Status	
Non-union	70%
Union	30%
Geographic Location	
Northeastern United States	60%
Southern United States	10%
Midwestern United States	30%
Western United States	0%
n=10	

Analysis of Response Rate

One thousand and seventy eight surveys were initially distributed to team members in the 10 participating organizations. When calculating the overall response rate, a subset of surveys were not included. Specifically, no surveys were received from 8 teams (118 surveys) who were initially mailed survey packets. After contacting the organizational contact person, it was determined that, in these cases, no surveys were distributed to the members of these seven teams, and, as a result, they were not included in the calculation of the overall response rate. Omitting surveys distributed to members of these teams, the total number of surveys actually distributed and used for the calculation of the overall response rate was 960. Four hundred and nine surveys were received resulting in an overall response rate of 43%. Table 3.2 presents the response rate for each participating organization. As can be seen, response rates across organizations were generally within acceptable standards, ranging from 26% to 95%.

Criteria for Inclusion in Data Analysis

In determining which surveys to include in the final sample for hypothesis testing, a subset of surveys were omitted from those received. First, 35 surveys were omitted from because subjects returned the survey uncompleted or the respondent indicated that he/she did not receive a team-based reward or incentive. In the majority of cases where an explanation was offered, respondents who indicated they did not receive a team reward were new employees and had worked for their organization less than a year. Second, data from 25 teams (32 surveys) were excluded because two or fewer completed surveys were received from the members of these team. Finally, data from 12 respondents was excluded because the code numbers that had been placed on the surveys were crossed out by the respondent, making it impossible to identify the individuals' team. As a result, the final sample for data analysis included 330 employees representing 57 teams.

Table 3.2Participating Organizations and Response Rates by Organization

Organization	Surveys Distributed ^a	Surveys Received	Response Rate
Aetna Health Care (4 offices combined)	90	60	67%
Blue Cross/Blue Shield of NH	169	91	54%
Blue Cross/Blue Shield of NJ	550	187	34%
Blue Cross/Blue Shield of TN	34	9	26%
Northern States Power Co.	58	31	53%
Reliastar Financial	30	11	37%
Westbend	21	20	95%
Total Sample	960	409	43% ^b

a. These totals do not include surveys mailed to teams that did not distribute surveys to individual team members

b. Calculated using the following formula: Total number of surveys received (409) divided by total number of surveys distributed (960).

Sample Characteristics

Sample characteristics for the team members are presented in Table 3.3. Eighty-three percent of the subjects were female and the remaining 17% were male. Subjects ranged in age from 18 to 67, with a mean age of 37.08 ($SD= 10.36$). Subjects were employed in a variety of functional areas, with the majority working in customer service (53%), production (16%), and clerical/administrative support (12%). All subjects were employed full-time, with a mean organizational tenure of 9.13 years ($SD= 8.0$). Subjects were primarily Caucasian (66%) and 70% of subjects had completed some college or had obtained a college degree or greater. Subjects had a mean, pre-tax, yearly base salary of \$27,566.58 ($SD= \$9,863.65$). With respect to their involvement in teams, subjects had a mean team tenure of 21.45 months ($SD= 24.80$). Forty-two percent of team members had previous experience working on teams. The vast majority of subjects in the present study only served on one team (94%). Teams in the present study ranged in size from 4 to 32, with a mean team size of 13.42 ($SD= 5.49$). Ninety-six percent of teams participating in the present study were production and service teams.

Sample characteristics for team leaders are presented in Table 3.4. Data was obtained from 58 team leaders, representing a team leader response rate of 61%. After matching team leader and team member surveys, data from 12 team leaders were not included for one of two reasons: 1) the team leader survey was received but no team member surveys were received, 2) the team was dropped from inclusion due to one of the reasons presented earlier such as a low team member response rate (< 3 surveys received). This resulted in a final sample of 46 team leaders. Team leaders were primarily female (73%) and Caucasian (81%). The mean age of team leaders was 39.22 years ($SD= 8.34$) and the mean organizational tenure was 10.56 years ($SD= 6.72$). Sixty-nine percent of team leaders had obtained at least a college degree, as compared to 33 percent of team members, and the mean, pre-tax, yearly base salary was \$48,819.70 ($SD= 17,345.53$).

Table 3.3

Sample Characteristics: Team Members

Background Information	Percent	Mean	(SD)	Range
Age		37.08	(10.36)	18-67
Organizational Tenure (years)		9.13	(8.00)	1-38
Team Tenure (months)		22.45	(24.80)	1-288
Team Size		13.42	(5.49)	4-32
Yearly Pre-tax Base Pay (dollars)		27,566.58	(9,863.65)	14,955-72,000
Size of Team-Based Reward (dollars)		928.43	(1,276.83)	0-10,000
<u>Sex</u>				
Male	17%			
Female	83%			
<u>Race</u>				
Caucasian	66%			
African-American	23%			
Hispanic	3%			
Asian	5%			
Other	3%			
<u>Highest Level of Education</u>				
High School Degree	30%			
Some College	37%			
College Degree	29%			
Master's Degree	4%			
Ph.D.	0%			
<u>Functional Area</u>				
Clerical/Administrative Support	13%			
HR/Personnel/Training	3%			
Financial	1%			
General Management	0%			
Healthcare/Nursing	2%			
Information Systems	1%			
Production	16%			
Technical Support	1%			
Sales/Marketing	4%			
Communications/PR	2%			
Engineering/Research	3%			
Customer Service	53%			
Other	3%			

 n=259-330 due to missing data

Table 3.4

Sample Characteristics: Team Leaders

Background Information	Percent	Mean	(SD)	Range
Age		39.22	(8.34)	23-55
Organizational Tenure (years)		10.56	(6.72)	1-36
Team Tenure (months)		28.67	(26.31)	3-132
Yearly Pre-tax Base Pay (dollars)		48,819.70	(17,345.53)	22963-100000
<u>Sex</u>				
Male	27%			
Female	73%			
<u>Race</u>				
Caucasian	81%			
African-American	12%			
Hispanic	5%			
Asian	2%			
Other	0%			
<u>Highest Level of Education</u>				
High School Degree	17%			
Some College	13%			
College Degree	54%			
Master's Degree	13%			
Ph.D.	2%			
<u>Functional Area</u>				
Clerical/Administrative Support	2%			
HR/Personnel/Training	4%			
Production	33%			
General Management	15%			
Financial	0%			
Healthcare/Nursing	7%			
Technical Support	2%			
Sales/Marketing	7%			
Information Systems	0%			
Communications/PR	2%			
Engineering/Research	7%			
Customer Service	20%			
Other	2%			

n=46

Thirty-three percent of team leaders worked in production, 15% in general management, and 20% in customer service, although other functional areas were represented (see Table 3.4). The mean team tenure for the leaders was 28.67 months (SD= 26.31). Forty-two percent of team leaders belonged to another team and 29% were leaders of another team.

Assessment of Response Bias

Despite a generally high overall response rate (see Table 3.2), the possibility exists that employees who completed and returned a survey differ in some fashion from the sample who initially received survey packets. The potential for response bias was assessed by comparing the sample of individuals given survey packets to complete with those who actually returned a completed survey, on several dimensions: age, sex, salary, education level, and organizational tenure. Information regarding demographic characteristics of the employees who were initially given surveys to complete was obtained from the organizational background inventory, completed by the organizational contact person at the time of survey distribution. Mean scores for these two groups are presented in Table 3.5. As can be seen, subjects who returned completed surveys were similar to those initially given surveys with only slight differences in the two groups. For example, survey respondents reported somewhat lower base salaries (\$ 27,566 vs. \$32,192), were slightly more educated, and were less likely to be male (17% vs. 24%).

Table 3.5

Assessment of Response Bias

Variable	Study Respondents	Total Sample
Age	37.08 yrs	38.00 yrs
Percent Males	17.0%	24.3%
Average Annual Salary	\$27,566	\$32,192
Average Company Tenure	9.13 yrs	8.5 yrs
Average Education Level ^a	2.15	1.83

a. Education level: 1= High school degree, 2= Some college, 3= College degree, 4= Master's degree, 5= Ph.D.

INSTRUMENTATION

Data for the present study were obtained from surveys administered to multiple data sources: the team members receiving team-based rewards, their team leader or supervisor, and an organizational representative. This strategy was chosen for several reasons. First, examining reactions of recipients of team rewards extends previous research on team-based rewards which has predominantly examined effectiveness at the organizational level. Inclusion of the team member's perspective allowed the examination of process-oriented issues, including mediators of the relationship between reward and team characteristics and outcomes such as team cooperation and team performance.

Second, this strategy was chosen to avoid problems of single source bias. As noted by Podsakoff and Organ (1986), "problems arise when measures of two or more variables are collected from the same respondents and the attempt is made to interpret any correlation(s) among them...because both measures come from the same source, any defect in that source contaminates both measures, presumably in the same fashion and in the same direction" (p. 533).

While statistical procedures exist to isolate the covariance due to artifactual reasons, it has been recommended that procedural, rather than statistical, methods be adopted whenever possible to avoid problems of common method variance. According to Podsakoff and Organ (1986), researchers should attempt to obtain measures of the variables of interest from multiple sources using multiple methods. In the present study, data for the reward characteristics, team characteristics, and reactions to team rewards were obtained from a survey administered to the team members. Measures of team cooperation (information sharing and helping behavior) and team performance were obtained from a separate survey completed by the team leader. Additionally, firm characteristics were obtained from a separate organizational background survey completed by the organizational

contact person (see Figure 3.1). This sampling strategy permitted most of the hypothesized relationships to be examined with data collected from multiple sources.

In designing surveys, care was taken to select scales that would be broad and general enough to apply equally well to members of multiple organizations with different backgrounds (e.g., different levels of experience in teams, different education levels). Established measures were reviewed for their suitability and used whenever possible. For variables in which a previously developed scale was inappropriate or unavailable, one was developed for present research. Responses were made on seven-point Likert scales with anchors ranging from (1) Strongly Disagree to (4) Neither agree nor disagree to (7) Strongly Agree, unless otherwise indicated. Individual items were averaged yielding a mean score for each variable. In all cases, higher scores reflect higher levels of the construct. The three surveys are briefly described below.

Organizational Background Survey

An organizational background survey was completed by the organizational contact person and included general items regarding the organization, including its size, industry type, procedures for allocating rewards, and characteristics of teams selected for participation in the study. A copy of this survey is included in Appendix E.

Team Member Survey.

Several variables were measured with a survey administered to the team members. Team members provided demographic information, including subject sex, age, race, educational level, organizational tenure, work status (full or part-time), functional area, and base salary information. Team members were also asked to indicate their team tenure, past experience working in teams, team size, team training received, interdependence with other teams in the organization, and membership on additional teams. Information about incentive pay was also obtained from the team member survey, including the size in pre-tax dollars of the team bonus received in the most recent year, the frequency of reward

allocation (quarterly, twice a year, yearly, project-by-project basis, other), the method of determining team reward amount (percentage of base pay or specific dollar amount), and incentive pay received from other sources (e.g., bonuses received based on individual or organization performance). Team members were also asked to report how team-based rewards were distributed among team members: equal distribution in which the same size bonus was given to all team members or equitable distribution in which the amount given to team members was based on individual performance within the team. A copy of the Team Member survey is included in Appendix F³. The remaining multiple-item measures included on the team member survey are described below.

Satisfaction with Team Rewards. Satisfaction with team rewards was assessed with a 4-item scale developed for the present research. Items measured the extent to which subjects experienced positive affect as a result of the team-based rewards they received. This measure appears in Figure 3.2.

Perceived Outcome Interdependence. Perceptions of the extent to which consequences that are shared by the group are contingent on how well the group performs (Shea & Guzzo, 1987a) were measured with a five item scale comprised of three items modified from the work of Campion et al. (1993), one item developed by Barnard and Rush (1995), and one item developed for the present research (see Figure 3.2).

Perceived Task Interdependence. Perceived task interdependence was assessed with seven items developed by Pearce and Gregersen (1991) and used in previous research (e.g., Anderson & Williams, 1996). Items were slightly reworded to fit the context of the present study (see Figure 3.3). Specifically, the team was used as the referent in all items (e.g., "I frequently must coordinate my efforts with my teammates" as opposed to "I frequently must coordinate my efforts with others").

³In some cases, the surveys were slightly tailored to meet the needs of specific organizations. The sample survey included represents the version of the survey used by over 50% of the sample.

Instructions: Please answer the following questions based on the team-based rewards you receive. Use the scale: SD= Strongly Disagree, D= Disagree, MD= Mildly Disagree, N= Neither Agree nor Disagree, MA= Mildly Agree, A= Agree, SA= Strongly Agree.

(SATISFACTION WITH TEAM-BASED REWARDS)

1. I am satisfied with the use of team bonuses/rewards/incentives in my organization.
2. I do not like being evaluated and rewarded based on the performance of my team.
(R)
3. I am glad this organization uses team-based rewards.
4. Overall, receiving team-based rewards has been a positive experience.

(PERCEIVED OUTCOME INTERDEPENDENCE)

1. Rewards/bonuses are distributed based on the collective performance of my team.
2. My rewards/bonuses are influenced by how well my team performs.
3. The rewards I receive are dependent on my team's performance.
4. My rewards are determined by my contributions to the team.
5. Feedback about how well I am doing my job comes primarily from information about how well the entire team is doing.

FIGURE 3.2

Measures of Satisfaction with Team-Based Rewards and Perceived Outcome
Interdependence

Instructions: These questions ask how you feel about your job and your team. If you are a member of more than one team, please respond based on the team you belong to that receives team-based rewards or bonuses. Indicate your level of agreement with each item using the scale: SD= Strongly Disagree, D= Disagree, MD= Mildly Disagree, N= Neither Agree nor Disagree, MA= Mildly Agree, A= Agree, SA= Strongly Agree.

(PERCEIVED TASK INTERDEPENDENCE)

1. I frequently must coordinate my efforts with my teammates.
2. I work closely with others on my team in doing my work.
3. The way I perform my job has a significant impact on my teammates.
4. I work fairly independently of my teammates in completing my work. (R)
5. My work requires me to consult with other team members fairly frequently.
6. I depend on my teammates' work for information I need to do my work.

FIGURE 3.3

Measure of Perceived Task Interdependence

Procedural Justice. Procedural justice, the perceived fairness of pay procedures, was measured by 8 items used in previous research (see Figure 3.4). Specifically, Moorman (1991) developed a two-factor scale measuring fairness in formal procedures and interaction justice. Items developed for these scales were based on recent multidimensional models of procedural justice (e.g., Greenberg, 1990b). Four items from the fairness in formal procedures scale were modified and used in the present research. In addition, four items were adapted from the scale developed by Folger and Konovsky (1980).

Distributive Justice. Distributive justice, the perceived fairness of pay outcomes, was measured by six items adapted from the Distributive Justice Index (Price & Mueller, 1986). The DJI measures the extent to which rewards received by employees are believed to be related to performance inputs (e.g., experience, effort). This scale has been used extensively in previous research and has demonstrated acceptable levels of reliability and validity. Items were slightly modified to fit the context in the present study (see Figure 3.4). Specifically, items were modified to reflect the extent to which rewards received by the team are believed to be related to the team's performance inputs.

Collective Efficacy. Collective efficacy represents a group's belief about its ability to perform effectively. A group with high collective efficacy has collective expectations for success. To assess collective efficacy, four items were taken from the work of Riggs and Knight (1994) and three additional items were developed for the present research. The original six-item measure developed by Riggs and Wright (1994) demonstrated acceptable levels of reliability in their research ($\alpha=.84$). The additional items developed for this study were based on Bandura's (1986) conceptualization of the dimensions of self-efficacy and measures used in previous research (e.g., Whitney, 1994). Specifically, three items were developed to more comprehensively assess the extent to which team members believed that their group has the ability to be successful and the confidence of members in the team's ability to reach its goals (see Figure 3.5).

Instructions: The following items describe things that an organization could do to reach a decision regarding the rewards your team receives. Using the same scale as above, indicate the extent to which your organization does the following when making decisions about rewards. (SD= Strongly Disagree, D= Disagree, MD= Mildly Disagree, N= Neither Agree nor Disagree, MA= Mildly Agree, A= Agree, SA= Strongly Agree)

(PROCEDURAL JUSTICE)

1. Frequently observes my team's performance.
2. Discusses plans or objectives to improve my team's performance.
3. Generates standards so that decisions can be made with consistency.
4. Allows personal motives or biases to influence decisions. (R)
5. Obtains accurate information about my team's performance.
6. Makes clear what is expected of our team.
7. Collects accurate information necessary for making decisions.
8. Uses consistent standards in evaluating the team's performance.

Instructions: Indicate your level of satisfaction with each aspect of your pay listed below. Use the scale: SD= Strongly Disagree, D= Disagree, MD= Mildly Disagree, N= Neither Agree nor Disagree, MA= Mildly Agree, A= Agree, SA= Strongly Agree

(DISTRIBUTIVE JUSTICE)

1. My team is fairly rewarded for the work it has done well.
 2. My team is fairly rewarded for the amount of effort we put forth.
 3. My team is fairly rewarded considering the responsibilities we have.
 4. My team is fairly rewarded considering the amount of education and training it has.
 5. My team is fairly rewarded in view of the amount of experience that we have.
 6. My team is fairly rewarded for the stresses and strains of our jobs.
-

FIGURE 3.4

Measures of Procedural and Distributive Justice

Instructions: These questions ask how you feel about your job and your team. If you are a member of more than one team, please respond based on the team you belong to that receives team-based rewards or bonuses. Indicate your level of agreement with each item using the scale: SD= Strongly Disagree, D= Disagree, MD= Mildly Disagree, N= Neither Agree nor Disagree, MA= Mildly Agree, A= Agree, SA= Strongly Agree.

(COLLECTIVE EFFICACY)

1. The members of this team have excellent skills.
2. My team is more effective than most teams in this organization.
3. I am confident in my team's ability to successfully coordinate its tasks and assignments.
4. My team can coordinate its tasks and activities.
5. I am confident that our team will be successful in achieving its goals.
6. My team does not perform as well as it should. (R)
7. The team I work with has above average ability.

FIGURE 3.5

Measure of Collective Efficacy

Helping behavior. Team member's perceptions of within-team helping behavior were measured by six items adapted from a sub-scale of the organizational citizenship behavior measure developed by Smith et al. (1983) and used in recent research (e.g., Settoon, Kidwell & Bennett, 1994). These items reflect extra-role behaviors which may facilitate the performance of the team without necessarily being a part of the employees formal job requirements or specified by the team's objectives. The items used to assess helping behavior are included in Figure 3.6. This measure was included on the team member survey for exploratory purposes.

Information Sharing. Four items were included on the team member survey to assess the extent to which information is shared among team members (see Figure 3.6). These items were developed by Barnard and Rush (1995) and exhibited acceptable levels of internal consistency in their research ($\alpha=.71$). This measure was also included on the team member survey for exploratory purposes.

Team Leader Survey

Several variables were assessed via the team leader survey. Team leader surveys were used to obtain information regarding the team, including team type, team size, task interdependence among team members, the leader's level of involvement in the day-to day activities of the team, organizational pay practices, and team turnover. The measure of task interdependence was the same as that used on the team member survey. Additionally, team leaders were asked to rate the cooperation among team members (information sharing and helping behavior) and team performance. A copy of the Team Leader survey is included in Appendix G. In the next section, the variables assessed from the team leader survey are described.

Instructions: These questions ask how you feel about your job and your team. If you are a member of more than one team, please respond based on the team you belong to that receives team-based rewards or bonuses. Indicate your level of agreement with each item using the scale: SD= Strongly Disagree, D= Disagree, MD= Mildly Disagree, N= Neither Agree nor Disagree, MA= Mildly Agree, A= Agree, SA= Strongly Agree.

(HELPING BEHAVIOR)

1. Members of my team orient new people even though they are not required to do so.
2. Members of my team make innovative suggestions that help improve the department.
3. Members of my team help others who have been absent.
4. Members of my team help co-workers who have heavy work loads.
5. Members of my team volunteer for things that are not required.
6. Members of my team are always willing to lend a helping hand.

(INFORMATION SHARING)

1. Information is readily exchanged between team members.
 2. I do not hesitate to pass information along that might help one of my teammates.
 3. My teammates and I go out of our way to share job relevant information.
 4. My team members freely share information with each other.
-

FIGURE 3.6

Measures of Helping Behavior and Information Sharing: Team Member Survey

Leader Involvement. Team leaders were asked to describe their level of involvement in the day-to-day activities of their teams. Specifically, leaders indicated the extent to which their role was characteristic of an external leader, an internal leader, or a leader fulfilling a combined role (see Figure 3.7). The response scale ranged from 0 (external leader) to 100 (internal leader).

Team Type. Team leaders were asked to classify the team into one of three types, advice, production and service, or project, based on the typologies described by Sundstrom, DeMeuse, and Futrell (1990) and Lawler and Cohen (1992) (see Figure 3.7).

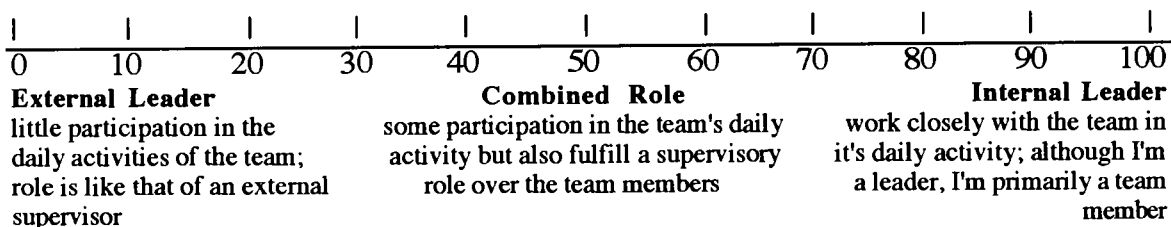
Helping behavior. Team leader's perceptions of the degree to which team members engage in helping behavior was measured by six items adapted from a sub-scale of the organizational citizenship behavior measure developed by Smith et al. (1983) and used in recent research (e.g., Settoon, Kidwell & Bennett, 1994). These items reflect extra-role behaviors which may facilitate team performance without necessarily being a part of the employees formal job requirements or specified by the team's objectives (see Figure 3.8).

Information Sharing. Four items were used to assess the extent to which information is shared between team members (see Figure 3.8). These items were developed by Barnard and Rush (1995) and exhibited acceptable levels of internal consistency in their research ($\alpha=.71$).

Team Performance. Team leaders were asked to evaluate the performance of their team relative to the performance of other teams in the organization on several performance dimensions, including: (1) Quality of Work, (2) Quantity of work, (3) Productivity, (4) Dependability, (5) Teamwork (6) Viability, (7) Customer Service, and (8) Overall Performance (see Figure 3.9). These dimensions reflect dimensions commonly used in research involving performance ratings (e.g., Alexander & Wilkins, 1982; Campion et al., 1993; Duarte, Goodson, & Klich, 1994; Judge & Ferris, 1993) and reflect the prominent definitions of team effectiveness in the literature (e.g., Sundstrom et al., 1990).

(TEAMLEADERINVOLVEMENT)

On a scale of 0 to 100, mark the axis below to indicate which best describes your role in this team.



(TEAMTYPE)

How would you best characterize the type of team you are currently leading: (please check one)

☐ Advice Team -employees contribute suggestions & participate in decision making (e.g., quality circles, employee involvement groups)	☐ Production and Service Team -employees work together to make a product or perform a service (responsible for performing day-to-day activities as a team) (e.g., self-managed teams, assembly teams, maintenance teams, manufacturing teams)	☐ Project Team -employees work on specific tasks or projects together (once project is complete, the team disbands) (e.g., task forces, cross-functional teams, research groups)
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FIGURE 3.7

Measures of Team Leader Involvement and Team Type

Instructions: Please indicate your agreement with each statement below using the scale:
SD= Strongly Disagree, D= Disagree, MD= Mildly Disagree, N= Neither Agree nor Disagree, MA= Mildly Agree, A= Agree, SA= Strongly Agree.

(HELPING BEHAVIOR)

1. Members of this team orient new people even though they are not required to do so.
2. Members of this team make innovative suggestions that help improve the department.
3. Members of this team help others who have been absent.
4. Members of this team help co-workers who have heavy work loads.
5. Members of this team volunteer for things that are not required.
6. Members of this team are always willing to lend a helping hand.

(INFORMATION SHARING)

1. Information is readily exchanged among members of this team.
2. Team members do not hesitate to pass information along that might help other teammates.
3. Teammates go out of their way to share job relevant information with each other.
4. Team members freely share information with each other.

FIGURE 3.8

Measures of Helping Behavior and Information Sharing: Team Leader Survey

Instructions: On the dimensions listed below, please rate your team's performance relative to other teams in your organization. Use the scale: 1=Much Worse; 2=Worse; 3=Slightly Worse; 4=About Equal; 5=Slightly Better; 6=Better; 7=Much Better.

(TEAM PERFORMANCE)

	1	2	3	4	5	6	7
1. Quality of work	☐	☐	☐	☐	☐	☐	☐
2. Quantity of work	☐	☐	☐	☐	☐	☐	☐
3. Productivity	☐	☐	☐	☐	☐	☐	☐
4. Dependability	☐	☐	☐	☐	☐	☐	☐
5. Teamwork	☐	☐	☐	☐	☐	☐	☐
6. Viability	☐	☐	☐	☐	☐	☐	☐
7. Customer service	☐	☐	☐	☐	☐	☐	☐
8. Overall performance	☐	☐	☐	☐	☐	☐	☐

FIGURE 3.9

Measure of Team Performance

Consideration of Control Variables

Before testing the proposed hypotheses, the role of potentially important variables were considered for their inclusion as control variables in subsequent analyses. One variable that was considered was team type. Researchers have proposed that type of group may be related to the appropriateness of alternative compensation strategies (Lawler & Cohen, 1993) and team effectiveness (McGrath, 1984). However because 96% of the teams in the present sample were service and production teams, it was determined that team type would not be included as a control variable. Another potential control variable was team turnover. It may be that teams with more turnover have more difficulty developing effective work strategies and, therefore, receive lower rewards. In addition, research has shown that turnover in teams influences the occurrence and nature of the team mental models that develop among team members (see Klimoski & Mohammed, 1994). As a result, team turnover was included as a control variable in all analyses. Team turnover was measured by one item included on the team leader survey which asked the team leader to describe the amount of turnover experienced in the team during the last three years using the following scale: 1= Almost no turnover, 2= Some turnover, 3= A moderate amount of turnover, 4= A great deal of turnover ($M = 2.16$, $SD = .89$).

Another team-level variables considered for inclusion as a control variable was team size. Given that team sizes varied considerably in the present study (range= 4-32), and team size has been shown to influence a variety of criteria, including social loafing behavior (Karau & Williams, 1993) and team effectiveness (Magjuka & Baldwin, 1991), team size was included as a control variable in all analysis in which a hypothesis involving team size was not being examined. Team size was measured by a single item included on both the team member and the team leader survey which asked the respondent to simply indicate the number of members currently on the team. The item included on the team member survey served as the primary source of information for this variable. When a discrepancy was

present (i.e., members of the same team reported a different team size), the item included on the team leader survey was used to resolve the discrepancy.

Finally, when satisfaction with team-based rewards was treated as the dependent measure, the overall pay satisfaction was included as a control variable. This strategy was taken to ensure that the measure of satisfaction with team-based rewards reflect reactions to the rewards themselves, rather than satisfaction with pay in general. Satisfaction with pay was measured the Pay Satisfaction Questionnaire (Heneman & Schwab, 1985). This questionnaire consists of 18 items which measure satisfaction with four aspect of satisfaction with pay: pay level, benefits, raises, and pay structure and administration. The four items measuring satisfaction with benefits and one item from the structure and administration scale were omitted, resulting in a 13-item scale (see Figure 3.10).

Summary

Figure 3.11 summarizes the source of the data for each variable. As can be seen, many of the hypothesized relationships involve data from multiple sources. In the next section, the results of the pilot test will be presented.

RESULTS OF PILOT STUDY

Participants and Procedure

Surveys were pilot-tested with a sample of 30 subjects comprised of 24 individuals enrolled in an Executive MBA program at a large state university in the southeast and 6 students enrolled in an upper-level evening class at the same university. All subjects were currently working in an organizational setting and 20% were currently receiving team-based rewards through their work. An additional 13% indicated that they were currently receiving another form of group-level outcome (i.e., team feedback, non-financial rewards).

Indicate your level of satisfaction with each aspect of your pay listed below. Use the scale:
VD= Very Dissatisfied; D= Dissatisfied; MD= Mildly Dissatisfied; N= Neither Satisfied
Nor Dissatisfied; MS= Mildly Satisfied; S= Satisfied; VS= Very Satisfied.

(PAY SATISFACTION)

1. My take home pay.
2. My current salary.
3. My overall level of pay
4. Size of my current salary.
5. My most recent raise.
6. Influence my supervisor has on my pay.
7. Raises I have typically received in the past.
8. How my raises are determined.
9. The company's pay structure.
10. Information the company gives about pay issues of concern to me.
11. Consistency of the company's pay policy.
12. Differences in pay among jobs in the company.
13. How the company administers pay.

FIGURE 3.10

Measure of Pay Satisfaction

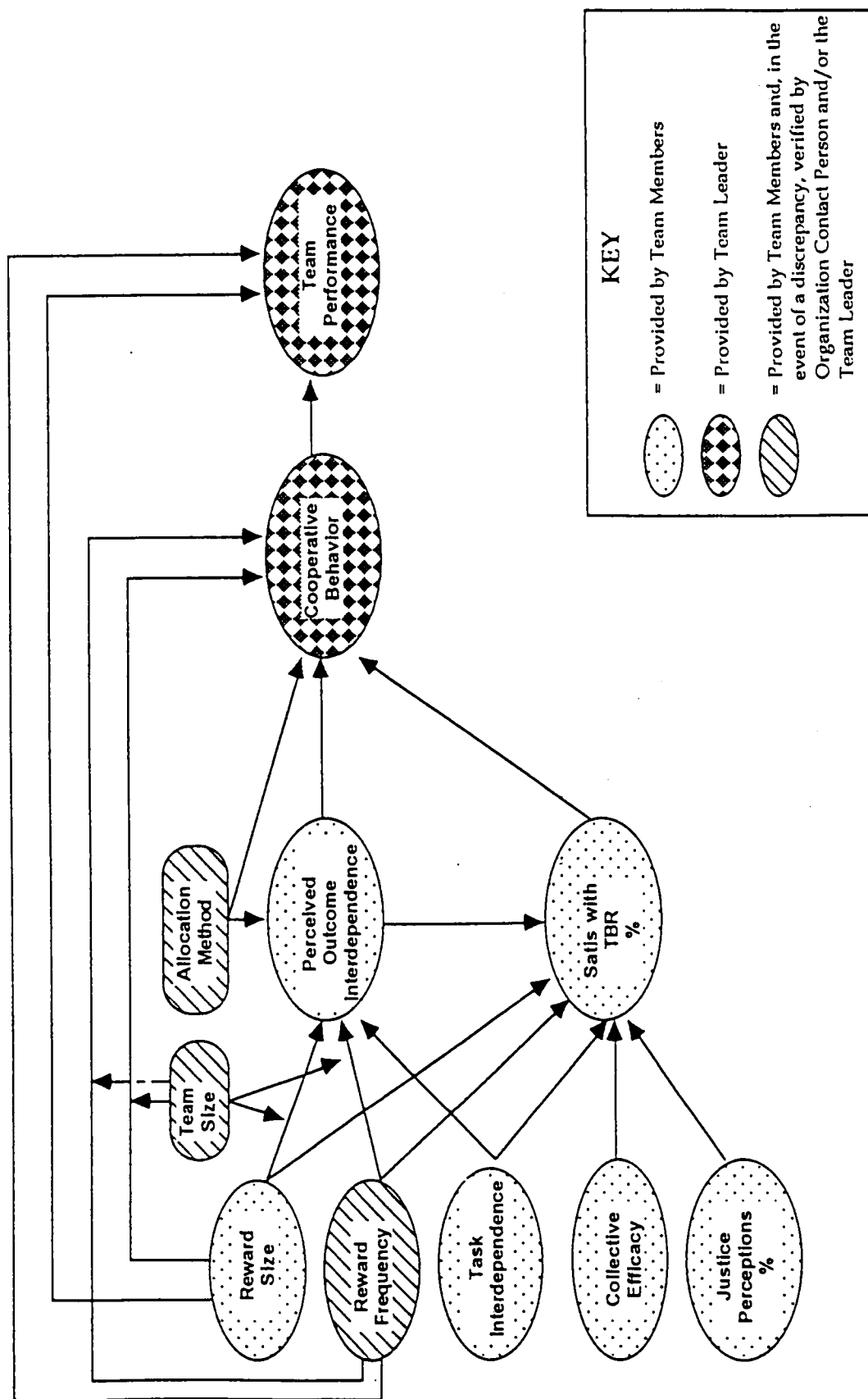


FIGURE 3.11

Data Sources for Primary Study Variables

Seventy-seven percent ($n=23$) of subjects were male. Subjects ranged from 22 to 46 years of age ($M=36.72$; $SD= 5.27$) and 93% had a college degree or higher. Forty-eight percent worked in a manufacturing organization and the remaining 52% worked in a service organization. Subjects represented a variety of functional areas, including general management (17%), technical support (17%), sales (13%), production (13%), and engineering (13%). Subjects organizational tenure ranged from one to 19 years ($M= 8.43$; $SD= 5.39$). Subjects' team tenure ranged from one month to approximately four and a half years, with a mean tenure of 10.8 months ($SD= 12.18$). The average team size was 10.86 ($SD= 8.41$). Subjects voluntarily participated in the pilot study.

Results of Pilot Test

Table 3.6 presents the means, standard deviations, and internal consistency reliability estimates for the measures. Table 3.7 presents the intercorrelations among the measures. As can be seen, all scales achieved acceptable levels of internal consistency, with the exception of the satisfaction with team reward scale. A closer examination of this scale revealed that two of the items were highly correlated with each other, while the other two items were also correlated with each other. The first two items were positively worded and assessed the extent to which subjects expressed positive affect toward the use of group-based rewards ("I am satisfied with the use of team bonuses/rewards/incentives in my organization" and "Overall, being in an organization that uses team-rewards has been a positive experience"). The other two items were negatively worded and measured the extent to which the subjects would prefer (if given the choice), the use of individual rewards rather than team-based rewards ("I do not like being evaluated and rewarded based on the performance of my team" and "If it were up to me, I would use individual rewards rather than team-based rewards"). Due to the low overall internal consistency reliability ($\alpha= .63$), the negatively worded items were dropped and three new items were written to better capture the positive affect associated with the use of team-based rewards.

Table 3.6

Descriptive Statistics and Reliability Estimates for Pilot Test Measures

Measures	# of items	Alpha	Mean	SD	min	max
Pay Satisfaction	14	.96	3.86	1.35	1.43	6.43
Distributive Justice	6	.94	3.81	1.62	1.50	6.83
Procedural Justice	8	.85	4.23	.83	2.70	5.60
Satisfaction with Team Rewards	4	.63	4.25	1.50	1.00	6.50
Outcome Interdependence	5	.92	4.02	1.39	1.20	5.60
Collective Efficacy	6	.89	4.96	.95	2.86	6.57
Task Interdependence	7	.81	5.17	.80	3.86	6.86
Helping Behavior	6	.80	4.57	.91	2.67	6.83
Information sharing	4	.77	5.39	.87	3.25	7.00

n=30

Table 3.7

Zero-order Correlations Among Pilot Test Measures

Measures	1	2	3	4	5	6	7	8	9
1. Outcome Interdependence	---								
2. Satisfaction w/ Team Rewards	39	---							
3. Pay Satisfaction	34	87	---						
4. Procedural Justice	30	56	45	---					
5. Distributive Justice	02	83	85	33	---				
6. Collective Efficacy	54	42	09	22	00	---			
7. Task Interdependence	-17	23	18	01	17	22	---		
8. Helping Behavior	18	30	13	-02	01	68	41	---	
9. Information Sharing	38	15	13	02	01	67	36	72	---

n=30

The only other change to the measurement system involved the distributive justice scale. The six items that comprise the Distributive Justice Index (Price & Mueller, 1986) measure the extent to which individuals believe they are fairly rewarded given various conditions (e.g., "I am fairly rewarded for the work that I have done well"; "I am fairly rewarded considering the responsibilities I have"). The decision was made to better adapt these items to the present context by changing the referent from the individual to the team (e.g., "My team is fairly rewarded for the work it has done well"). In addition, only three of the original six items were used on the final survey ("My team is fairly rewarded for the work it has done well"; "My team is fairly rewarded for the amount of effort we put forth"; "My team is fairly rewarded considering the responsibilities we have").

In summary, the majority of measures used in the pilot study demonstrated adequate levels of internal consistency reliability. Two changes were made to the measurement instruments as a result of the pilot test. First, the satisfaction with team-based rewards scale was modified as described above. Second, the referent in the distributive justice scale was changed from the individual to the team and only three items from the original scale will be used ("My team is fairly rewarded for the work it has done well"; "My team is fairly rewarded for the amount of effort we put forth"; "My team is fairly rewarded considering the responsibilities we have").

Power Analysis

A power analysis using the procedures and conventional standards set forth by Cohen and Cohen (1983) and Cohen (1977) was conducted to assess the number of subjects needed to detect the hypothesized moderating effects. This analysis was based on a hierarchical regression model of hypothesis testing in which the effects of a set of control variables were statistically partialled out before examining the effects of the predictor variables of interest. The analysis was conducted on a model including six independent

measures and one dependent measure, plus a maximum of three control variables. The computational formulas used to conduct the power analysis are presented in Appendix A.

According to the equations provided by Cohen (1988), a sample size of approximately 231 would be required to have an 80% probability of detecting a significant ($\alpha = .05$) effect of medium magnitude for six independent variables on one dependent variable, after controlling for the effects of 3 additional variables. While the results of the power analysis suggest the need for 231 subjects, caution should be exercised in interpreting this number. The calculation of the required sample size was based on equations derived for the use of individual level data. The author is unaware of an equivalent equation available for use with aggregated data. Thus, the equations available and the solutions they yield may not directly correspond to the use of group-level data. Furthermore, the interrater reliability of the team measures should lower the number of teams required to achieve similar levels of power.

CHAPTER IV

RESULTS

In this chapter, the results of the study are described. In the first section, results of analyses conducted to examine the psychometric properties of the measurement system are presented. In the second section, the proposed hypotheses are tested and results of these analyses are presented. Finally, the results of post hoc analyses are presented.

PSYCHOMETRIC EVALUATION OF MEASURES

Prior to hypothesis testing, the psychometric characteristics of the measures used in the present study were examined. This included an examination of internal consistency reliability estimates and confirmatory factor analysis.

Internal Consistency Reliability.

Internal consistency reliability (coefficient alpha) was computed for all multiple-item measures included in the present study. Initial reliability estimates ranged from .62 for task interdependence to .97 for distributive justice (see Table 4.1). Results of these analysis suggested several ways the a priori scales could be modified to enhance their psychometric properties. Specifically, one item with a low item-total correlation (.29) was deleted from the outcome interdependence scale, yielding a revised coefficient alpha of .72 ("Feedback about how well I am doing my job comes primarily from information about how well the entire team is doing"). An item with a low item-total correlation (.26) was also deleted from the satisfaction with team-based rewards scale, resulting in a revised coefficient alpha of .83 ("I do not like being evaluated and rewarded based on the performance of my team"- reverse coded). Additionally, one item with a negative item-total correlation (-.08) was dropped from the procedural justice scale, resulting in a final coefficient alpha of .91 ("Allows personal motives or biases to influence decisions"- reverse coded).

Table 4.1

Initial Reliability Estimates

Measures	Number of Items	Initial Reliability Estimate
<u>TEAMMEMBER SURVEY^a</u>		
Task Interdependence	6	.62
Collective Efficacy	7	.87
Procedural Justice	8	.85
Distributive Justice	3	.97
Perceived Outcome Interdependence	5	.70
Satisfaction With Team-Based Rewards	4	.74
Pay Satisfaction (control variable)	14	.95
Information Sharing	4	.79
Helping Behavior	6	.82
<u>TEAMLEADER SURVEY^b</u>		
Information Sharing	4	.90
Helping Behavior	6	.82
Team Performance	8	.91

a. n=239-324 due to missing data

b. n=44

The measure of task interdependence was somewhat more problematic. The initial internal consistency reliability estimate was .62. An examination of item-total correlations indicated that one item exhibited a low item-total correlation (.11). After deleting this item, the revised coefficient alpha was still below acceptable standards ($\alpha = .66$). This finding is similar to low coefficient alphas found in previous research (e.g., Barnard & Rush, 1995). An examination of the correlation matrix for the items comprising this scale suggested that the items used to measure task interdependence in this research were relatively uncorrelated ($M = .30$). Given the low reliability for this scale, any results obtained with this variable should be viewed with caution.

Confirmatory Factor Analysis

Confirmatory factor analyses were conducted using LISREL VII (Joreskog & Sorbom, 1989). Confirmatory, rather than exploratory, factor analysis was conducted due to its ability to test specific structures suggested by substantive theory (i.e., the items were developed to reflect a priori constructs). Moreover, confirmatory factor analysis allows the researcher to assess the overall fit of the model to the data and to compare the fit of competing models through statistical means such as the chi-square goodness of fit statistic and other fit indices that have been proposed to supplement the chi-square test. As recommended, the covariance matrix was used as input for all analyses (Long, 1983).

Team Member Data. A six factor model was estimated which included variables from the team member survey including perceived task interdependence, collective efficacy, perceived outcome interdependence, procedural justice, distributive justice, and satisfaction with team-based rewards. This resulted in indicator to sample size ratios of 29 to 330. The fit of the model was assessed via several fit indices. The chi-square test, the conventional overall test of fit in covariance structure analysis, assesses the magnitude of the discrepancy between the sample and fitted covariance matrices. Due to the problems associated with the chi-square test, additional fit indices are presented including absolute fit indices such as the

goodness of fit index (GFI; Joreskog & Sorbom, 1986), and the root mean square residual (RMSR; Joreskog & Sorbom, 1983), as well as incremental fit indices such as the normed fit index (NFI; Bentler & Bonett, 1980), the comparative fit index (CFI; Bentler, 1990), and the Tucker-Lewis Index (TLI, Tucker & Lewis, 1973). The GFI is a measure of the relative amount of variance and covariance in the sample covariance matrix (S) that is accounted for by the implied covariance matrix (Σ ; Hu & Bentler, 1995). The RMSR is a measure of overall fit based on the residual matrix. The NFI represents the proportion of total covariance among observed variables explained by the hypothesized model relative to a baseline model (Mulaik, James, Van Alstine, Bennett, Lind, & Stillwell, 1989). The CFI is an incremental fit index based on the noncentrality parameter of the chi-square and represents the relative reduction in lack of fit as estimated by the noncentral chi-square of the hypothesized model versus a baseline model. (Hu & Bentler, 1995; Tanaka, 1993). The TLI (Tucker & Lewis, 1973) lessens the dependency of the model fit on sample size. Utilizing these fit indices, "good fit" is supported by a non-significant chi-square value, a RMSR which approaches zero, and GFI, NFI, CFI, and TLI values which approach unity. Computation of CFI and NFI indices require the estimation of a comparison model. The comparison model was a null model in which all of the observed variables were uncorrelated (Bentler & Bonett, 1980).

The results of these analyses are presented in Table 4.2. As can be seen, all fit indices were in acceptable ranges lending support to the conclusion that the hypothesized model provide a reasonable fit to the data. Lambdas, t-values, and standard errors are presented in Table 4.3. T-values ranged from 6.716 to 24.192. Moreover, the standard errors for each item were relatively low (see Table 4.3). Finally, the additional fit indices calculated approach or exceed the conventional standard of "good fit" of .90 (Bentler & Bonett, 1980). Taken together, the results of the confirmatory factor analyses provide evidence supporting the proposed measurement model.

Table 4.2Goodness of Fit Indices: Team Member Survey

MODEL	X ²	df	GFI	RMSR	NFI	CFI	TLI
Measurement Model	839.24**	362	.85	.18	.85	.91	.84
Null Model	5574.80**	377	.49	.70			

Note: df=degrees of freedom; GFI= goodness of fit index; RMSR= root mean square residual; NFI= normed fit index; CFI= comparative fit index; TLI= Tucker-Lewis Index.
 **p<.001 n=330

Table 4.3

Results of Confirmatory Factor Analysis: Team Member Survey

Item	Lambda	Std Error	T-Value
TASK INTERDEPENDENCE1	.650	.090	7.194
TASK INTERDEPENDENCE2	1.030	.084	12.288
TASK INTERDEPENDENCE3	.452	.067	6.716
TASK INTERDEPENDENCE4	.717	.094	7.627
TASK INTERDEPENDENCE5	.771	.102	7.556
COLLECTIVE EFFICACY 1	.856	.067	12.727
COLLECTIVE EFFICACY2	.749	.072	10.368
COLLECTIVE EFFICACY3	1.059	.064	16.654
COLLECTIVE EFFICACY4	1.078	.067	16.104
COLLECTIVE EFFICACY5	.955	.060	15.973
COLLECTIVE EFFICACY6	1.077	.096	11.178
COLLECTIVE EFFICACY7	.819	.075	10.846
OUTCOME INTERDEPENDENCE1	.762	.084	9.028
OUTCOME INTERDEPENDENCE2	1.417	.077	18.509
OUTCOME INTERDEPENDENCE3	1.329	.083	16.052
OUTCOME INTERDEPENDENCE4	.723	.104	6.940
REWARD SATISFACTION1	1.257	.087	14.406
REWARD SATISFACTION2	1.511	.085	17.778
REWARD SATISFACTION3	1.380	.089	15.514
DISTRIBUTIVE JUSTICE1	1.590	.069	23.160
DISTRIBUTIVE JUSTICE2	1.624	.067	24.192
DISTRIBUTIVE JUSTICE3	1.561	.069	22.649
PROCEDURAL JUSTICE1	1.035	.089	11.680
PROCEDURAL JUSTICE2	1.228	.087	14.145
PROCEDURAL JUSTICE3	1.342	.084	16.012
PROCEDURAL JUSTICE4	1.397	.074	18.786
PROCEDURAL JUSTICE5	1.193	.078	15.294
PROCEDURAL JUSTICE6	1.474	.077	19.168
PROCEDURAL JUSTICE7	1.420	.079	18.064
n=330			

Team Leader Data. Despite the low sample size ($n=46$), confirmatory factor analysis was conducted to examine the factor structure of the three constructs assessed via the team leader survey (helping behavior, information sharing, and team performance). As can be seen in Table 4.4, the chi-square with 132 degrees of freedom was 249.86, $p<.01$, and the results of the remaining fit indices calculated were as follows: $GFI=.66$, $RMSR=.12$, $CFI=.80$, $NFI=.65$, $TLI=.79$. Lambda's, t-values, and standard errors are presented in Table 4.5. T-values were relatively low with a range from 3.516 to 8.179 and standard errors were relatively high, with a range from .113 to .210. Taken together, there was little evidence that the intended three factor model provided an adequate fit to the data. Because the three-factor model failed to conform to expectations, an exploratory factor analysis was conducted to examine the factor structure of the items measured in the leader survey.

Results of the exploratory factor analysis indicated a four factor solution accounting for 73% of the variance in the data. Examination of the rotated factor loadings revealed that the 18 items were grouped in a manner consistent with their a priori factors, with two exceptions. As can be seen in Table 4.6, one item intended to measure helping behavior ("Members of this team are always willing to lend a helping hand") demonstrated substantial cross-loading on the information sharing factor. In addition, the factor structure of the performance measure was multidimensional. Specifically, two of the performance items, "Quantity of work" and "Productivity" loaded on a separate factor. These results suggest that it might be informative to examine the separate components of performance identified in this sample. This would enable a better understanding of how the predictor variables influence these different aspects of team performance. Internal consistency reliability estimates were calculated for these two sub-factors and revealed a coefficient alpha of .89 for the 6-item sub-scale and .94 for the two-item sub-scale.

Table 4.4

Goodness of Fit Indices: Team Leader Survey

MODEL	X ²	df	GFI	RMSR	NFI	CFI	TLI
Measurement Model	249.86***	132	.66	.12	.65	.80	.79
Null Model	714.49***	135	.22	.55			

Note: df=degrees of freedom; GFI= goodness of fit index; RMSR= root mean square residual; NFI= normed fit index; CFI= comparative fit index; TLI= Tucker Lewis Index
 ***p<.001 n=46

Table 4.5

Results of Confirmatory Factor Analysis: Team Leader Survey

Item	Lambda	Standard Error	T-Value
HELPING1	.610	.173	3.516
HELPING2	.757	.163	4.634
HELPING3	.743	.157	4.730
HELPING4	1.041	.155	6.716
HELPING5	.859	.210	4.085
HELPING6	.645	.144	4.487
INFO SHARING1	1.018	.136	7.489
INFO SHARING2	1.120	.158	7.080
INFO SHARING3	.967	.144	6.717
INFO SHARING4	.709	.122	5.802
PERF1 (Quality of Work)	.734	.136	5.405
PERF2 (Quantity of work)	.993	.150	6.611
PERF3 (Productivity)	.928	.149	6.228
PERF4 (Dependability)	.779	.151	5.172
PERF5 Teamwork)	.843	.161	5.245
PERF6 (Viability)	.776	.118	6.595
PERF7 (Customer Service)	.658	.147	4.489
PERF8 (Overall Performance)	.922	.113	8.179

n=46

Table 4.6

Results of Exploratory Factor Analysis: Team Leader Survey

Items	Rotated Factor Loadings			
	1	2	3	4
HELPING1	.66			
HELPING2	.64			
HELPING3	.44			
HELPING4	.57	.45		
HELPING5	.56			
HELPING6		.45		
INFO SHARING1		.84		
INFO SHARING2		.87		
INFO SHARING3		.76		
INFO SHARING4	.44	.72		
PERF1 (Quality of Work)			.61	
PERF2 (Quantity of work)				.86
PERF3 (Productivity)				.81
PERF4 (Dependability)			.67	
PERF5 Teamwork)	.43		.66	
PERF6 (Viability)			.73	
PERF7 (Customer Service)			.62	
PERF8 (Overall Performance)			.68	.55

Note: Results based on principle axis analysis with a varimax rotation (n=46). Loadings <.40 omitted for clarity.

Given the multidimensional structure evidenced by the exploratory factor analysis, the ability to identify meaningful patterns in the item-loadings, and the high internal consistency reliability of the two sets of items, a two factor structure for the performance measure was retained for all subsequent analyses. For clarity, these two factors will be referred to as team productivity and team effectiveness. The mean score for the team productivity sub-factor was 5.34 ($SD = 1.16$) and responses ranged from three to seven, on a seven point scale. The mean score for the team effectiveness sub-factor was 5.29 ($SD = .86$) and responses also ranged from three to seven. A summary of refinements to the measurement system is presented in Table 4.7.

Descriptive Statistics

To assess the distribution and variance of responses, descriptive statistics were computed for all study variables. Due to missing data on the team member surveys, the total number of subjects varied across these measures, ranging from 307 to 328. As can be seen in Table 4.8, scale means ranged from 3.10 for distributive justice to 5.70 for information sharing among team members (subjects responded on a 1 to 7 scale). Most items demonstrated adequate variance, although there was more variance on items from the team member survey than those from the team leader survey (see Table 4.8). An examination of the response distributions from the team member survey revealed some evidence of a negative skew ($M = -.58$; $Range = -1.46$ to $.46$), although for all variables, subjects responded using the full range of the scale provided (1 to 7). An examination of the response distributions on measured from the team leader survey revealed a similar trend indicating a negative skew ($M = -.65$; $Range = -1.99$ to $.18$).

Table 4.7

Summary of Refinements to the Measurement System

<u>Measure</u>	<u>Refinements</u>	<u>Final Coefficient Alpha</u>
<u>Team Member Survey^a</u>		
Task Interdependence	dropped one item	.66
Collective Efficacy	none	.87
Procedural Justice	dropped one item	.91
Distributive Justice	none	.97
Outcome Interdependence	dropped one item	.72
Satisfaction with Team-Based Rewards	dropped one item	.83
Pay Satisfaction	none	.95
Helping Behavior	none	.82
Information Sharing	none	.79
<u>Team Leader Survey^b</u>		
Information Sharing	none	.90
Helping Behavior	none	.82
Team Performance	split into sub-factors	
• Team Productivity		.94
• Team Effectiveness		.89

a. n=239-324 due to missing data

b. n=44

Table 4.8

Descriptive Statistics for the Study Variables^a

Study Variable	# of Items	Mean	SD	Range	n
<u>TEAM MEMBER SURVEY</u>					
Reward Size ^b	1	2.94	2.25	0 - 16.67	234
Frequency of Payout ^c	1	1.67	.85	1 - 3	330
Allocation Method ^d	1	1.24	.43	1 - 2	279
Task Interdependence	5	4.97	.94	2.00 - 7.00	328
Collective Efficacy	7	5.18	1.03	1.29 - 7.00	328
Procedural Justice	7	4.49	1.38	1.00 - 7.00	308
Distributive Justice	3	3.10	1.62	1.00 - 7.00	324
Perceived Outcome Interdependence	4	4.77	1.22	1.00 - 7.00	307
Satisfaction With Team Rewards	3	3.59	1.51	1.00 - 7.00	311
Pay Satisfaction (control variable)	14	3.32	1.33	1.00 - 6.70	330
Information Sharing ^e	4	5.49	1.07	1.50 - 7.00	328
Helping Behavior ^e	6	4.92	1.13	1.00 - 7.00	328
<u>TEAMLEADER SURVEY</u>					
Leader Involvement ^f	1	67.33	22.48	10 - 100	45
Information Sharing	4	5.70	1.00	2.75 - 7.00	45
Helping Behavior	6	5.35	.87	3.17 - 6.83	45
Team Productivity	2	5.34	1.16	3.00 - 7.00	45
Team Effectiveness	6	5.29	.86	3.50 - 7.00	45

Note: Unless otherwise indicated, larger values represent higher levels of the construct.

a. Descriptive statistics are presented at the individual level.

b. Reward size is expressed as a percentage of base pay.

c. Frequency of payout coded: 1= Yearly, 2= Twice a year, 3= Quarterly

d. Allocation method coded: 1=Same size rewards (equal), 2=Different size rewards (equitable)

e. Team member responses on these measures were included for exploratory purposes.

f. Responses to the leader involvement scale ranged from 0 (external leader) to 100 (internal leader).

Prerequisites for Aggregation and Inter-rater Agreement. Research on levels of analysis has clearly specified that in order to justify aggregation, two conditions must be met: one conceptual in nature and one statistical. As noted by James (1982), the major conceptual issue is whether a concept developed to refer to one level is equally meaningful at the higher level of analysis. In the present study, the variables task interdependence, collective efficacy, and outcome interdependence can clearly be justified on the basis of a conceptual argument. That is, these variables are theoretically meaningful at the group level. As a result, group-level variables were formed by calculating unit group means for these measures and assigning the group mean to each team. To address the statistical issues, researchers have argued that some amount of homogeneity of within-group variance must exist before an aggregate measure may be used. Thus, prior to aggregating individual responses to the team level, within-team agreement on all variables meeting the conceptual criteria for aggregation was examined (task interdependence, outcome interdependence, and collective efficacy). Specifically, interrater agreement was computed for each team using James, Demaree, and Wolf's (1984) interrater agreement formula ($r_{wg(j)}$) based on the uniform, null distribution. Interrater agreement values of .70 or above are generally considered acceptable.

As can be seen in Table 4.9, the mean interrater agreement coefficient was within acceptable limits for the three variables meeting the conceptual criteria for aggregation. Moreover, 90% of the estimates for collective efficacy, 84% of the estimates for perceived task interdependence, and 63% of the estimates for outcome interdependence were greater than .70. Researchers have also advocated the use of analysis of variance techniques to detect the presence of between group differences (e.g., George & Bettenhausen, 1990; Campion et al, 1993). According to Hays (1988), F-values greater than one indicate sufficient between-group variance to support aggregation. Results of these analyses indicated that all three variables achieved an F greater than one (see Table 4.9).

Table 4.9

Estimates Of Within Group Agreement For Primary Study Variables^a

	F-Value	Mean	<.70	.70-.79	.80-.89	.90-1.00
Task Interdependence	1.47*	.82	16%	16%	43%	25%
Collective Efficacy	2.02**	.84	10%	6%	25%	59%
Outcome Interdependence	1.58*	.72	37%	14%	27%	22%

**p<.01 * p<.05 n=42

Note: The $R_{WG(J)}$ statistic was computed for all groups (James, Demaree & Wolf, 1984). Overall, 78% of these estimates were in the acceptable range.

a. The $R_{WG(J)}$ statistic was also computed for variables included on the team member survey for exploratory purposes. Results indicated a mean level of inter-rater agreement of .75 for team member ratings of information sharing and .75 for team member ratings of helping behavior.

Taken together, within group agreement was demonstrated on these variables as well as sufficient between group differences. Having met both conceptual and statistical prerequisites, data for these three variables were aggregated and the team's mean response was used as the input for all subsequent analyses..

Other predictors in the present study (perceived procedural and distributive justice, satisfaction with team-based rewards and the control variable, pay satisfaction), do not appear to meet the conceptual criteria for aggregation. That is, it would seem reasonable to argue that justice perceptions, pay satisfaction, and satisfaction with team-based rewards are individual level variables influenced by individual perceptions, making it meaningless to compute a group mean for these types of variables. To address this issue, a group composition variable was created which represented the percentage of members on each team that had a score above the population median on the measure in question. Thus, rather than using team means to examine group level predictions for these variables, a new group-level variable was created which represented the proportion of members on each team who scored above the population median on each variable⁴. For example, a team in which 3 out of 5 team members scored above the total sample median for procedural justice would receive a score of .60 whereas a team in which only 1 out of 5 team members scored above the sample median would receive a score of .20. In other words, teams with higher proportion values were comprised of more members who believed that the procedures used to allocate team rewards were fair than teams with lower proportion values. These group-level variables served as the input for all subsequent data analyses.

⁴This strategy was generally supported by the results of inter-rater agreement analysis conducted on these variables. Specifically, the Rwg statistic (James, DeMaree & Wolf, 1984) was calculated for each of the variables claimed to not meet the conceptual justification for aggregation because of their inherently individual nature. The mean level of interrater agreement for these variables are as follows: Procedural justice= .82; Distributive justice= .64; Satisfaction with team-based rewards= .49 (n=42).

HYPOTHESIS TESTING

General Analytic Strategy

A variety of statistical techniques were used for hypothesis testing. Correlational analysis and hierarchical multiple regression were used to examine the hypothesized direct relationships among the variables. Hierarchical multiple regression was also used to test moderated and mediated relationships. Specifically, the procedures described by James and Brett (1984) were used to test moderated relationships. Accordingly, moderation is supported when the addition of the interaction term (the product of the predictor variable and the moderator) explains incremental variance in the dependent variable over and above the main effects. Using the procedures described by Baron and Kenny (1986) hierarchical regression analyses were conducted to detect the presence of mediation. Specifically, mediation is supported when the following conditions are met: (1) Variation in levels of the predictor must significantly account for variance in the mediator, (2) Variance in the mediator variable must significantly account for variance in the criterion, and (3) A previously significant relationship between the predictor and criterion variable is no longer significant when the effects of the mediator are held constant. In other words, the relationship between the predictor and the criterion must become weaker when the effects of the mediator are held constant. If the path between the predictor and the criterion drops to zero, full mediation is demonstrated; if it is weaker but not zero, partial mediation is demonstrated.

Intercorrelations Among Study Variables

The zero-order correlations among the study variables are presented in Table 4.10. In the following section, the results of the correlational analysis with respect to the hypothesized relationships will be discussed. Immediately following, the presence of other additional significant correlations will be discussed.

Table 4.10

Zero-Order Correlations Among Aggregated Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<i>Control Variables</i>																
1. Pay Satisfaction	-															
2. Team Turnover	15	-														
<i>Reward Characteristics</i>																
3. Size of Team Reward ^a	35**	-13	-													
4. Frequency ^b	34**	-05	-23*	-												
5. Allocation ^c	42**	-15	41**	09	-											
<i>Team Characteristics</i>																
6. Team Size	10	07	-22†	42**	-02	-										
7. Task Interdependence	27*	21	17	08	13	12	-									
8. Collective Efficacy	29*	-11	21†	-07	17†	-10	50**	-								
<i>Reactions to Team Rewards</i>																
9. Outcome Interdependence	13	-03	-14	29*	-16	00	-27*	-12	-							
10. Satisfaction with TBRs	49**	17	25*	07	26*	-08	20†	24*	28*	-						
11. Procedural Justice	04	-02	04	16	00	09	02	13	20†	26*	-					
12. Distributive Justice	54**	-19	06	43**	42**	26*	24*	09	14	51**	29*	-				
<i>Team Coop. & Perf.</i>																
13. Information Sharing	21†	-08	15	-03	19	03	-04	42**	-29*	-12	-03	14	-			
14. Helping Behavior	11	-46**	16	02	27*	11	00	30*	-23†	-20	-17	13	63**	-		
15. Team Productivity	26†	02	31*	04	20	-05	-03	29*	-21†	-04	01	09	39**	52**	-	
16. Team Effectiveness	25†	-34*	27*	05	30*	-07	-10	36*	-07	-06	11	14	49**	64**	66**	-

**p<.01 *p<.05 †p<.10 One-tailed n=38-57 due to missing data

a. Size of team reward measured as a proportion of base pay.

b. Frequency of reward payout: 1= Yearly, 2=Bi-annually, 3= Quarterly.

c. Allocation represents the method used to allocate team-based rewards (1=Same size bonuses, 2=Different size bonuses based on individual performance within the team).

Hypothesized Relationships. As can be seen in Table 4.10, the zero-order correlations provide initial support for some of the hypotheses involving direct relationships between variables. With respect to satisfaction with team-based rewards, reward size was positively related to satisfaction with team-based rewards ($r=.25$, $p<.05$) providing support for Hypothesis 12. Perceived distributive justice and procedural justice were both related to satisfaction with team-based rewards ($r=.51$, $p<.01$; $r=.26$, $p<.05$, respectively), providing support for Hypotheses 14 and 15. That is, the extent to which team members perceived that the rewards their team receives and the procedures used to allocate team rewards were fair was associated with increases in satisfaction with team rewards. The significant positive correlation between perceived outcome interdependence and satisfaction with team-based rewards ($r=.28$, $p<.05$) provides support for Hypothesis 10. In other words, shared expectations of success among team members was associated with satisfaction with the use of rewards based on the team's performance. As predicted by Hypothesis 16, collective efficacy was also related to satisfaction with team rewards ($r=.24$, $p<.05$). Satisfaction with team-based rewards was not associated with the frequency of reward payout ($r=.07$, $p>.10$) and was only marginally related to perceived task interdependence ($r=.20$, $p<.10$). Taken together, increases in reward size, perceived outcome interdependence, collective efficacy, procedural justice, and distributive justice, were associated with increases in satisfaction with team rewards among team members.

Several predictions were made about the determinants of perceived outcome interdependence. The frequency of reward payout was associated with outcome interdependence ($r=.29$, $p<.05$) such that as frequency of payout increased, perceived outcome interdependence among team members increased. This finding supports Hypothesis 3a. Contrary to Hypothesis 7, task interdependence was negatively related to outcome interdependence such that teams who described their task driven interaction as interdependent perceived fewer shared consequences ($r= -.27$, $p<.05$). Neither reward size

nor allocation method was correlated with perceived outcome interdependence. Thus, Hypotheses 2a and 4a were not supported by the zero order correlations.

It was predicted that cooperative team behavior would be related to the size of team rewards, the frequency of reward payout, allocation method, perceived outcome interdependence, task interdependence, and satisfaction with team-based rewards. No significant effects were found for task interdependence or the reward characteristics, with the exception of allocation method: teams receiving rewards which were allocated based on an equity principle were rated by team leaders as exhibiting greater levels of helping behavior ($r=.27$, $p<.05$). Given that this significant correlation is in the opposite direction as predicted by Hypothesis 4b, this hypothesis was not supported. Similarly, although a significant correlation was detected between outcome interdependence and information sharing, it was in the opposite direction ($r=-.29$, $p<.05$). In other words, shared perceptions of outcome interdependence were associated with lower levels of information sharing. No relationships were found between satisfaction with team-based rewards and team cooperation (for information sharing, $r=-.12$, $p>.10$; for helping, $r=-.20$, $p>.10$).

Finally, as can be seen in Table 4.10, cooperative team behavior was associated with both team productivity and team effectiveness, supporting Hypothesis 18. Reward size was positively correlated with both team productivity ($r=.31$, $p<.05$), and team effectiveness ($r=.27$, $p<.05$), supporting Hypothesis 2c. The significant positive correlations between reward size and team productivity and team effectiveness suggests that increases in the amount of team reward relative to base pay were directly associated with increases in team performance. The predicted relationship between frequency of reward payout and team performance was not supported.

Additional Correlational Results. Several additional intriguing correlations were detected among the study variables. Especially noteworthy, were the effects for allocation method and collective efficacy. A significant positive correlation was detected between

allocation method and satisfaction with team-based rewards ($r=.26$, $p=.05$) such that team rewards based on an equity principle were associated with greater levels of satisfaction among team members. In addition, allocation method was also associated with perceptions of distributive justice ($r=.42$, $p<.01$). Thus, teams in which rewards were allocated based on an equity principle, rather than an equality principle, exhibited higher levels of satisfaction with the team rewards they received and had a greater proportion of members who believed the rewards were fair. Moreover, allocation method was associated with team effectiveness ($r=.30$, $p=.05$). That is, teams in which members received differential reward amounts based on their performance within the team (rather than receiving equal amounts) were rated as more effective by team leaders.

Several interesting correlations were detected between collective efficacy and the study variables. Collective efficacy was correlated with helping behavior among team members ($r=.30$, $p<.05$) and information sharing ($r=.42$, $p<.01$), as rated by the team leader. Team members' collective expectations for success (collective efficacy) were also significantly correlated with ratings of the team's productivity ($r=.29$, $p<.05$) and effectiveness ($r=.36$, $p<.05$). In other words, based on the zero-order correlations, collective efficacy appears to play a more pivotal role in understanding team cooperation and performance than hypothesized.

Interestingly, reward frequency was associated with distributive justice ($r=.43$, $p<.01$). In other words, the more frequently team rewards were given to teams, the greater were team members' perceptions that their rewards were fair.

Hierarchical Multiple Regression

Determinants of Satisfaction With Team-Based Rewards. Several antecedents of satisfaction with team-based rewards were hypothesized. Specifically, it was predicted that reward characteristics (reward size and frequency of payout), team characteristics (task interdependence and collective efficacy), and perceived fairness (procedural and distributive

justice) would be associated with satisfaction among team members with team-based rewards. To test these hypotheses, satisfaction with team-based rewards was regressed on these variables in a two step, hierarchical manner. In the first step, control variables were entered to remove the effects of team size, team type, and overall pay satisfaction on satisfaction with team-based rewards. In the second step, the hypothesized predictor variables were entered.

Results of these analyses are presented in Table 4.11. As can be seen, the total variance accounted for by all independent variables was 69%. The control variables accounted for a significant proportion of variance in satisfaction with team-based rewards. Specifically, overall pay satisfaction among team members was positively related to satisfaction with team-based rewards. In addition, team size was negatively correlated with reward satisfaction such that members of larger teams were less satisfied with team-based rewards. After controlling for team size, team turnover, and overall pay satisfaction, the primary study variables accounted for an additional 23% of variance in satisfaction with team-based rewards. The regression model confirmed the predicted effects of perceived outcome interdependence and procedural justice and, although the coefficient for frequency of payout was significant, it was in the opposite direction than was hypothesized. The positive significant coefficient for outcome interdependence confirms that as shared perceptions of outcome interdependence increase, satisfaction with rewards based on the team's performance increase and provides support for Hypothesis 10. As predicted, procedural justice was also related to satisfaction with team-based rewards, providing support for Hypotheses 15. In other words, satisfaction with team-based rewards increased when team members believed that the procedures used to allocate team-based rewards were fair. A significant negative correlation between frequency of payout and satisfaction was found: rewards allocated less frequently were associated with higher levels of satisfaction. Thus, Hypothesis 13 was not supported.

Table 4.11

Determinants of Satisfaction with Team-Based Rewards

Predictor Variables	Satisfaction with Team-based Rewards			
	Mult. R	R ²	ΔR^2	β
<i>Step 1: Control Variables</i>	.67**	.45**	.45**	
Team Size				-.32*
Team Turnover				.09
Pay Satisfaction				.62**
<i>Step 2: Reward Characteristics</i>	.83**	.69**	.23*	
Reward Size				.18
Frequency of Payout				-.30†
Perceived Outcome Interdependence				.24†
Procedural Justice				.30*
Distributive Justice				.19
Task Interdependence				-.10
Collective Efficacy				.06

†p<.10 *p<.05 **p<.01 n=34 teams

Contrary to Hypothesis 12 and 14, neither reward size nor distributive justice, respectively, were significant predictors of satisfaction with team-based rewards.

Interestingly, the results for both distributive justice and reward size were inconsistent with those found in the zero-order correlations. When the effects of the control variables were removed and all hypothesized predictors of satisfaction with team-based rewards were entered simultaneously, reward size and distributive justice failed to account for additional variance in satisfaction with team-based rewards. This may have occurred because of the significant relationships between pay satisfaction and satisfaction with team-based rewards and distributive justice such that controlling for overall pay satisfaction may have masked the effects of reward size and distributive justice. This possibility was explored by estimating an additional regression equation and omitting pay satisfaction as a control variable. The results of these analyses were similar to those reported in Table 4.11 with three exceptions: the coefficients for both reward size ($\beta = .33$, $p < .05$) and perceived distributive justice ($\beta = .41$, $p < .05$) were significant, and the negative coefficient for frequency of payout was positive and no longer significant.

Hypotheses 16 and 17 predicted that collective efficacy and task interdependence, respectively, would be positively related to satisfaction with team-based rewards. No support for these hypotheses was found.

Determinants of Outcome Interdependence. Several antecedents of outcome interdependence were hypothesized. Specifically, it was predicted that reward size, frequency of payout, allocation method, and task interdependence would contribute to perceived shared consequences among team members. To test these hypotheses, outcome interdependence was regressed on these variables in a two step, hierarchical manner. In the first step, control variables were entered to remove the effects of team size, and team turnover on perceived outcome interdependence. The remaining predictors were entered in the second step simultaneously.

The results of these analyses are presented in Table 4.12. As can be seen, although the variables together accounted for 22% of the variance in perceived outcome interdependence, neither step in the regression equation achieved significance. In addition, the only significant regression coefficient was a marginally significant effect for frequency of payout (Hypothesis 3a). As was found in the zero order correlations, rewards allocated more frequently were associated with higher levels of perceived outcome interdependence. No support was found for Hypotheses 2a, 4a, and 7. In other words, the hypothesized variables were unable to explain perceived outcome interdependence among team members.

Moderating Role of Team Size on Relationship Between Reward Characteristics and Perceived Outcome Interdependence. Hypotheses 5a and 5b predicted that team size would moderate the relationships between reward characteristics and perceived outcome interdependence. Specifically, the relationship between reward size and perceived outcome interdependence would be stronger when teams were smaller (Hypothesis 5a). Similarly, Hypothesis 5b predicted that the relationship between frequency of payout and perceived outcome interdependence would be greater when teams were smaller. These hypotheses were tested using hierarchical regression in which perceived outcome interdependence was regressed on the predictor variables in the following order: Set 1= control variables, Set 2= reward size and team size, and Set 3= the interaction term (reward size x team size). The same procedure was followed to examine whether team size moderates the relationship between frequency of payout and perceived outcome interdependence as proposed by Hypothesis 5b. In both cases, moderation is supported by a significant increment in R^2 in the third equation.

As shown in Table 4.13, team size did not significantly moderate the relationship between the two reward characteristics examined and outcome interdependence. Thus, the effects of reward characteristics on perceived outcome interdependence did not vary as a function of team size, and Hypotheses 5a and 5b were not supported.

Table 4.12

Determinants of Outcome Interdependence

Predictor Variables	Outcome Interdependence			
	Mult R	R ²	ΔR^2	β
<i>Step 1: Control Variables</i>	.06	.00	.00	
Team Size				.04
Team Turnover				-.05
<i>Step 2: Predictor Variables</i>	.47	.22	.22	
Reward Size				-.12
Frequency of Payout				.38†
Allocation Strategy				-.06
Task Interdependence				-.21

†p<.10 *p<.05 **p<.01 n=34 teams

Table 4.13

Hierarchical Multiple Regression Analyses: Moderating Role of Team Size on Relationship
Between Reward Characteristics and Perceived Outcome Interdependence

Predictor Variables	Standardized Regression Weights		
	Step 1	Step 2	Step 3
Team Turnover	-.05	.00	.02
Team Size		-.20	.05
Reward frequency		.43*	.63
Reward frequency x Team size			-.40
R ²	.00	.13	.13
ΔR^2		.13	.01
Team Turnover	-.05	-.08	-.07
Team Size		-.03	.12
Reward Size		-.29	-.09
Reward size x Team size			-.25
R ²	.00	.08	.09
ΔR^2		.08	.01

†p<.10 *p<.05 **p<.01 n=33 teams

Determinants of Cooperative Behavior. Hypotheses 2b, 3b and 4b predicted that reward size, frequency of reward payout, and allocation method, respectively, would be directly related to cooperative behavior in teams. Hypothesis 8 predicted that task interdependence would also be associated with cooperative team behavior. In addition, Hypotheses 1 predicted that perceived outcome interdependence would explain additional variance in team cooperation, beyond that explained by reward characteristics and task interdependence. Hypothesis 9 predicted that satisfaction with team-based rewards would explain additional variance in the dependent measures beyond the effects of reward characteristics, task interdependence, and perceived outcome interdependence. These hypotheses were tested using hierarchical regression in which the dependent measures (helping and information sharing) were each separately regressed on sets of independent variables in the following order: Set 1= control variables, Set 2= reward size, frequency of payout, allocation method, and task interdependence, Set 3= perceived outcome interdependence, and Set 4= reward satisfaction. Hypotheses concerning main effects (2b,3b,4b, & 8) are supported by the presence of a significant regression coefficient in the second step of the equation. Hypotheses 1 and 9 are supported by a significant increment in R^2 in the third and fourth equations, respectively. As can be seen in Tables 4.14 and 4.15, the reward characteristics accounted for little incremental variance in helping behavior and information sharing beyond the control variables. Moreover, the addition of satisfaction with team-based rewards and outcome interdependence in steps three and four in both equations did not explain a significant amount of incremental variance in helping or information sharing. Based on these findings, no support was found for Hypotheses 1, 2b, 3b, 4b, 8, or 9. The only significant relationship found was between team turnover and helping behavior. The significant negative coefficient for team turnover suggests that lower amounts of turnover within the teams were associated with greater helping behavior among team members.

Table 4.14

Determinants of Helping Behavior

Predictor Variables	Standardized Regression Weights			
	Step 1	Step 2	Step 3	Step 4
Team Size	.16	.25	.22	.22
Team Turnover	-.55**	-.58**	-.57**	-.59**
Allocation Method		.17	.16	.15
Reward Size		.01	-.01	-.04
Frequency of Payout		-.15	-.09	-.08
Task Interdependence		.10	.07	.07
Perceived Outcome Interdependence			-.15	-.18
Satisfaction with Team-Based Rewards				.07
R ²	.32**	.39*	.41*	.41†
ΔR ²		.07	.02	.00

†p<.10 *p<.05 **p<.01 n=33 teams

Table 4.15

Determinants of Information Sharing

Predictor Variables	Standardized Regression Weights			
	Step 1	Step 2	Step 3	Step 4
Team Size	.06	.10	.05	.05
Team Turnover	-.20	-.23	-.22	-.24
Allocation Method		.15	.14	.12
Reward Size		.02	-.01	-.05
Frequency of Payout		-.02	.07	.07
Task Interdependence		.16	.11	.11
Perceived Outcome Interdependence			-.23	-.28
Satisfaction with Team-Based Rewards				.09
R ²	.04	.11	.15	.16
ΔR ²		.07	.04	.01

†p<.10 *p<.05 **p<.01 n=33 teams

Moderating Role of Team Size on Relationship Between Reward Characteristics and Cooperative Team Behavior. Hypothesis 6a predicted that the relationship between reward size and cooperative behavior would be moderated by team size. Similarly, Hypothesis 6b predicted that the relationship between frequency of payout and cooperative behavior would be moderated by team size. That is, these hypotheses predicted that larger team rewards and team rewards distributed frequently would provoke higher levels of cooperative team behavior among team members when teams were small than when teams were large. Hierarchical multiple regression was utilized to test these Hypotheses. Specifically, after controlling for team turnover, helping was regressed on reward size and team size. In the next step, the interaction term (team size x reward size) was entered and the change in R^2 was examined. A significant change in R^2 would indicate support for the hypothesized role of team size as a moderator. The same procedure was followed for frequency of payout. Finally, both regression equations were estimated using the same procedure for information sharing.

As can be seen in Table 4.16, team size failed to moderate the relationships between reward size and frequency of payout and helping behavior as predicted. Similarly, team size failed to moderate the relationships between reward size and frequency of payout and information sharing (see Table 4.17). In both cases, the addition of the interaction term did not explain significant amounts of incremental variance in the dependent measures. Consequently, Hypotheses 6a and 6b were not supported.

Table 4.16

Moderating Role of Team Size on Relationship Between Reward Size and Frequency of Payout and Helping Behavior

Predictor Variables	Standardized Regression Weights		
	Step 1	Step 2	Step 3
Team Turnover	-.54**	-.58**	-.59**
Team Size		.24	-.07
Reward frequency		-.16	-.42
Reward frequency x Team size			.52
R ²	.30**	.34**	.35*
ΔR ²		.04	.01
Team Turnover	-.54**	-.54**	-.53**
Team Size		.19	.36
Reward Size		.13	.38
Reward size x Team size			-.30
R ²	.30**	.34**	.36*
ΔR ²		.04	.02

†p<.10 *p<.05 **p<.01 n=33 teams

Table 4.17

Moderating Role of Team Size on Relationship Between Reward Size and Frequency and Information Sharing

Predictor Variables	Standardized Regression Weights		
	Step 1	Step 2	Step 3
Team Turnover	-.19	-.20	-.22
Team Size		.09	-.25
Reward frequency		-.04	-.32
Reward frequency x Team size			.55
R ²	.04	.04	.06
ΔR ²		.01	.01
Team Turnover	-.19	-.18	-.18
Team Size		.10	.13
Reward Size		.14	.19
Reward size x Team size			.06
R ²	.04	.06	.06
ΔR ²		.02	.00

†p<.10 *p<.05 **p<.01 n=34 teams

Determinants of Team Performance.

Hypotheses 2c, 3c, and 18 predicted that reward size (relative to base pay), frequency of reward payout, and team cooperation, respectively, would be positively related to team performance. As can be seen in Table 4.18, the control variables accounted for a significant amount of variance in team performance. Specifically, teams with little turnover were more likely to be rated as effective by the team leaders. In step 2, the hypothesized variables were entered and accounted for a significant portion of incremental variance in both team productivity and effectiveness. As can be seen, reward size was significantly related to team productivity but was unrelated to team effectiveness providing some support for Hypothesis 2c. Frequency of payout was unrelated to both dependent measures, thus, Hypothesis 3c was not supported. Consistent with Hypothesis 18, within-team helping behavior was significantly related to both team productivity ($\beta = .68$, $p < .05$) and team effectiveness ($\beta = .39$, $p < .10$). The regression coefficients for information sharing did not achieve significance in either equation, perhaps due to the high correlation between helping and information sharing ($r = .63$, $p < .01$).

Hypotheses Involving Mediation. Several hypotheses propose mediation among the study variables. According to Howell, Dorfman and Kerr (1986) "a mediator must be part of an active causal process in which the mediator transmits the effects of an independent variable (x) to a criterion (y) such that $x \rightarrow m \rightarrow y$ ". Secondly, because mediators are a link in a causal chain, they must be correlated with both the independent and the dependent variable such that $m = f(x)$ and $y = f(m)$ (James & Brett, 1984).

An examination of the correlation matrix presented in Table 4.10 reveals that the relationship between outcome interdependence and information sharing was marginally significant and was in the opposite direction than hypothesized and the relationship between outcome interdependence and helping was nonsignificant.

Table 4.18

Determinants of Team Performance

Predictor Variables	Team Productivity			
	Mult R	R ²	ΔR ²	β
<i>Step 1: Control Variables</i>	.15	.02	.02	
Team size				-.04
Team turnover				-.15
<i>Step 2: Predictor Variables</i>	.55†	.31†	.28*	
Reward Size				.29†
Frequency of payout				.12
Helping Behavior				.68*
Information Sharing				-.24
	Team Effectiveness			
	Mult R	R ²	ΔR ²	β
<i>Step 1: Control Variables</i>	.45*	.20*	.20*	
Team size				-.03
Team turnover				-.44**
<i>Step 2: Predictor Variables</i>	.73**	.53**	.33**	
Reward Size				.19
Frequency of payout				.02
Helping Behavior				.39†
Information Sharing				.25

†p<.10 *p<.05 **p<.01 n=34 teams

Similarly, satisfaction with team-based rewards was not significantly related to the two indicators of cooperative team behavior. Given that prerequisites for mediation were not supported, Hypothesis 11 which proposed that reward satisfaction would mediate the relationship between outcome interdependence and cooperative team behavior was not supported and a formal test for mediation was not conducted. Similarly, Hypotheses 19 and 20 were not supported and formal tests for mediation were not conducted for the same reason.

Summary of Results

Figure 3.12 presents an illustration of the study's findings relative to the overall framework. In addition, Table 4.19 presents the results of the correlational and regression analyses relative to the proposed hypotheses. As can be seen, few of the hypothesized relationships were supported. Given the lack of support for the overall framework and the number of significant relationships identified that were not hypothesized a priori, Figure 3.13 illustrates the pattern of findings found in the present study.

Post Hoc Analyses

Level of Leader Involvement. Given the lack of significant relationships between outcome interdependence and satisfaction with team-based rewards and team cooperation, it may be that team leader/supervisor ratings were not the most appropriate source of information for these dependent measures. Specifically, while the team leader may have sufficient knowledge of the team's overall performance, he/she may not be in a good position to observe the daily exchange of information among team members or their helping behavior. To explore this possibility, two strategies were taken. First, all regression analyses involving these dependent measures were re-estimated controlling for the team leader's level of involvement in the team's daily activities. This variable was measured with a single item included on the team leader survey and represents the extent to which the team-leader was involved in the day-to-day activities of it's team (see Figure 3.7).

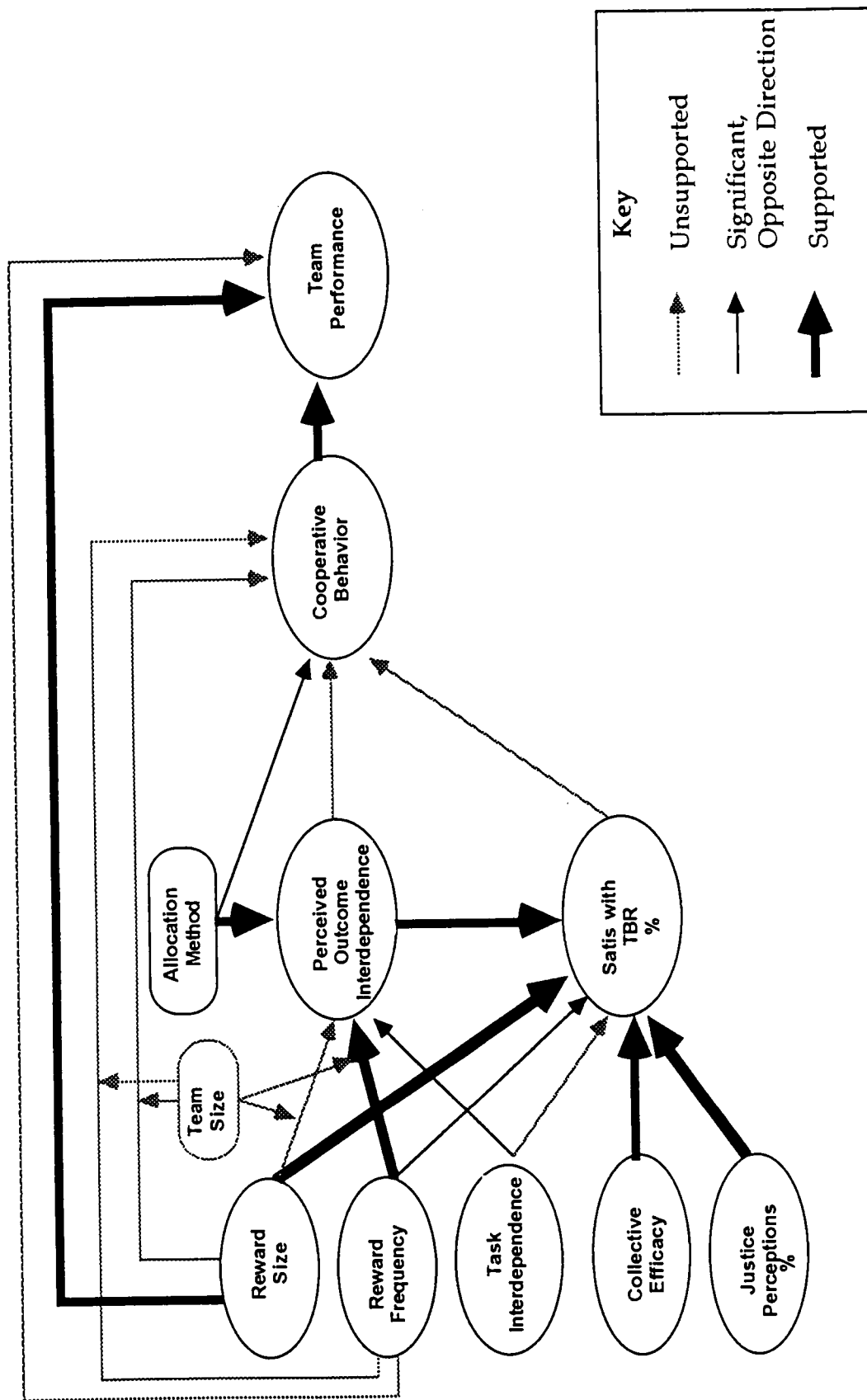


FIGURE 3.12

Table 4.19

Summary of Findings

Hypotheses	Correlational Results	Regression Analysis
Hypothesis 1	Untested	Unsupported
Hypothesis 2a	Unsupported	Unsupported
Hypothesis 2b	Unsupported	Unsupported
Hypothesis 2c	Supported	Supported
Hypothesis 3a	Supported	Supported
Hypothesis 3b	Unsupported	Unsupported
Hypothesis 3c	Unsupported	Unsupported
Hypothesis 4a	Unsupported	Unsupported
Hypothesis 4b	<i>Supported-Opposite direction</i>	Unsupported
Hypothesis 5a	Untested	Unsupported
Hypothesis 5b	Untested	Unsupported
Hypothesis 6a	Untested	Unsupported
Hypothesis 6b	Untested	Unsupported
Hypothesis 7	<i>Supported-Opposite direction</i>	Unsupported
Hypothesis 8	Unsupported	Unsupported
Hypothesis 9	Untested	Unsupported
Hypothesis 10	Supported	Supported
Hypothesis 11	Untested	Unsupported
Hypothesis 12	Supported	Unsupported
Hypothesis 13	Unsupported	<i>Supported-Opposite direction</i>
Hypothesis 14	Supported	Unsupported
Hypothesis 15	Supported	Supported
Hypothesis 16	Supported	Unsupported
Hypothesis 17	Unsupported	Unsupported
Hypothesis 18	Supported	Supported for Helping
Hypothesis 19	Untested	Unsupported
Hypothesis 20	Untested	Unsupported

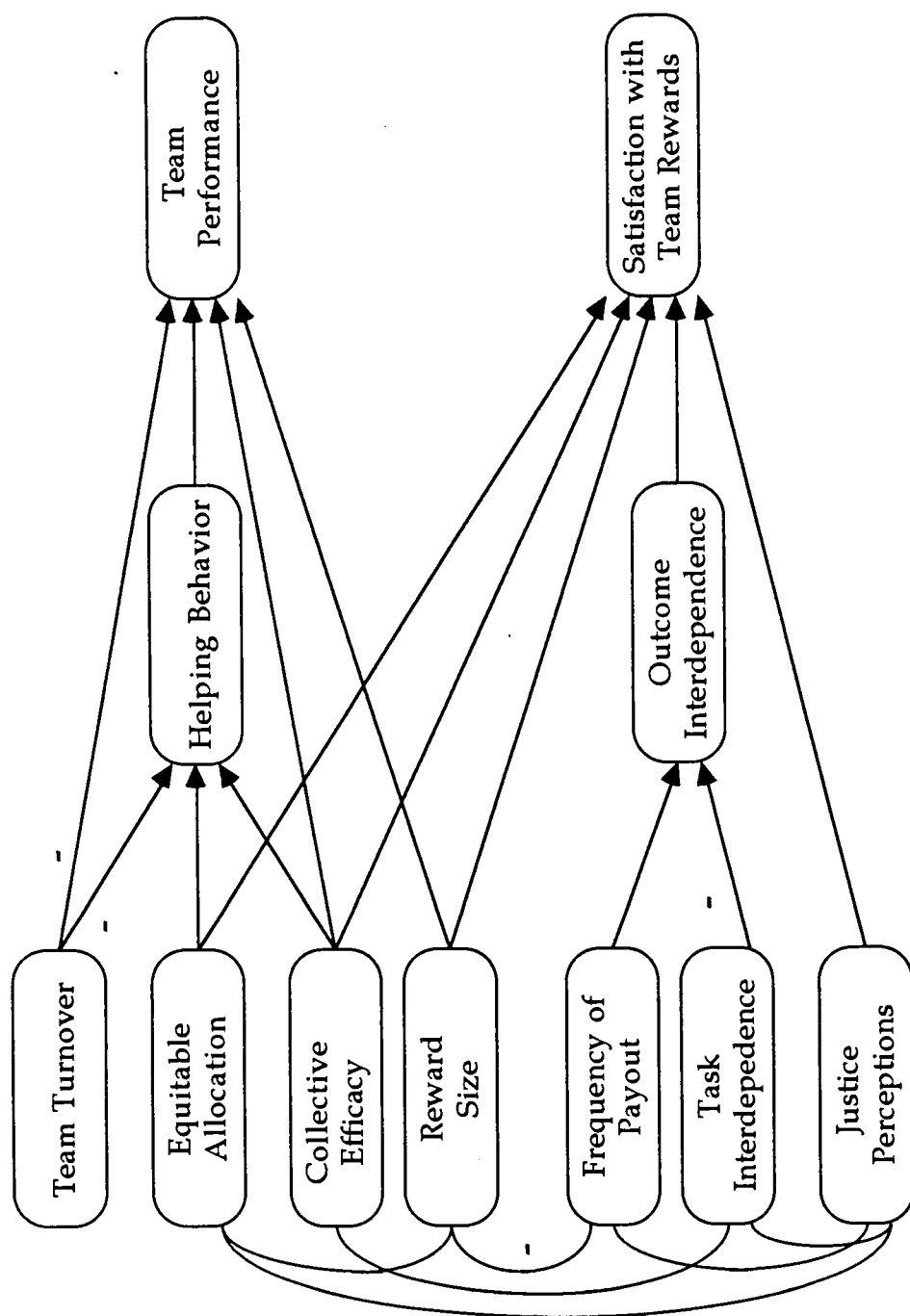


FIGURE 3.13

Post-hoc Illustration of the Pattern of Zero-Order Correlations Among Study Variables

Results revealed that controlling for the leader's level of involvement did not produce any differences in the findings. That is, leader involvement in the team's daily activities did not account for a significant amount of variance in ratings of helping or information sharing or alter the significance levels of the other variables included in the regression equations.

Second, the zero order correlations were examined between leader involvement and the other study variables. Leader involvement was not significantly correlated with any of the study variables. As a result, it appears that the leader's level of involvement in the team's daily activities and, hence, his or her opportunity to observe the teams daily interaction, was unrelated to the variables in the present study.

Appropriate Source of Cooperation Ratings. A related issue is the appropriate source of data for the variables assessing team cooperation. Measures of within-team helping and information sharing were provided by the team leaders. It may be that team leaders have a different perception of these behaviors than the team members themselves and may not be the most appropriate source of this information. Given that team leaders are not the recipient of helping or information sharing, even team leaders with sufficient opportunity to observe may not be privy to discretionary, extra-role behaviors such as helping one's teammates after an absence or a willingness to lend a helping hand. Therefore, it may be that the team members are a more appropriate source of information regarding helping and information sharing among team members than the team leaders.

To explore this possibility, ratings of helping and information sharing as provided by the team members were examined. In Table 4.20, a correlation matrix is presented in which the two different sources of data for the two indicators of team cooperation are both provided. As can be seen in Table 4.20, a different pattern of findings emerges with respect to the criticality of affective reactions when one examines the information on team cooperation provided by the team members.

Table 4.20

Revised Correlation Matrix with Team Member Ratings of Helping and Information Sharing Included

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Control Variables																	
1. Pay Satisfaction	-																
2. Team Turnover	15	-															
Reward Characteristics																	
3. Size of Team Reward ^a	35**	-13	-														
4. Frequency ^b	34**	-05	-23*	-													
5. Allocation ^c	42**	-15	41**	09	-												
Team Characteristics																	
6. Team Size	10	07	-22†	42**	-02	-											
7. Task Interdependence	27*	21	17	08	13	12	-										
8. Collective Efficacy	29*	-11	21†	-07	17†	-10	50**	-									
Reactions to Team Rewards																	
9. Outcome Interdependence	13	-03	-14	29*	-16	00	-27*	-12	-								
10. Satisfaction with TBRs	49**	17	25*	07	26*	-08	20†	24*	28*	-							
11. Procedural Justice	04	-02	04	16	00	09	02	13	20†	26*	-						
12. Distributive Justice	54**	-19	06	43**	42**	26*	24*	09	14	51**	29*	-					
Team Coop. & Perf.																	
13. Info. Sharing- Leader	21†	-08	15	-03	19	03	-04	42**	-29*	-12	-03	14	-				
14. Info. Sharing- Member	38**	19	18†	13	10	-01	51**	78**	-06	38**	25*	25*	35*	-			
15. Helping Beh.- Leader	11	-46**	16	02	27*	11	00	30*	-23†	-20	-17	13	63**	00	-		
16. Helping Beh.- Member	31**	04	23*	01	17	-02	49**	88**	-04	30*	12	14	36*	77**	27*	-	
17. Team Productivity	26†	02	31*	04	20	-05	-03	29*	-21	-04	01	09	39**	09	52**	22†	-
18. Team Effectiveness	25†	-34*	27*	05	30*	-07	-10	36*	-07	-06	11	14	49**	15	64**	33*	66**

**p<.01 *p<.05 †p<.10 n=38-57 due to missing data

Shaded areas represent team cooperation data provided by team members.

a. Size of team reward measured as a proportion of base pay. b. Frequency of reward payout: 1= Yearly, 2=Bi-annually, 3= Quarterly.

c. Allocation represents the method used to allocate team-based rewards (1=Same size bonuses, 2=Different size bonuses based on individual performance within the team)

According to the data provided by team members, satisfaction with team-based rewards was correlated with self-reports of within-team helping and information sharing. In addition, team member self-reports of these variables were also correlated with the leader's ratings of team performance. Specifically, within team helping as evaluated by the team members was correlated with ratings of team effectiveness as evaluated by the team leader.

CHAPTER V

DISCUSSION

The movement toward team-based approaches to organizing work has resulted in experimentation with alternative human resource practices to support team-based organizational structures. Rewards contingent upon team, rather than individual, performance represent one such practice. While the use of team-based rewards in organizational settings has increased (Ledford et al., 1995), there is little research to aid the practitioner in their implementation. The primary purpose of the present study was to extend current research on team rewards by examining the direct and indirect effects of several reward characteristics (reward size, frequency of reward payout, allocation method) on team behavior and performance in a field setting. Secondly, affective reactions to team rewards, as well as determinants of those reactions, were explored in an attempt to explain additional variance in team cooperation. These issues were investigated in a field setting involving 330 employees and 46 team leaders representing 57 teams from 10 different organizational units. In addition, multiple data sources were utilized to provide a more methodologically rigorous test of the proposed hypotheses and to avoid capitalizing on artifacts which can arise from the use of same source data (e.g., common method bias). Finally, the literature and theory on team-based rewards was extended by examining predictions grounded in motivation theory regarding procedural and distributive justice and collective efficacy.

In this chapter, the suitability of the proposed framework and the results of the specific tests of the hypotheses will be discussed, as well as the results of post hoc analyses. Following these sections, practical and theoretical implications will be presented followed by directions for future research. In the final sections, limitations of the study are explored and conclusions are offered.

ASSESSMENT OF THE PROPOSED FRAMEWORK

The main purpose of the current study was to integrate and extend research and theory on team-based rewards. It was proposed that reward characteristics (e.g., reward size, frequency of reward payout, allocation method) and task interdependence would be positively associated with perceived outcome interdependence among team members and that outcome interdependence would, in turn, be related to cooperative team behavior and team performance. Affective reactions to team rewards were also considered. Specifically, reward characteristics and task interdependence were hypothesized to be related to satisfaction with team-based rewards. The present study was the first field-based study of team rewards the author is aware of which also considered issues related to perceptions of justice and collective efficacy.

Role of Perceived Outcome Interdependence

Overall, the framework presented in Figure 2.1 was only weakly supported. Based on the results of correlational and regression analyses, it was found that the tenets of Goal Linkage theory were not supported. Reward characteristics such as the proportion of pay based team on performance and allocation method were not associated with perceived outcome interdependence among team members. In fact, the only reward characteristics that was able to explain significant variance in perceived outcome interdependence was frequency of reward payout: as the frequency with which team-based rewards were allocated increased, perceived outcome interdependence increased. Further, the results of the present study do not support the view that reward characteristics influence team interaction and team performance through subjective perceptions of outcome interdependence as predicted by Tjosvold (1986). Outcome interdependence was unrelated to team leaders' ratings of within-team citizenship behavior, information sharing among team members, and team performance. Reward size was directly related to team performance but this relationship was not mediated by perceived outcome interdependence.

In other words, despite strong theoretical support, perceived outcome interdependence was not a critical determinant of team outcomes.

Contrary to prediction, a significant negative relationship was detected between perceived task interdependence and perceived outcome interdependence. Research by Wageman (1995) suggested that perceived task interdependence influences the way rewards are experienced among group members. In the present study, this finding was not supported. Rather, respondents indicated that as task interdependence increased, team members were less likely to experience their outcomes as interdependent. It is unclear why this effect occurred; however, this issue is explored at a later point in this chapter.

Satisfaction with Team-Based Rewards

Several significant predictors of satisfaction with team-based rewards were identified. As predicted, the regression analyses revealed that perceived outcome interdependence was associated with satisfaction with team-based rewards. In light of the discussion above, it appears that outcome interdependence may be related to team members reactions to the use of team rewards but not to their propensity to engage in cooperative behavior or exhibit higher levels of team performance.

This study also examined the relationship between justice perceptions and satisfaction with team-based rewards. Results of the regression analyses indicated that team members were more satisfied with the use of team-based rewards when they believed that the procedures used to allocate the rewards were fair. Based on the results of the correlational analyses, distributive justice was also associated with satisfaction with team-based rewards. Interestingly, the regression coefficient for distributive justice was not significant in the regression analysis, despite a significant zero order correlation between distributive justice and satisfaction with team rewards ($r=.51$, $p<.01$). This may have occurred because of the significant correlation between overall pay satisfaction and perceptions of distributive justice ($r=.54$, $p<.01$). That is, after controlling for overall pay

satisfaction, the effects of distributive justice on pay satisfaction were masked. This possibility was confirmed by re-estimating the regression equation omitting pay satisfaction as a control variable. Results were similar to those reported in Table 4.10 with one exception: the coefficient for distributive justice was significant ($\beta = .41$, $p < .01$).

Contrary to prediction, task interdependence was unrelated to satisfaction with team-based rewards. Although the author is unaware of any research that has sought to test this relationship, it seemed reasonable to expect that team members would be more satisfied with the use of team-based rewards when they perceive that the team's task was interdependent. Given the negative correlation between task interdependence and outcome interdependence and the lack of relationship between task interdependence and satisfaction with team-based rewards, it seems that the role of task interdependence is substantially different than was hypothesized in the present study. It is instructive to more closely consider past research to further understand the nature of the relationship between task and reward interdependence.

The literature on the relationship between task and reward interdependence has yielded two general conclusions: 1) task interdependence is directly related to outcomes such as helping, information sharing, and communication (e.g., Johnson, 1973) and, 2) task and reward interdependence interact such that teams tend to exhibit higher levels of performance when they are engaged in interdependent tasks and receive group-based (i.e., cooperative, interdependent rewards) versus individually-based (competitive) rewards (e.g., Miller & Hamblin, 1963). Several authors have proposed congruency-based models of team effectiveness based on the notion that if tasks and outcomes are congruent (i.e., independent task paired with individually-based rewards or interdependent tasks paired with group-based rewards), team effectiveness will be maximized (e.g., Saavedra et al., 1993). For instance, Shea and Guzzo (1987) proposed an interactive influence of task and outcome interdependence on group effectiveness such that effectiveness is maximized when

task and outcome interdependence are congruent. In addition, Saavedra et al. (1993) obtained support for a three-way interactive influence of task, goal, and feedback interdependence on team effectiveness. In light of these findings, it may be that task and outcome interdependence interact to explain satisfaction with team-based rewards. That is, congruence between task and outcome interdependence may result in high levels of satisfaction with team-based rewards whereas a lack of congruence may result in lower levels of satisfaction.

To test this possibility, moderated regression analysis was conducted in which satisfaction with team-based rewards was regressed on task interdependence, outcome interdependence, and the task-by-outcome interdependence interaction term. Results of this analysis failed to support a significant interaction between task and outcome interdependence in predicting satisfaction with team based rewards.

Another possible explanation for the support for task interdependence is the psychometric weaknesses of the measurement instrument. As was discussed previously, the task interdependence scale exhibited a coefficient alpha of .66. Thus, the low reliability of the scale in the present sample may not have permitted an adequate test of the proposed relationships. However, team leader ratings of task interdependence ($\alpha = .82$) used in place of team member ratings resulted in the same pattern of findings. That is, team leader ratings of the team's task interdependence were negatively correlated with team member's perceived outcome interdependence ($r = -.37, p < .01$). The relationship between leader ratings of task interdependence and member satisfaction with team-based rewards was also non-significant ($r = -.17, p > .10$). And, the inclusion in the regression analyses of the measure of task interdependence provided by the team leader failed to produce any significant differences. Thus, it doesn't appear that the psychometric weaknesses of the task interdependence scale were responsible for the negative relationship between task interdependence and outcome interdependence.

The predicted positive relationship between perceptions of collective efficacy and satisfaction with team-based rewards was marginally supported. Although a significant zero-order correlation was detected ($r=.24$, $p<.05$), the regression coefficient was not significant when the other predictors were included in the regression equation. Thus, collective efficacy had little unique effect beyond the other variables considered. Contrary to prediction, frequency of reward payout was negatively related to satisfaction with team-based rewards. That is, the more frequently team rewards were allocated, the less satisfied were team members. This negative coefficient is in contrast to a positive, albeit non-significant, zero order correlation.

Do Team-Based Rewards Increase Team Cooperation?

The proposed framework also predicted that reward size, frequency of reward payout, allocation method, perceived outcome interdependence and satisfaction with team rewards would be associated with helping and information sharing among team members. Unfortunately, the hypothesized variables were unable to explain a significant amount of variance in team cooperation beyond the role of the control variables in the regression analysis. These results suggest that the use of team-based rewards did not contribute to increases in team cooperative behavior, which is one of the primary reasons organization implement team-based rewards.

The only significant relationship detected was between team turnover and within-team helping behavior: as team turnover decreased, ratings of helping behavior increased. Research on the antecedents of citizenship behavior may shed light on this finding. According to Van Dyne, Graham, and Dienesch (1994), positional factors such as organizational tenure may be related to citizenship behavior due to the greater number of embedded relationships and organizational ties that develop over time. Specifically, employees with longer organizational tenure are more likely to develop confidence in their ability to perform their jobs and exhibit positive affect toward their jobs and their

organizations which, in turn may trigger the development of affective ties to the organization (Meyer, Allen, & Gellatly, 1990). Drawing a parallel to the present context, teams characterized by greater stability of membership may afford team members a greater opportunity to develop effective working relationships as team members learn to maximize team performance given the unique skills of each member, which may contribute to higher levels of affective commitment to the team. Moreover, membership stability may also be associated with greater levels of cohesion among team members, which has been shown to influence within-team helping behavior (Settoon, Kidwell, & Bennett, 1994). Thus, teams with low turnover may exhibit stronger affective ties to their team (i.e., affective commitment) or higher levels of cohesion which may, in turn, trigger greater levels of citizenship behavior among team members (Manogram & Conlon, 1995; O'Reilly & Chatman, 1986). Although not central to the hypotheses examined in the present study, this finding represents the first empirical link between team turnover and team citizenship behavior.

As reported in the zero-order correlations, there was also a significant relationship between allocation method and within-team helping. Rewards allocated equitably among team members (i.e., based on individual performance within the team) were associated with greater levels of helping behavior than rewards allocated equally. Although it is unclear why this pattern of findings emerged, the literature on justice may provide some insight. As shown in Table 4.9, the correlation between allocation method and distributive justice was significant ($r=.42$, $p<.01$). Based on this finding, it appears that when rewards are allocated based on the equity principle, team members perceive the rewards they receive to be fair. Thus, if team members believe the rewards they obtained as a function of serving as a team member are fair, they may be more likely to engage in discretionary behaviors to assist other team members to obtain additional financial rewards in the future through continued high performance. Conversely, rewards allocated according to the equality

principle were perceived to be unfair which may have influenced the extent to which team members were willing to engage in discretionary behavior to assist other team members. Support for this possibility can be found in the literature on organizational citizenship behavior which has consistently supported the relationship between fairness perceptions and citizenship behavior (Organ, 1988a; Manogran & Conlon, 1995) and, specifically, the relationship between pay equity and citizenship (Scholl, Cooper, & McKenna, 1987). Given these findings, justice perceptions may mediate the relationship between allocation method and team cooperation. This possibility should be evaluated in future research.

Do Team-Based Rewards Influence Team Performance?

Hypotheses were also offered with respect to the determinants of team performance. As predicted, higher levels of the team-based reward relative to base salary were directly related to higher levels of team productivity. As noted, the effects of reward size were not mediated by perceived outcome interdependence or by satisfaction with team rewards. Interestingly, increases in the size of the team reward was not related to within-team helping or information sharing. In other words, the higher levels of team performance achieved when larger team bonuses were awarded cannot be attributed to the mediating effect of greater levels of helping or information sharing among team members.

The direct relationships between reward size and team productivity and effectiveness supports the utility of team rewards but does not support the theoretical model offered by Tjosvold (1986) or the mediated relationships proposed in the present study. It may be that the relationship between reward size and team performance is mediated by effort or motivation rather than team process or the psychological states which may derive from the task or reward structure (e.g., perceived outcome interdependence). Clearly, the present findings need to be replicated and extended before firm conclusions can be drawn about the nature of the relationship between reward size and team productivity.

While not a primary focus of the present study, the relationship between cooperative team behavior and team performance was also examined. The results of the regression analysis supported the predicted relationship between helping behavior and both team productivity and team effectiveness. In addition, the relationship between helping and team effectiveness was supported even when different sources of data were used to examine this relationship (i.e., team member's ratings of helping and team leader's ratings of team effectiveness). No significant relationships were found between information sharing and these variables; however, this may have occurred due to the high correlation between helping and information sharing ($r=.63$, $p<.01$).

Additional Findings

Interestingly, the post hoc analyses revealed that different conclusions are reached regarding satisfaction with team-based rewards when one examines the data using team member ratings of information sharing and helping. According to the zero-order correlations, the proportion of members on the team who are satisfied with team-based rewards was positively associated with team member self-reports of both information sharing ($r=.38$, $p<.01$) and within-team helping behavior ($r=.30$, $p<.05$). In addition, self-reports of within-team helping behavior were correlated with team leader ratings of team effectiveness ($r=.33$, $p<.05$), but only marginally related to productivity ($r=.22$, $p<.10$). While this pattern of findings appears to suggest that satisfaction with team-based rewards may indirectly contribute to team effectiveness via its influence on team cooperation as reported by team members, this is highly speculative. In addition, the lack of a significant correlation between satisfaction with team rewards and team effectiveness in the present study suggest that this possibility is unlikely. Nevertheless, team members' perspective on the cooperative behavior in their teams may still be valuable and the finding that satisfaction with team rewards was related to self-reports of team cooperation should not be dismissed. Further study is needed to clarify the precise role of affective reactions.

The results for allocation method were also interesting in that a positive correlation was detected between allocation method and satisfaction with team-based rewards ($r=.26$, $p=.05$) such that team rewards allocated based on an equity principle were associated with greater levels of satisfaction. As discussed previously, rewards distributed based on an equity principle were associated with greater within-team helping and higher levels of team performance. Although no hypotheses were offered with respect to these relationships, the finding that rewards allocated equitably, rather than equally, are more satisfying has been supported in some literature (cf. Cable & Judge, 1994) and is consistent with findings suggesting the importance of pay for performance perceptions (Heneman, Greenberger, & Strasser, 1988). Nevertheless, this finding stands in contrast to a large number of laboratory-based studies which found that rewards allocated cooperatively (i.e., equally) versus competitively (i.e., equitably) were associated with greater team cooperation and performance (e.g., Johnson, et al, 1981; Rosenbaum, et al, 1980). Thus, this finding calls into question the basic assumption that rewards have to be distributed equally to foster team cooperation and support a team-based environment.

Somewhat surprising were the relationships between collective efficacy and both indicators of team cooperation (helping and information sharing) and team performance (productivity and effectiveness). Since only marginal support was found for the relationship between collective efficacy and satisfaction with team rewards, collective efficacy appears to play a more pivotal role in understanding team effectiveness than in understanding the determinants of reward satisfaction. In a recent review by Zaccaro, Blair, Peterson, and Zazanis (1995), it was noted that similar to self-efficacy, collective efficacy beliefs among team members have been associated with effort, team cohesion, team performance, the establishment of group goals, and the development of performance standards and expectations. Direct correlations between collective efficacy and information sharing, within-team helping, and team effectiveness extends this research base.

Theoretical Implications

One purpose of the present research was to explore the predictions from Goal Linkage Theory (Tjosvold, 1986) with respect to the mediating role of perceived outcome interdependence. As noted, the results do not support the view that reward characteristics influence team interaction and team performance through subjective perceptions of outcome interdependence. Outcome interdependence was unrelated to team leaders' ratings of within-team citizenship behavior, information sharing among team members, and team performance. This suggests that research is still need to identify the process through which team-based rewards influence team-level outcomes.

Although reward characteristics were related to some team-level outcomes, the exact process by which these effects occurred needs to be explicated. Two possible mechanisms exist that were not explored in the present research, both related to the importance of team goals. First, task interdependence coupled with team-based rewards may influence cooperative team behavior through the creation of goal (rather than outcome) interdependence among team members. The ability of team rewards to foster team cooperation may be dependent on the extent to which individual team members believe their goals are inter-twined, especially since team members may have other significant independent goals which may detract from their willingness to assist the team (i.e., desire for advancement or recognition). Attaching financial incentives to the team's performance in an interdependent environment may increase the salience of the group's goal and the perceived instrumentality of goal achievement which may, in turn, influence cooperative team behavior and performance. In other words, task and reward characteristics may interact to create goal interdependence among team members which may influence the group's process and performance. As such, the failure to consider goal interdependence may have hindered the ability to understand the relationship between task and reward characteristics and cooperative group behavior.

Alternatively, team-based rewards may enhance the attractiveness of attaining group goals and build goal commitment among team members in team settings (cf. Hollenbeck & Klein, 1987). Group goal commitment refers to an attachment by team members to the team's goals and a determination to reach those goals (Weldon & Weingart, 1988). Previous research has delineated characteristics of the situation which may influence the attractiveness of group goal attainment including identification with the group, group efficacy, and expectations of goal attainment. Allocating rewards based on the teams' performance may enhance the attractiveness of goal accomplishment and, thus, augment goal commitment among team members. In other words, team-based rewards may influence goal commitment which may contribute to higher levels of team productivity.

Another explanation for the pattern of findings in the present study may be that reward characteristics such as size and frequency influence team performance through their effects on collective work motivation. According to Shamir (1990), three qualitatively different types of collectivistic work motivation exist, one of which is calculative in nature and derives from the belief that rewards or sanctions will follow from group performance. Group rewards may influence motivation and effort without influencing team cooperation. In other words, higher levels of productivity may be achieved due to greater calculative motivation and effort on the part of each team member. According to this explanation, other factors (i.e., collectivistic orientation, social norms, or internalized values; Shamir, 1990) may have influenced the extent to which team members engaged in helping behavior. Future research in this area should seek to identify the various mechanisms responsible for the effects of different reward characteristics.

The lack of a significant relationship between reward satisfaction and cooperative behavior or team performance suggests the possibility that satisfaction with team-based rewards is not related to team cooperation and performance. In both cases, affective reactions may not be important in understanding the effects of team-based rewards on team

process and performance. However, the importance of affective reactions should not be quickly dismissed. Satisfaction with team rewards may still be related to other outcomes that may significantly influence team and organizational effectiveness (e.g., organizational commitment, turnover).

Future theoretical development in this area should pay particular attention to the specifics of the reward system. Previous research and theory in this area has sought to answer the question "which is more effective, individual or group-based rewards". From the results of the present study it is clear that which reward strategy is more effective may depend on the criteria of effectiveness and the specifics of the reward system. The issue may not be whether to use team or individual rewards but how to design team-rewards in a way to maximize the desired outcomes. As a result, researchers need to operationalize team-based rewards in a manner that mirrors their complexity in organizational settings to fully understand their influence on different types of criteria.

For example, the findings of the present study suggest that allocation method was a critical reward characteristic, given the number of significant correlations with the various criteria examined. Current research has suggested that rewards distributed equally to team members may foster group harmony and cohesion, and rewards distributed equitably may lead to higher levels of individual motivation and performance (Greenberg & Leventhal, 1976; Heneman et al, 1988). In the present study, equitably distributed rewards were rated as more satisfying, and were related to within-team helping. Theoretical development needs to pursue this finding in an attempt to explain why these effects occurred. Along these lines, Welbourne and Cable (1995) recently developed a conceptual model of the effects of team incentives on pay satisfaction based on predictions from identity theory (Burke, 1991). According to this model, group incentives influence outcomes by increasing the salience of different work related roles. For example, group bonuses distributed equally may result in employees' referring to their organizational or team

membership as the most salient role. In contrast, when rewards are distributed equitably, the most salient role should be the personal role of job holder. Welbourne and Cable (1995) contend that the activation of different roles will dictate whether employees will be satisfied with different aspects of their pay. In two, quasi-experimental field studies some support was found for these hypotheses. Other theoretical frameworks could also be adopted to further explore the pattern of findings found in the present study.

Practical Applications

The results of the present study have several practical implications. First, the results for reward size suggest that higher levels of pay contingent on team performance are associated with higher levels of team productivity and effectiveness. While the mechanism by which these effects occur is unclear from the present study, it is apparent that organizations using team-based rewards should consider placing a sizable portion of rewards contingent on team performance if increases in team performance are goals of the reward system.

In addition, organizations designing team-based reward systems should consider their goals for this type of reward strategy. Specifically, the results suggests that when designing team-based reward systems, practitioners need to be aware that different characteristics of team-based rewards may influence different outcomes. For example, in the regression analyses, reward size was significantly related to increases in team productivity, frequency of reward payout was correlated with perceived outcome interdependence and satisfaction with team-based rewards, and according to the correlational results, allocation method was correlated with satisfaction with team rewards, perceived distributive justice, within-team helping, and team effectiveness. Consequently, in designing team-based reward systems, practitioners should consider their intended outcomes and be aware that different reward characteristics may be more or less important in terms of achieving the desired outcomes.

More specifically, the findings of the present study suggest that organizations should allocate team-based rewards equitably (i.e., based on the individual performance of team members) to stimulate satisfaction, perceived distributive justice, helping behavior among team members, and higher levels of team effectiveness. Not only may equitable reward distribution contribute to various aspects of team performance, compensation practices have also been shown to influence attraction to organizations. Consistent with the tenets of person-organization fit theory (e.g., Schneider, 1987), researchers have found that job seekers make job search and choice decisions based on their perception of the match between their dispositions and organizational culture. Because pay and reward practices are important and visible organizational characteristics which contribute to the organization's climate, they are salient to job seekers and often play an important role in job search decisions based on fit (James & Jones, 1974; Rynes, 1987). Current research on job-choice behavior has demonstrated that equitable reward distribution may be beneficial in terms of attracting and retaining high ability employees (cf. Cable & Judge, 1994). Thus, the methods used to allocate team-based rewards may have more consequences than those examined in the present study.

Another implication lies in the importance of justice perceptions in contributing to satisfaction with team-based rewards. Although satisfaction with team-based rewards was unrelated to team cooperation and performance, affective reactions to human resource systems such as pay practices have been shown in previous research to be related to other criteria such as withdrawal cognitions, absenteeism, and employee theft (Lawler, 1987). In addition, Cardy and Dobbins (1994) argue that a concern for employee satisfaction should be a legitimate terminal goal of human resource systems in and of itself. As a result, it is important to understand the factors that contributed to employees' low levels of satisfaction with the team-based reward practices in their organizations.

According to the regression analyses and the zero-order correlations, distributive justice perceptions had the largest effect on satisfaction with team-based rewards. Thus, in designing team-based reward systems, practitioners should ensure that team's are fairly rewarded given their contributions and performance. This is often difficult to do for several reasons. An organization may be experiencing slow corporate growth or an economic downturn, which may create a situation where the teams may be achieving high performance but poor organizational performance results in little discretionary capital available for bonuses. In addition, different criteria or standards may be used to allocate bonuses in different departments or functional areas (e.g., customer service versus production), resulting in potential inequity across teams. As noted by a survey respondent in the present study, "The team concept is great. The team incentive program has begun to fail because other departments who do less work get larger bonuses!!!".

Procedural justice was also related to satisfaction with team rewards. Thus, strategies should be adopted to ensure that employees believe that the procedures associated with team-based rewards are fair in their organization. These strategies may include providing adequate information regarding the procedures used to allocated rewards, ensure that standards are fairly and consistently applied, and obtaining accurate information about the team's performance. In essence, it is incumbent on organizations to maintain open lines of communication to ensure that employees understand how decisions are made regarding the size of the bonuses received by the teams and the procedures used to allocate team rewards.

Future Research and Applied Issues

Perhaps the most important area for future research is an examination of alternative theoretical perspectives in an attempt to gain insight into the mechanisms through which characteristics of the reward systems and the task influence team behavior and performance. While several alternative perspectives where offered (i.e., goal

interdependence, goal commitment, collective work motivation), the validity of these, or other, possibilities remains an empirical question. The present study suggests that several characteristics of team rewards are associated with affective reactions and several reward characteristics are related to team behavior and performance, but that these two effects are not necessarily related. Naturally, these findings should be replicated before firm conclusions can be drawn about the effectiveness of team rewards.

Examining perceptions of justice in the context of team-based pay plans deserves continued attention given the relationships between perceived fairness and affective reactions to team rewards detected in the present study. In general, employees perceived the amount of their team rewards as somewhat unfair ($M=3.10$) and only slightly agreed that the procedures used to allocate team rewards were fair ($M=4.49$). Future research should seek to identify the antecedents of justice perceptions. In addition, the pattern of correlations detected in the present research suggested that justice perceptions may mediate the relationship between method of allocation and cooperative team behavior. The role of justice perceptions as a mediating mechanism needs to be further explored. Only one other study (Hofmann & Salter, 1995) examining the role of reward interdependence on justice perceptions in teams was identified and this study was conducted in the laboratory. Perceptions of inequity among team members may develop due to varying ability levels and contributions among team members, differing expectations among team members with regard to acceptable standards of performance, potential for social loafing and free riding in team settings, and the administrative complexity of implementing team-based rewards. The absence of research on this topic suggests the need for more research attention in this area.

Research on team rewards has exclusively focused on within-team effects with little consideration of the effects of team rewards on between-team relations and overall organizational productivity (DeMatteo, Eby, & Sundstrom, in press). Rewards based on team performance may encourage teams to focus on their own performance at the expense

of other team's performance (Mohrman et al., 1992). This may promote a reluctance on the part of teams to share information or assist other teams and may be especially problematic in organizations where the work of different teams is interdependent (Lawler & Cohen, 1992). In the aggregate, these unintended outcomes may lead to sub-optimization of organizational goals (Mohrman et al., 1992). Researchers should continue to develop and test additional hypotheses about the effects of team-based reward practices on a broad array of criteria.

The present research only examined linear effects; however, it may be that several relationships are curvilinear in nature. For example, the influence of reward size may asymptote such that when the amount of pay contingent on team performance gets too large, the beneficial effects may decrease and concerns over equity or workload sharing may be magnified. In addition, longitudinal research is needed to examine whether the effects of team rewards on different criteria vary over time. For instance, the effectiveness of a team reward system may vary with the developmental progress of the group and optimal incentive characteristics may depend on these developmental factors. Members of newly formed groups may be satisfied with a team reward system that provides an equal distribution of rewards, at least until the group has worked out its members roles and working relationships. As groups mature, however, members may notice differential contributions by individuals in the group and may prefer differential (i.e., "equitable") distribution to reflect those contributions (DeMatteo, Eby, & Sundstrom, in press). In effect, group development may bring rise to a norm shift in the group from one of equality to one of equity (cf. Greenberg & Leventhal, 1976). Consistent with the possibility that satisfaction with reward practices may vary over time, Rothgerber, Worchel, Day, and Goodwin (1995) found that individual's allocation preferences varied as a function of the group's stage of development such that group members preferred giving themselves a

greater proportion of a group bonus as the group developed over time. Thus, an allocation method well-suited for a newly formed team may not be optimal for a mature team.

Longitudinal research is also needed to examine whether reward practices need to be altered over time to adapt to changing conditions. For instance, whether the plan has a mechanism to deal with the "novelty" problem may be an important characteristic influencing the effectiveness of team-based rewards (Goodman & Dean, 1982). New incentive systems typically have a high level of novelty that subsequently diminishes over time as individuals adapt to the level of the reward. As a result, rewards may lose their motivational pull over time and be perceived as less valuable to team members (Lawler, 1971). Accordingly, practitioners have suggested that small group incentive systems be flexible enough to accommodate the need for changing reward amounts over time. While virtually no research has examined why team-incentive plans are abandoned, one of the reasons frequently cited is the inability of the plan to adapt to changing organizational conditions. As organizations continue to evolve, human resource systems need to be updated to reflect these changes, and reward systems in particular may need to be recalibrated over time to accommodate new organizational conditions and ensure that the plan continues to meet its goals (Geber, 1995; Lawler & Cohen, 1992).

Research on team rewards has tended to adopt an "either-or" approach. Specifically, most research has examined the effectiveness of individual- versus group-based rewards in team settings (for an exception, see Rosenbaum et al., 1980). Perhaps a more appropriate question is the most effective combination of reward strategies to best meet the often conflicting goals in today's organizational environment. In other words, how can multiple reward practices be used to reinforce and encourage high levels of individual performance and, at the same time, foster teamwork among individuals?

In most organizational settings, group-based rewards are implemented as a supplement to existing compensation systems. As reward systems become increasingly

sophisticated, an important issue is the optimal combination of incentives such as individually-based merit pay, skill-based pay, team-based incentives, and large group incentives (cf. Lawler & Cohen, 1992). There is virtually no research examining the optimal distribution of pay across these pay elements, including the relative size of the team reward component. Researchers have suggested that rather than choosing either individual- or group-based incentives, a combination of the two incentive strategies may be more effective in motivating performance at the individual level and cooperation at the team level (Heneman & von Hippel, 1995; Pearce & Ravlin, 1987). It has also been recommended that the appropriate balance between team-based and organization-based rewards should depend on the degree of interdependence between the team and other organizational units (Lawler & Cohen, 1992), although there is little research exploring this issue. Finally, research examining how these reward strategies interact to influence different criteria (i.e., motivation, cooperation, team performance, organizational performance) is almost non-existent.

A final question is the impact of reward characteristics in relative terms. In other words, what is the size of the effect of team-based rewards on various criteria as compared to task characteristics, team composition, other human resource practices (e.g., peer feedback), or organizational structure or climate. Although some research has explored these types of questions (e.g., Pritchard et al, 1988; Wageman, 1995), it is still not clear whether team-based rewards provide incremental benefits beyond other organizational conditions and practices, especially given the lack of findings in the present study.

On a more general note, future research needs to be particularly sensitive to levels of analysis issues (Ostroff, 1993). Specifically, given the organizational context of team reward systems, reactions to, and effects of, team-based rewards should be considered from multiple levels of analysis. Moreover, it is strongly recommended that variables are operationalized, measured, evaluated, and interpreted at the appropriate level of analysis

(James, 1982). In other words, researchers must be careful to avoid making inferences from data collected at one level (i.e., individual) to another level (i.e., the group). Finally, cross-level hypotheses may also be meaningful in this context. It may be possible that group- and organization-level variables may impact individual reactions to team-based incentives or that variables within one level may moderate the effects of reward characteristics on variables at another level. For example, the effects of team-based rewards on helping and information sharing among team members may depend, in part, on characteristics of the organizational climate or on individual differences among team members.

Limitations of the Present Study

The present study sought to examine the effects of reward characteristics on various team level outcomes. A rigorous and sound methodology was adopted to pursue these goals. First, established measures with known psychometric properties were used whenever possible and a pilot test was conducted to examine the reliability of measures developed for the present study. Second, data was collected from individuals currently employed in organizations using team-based reward systems in an attempt to capture the phenomenon of interest in a realistic setting. This approach represents an improvement over alternative methodologies by examining the effectiveness of team-based rewards as perceived by the recipients of these rewards. Additionally, multiple data sources were used to avoid capitalizing on spurious effects that may arise from the use of single source data (Podsakoff & Organ, 1986).

Despite a vigorous attempt to solicit greater levels of participation for the present study, the total sample was comprised of 57 teams, and team leader data was available for only 46 teams of those teams. Many organizations which have used team-based rewards in the past indicated abandoning these programs due to a host of problems, including employee reactions, the inability to adapt the program to changing conditions, and a lack of

funding for the programs. In addition, other potential organizations reported moving to larger group rewards such as gainsharing plans. These as well as other circumstances (poor timing, overuse of surveys, inability to make changes based on employee feedback), limited the number of potential organizations. A result of this limitation could be low statistical power to detect effects among the study variables, which is especially problematic with respect to testing the moderated relationships hypothesized in the present study (Podsakoff, MacKenzie, Ahearne, & Boomer, 1995). Despite this potential limitation, it should be noted that the majority of field-based studies in this area using aggregated data have used similar sample sizes (e.g., $n=56$ teams, Barnard & Rush, 1995; $n=80$, Campion, Medsker, & Higgs, 1993; $n=60$, Campion, Papper, & Medsker, 1996; $n=15$ groups, Rothgerber, Worchel, Day, & Goodwin, 1995). Future research should obtain larger samples to ensure adequate statistical power.

Another potential problem is the appropriate source of data for the team cooperation variables. As discussed in the post hoc analyses, the measures of within-team helping and information sharing were provided by the team leaders. Given that team leaders are not the recipients of helping or information sharing, even team leaders with sufficient opportunity to observe may not be privy to discretionary, extra-role behaviors such as helping one's team mates after an absence or a willingness to lend a helping hand. In other words, it is unclear whether the use of supervisor ratings of team cooperation was the most appropriate choice. While the team members ratings could have been used, the decision was made to employ the team leaders ratings to avoid problems of common method bias and because the majority of team leaders were quite involved with their teams and appeared to have adequate opportunity to observed the relevant behaviors.

These types of issues were explored in the post hoc analyses. As was shown in Table 4.19, a different pattern of findings emerges with respect to the role of affective reactions when one examines the information on team cooperation provided by the team

members. Namely, satisfaction with team-based rewards was correlated with self-reports of within-team helping and information sharing. In addition, team member self-reports of these variables were also correlated with the leaders' ratings of team performance. Specifically, within-team helping as provided by the team members was correlated with team effectiveness ratings provided by the team leader. While it is impossible to know which source of data is most appropriate and arguments can be made favoring either source, it is clear that different information was provided by each source. Future research needs to be sensitive to these different perspectives and carefully consider the appropriate source of data for addressing the research question given that this decision may be related to the conclusions one reaches.

In addition, although multiple data sources were used to test many hypothesized relationships, some hypotheses involved the examination of relationships in which data for the predictor and criterion were both obtained from the team member survey, creating the potential for problems such as common method variance. Nevertheless, employee perceptions of several variables were essential to test these research hypotheses. No alternative source exists to capture the employees' perceptions of variables such as outcome and task interdependence and satisfaction with team rewards than the employees themselves. While the results of the confirmatory factor analysis suggest that common method bias was not a large problem in the present study, future research should seek to obtain data from additional sources or over different time periods, using multiple methods. For example, team members could have been surveyed at two time periods. Another strategy would have been to use a randomly selected portion of team members within each team to provide the data for some variables (i.e., reward characteristics, team characteristics) and the remaining team members in the same unit for obtaining data for the other variables (e.g., justice perceptions, satisfaction with team-based rewards; Podsakoff

& Organ, 1987). The obvious difficulty is obtaining a sufficiently large sample to use this strategy, which prevented the adoption of this approach in the present study.

Another possible limitation deals with alternative explanations for the study's findings and unmeasured variables (Mauro, 1990). According to Mauro (1990), "whenever researchers use nonexperimental methods and fail to account for all of the variables that affect a criterion, their inferences about the effects of the predictors on that criterion may be biased. Whenever a relevant variables is neither held constant nor entered into an analysis, that variable could account entirely for the effects attributed to one or more of the predictor variables" (p. 314). According to James (1980), the unmeasured variables problem is generally unavoidable in nonexperimental studies. The critical issue is the degree to which omission of variables biases regression coefficients and provides a basis for alternative explanations for the findings. Although the present study extended existing research by broadening the scope of variables included, other variables exist which could have contributed to the criterion measures and/or account for the relationships reported. For example, it may be that pay for performance perceptions (Heneman et al., 1988) or perceived organizational support (Eisenberger, Huntington, Hutchinson, & Sowa, 1986) can account for the effect attributed to reward size.

The decision was made to focus only on the variables included in the framework presented in Figure 2.1 (plus the control variables) for two reasons. First, the primary purpose of the study was to examine the effects of reward characteristics on different group-level outcomes and to test the predictions of Goal Linkage Theory with respect to the mediating role of perceived outcome interdependence. The purpose was not to explain as much variance as possible in team cooperation and performance or to develop a comprehensive model of team cooperation or performance. Secondly, based on the theoretical and empirical research, the variables chosen were those which received the most consideration in the extant literature reviewed. The exceptions to this statement were the

inclusion of justice perceptions and collective efficacy which were included for exploratory purposes in an attempt to extend the research literature on team-based rewards by considering motivational processes.

Another limitation in the study was the low reliability of the task interdependence scale. Even with item deletion, the internal consistency reliability estimate did not reach acceptable levels. Despite the low reliability, the scale was used in the present study, limiting the ability to appropriately test the proposed relationships with this variable. While not resolving the psychometric weaknesses of the task interdependence scale, leader ratings of task interdependence also failed to exhibit significant relationships with the study variables. As a result, the role of task interdependence remains unclear in the present study.

Another limitation deals with the inferences that may be drawn from this study. Since the data were cross-sectional in nature, causality cannot be established. As a result, the present study does not allow inferences regarding the causal influence of reward or team characteristics. For example, while reward size was explored for its role in explaining perceived outcome interdependence, cooperative behavior, and team performance, the causal sequence uniting these variables may be reversed or the process may be nonrecursive and reciprocal relationships may characterize some of the relationships examined (Namboodiri, Carter, & Blalock, 1975). For example, the relationship between reward size and team performance may be nonrecursive such that high performance lead to rewards and receiving rewards motivates high performance. Or, satisfaction with team-based bonuses may cause employees to see the rewards they receive as fair. While these issues cannot be addressed in the present study, the causal ordering of the primary study variables was consistent with that proposed by current theoretical models (e.g., Goal Linkage Theory; Tjosvold, 1986). These types of issues can be better addressed by examining the effects of rewards in experimental or longitudinal designs.

A final limitation relates to the degree of multicollinearity among the predictors. Several predictor variables were moderately intercorrelated in the present sample. For example, reward size was correlated with allocation method ($r=.41$, $p<.01$) such that larger rewards tended to be allocated based on an equity principle. In addition, frequency of reward allocation was correlated with team size ($r=.42$, $p<.01$). These correlations make it difficult to separate the effects of one predictor from another with any degree of precision and inflate the standard errors of the regression coefficients (Berry & Feldman, 1985). Nevertheless, it is unrealistic to expect orthogonality among such predictors in naturally-occurring, organizational settings.

Summary and Conclusions

While small group incentive systems are still only used at a relatively small percentage of firms, understanding their effectiveness is critical considering the potentially powerful role of rewards in shaping behavior in organizations and recent evidence that the use of team-based rewards will continue to increase (Lawler et al, 1995). The issues explored in this study are not only important for theoretical reasons but also for the practitioner struggling with the design and implementation of team-based rewards. The results of the present study suggest that several characteristics of team rewards were related to affective reactions, perceived outcome interdependence, team cooperation and team performance. However, only weak support was obtained for the framework relating these variables. Given the effects of reward characteristics in the present research, additional research seeking to understand the mechanism through which team rewards influence these various outcomes is critical to understand of the effectiveness of team-based rewards.

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APPENDICES

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APPENDIX A

Determination of Needed Sample Size Via Power Analysis

Desired Power= .80 (by convention, p. 445)

Significance Criterion= .05 (by convention, p. 531)

Effect Size= f^2 = .15 (medium effect size p. 478)

$k_y=1$

$k_x=6$

$k_c^1=3$

$s=2$

Numerator df= $u=k_y k_x=6$

Denominator² df= $v=(L/F2)u - 1$

(where L is taken from table 9.4.2 under the following assumptions: $u=6$, power=.8, significance level=.05, $v=120$ [by convention, p. 445])

$v=(11.1/.15)6-1$

$v=443$

Determination of Sample Size (10.4.3, p. 515):

$N= 1/s (v + u/2 - 1) + (k_y + k_x + 3)/2 + \max (k_C, k_A + k_G)$

$= 1/2(443+6/2 - 1) + (1 + 6 + 3)/2 + (3)$

$= 1/2(445) + 5 + 3$

$= 230.5$

≈ 231

1. For purposes of estimation, the use of up to three control variables was assumed.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

APPENDIX B

Correspondence Included in Introductory Packets Sent to Interested Organizations After
Initial Phone Contact

<Date>

<Contact Person's Name>

<Title>

<Organization>

<Address>

<Address>

Dear <Contact Person's Name>:

Thank you for agreeing to participate in our research on team-based reward systems. As we discussed, this project is being conducted by a team of researchers at the University of Tennessee in conjunction with the American Compensation Association. The growth of team-based approaches to organizing work has prompted the need to understand the role of pay practices in fostering and supporting a team environment. As such, we are soliciting participation from organizations currently using team-based incentive, reward, and/or pay practices. We would be pleased to include your organization in our sample for this important research project.

Enclosed you will find several items related to the study. Specifically, I have enclosed a brief information sheet which provides an overview of the study, a copy of the cover letter will be attached to all surveys, and a sample copy of the employee survey.

I will personally be in touch with you the week of <Date of Second Contact> to review the information provided and answer any questions you may have at that point. As mentioned previously, your organization will incur no expenses for their participation. All expenses (i.e., duplication, postage, etc.) will be paid for by the research team. All we will ask from you is distribution of the survey packets to the employees in your organization who currently participate in the team-based reward system and the completion of a brief organization background sheet. Upon completion of data collection and analysis, we will provide all participating organizations with a technical report at no charge.

Thank you again for your interest in our research. I am looking forward to speaking with you in the near future. Please feel free to contact me by phone at (423) 974-3161, by fax at (423) 974-3163 or by e-mail at jsd@utkux.utcc.utk.edu if you have any questions about the project or if I can provide additional information. We look forward to working with you.

Sincerely,

Jacquelyn S. DeMatteo

TO: Participating Organizations
FROM: Jacquelyn DeMatteo
Principal Researcher, University of Tennessee Research Team
RE: Team Rewards Project

Today's organizations increasingly use work teams. In a 1992 survey of U.S. companies, 82% reported that at least some employees belonged to teams. While having employees work in teams may be the answer to many management problems, implementing teams has also introduced new challenges, especially performance management. Specifically, many organizations are currently struggling with issues such as how to measure and reward team performance.

To better understand the experiences and feelings of individuals working in team-based environments, researchers at the University of Tennessee are conducting a large-scale study of team-based reward practices and factors contributing to team effectiveness. This project is being funded by the American Compensation Association and is designed to assess the factors that contribute to the success of team-based reward practices. This will be accomplished by an assessment of work-related attitudes, factors influencing satisfaction with team-based pay practices, and perceptions of team effectiveness. Participating organizations will receive a detailed technical report. This report will provide useful feedback to managers and human resource professionals as they attempt to design effective pay practices that meet the needs of their work force.

Outcomes and Benefits to Participating Organizations:

- Assessment of employee perceptions of pay practices and team effectiveness by a third party.
- A technical report outlining the findings of the study in which the results at your firm will be bench-marked against the total sample of participating organizations across the country.
- Feedback for participating employees (if requested).
- Communication to employees that your organization is interested in and committed to understanding their needs.
- Survey results that can serve as a baseline measure for later comparisons and/or to assess the effectiveness of other organizational interventions.

To participate in this project, we will ask you to distribute our survey to a random sample of employees who are currently working in teams and receiving a team-based bonus, reward, or incentive. Completed questionnaires will be sent directly to the research team at The University of Tennessee for data entry and analysis. Confidentiality will be maintained throughout all phases of the project. All expenses (e.g., duplication, postage, etc.) will be paid by the research team. All we ask of you is distribution of the survey. After survey administration, we will provide all participating organizations with a technical report at no charge.

APPENDIX C

Instruction Letter and Distribution Guidelines

<Date>

<Contact Person's Name>

<Title>

<Organization>

<Address>

<Address>

Dear <Contact Person's Name>:

Enclosed you will find the surveys for the study on team-based compensation being conducted by the University of Tennessee in cooperation with the American Compensation Association. Specifically, I have enclosed a memo describing the recommended survey distribution method and the actual team member and team leader surveys, organized into bundles. Please give the appropriate bundle to each team leader and allow the team leaders to distribute the surveys to all of their team members. **The most critical aspect of survey distribution is that team leaders only distribute surveys to their own team members.** As noted on the instruction sheet attached, **any extra surveys should be discarded and not be distributed to members of other teams.** If you need additional surveys, I will be glad to send them to you immediately. It is also noted on the instruction sheet that, should we have low response rates from certain teams, we will provide you with additional surveys for distribution. As a result, you will need to keep a list for yourself of the team leaders who were given surveys in the event that we need to ask them to redistribute (see enclosed checklist). If you should have any questions about survey distribution, please do not hesitate to call me for assistance at (423) 974-1677.

Upon completion of data collection and analysis, we will provide all participating organizations with a technical report at no charge. Thank you again for your interest in our research and your willingness to participate. Please feel free to contact me by phone at (423) 974-3161, by fax at (423) 974-3163 or by e-mail at jsd@utkux.utcc.utk.edu if you have any questions about the project or if I can provide additional information.

Sincerely,

Jacquelyn S. DeMatteo

TO: Organizations Participating in the University of Tennessee/American Compensation Association Study of Team-based Pay Practices

FROM: Jacquelyn S. DeMatteo, M.A.
Principal Researcher, University of Tennessee Research Team

RE: Procedure for Participation and Survey Distribution

Thank you for your interest and willingness to participate in our study of team-based pay and reward practices. The package you have just received contains the surveys you requested, pre-bundled for distribution. Each bundle contains 1 Team Leader survey and a pre-determined number of Team Member surveys. Each 9x12 survey packet in the bundle includes a cover letter, a copy of the survey, and a stamped, pre-addressed envelope for return of the completed survey. *The only administrative task required by your organization is distribution of the survey packets.* To facilitate this process, we would like to provide you with some guidelines for survey distribution. If you have additional questions, please do not hesitate to call me at (423) 974-1677 **before** distributing the surveys.

Guidelines for Survey Distribution

- Please give each team leader a **bundle** of surveys containing a Team Leader survey and the Team Member surveys. The team leader should **complete** the Team Leader survey and **distribute** the remaining Team Member surveys to the members of his or her team. It is critical that the team leader **only** distribute surveys to members of **his or her own team** since the surveys are coded for tracking purposes. **Any extra surveys should be discarded and should not be handed out to other employees.**
- Completed surveys should be mailed directly to the University of Tennessee in the attached pre-addressed, stamped envelopes.
- Following the receipt of all surveys, the data will be summarized statistically and a technical report will be provided to all participating organizations.
- If your organization would like to survey additional teams in your organization, please contact me at (423) 974-1677 and I will promptly send you additional team bundles.
- In the event that few completed surveys are received at UT, reminder letters and extra copies of the survey will be provided for re-distribution. Because re-distribution of surveys may be necessary, please keep a record of the team leaders who were asked to distribute surveys (see attached sheet).
- An organizational representative, such as yourself, should complete the organizational background inventory and mail it to the research team in the attached stamped, pre-addressed envelope at your earliest convenience or you may fax it to me at (423) 974-3163.

Thank you again for your involvement in our project. Please do not hesitate to call me directly with any additional questions at (423) 974-1677.

APPENDIX D

Sample Employee Cover Letter Included with all Team Member Surveys

Dear Employee:

A team of researchers at The University of Tennessee, in cooperation with the American Compensation Association, is conducting a study on team effectiveness and team-based pay practices. The purpose of this research is to understand the factors that influence your general reactions to working as a member of a team. Your participation in this project is critical in understanding the complex factors that influence these reactions.

The enclosed survey will ask your reaction to several issues related to your team, your organization, and the pay you receive. The survey will take approximately 15 minutes of your time.

This survey is being administered to a nationwide sample of employees who are working in team-based organizations. Your organization was selected to be part of this sample. To ensure total confidentiality, all responses are anonymous. To further guarantee confidentiality, completed surveys should be returned directly to the principal researcher using the pre-addressed, stamped envelope provided. Please return the survey at your earliest convenience, preferably within two weeks. The completed survey will be seen only by the university research team. A number will be placed on the survey for the purpose of coding data by organizations. Your participation is completely voluntary. The return of your completed survey will indicate your informed consent to participate.

Thank you in advance for your participation and feedback on these important issues. Please feel free to contact me at (423) 974-1677 if you have any questions or concerns.

Sincerely,

Jacquelyn DeMatteo
Principal Researcher, University of Tennessee Research Team

APPENDIX E
Organizational Background Inventory

ORGANIZATIONAL BACKGROUND INVENTORY

Please complete and return the following background inventory using the pre-addressed, stamped envelope or fax to my attention at (423) 974-3163. This information is important in order to better understand the issues facing your employees. Please forward any questions or comments to Jacquelyn DeMatteo at (423) 974-3161.

I. BACKGROUND INFORMATION

Your name: _____

Your title: _____ Years in current position: _____

Name of organization: _____ Location (City, State): _____

Annual corporate revenue: _____ Annual revenue in your location/plant/facility: _____

Number of employees worldwide: _____ Number of employees at your location: _____

Number of offices worldwide: _____

Type of organization: ☐ Public Corp. ☐ Private Corp. ☐ Non-profit organization ☐ Government

Type of Industry: ☐ Service ☐ Production

Union Status: ☐ Non-union ☐ Union

Percentage of work force under 40 years old _____ Gender composition: %Male _____ %Female _____

Racial composition: %Caucasian _____ %African-American _____ %Hispanic _____ %Asian _____ %Other _____

What industry does your organization belong to? (Please check one)

☐ Automobile	☐ Construction	☐ Insurance	☐ Retail Trade
☐ Banking	☐ Educational Services	☐ Legal Services	☐ Securities/Investment
☐ Business Services	☐ Energy	☐ Mining	☐ Transportation
☐ Chemical/Pharmaceutical	☐ Food/Tobacco Manufacturing	☐ Other Manufacturing	☐ Utilities/Sanitation
☐ Communications	☐ Government Services	☐ Other Service	☐ Wholesale Trade
☐ Computer/Electronic	☐ Health Services/Medical	☐ Real Estate	☐ Other _____

II. PAY PLAN INFORMATION

These questions ask you to describe the characteristics and structure of the pay/incentive plan used by your firm. Specifically, we ask about the use of team-based bonuses/rewards/pay, gainsharing plans, and profit sharing plans.

A. TEAM-BASED REWARDS

Do you have a team-based incentive/reward/pay plan? ☐ No ☐ Yes If no, skip to Section B on gainsharing.

Who currently participates in this plan? (check all that apply)

☐ Upper levels of management ☐ Non-management employees ☐ Clerical/office support

☐ Mid management ☐ Sales people ☐ Janitorial/maintenance

☐ Lower management (e.g., supervisors) ☐ Non-managerial functional (e.g., accounting clerk, HR)

Of those eligible to participate, what percentage are: Salaried _____ Hourly _____ = 100%

What is the average salary of plan participants: \$ _____

What is the average size of the teams which receive bonuses based on their performance? _____

Do the teams have to pass a performance hurdle in order to receive a payout? ☐ No ☐ Yes

How are bonuses allocated? ☐ As a percentage of base pay (e.g., 3%) ☐ Specific dollar amount (e.g., \$500)

Which best categorizes the allocation rules used by your organization to allocate team bonuses/incentives:

☐ All team members receive an equal amount or percentage based on the team's performance

☐ Bonuses are not equal- team members receive a bonus based on their individual performance within the team

☐ All team members receive an equal amount or percentage based on the team's performance plus an additional bonus based on their individual performance within the team

☐ Other, please describe _____

How would you rate your overall satisfaction with the team-based bonus/incentive plan currently being used?
☐ Very Unsatisfied ☐ Unsatisfied ☐ Neutral ☐ Satisfied ☐ Very Satisfied

Do you think it has been effective in encouraging performance gains? ☐ No ☐ Yes

Do you think it has been effective in encouraging greater levels of productivity? ☐ No ☐ Yes

Do you think it has been effective in fostering teamwork among team members? ☐ No ☐ Yes

Will your company's use of this plan: ☐ Decrease ☐ Stay about the same ☐ Grow

How long has the plan been in place? _____ Months

To what extent does your team-based pay plan contribute to the following conditions: (Use the scale: SD= Strongly disagree; D= Disagree; N= Neither agree nor disagree; A= Agree; SA= Strongly Agree)

	SD	D	N	A	SA
Provide better pay-for-performance linkages.....	☐	☐	☐	☐	☐
Reduce an "entitlement mentality" in your organization.....	☐	☐	☐	☐	☐
Make labor costs more variable with organizational performance.....	☐	☐	☐	☐	☐
Provide a method to allocate award funds to high performing teams.....	☐	☐	☐	☐	☐
Improve business performance and profitability.....	☐	☐	☐	☐	☐
Assist in recruiting new employees.....	☐	☐	☐	☐	☐
Assist in improving employee retention.....	☐	☐	☐	☐	☐
Assist in upgrading the quality of your work force.....	☐	☐	☐	☐	☐
What are some of the problems, if any, with the team-based pay plan you are currently using?					

In what ways do you think the plan could be improved? (additional comments on back of survey if necessary)

B. GAINSHARING

Do you have a gainsharing plan? ☐ No ☐ Yes (If no, please skip to Section C on profit sharing)

Who is eligible to participate (check all that are eligible)?

- ☐ Upper levels of management ☐ Non-management employees ☐ Clerical/office support
☐ Mid-management ☐ Sales people ☐ Janitorial/maintenance
☐ Lower management (e.g., supervisors) ☐ Non-managerial functional (e.g., accounting clerk, attorney, HR)

Using the scale below, please indicate the level at which group performance is evaluated for gainsharing bonuses

- ☐ The entire company ☐ Facility/Plant ☐ Small Team/Work groups
☐ The group/division/business unit ☐ Department (If yes, respond to questions in Section A on team rewards regarding this plan)
☐ Related units within a division (e.g., region)

Of those employees eligible to participate, what percentage are: Salaried _____ Hourly _____ =100%

What is the average salary level of plan participants: \$ _____

How are bonuses determined in the gainsharing plan at your organization:

- ☐ Increases in labor productivity ☐ Increases in productivity ☐ Other _____

Please describe how bonuses are determined in the gainsharing plan at your organization:

How would you rate your overall satisfaction with the gainsharing plan currently being used? (please check one)
☐ Very Unsatisfied ☐ Unsatisfied ☐ Neutral ☐ Satisfied ☐ Very Satisfied

Do you think it has been effective in encouraging performance gains? ☐ No ☐ Yes

Do you think it has been effective in encouraging greater levels of productivity? ☐ No ☐ Yes

Do you think it has been effective in fostering cooperation among employees? ☐ No ☐ Yes

How long has the plan been in place? _____ Months

Will your company's use of this plan: ☐ Decrease ☐ Stay about the same ☐ Grow

C. PROFIT-SHARING

Do you have a profit sharing/stock ownership plan? ☐ No ☐ Yes (If no, skip to Section III)

Who is eligible to participate (check all that apply)?

☐ Upper levels of management ☐ Non-management employees ☐ Clerical/office support
☐ Mid management ☐ Sales people ☐ Janitorial/maintenance
☐ Lower management (e.g., supervisors) ☐ Non-managerial functional (e.g., accounting clerk, HR)

Of those eligible to participate, what percentage are: Salaried _____ Hourly _____ = 100%

What is the average salary level of plan participants: \$ _____

How would you rate your overall satisfaction with the profit sharing plan currently being used?

☐ Very Unsatisfied ☐ Unsatisfied ☐ Neutral ☐ Satisfied ☐ Very Satisfied

Do you think it has been effective in encouraging performance gains? ☐ No ☐ Yes

Do you think it has been effective in encouraging greater levels of productivity? ☐ No ☐ Yes

Do you think it has been effective in fostering cooperation among employees? ☐ No ☐ Yes

Do you think it has been effective in fostering organizational commitment? ☐ No ☐ Yes

Do you think it has contributed to lower levels of turnover in the organization? ☐ No ☐ Yes

How long has the plan been in place? _____ Months

Will your company's use of this plan: ☐ Decrease ☐ Stay about the same ☐ Grow

III. ORGANIZATIONAL INTERVENTIONS

Please check the other types of programs used at your organization: (check all that apply)

☐ Use of employee surveys ☐ Knowledge/skill-based pay ☐ Flexible, cafeteria-style benefits
☐ Job enrichment or redesign ☐ Employee suggestion system ☐ Peer performance appraisal
☐ Quality circles ☐ Individual incentives ☐ 360° Feedback
☐ Employee participation groups ☐ Employee stock ownership plan ☐ Cross-training

IV. CHARACTERISTICS OF SURVEYED EMPLOYEES

To the best of your ability, please describe the characteristics of employees who will receive the surveys for this study. Even if you are unable to answer all questions, please answer as many as you can. Partial information is still very useful. This information is critical to assess the similarity of the survey respondents to the total sample of individuals who received surveys. Such a comparison will allow the research team to assess whether respondents differ from those who do not return a completed survey.

Average Age _____ Average Annual Salary _____

Percent Males _____ Average Company tenure _____

Average level of education: ☐ High school degree ☐ Some college ☐ College degree ☐ Master's degree ☐ PhD

Thank you for your assistance and participation in this research

APPENDIX F
Team Member Survey

REACTIONS TO TEAMS

Thank you for agreeing to participate in this research. In this survey, you will be asked several questions about your work and your reactions to being a team member. If you are a member of more than one team, please respond based on the team you belong to that receives team-based incentives. If at any time a question does not apply to you, please leave it blank. Demographic information is requested for statistical purposes only. Thank you for your input on these important issues.

Section 1: Background Information

What is your current functional area? (please check one)

☐ Clerical/Admin Support	☐ Financial/Acctg.	☐ Healthcare/Nursing	☐ Technical support	☐ Engineering/Research
☐ HR/Personnel/Training	☐ General Mgmt	☐ Information Systems	☐ Sales/Marketing	☐ Customer Service
		☐ Production	☐ Communications/PR	☐ Other _____

How long have you worked for your present employer? _____ (years)
 How long have you been a member of your work team? _____ (months)
 How many members are there on your current team? _____ (number)
 Has your team received any specialized training? ☐ No ☐ Yes If yes, what type of training _____
 Are you currently a member of another team? ☐ No ☐ Yes If yes, how many other teams _____
 Do you have any past experience working in teams? ☐ No ☐ Yes If yes, for how long _____ (months)

CURRENT YEARLY BASE PAY= \$ _____

YEARLY INCENTIVES FOR TEAM PERFORMANCE= \$ _____ (i.e., Team Incentive Program)

ADDITIONAL INCENTIVES YOU RECEIVE= \$ _____ (i.e., individual bonuses or rewards)

SEX: ☐ Male ☐ Female AGE: _____ RACE: ☐ Caucasian ☐ African-American ☐ Hispanic ☐ Asian ☐ Other

Highest Level of Education Completed: ☐ High school degree ☐ Some college ☐ College degree ☐ Master's degree ☐ PhD

Section 2: Attitudes Toward Your Pay

Indicate your satisfaction with each aspect of your pay listed below. Use the scale: VD= Very Dissatisfied; D= Dissatisfied; MD= Mildly Dissatisfied; N= Neither Satisfied Nor Dissatisfied; MS= Mildly Satisfied; S= Satisfied; VS= Very Satisfied.

	VD	D	MD	N	MS	S	VS
1. My take home pay.....	☐	☐	☐	☐	☐	☐	☐
2. My most recent raise.....	☐	☐	☐	☐	☐	☐	☐
3. The consistency of the company's pay policy.....	☐	☐	☐	☐	☐	☐	☐
4. My overall level of pay.....	☐	☐	☐	☐	☐	☐	☐
5. How my raises are determined.....	☐	☐	☐	☐	☐	☐	☐
6. How the company administers pay.....	☐	☐	☐	☐	☐	☐	☐
7. The size of my current salary.....	☐	☐	☐	☐	☐	☐	☐
8. Information the company gives about pay issues of concern to me.....	☐	☐	☐	☐	☐	☐	☐
9. The influence my supervisor has on my pay.....	☐	☐	☐	☐	☐	☐	☐
10. The company's pay structure.....	☐	☐	☐	☐	☐	☐	☐
11. My current salary.....	☐	☐	☐	☐	☐	☐	☐
12. Raises I have typically received in the past.....	☐	☐	☐	☐	☐	☐	☐
13. Differences in pay among jobs in the company.....	☐	☐	☐	☐	☐	☐	☐

Please indicate your level of agreement with each item below using the scale: SD= Strongly Disagree; D= Disagree; MD= Mildly Disagree; N= Neither Agree Nor Disagree; MA= Mildly Agree; A= Agree; SA= Strongly Agree.

	SD	D	MD	N	MA	A	SA
1. I am fairly rewarded for the work that I have done well.....	☐	☐	☐	☐	☐	☐	☐
2. I am fairly rewarded considering the amount of education and training I have.....	☐	☐	☐	☐	☐	☐	☐
3. High performers and low performers get the same pay raises.....	☐	☐	☐	☐	☐	☐	☐
4. I am fairly rewarded considering the responsibilities I have.....	☐	☐	☐	☐	☐	☐	☐
5. The best workers in our organization get the highest pay raises.....	☐	☐	☐	☐	☐	☐	☐
6. I am fairly rewarded in view of the amount of experience that I have.....	☐	☐	☐	☐	☐	☐	☐
7. If I perform especially well on my job, it is likely that I will get a pay raise.....	☐	☐	☐	☐	☐	☐	☐
8. I am fairly rewarded for the amount of effort I put forth.....	☐	☐	☐	☐	☐	☐	☐
9. I am fairly rewarded for the stresses and strains of my job.....	☐	☐	☐	☐	☐	☐	☐
10. My team is fairly rewarded for the work it has done well.....	☐	☐	☐	☐	☐	☐	☐
11. My team is fairly rewarded for the amount of effort we put forth.....	☐	☐	☐	☐	☐	☐	☐
12. My team is fairly rewarded considering the responsibilities we have.....	☐	☐	☐	☐	☐	☐	☐

Please use the scale below to indicate how your pay compares to the other situations listed below.

1=Much Too Low 2=Too Low 3=Somewhat Too Low 4=About Right 5=Somewhat Too High 6=Too High 7=Much Too High

How does your pay compare to ...

	1	2	3	4	5	6	7
Others in similar jobs in your organization	☐	☐	☐	☐	☐	☐	☐
Others in similar jobs outside your organization	☐	☐	☐	☐	☐	☐	☐
The pay you received at your previous job (if applicable)	☐	☐	☐	☐	☐	☐	☐
The pay you think you deserve	☐	☐	☐	☐	☐	☐	☐

Section 3: Attitudes Toward Team Rewards

Do you receive incentives or rewards based on your team's performance? ☐ No ☐ Yes (If no, skip to Section 4)

What was the pre-tax dollar amount of the last bonus you received based on your team's performance? \$ _____

How are the team bonuses divided among your team members (please check one):

- ☐ Team members each receive the same size bonus -same dollar amount (e.g., \$500) or percentage of base pay (e.g., 3%)
☐ Team members each receive different amounts based on their performance within the team
☐ Other, Please describe _____

Are team bonuses distributed as (check one) ☐ A percentage of your base pay (e.g., 3%) or ☐ A specific dollar amount (e.g., \$500)

If distributed as a percentage of your base pay, what percentage of your pay is based on your team's productivity? _____%

How often do you receive team bonuses? ☐ Quarterly ☐ Twice a year ☐ Yearly ☐ Project-by-project basis ☐ Other _____

Please answer the following questions based on the team-based incentives you receive. Use the scale: SD= Strongly Disagree; D= Disagree; MD= Mildly Disagree; N= Neither Agree Nor Disagree; MA= Mildly Agree; A= Agree; SA= Strongly Agree.

	SD	D	MD	N	MA	A	SA
The team-based incentives we receive support the organization's goals	☐	☐	☐	☐	☐	☐	☐
I am satisfied with the team incentive program in my organization	☐	☐	☐	☐	☐	☐	☐
I am often uncertain about the way team-based incentives are allocated	☐	☐	☐	☐	☐	☐	☐
I do <u>not</u> like being evaluated and rewarded based on the performance of my team	☐	☐	☐	☐	☐	☐	☐
I understand the procedures used in my organization to evaluate team performance	☐	☐	☐	☐	☐	☐	☐
Incentives/rewards are distributed based on the collective performance of my team	☐	☐	☐	☐	☐	☐	☐
I am glad this organization uses team-based incentives	☐	☐	☐	☐	☐	☐	☐
I understand the procedures used to allocate team incentives in this organization	☐	☐	☐	☐	☐	☐	☐
My incentives/rewards are influenced by how well my team performs	☐	☐	☐	☐	☐	☐	☐
The incentives I receive are dependent on my team's performance	☐	☐	☐	☐	☐	☐	☐
Overall, receiving team-based incentives has been a positive experience	☐	☐	☐	☐	☐	☐	☐
My incentives are determined by my contributions to the team	☐	☐	☐	☐	☐	☐	☐
Feedback about how well I am doing my job comes primarily from information about how well the entire team is doing	☐	☐	☐	☐	☐	☐	☐

The following items describe things an organization could do to reach a decision regarding the rewards your team receives. Using the same scale as above, indicate the extent to which your organization does the following when making decisions about rewards.

	SD	D	MD	N	MA	A	SA
Frequently observes my team's performance	☐	☐	☐	☐	☐	☐	☐
Discusses plans or objectives to improve my teams performance	☐	☐	☐	☐	☐	☐	☐
Generates standards so that decisions can be made with consistency	☐	☐	☐	☐	☐	☐	☐
Allows personal motives or biases to influence decisions	☐	☐	☐	☐	☐	☐	☐
Obtains accurate information about my teams performance	☐	☐	☐	☐	☐	☐	☐
Makes clear what is expected of our team	☐	☐	☐	☐	☐	☐	☐
Collects accurate information necessary for making decisions	☐	☐	☐	☐	☐	☐	☐
Uses consistent standards in evaluating the team's performance	☐	☐	☐	☐	☐	☐	☐

Section 4: Individual and Team Effectiveness

How would you rate your ability and skills relative to your teammates?

- ☐ Much worse ☐ Worse ☐ Slightly worse ☐ About equal ☐ Slightly better ☐ Better ☐ Much better

How would you rate your contributions to the team relative to your teammates?

- ☐ Much less ☐ Less ☐ Slightly less ☐ About equal ☐ Slightly more ☐ More ☐ Much more

How would you rate your performance relative to your teammates?

- ☐ Much worse ☐ Worse ☐ Slightly worse ☐ About equal ☐ Slightly better ☐ Better ☐ Much better

SD= Strongly disagree; D= Disagree; MD= Mildly disagree; N= Neither agree nor disagree; MA= Mildly agree; A= Agree; SA= Strongly Agree.

	SD	D	MD	N	MA	A	SA
33. Our team relies on other teams to do their work before we can do ours.....	☐	☐	☐	☐	☐	☐	☐
34. I am confident that our team will be successful in achieving its goals.....	☐	☐	☐	☐	☐	☐	☐
35. There is a lot of competition between teams in this firm.....	☐	☐	☐	☐	☐	☐	☐
36. I generally prefer to work as part of a team.....	☐	☐	☐	☐	☐	☐	☐
37. There is very little sharing of information between different teams in this firm.....	☐	☐	☐	☐	☐	☐	☐
38. Members of my team orient new people even though they are not required to do so.....	☐	☐	☐	☐	☐	☐	☐
39. The members of my team get along well with each other.....	☐	☐	☐	☐	☐	☐	☐
40. My teammates make innovative suggestions that help improve the department.....	☐	☐	☐	☐	☐	☐	☐
41. My work requires me to consult with other team members fairly frequently.....	☐	☐	☐	☐	☐	☐	☐
42. Information is readily exchanged between team members.....	☐	☐	☐	☐	☐	☐	☐
43. I am willing to work hard to contribute to my team.....	☐	☐	☐	☐	☐	☐	☐
44. The work team I belong to is a close one.....	☐	☐	☐	☐	☐	☐	☐
45. My team members freely share information with each other.....	☐	☐	☐	☐	☐	☐	☐
46. There is little competition between my team and other teams in the company.....	☐	☐	☐	☐	☐	☐	☐
47. I look forward to being with the members of my team each day.....	☐	☐	☐	☐	☐	☐	☐
48. My team does not perform as well as it should.....	☐	☐	☐	☐	☐	☐	☐
49. I enjoy belonging to this team because I am friends with many team members.....	☐	☐	☐	☐	☐	☐	☐
50. Each member of my work group has a clear idea of the group's goals.....	☐	☐	☐	☐	☐	☐	☐
51. The team I work with has above average ability.....	☐	☐	☐	☐	☐	☐	☐
52. If given a choice, I would prefer to work as part of a team rather than work alone.....	☐	☐	☐	☐	☐	☐	☐
53. I am not motivated to work hard on this team.....	☐	☐	☐	☐	☐	☐	☐
54. I am willing to exert high levels of effort when working with my team.....	☐	☐	☐	☐	☐	☐	☐
55. I depend on my team mates' work for information I need to do my work.....	☐	☐	☐	☐	☐	☐	☐
56. Given the choice, I would rather do a job where I can work alone rather than do a job where I have to work with others in a group.....	☐	☐	☐	☐	☐	☐	☐
57. For me, this is the best of all possible organizations for which to work.....	☐	☐	☐	☐	☐	☐	☐
58. I talk up this organization to my friends as a great organization to work for.....	☐	☐	☐	☐	☐	☐	☐
59. All in all, I am satisfied with my job.....	☐	☐	☐	☐	☐	☐	☐
60. I am proud to tell others that I am part of this organization.....	☐	☐	☐	☐	☐	☐	☐
61. In general, I don't like my job.....	☐	☐	☐	☐	☐	☐	☐
62. I often think about quitting my job.....	☐	☐	☐	☐	☐	☐	☐
63. I will probably look for a new job in the next year.....	☐	☐	☐	☐	☐	☐	☐
64. I really care about the fate of this organization.....	☐	☐	☐	☐	☐	☐	☐
65. If I could find a comparable job with another company, I would leave my job.....	☐	☐	☐	☐	☐	☐	☐
66. In general, I like working here.....	☐	☐	☐	☐	☐	☐	☐
67. I am very glad I chose this organization to work for over others I considered at the time I joined.....	☐	☐	☐	☐	☐	☐	☐
68. I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful.....	☐	☐	☐	☐	☐	☐	☐
69. I would like to continue working with my team in the future.....	☐	☐	☐	☐	☐	☐	☐

Which statement best describes your opinion on how team-based rewards should be allocated: (check one)

☐ Team rewards should be allocated equally among team members (all team members should receive the same amount)

☐ Team rewards should be allocated based on one's individual contributions to the team (some members should receive less than others)

Do you receive non-monetary bonuses (e.g., recognition) for your team's performance? ☐ No ☐ Yes

Thank you for your participation. Please return your survey in the attached pre-addressed, stamped envelope.

APPENDIX G
Team Leader Survey

Number of Employee Surveys You Distributed: _____

TEAM LEADER/SUPERVISOR SURVEY: REACTIONS TO TEAMS

Thank you for agreeing to participate in this research. In this survey, you will be asked questions about your team and your reactions to being a team leader. If you are a leader of more than one team, please respond based on the team you belong to that receives team-based bonuses. Participants are guaranteed total confidentiality. If a question does not apply to you, please leave it blank. Demographic information is requested for statistical purposes only. Thank you for your input on these important issues.

Section 1: Background Information

What is your current functional area?

- | | | | |
|---|---|--|--|
| ☐ Clerical/Admin Support | ☐ General Mgmt | ☐ Technical support | ☐ Communications/Public Relations |
| ☐ HR/Personnel/Training | ☐ Financial | ☐ Sales/Marketing | ☐ Engineering/Research |
| ☐ Production | ☐ Healthcare/Nursing | ☐ Information Systems | ☐ Other _____ |

How long have you worked for your present employer? _____ (years)

CURRENT YEARLY BASE PAY= \$ _____

YEARLY INCENTIVES FOR TEAM PERFORMANCE= \$ _____ (i.e., Team Incentive Program)

ADDITIONAL INCENTIVES YOU RECEIVE= \$ _____ (i.e., individual bonuses or rewards)

SEX: ☐ Male ☐ FemaleAGE: _____ RACE: ☐ Caucasian ☐ African-American ☐ Hispanic ☐ Asian ☐ Other _____Highest Level of Education Completed: ☐ High school degree ☐ Some college ☐ College degree ☐ Master's degree ☐ PhD

How long have you been a member of your work team? _____ (months)

How many members are there on your current team? _____ (number)

Has your team received any specialized training? ☐ No ☐ Yes If yes, what type of training _____Do you have any past experience working in teams? ☐ No ☐ Yes If yes, for how long _____ (months)Are you currently a leader of another team? ☐ No ☐ Yes If yes, how many other teams _____Are you currently a member of another team? ☐ No ☐ Yes If yes, how many other teams _____

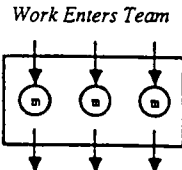
How would you best characterize the type of team you are currently leading: (please check one)

- | | | |
|---|---|--|
| ☐ Advice Team
-employees contribute suggestions & participate in decision making

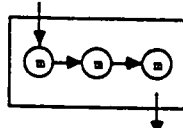
(e.g., quality circles, employee involvement groups) | ☐ Production and Service Team
-employees work together to make a product or perform a service (responsible for performing day-to-day activities as a team)
(e.g., self-managed teams, assembly teams, maintenance teams, manufacturing teams) | ☐ Project Team
-employees work on specific tasks or projects together (once project is complete, the team disbands)
(e.g., task forces, cross-functional teams, research groups) |
|---|---|--|

How would you characterize the work flow between members of the work team you lead: (check one)

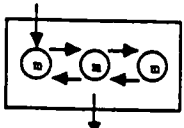
- | | | | |
|--|---|---|--|
| ☐ Independent Work Flow
-each group member (m) independently contributes without direct interaction between team members.



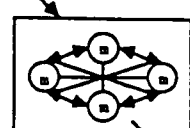
Work Enters Team
Work Leaves | ☐ Sequential Work Flow
-each member (m) has a different role and performs different parts of the task in a prescribed order.



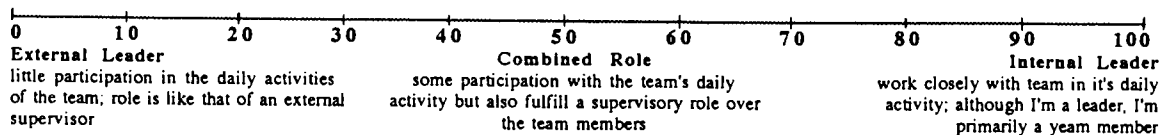
Work Enters Team
Work Leaves | ☐ Reciprocal Work Flow
-each member's (m) output becomes another's input (characterized by two-way interactions).



Work Enters Team
Work Leaves | ☐ Team Work Flow
-group members (m) jointly diagnose, problem-solve, and collaborate to complete a problem.



Work Enters Team
Work Leaves |
|--|---|---|--|

On a scale of 0 to 100, mark the axis below to indicate which best describes your role in this team?

In your own words, please describe your supervisory role in this team: _____

VITA

Jacquelyn S. DeMatteo was born in Teaneck, New Jersey on July 21, 1967. She attended Stony Lane Elementary School and West Brook Middle School in Paramus, New Jersey. She graduated from Paramus Catholic High School in June, 1985. Jacquelyn received her Bachelor of Science degree in psychology from The Pennsylvania State University, University Park, PA in 1989, and her Master of Arts degree in psychology from The American University, Washington, DC in 1992. During her Master's program, she was employed as a Consortium Research Fellow at the Army Research Institute. She entered The University of Tennessee in 1991 to pursue a Doctorate of Philosophy in Industrial and Organizational Psychology. She has taught several undergraduate-level courses at The University of Tennessee, including Principles of Management and Organizational Behavior. Her primary areas of research and applied work include work teams, compensation, training, and selection. To date, she has published 4 articles in refereed journals, and has presented 13 papers at professional conferences. She has also co-authored several book chapters. She has consulted with a variety of organizations, including TRW-Fuji Valve, Bryce Corporation, Eastman Chemical, the UT Management Development Center's Executive Development Program, the Tennessee Government Executive Institute, and the City of Oak Ridge. She has also served as an assessor for the Tennessee Assessment Center for the past five years.

On May 22, 1993, Jacquelyn married Stanton John Jacobs, Vice President of Investments at Dean Witter. While completing her dissertation, they had their first child, Ryan John Jacobs.