This is to certify that the

dissertation entitled

SINGLED OUT: TASK AND SOCIAL IMPLICATIONS OF PROVIDING INDIVIDUAL LEVEL PERFORMANCE FEEDBACK IN TEAMS

presented by

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has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Business Administration

Major professor

Date 11/28/01

SINGLED OUT: TASK AND SOCIAL IMPLICATIONS OF PROVIDING INDIVIDUAL LEVEL PERFORMANCE FEEDBACK IN TEAMS

By

Christopher Olden Lee Howard Porter

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Management

2001

ABSTRACT

SINGLED OUT: TASK AND SOCIAL IMPLICATIONS OF PROVIDING INDIVIDUAL LEVEL PERFORMANCE FEEDBACK IN TEAMS

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Christopher Olden Lee Howard Porter

This study examined and compared predictions from several different theoretical frameworks, all of which suggested that there were task and/or social implications of singling out a member of a team and providing him or her with individual level performance feedback. Of particular interest was 1) what are the task performance effects on both those who directly receive individual level performance feedback and those others who observe its provision and 2) what, if any, effects does providing individual level performance feedback in teams have on team social outcomes?

The research methodology utilized undergraduate students who were arranged in four-person teams and worked interdependently on a computerized decision-making task. Results of the study indicate that the provision of individual level performance feedback to a singled out member of the team has small, yet nevertheless important, positive task performance effects on both those who directly receive the feedback and those who merely observe the provision of the feedback. No one theoretical framework adequately explained those effects. Finally, the results of this study indicate that singling out one team member and provided with him or her with individual level performance feedback had no negative effects on the social dynamics and functioning of teams therefore raising doubts about the admonitions offered by a number of team scholars regarding the detrimental effects of providing such feedback to individuals working in teams.

This work is dedicated to the family and friends who supported me through all these years of graduate school, especially my son, Nickolas O.L.H. Porter. Nickolas, you have been and continue to be my inspiration. Throughout my doctoral program and especially throughout the dissertation process you were constantly on my mind. You gave me the strength and motivation to keep striving for my goals when the going got tough. I hope that I, and whatever my accomplishments may be, provide the same inspiration and encouragement for you.

ACKNOWLEDGEMENTS

This dissertation would not be complete with a special thank you and acknowledgement to Dan Ilgen, without whom I would have not even pursued this particular degree. Dan not only inspired me but he also provided guidance to me over the last several years. Moreover, he helped to make my time at Michigan State University a true learning experience from beginning to end.

Also, I thank both Dan and John Hollenbeck for giving me the opportunity to work closely with them in the Team Effectiveness Laboratory. Simply put, that opportunity was an invaluable experience. Those of us who have and continue to work in the laboratory do not say it often enough but we truly appreciate your time, expertise, willingness to help us develop, and patience. Thank you so much.

Don Conlon and Kevin Ford were also invaluable members of my dissertation committee that deserve mention. Just as important, they have both been good friends to me during my time at MSU. Their guidance and support, both academically and personally, has been and continues to be greatly appreciated.

Finally, Alison Barber, while not a member of my dissertation committee, was key to my entering into the Department of Management. She introduced me to human resource management and her ability to bring this area of study to life and her passion about the field had a major influence on my developing goals and my academic choices.

I also want to thank to Aleksander Ellis, Stephen Humphrey, and Ann Appledorn, all of who helped me collect the data for this dissertation. I truly appreciate all the hours they put into this project. Best wishes to all of you in your future endeavors.

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CHAPTER ONE: INTRODUCTION

The changing nature of work was recently noted in an insightful popular press article entitled, "The End of the Job" by William Bridges. While Bridges (1994) wrote specifically about the shift in emphasis on work scheduled around jobs to work scheduled around tasks that need to be completed, there are a number of ways in which the nature of work has dramatically changed in recent years. For example, a number of authors have discussed how work roles have evolved from static, structured, and prescribed roles to those that can be better characterized as having a more social, unstructured, and emergent nature (Ilgen & Hollenbeck, 1991; Murphy & Jackson, 1999). Yet another recent change that manifests itself at higher levels of organizational functioning is the changing structure of organizations. Mohrman and Cohen (1995) discussed the changing forms of organizations from ones in which people are connected through boxes and lines in a hierarchical fashion to ones that are flatter, characterized by more "connectedness," and in which collectives of individuals perform work rather than individuals alone. Clearly, organizational scholars' and practitioners' thinking about organizations has evolved tremendously in recent years from lower level phenomena such as the extent to which work is structured around jobs to higher level phenomena such as the structure of organizations themselves.

One of the more prevalent recent changes noted by a number of organizational scholars (e.g., Applebaum & Blatt, 1994; Cohen & Bailey, 1997; Gordon, 1992; Lawler, Mohrman, & Ledford, 1992; Mohrman & Cohen, 1995; O'Leary-Kelly, 1998) is the increasing use of groups and teams by contemporary work organizations. Teams can be generally defined as groups of highly interdependent individuals working towards a

common goal (Sundstrom, De Meuse, & Futrell, 1990) and Reilly and McGourty (1997) went so far as to suggest that the move to team-based work structures is perhaps the most dramatic change in recent American business. In recent years, organizations have increasingly relied on teams and team-based work structures for organizing the way in which work is completed. Gordon (1992), for instance, reported that 82% of companies with 100 or more employees reported using some form of team-based work units. As one surveys all facets of work organizations, it becomes clear that much of the work traditionally done by individuals working alone is now being done by individuals working in groups and teams. As such, teams have and continue to be an important issue for organizational practitioners and scholars alike.

The implications of the shift to team-based work arguably have the most impact on human resource management scholars and practitioners whose interventions have historically been aimed at levels of analysis lower than the team level. For example, most if not all, human resource practices (e.g., recruitment, selection, and compensation) are developed around an individual job via job analysis. Employees are recruited and selected based on individual qualifications and fit with prospective employers. Traditionally, compensation has been focused at the individual employee level. This is the case for almost all human resource management practices yielding quite a dilemma for human resource management practitioners.

Recently, organizational scholars have responded by shifting focus in organizations to group and team levels. Researchers (e.g., Campion, Medsker, & Higgs, 1993; Campion, Papper, & Medsker, 1996; Cannon-Bowers, Tannenbaum, Salas, & Volpe, 1995) have proposed team-based training interventions. Further, a number of

researchers have attempted to explore the impact of compensation systems designed to reward employees at the team level (see DeMatteo, Eby, & Sundstrom, 1998 for a review). Indeed, a survey of the current literature suggests that human resource management scholars have begun to develop theories that better embrace today's organizations and their new forms (Ferris, Hochwater, Buckley, Harrell-Cook, & Frink, 1999). As it relates to the current state of knowledge regarding the use of teams, there is still however quite an amount of work that must be done if organizational scholars and practitioners hope to better close the gap between their recent popularity and understanding of how to best utilize human resource management interventions with those working in teams.

One particularly common human resource management intervention that has yet to receive adequate attention in the context of the shift to team-based work structures is the provision of performance feedback. Feedback can be generally defined as the process of communicating information regarding the results and outcomes of actions or behaviors (Taylor, Fisher, & Ilgen, 1984). Interestingly, little theoretical and empirical work has been devoted to understanding the use and effectiveness of providing performance feedback to those working in teams. This is unfortunate given that the provision of performance feedback is likely to be critical for influencing team effectiveness (Campion et al., 1993; O'Leary-Kelly, 1998; Sundstrom et al., 1990).

The Provision of Performance Feedback in Teams

Despite a long history of research on the subject, debate still exists surrounding the effectiveness of feedback interventions in influencing employee behavior. Kluger & DeNisi (1996), in a meta-analytic investigation of the topic, found that one-third of all

feedback interventions have a negative effect on performance. This finding is particularly interesting in that it undermines a commonly held assumption—that performance feedback leads to increased performance. Despite this finding, feedback remains an integral management tool (Earley, Northcraft, Lee, & Lituchy, 1990) that is, more often than not, thought to enhance work performance. The changing nature of work, in particular the shift from individuals to teams as the basic work unit, has presented an additional layer of complexity to the uncertainty surrounding the effectiveness of feedback interventions in enhancing work performance (Barr & Conlon, 1994; Hinsz, Tindale, & Vollrath, 1997; Nadler, 1979; O'Leary-Kelly, 1998). The proposed study is an attempt to resolve some of this ambiguity.

Whatever is understood regarding the effects of feedback in general, less is understood regarding the effects of feedback in teams (McIntyre & Salas, 1995) despite widespread acknowledgement by many scholars that feedback interventions are important, if not critical to successful team development (Kozlowski, Gully, McHugh, Salas, & Cannon-Bowers, 1996; Kozlowski, Gully, Nason, & Smith, 1999; Sundstrom et al., 1990). A paucity of empirical work in this area is unsettling given the frequency in which teams can be found in today's workplace. Given the frequency in which teams are now being relied upon to meet organizational goals, there is clearly a need to better understand the effects of feedback interventions in groups and teams.

The Debate Regarding the Provision of Performance Feedback in Teams

Perhaps the most interesting debate regarding the use of feedback interventions in teams concerns the level at which the performance feedback should be provided. Nadler (1979), one of the first scholars to identify the need for increased understanding regarding

the role of feedback on group (or team) functioning, proposed three types, or levels, of feedback that could be presented to those working in organizational contexts: feedback provided at the individual level to individuals working alone, feedback provided at the group level to individuals working in the context of a group, and feedback provided at the individual level to individuals working in the context of a group. Nadler further suggested that feedback received by individuals working alone (i.e., non-social settings) may be very different from feedback received by individuals working in the context of a group.

Feedback provided at the individual level to individuals working alone has been the most often explored type of feedback intervention in the organizational literature (Conlon & Barr, 1989; Pritchard, Jones, Roth, Stuebing, & Ekeberg, 1988). Such feedback entails simply providing information to a single employee about his or her performance. As such, individual level performance feedback of this nature is devoid of intervening social factors (Nadler, 1979).

Feedback at the group level to individuals working in the context of a group entails providing aggregated feedback to a group of individuals who perform as a unit. Such feedback provides information about the result of the joint performances in the group (Conlon & Barr, 1989). Providing group level performance feedback is increasingly becoming commonplace in work organizations where individuals are called upon to work in groups and teams. Self-directed work teams and quality circles are examples in which the provision of group or team level feedback is common.

Finally, feedback provided at the individual level to individuals working in the context of a group entails providing information to an individual about only his or her performance when that individual is working in a group or team setting. In this case,

information may or may not be given about the aggregate performance of the team unit. Such feedback may be provided when the individuals work more independently as is often the case in work groups but it can also be provided when the individuals work interdependently as is the case of work teams. It should be noted that these latter two types of feedback (i.e., individual level performance feedback provided in the context of a group and group level feedback provided to a group) both include intervening social factors (Nadler, 1979).

With the increased use of team-based work structures, both the provision of performance feedback at the team level and performance feedback at the individual level in the context of a team have the potential to become increasingly important interventions for influencing team effectiveness and performance in contemporary work organizations (DeNisi, 2000). To date, both are under-researched by scholars (McIntyre & Salas, 1995). This is especially the case as it concerns the provision of individual level performance feedback to those working in the context of a group or team. The lack of research on the effects of providing individual level performance feedback to such individuals may be due, in part, to the common recommendation by some scholars that individual level performance feedback not be provided to those working in groups and teams (e.g., Reilly & McGourty, 1998; Smither, 1998).

While most team scholars agree that performance feedback should be provided at the team level, there is disagreement regarding whether or not performance feedback should be provided about individual team member performance (i.e., individual level performance feedback). Some scholars suggest that feedback provided to those working in teams should be provided only in aggregate form (i.e., team level performance

feedback). In other words, many scholars (e.g., Smither, 1998) suggest that in teams the only feedback provided should be feedback regarding how the team as a whole has performed. Recommendations against the use of individual level performance feedback in teams appear to be based on the belief that individual level feedback will have detrimental effects on team social processes (e.g., coordination, cooperation, social attraction) and team outcomes (e.g., cohesion). On the other hand, other scholars (e.g., Brannick & Prince, 1997; DeNisi, 2000) suggest that for feedback interventions to be successful in increasing team effectiveness, the feedback should be provided at both the team and individual levels.

It should be noted, however, that little to no empirical research has demonstrated the negative effects of individual level performance feedback on social processes and outcomes in teams. Rather, these recommendations are based wholly on anecdotal evidence. Unfortunately, anecdotal evidence of this nature is insufficient in a number of ways, most important of which is it provides little help to those attempting to further theory and practice as it relates to the influence of feedback interventions on team performance and effectiveness. As such, the extant literature that suggests that there are negative consequences to providing individual level performance feedback to those working in teams is, at best, of limited utility. Coupled with the ever-increasing importance of teams in today's work organizations and the need to better understand how to best train, develop, utilize, and maintain effective teams, the state of knowledge regarding the provision of individual level feedback to teams is clearly troublesome.

The Importance of Individual Level Performance Feedback in Teams

There are several reasons why the provision of individual level feedback to those working in teams is both practically necessary and theoretically interesting despite arguments to the contrary. First, employees have a tendency to want to know how they are performing (DeNisi & Kluger, 2000; Kavanagh, 1997, Taylor et al., 1984). The fact is that oftentimes employees expect and, in some cases, seek out some sort of feedback about how they are performing. There is simply no reason to believe that working in a team makes feedback about individual performance any less important to individual performers.

Second, many problems with team performance are the result of individual performances. There is little question that in most cases the performance of a team is a function of some combination of individual team member contributions. As such, feedback at the individual level may be necessary but not sufficient for increasing the performance of the team as a whole.

Third, team level performance feedback is not likely to have the motivating and informational effects that individual level performance feedback may have on individuals in a team (Conlon & Barr, 1989). Performance feedback provided at the team level usually is not aimed at any particular individual team member. As such, individual team members may not accept personal responsibility for team level feedback. Indeed, some empirical work has shown increased levels of social loafing among those working in teams that have been provided team level feedback absent of any accompanying individual level feedback (Latane, Williams, & Harkins, 1979; Williams, Harkins, & Latane, 1981). Moreover, individual team members may be less likely to correctly

associate their individual behaviors with the feedback the team receives on its aggregate performance. Therefore, failure to provide individual level performance feedback to those working in teams may increase the probability that individual team members continue displaying inappropriate behaviors when told that overall the team is performing well. Similarly, failure to provide individual level performance feedback may increase the probability that individual team members may discontinue displaying appropriate behaviors when told that overall the team is performing poorly.

Finally, little is known about the implications of providing individual level performance feedback in social contexts such as teams. A number of authors have noted that most of the feedback literature deals with individuals working alone (Conlon & Barr, 1989; Pritchard et al., 1988). This state of affairs is unfortunate considering that the feedback literature has typically neglected the role of the feedback context on the effects of feedback interventions. Indeed, scholars have noted the lack of attention given to the context in which feedback and performance appraisals take place (Bretz, Milkovich, & Read, 1992; Waldman, 1997). Conlon & Barr (1989) suggested that the context becomes more social as individuals become more interdependent with others, interact with others, or are able to make comparisons against the feedback that others receive. When individuals working in teams are provided with individual level performance feedback, this is the just the sort of context that is created. As a result of being in such a social context, several socially mediated processes may occur when individual level feedback is provided to teams. These processes and their effects on individuals in teams have yet to receive adequate theoretical and empirical attention.

This study seeks to fill a void in the empirical literature regarding the provision of individual level performance feedback to those working in teams. In particular, it seeks to determine whether providing individual level performance feedback yields benefits to teams in terms of individual performance and at what social costs? In other words, are the benefits, if any, that result from providing individual level performance feedback to those working in teams outweighed by the detrimental effects that may result when individual team members are provided with information about how they or the others with whom they are interdependent have individually performed?

Figure 1 depicts a model of team performance that, while oversimplifying the complexities of team performance, nevertheless brings an important issue to bear, namely the importance of individual level performance in team performance. As can be seen in the model, individual level performance has a direct effect on the performance of a team. Accordingly, attempts to improve the effectiveness of teams must address performance at the individual, team member level. It must be remembered that teams do not actually do anything but rather it is the individuals in the team that do (Brannick & Prince, 1997; Zalesny, Salas, & Prince, 1995) and thus attempts to influence team performance must address individual team member performance as these individual performances are a necessary component of successful team performance. Dickinson and McIntyre (1997) stated that to improve team performance, one must focus attention on individual performance. As such, feedback interventions directed at individuals working in teams, represent no less of an important type of intervention for increasing team effectiveness than feedback interventions directed at a team as a whole.

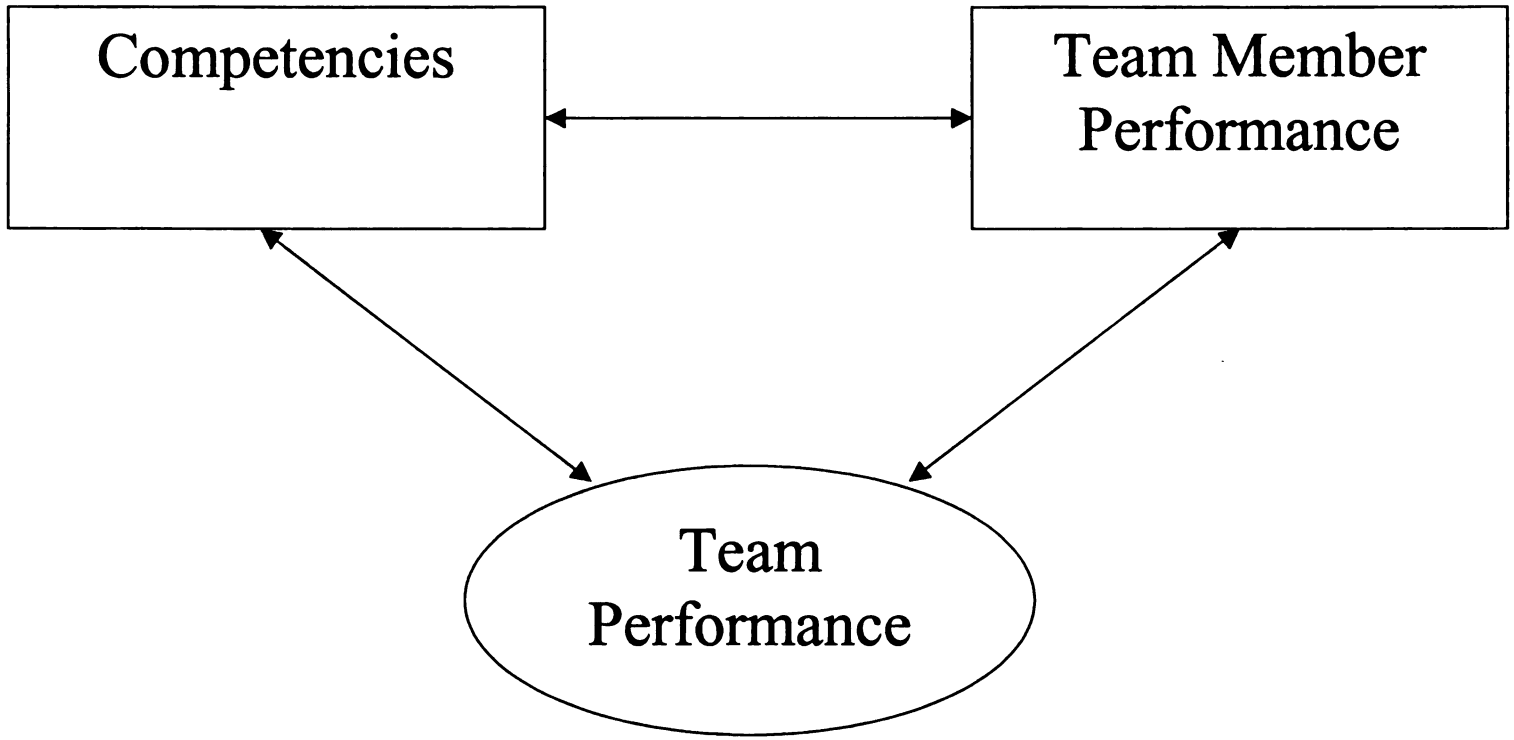

Figure 1. A Model of Team Performance. Adapted from Reilly & McGourty (1998).

Indeed, individual level performance feedback would seem to be more effective in directly influencing individual performance (Nadler, 1979). In fact, Brannick and Prince (1997) stated that for teams to become effective, it is likely that both individual and team level feedback must be provided. Given both the informational and motivational functions that feedback has long been thought to serve (Ilgen, Fisher, & Taylor, 1979), it is likely that feedback interventions directed towards individuals in teams will have at least some positive effects on the individual feedback recipient's performance, other team members who observe the provision of the feedback, and thus the performance of the team as a whole.

In this study, I attempt to determine the consequences of providing individual level feedback in teams. Specifically, I examine the effects of receiving individual level performance feedback in a team context on both the direct feedback recipient and those who observe the provision of such feedback to another team member regarding his or her performance. I address two distinct, but nevertheless, related research questions regarding both those who directly receive performance feedback and those that observe a team member receive performance feedback: 1) can both feedback recipients and observers experience performance improvements as a result of providing individual level performance feedback in teams and 2) what, if any, effects does providing individual level performance feedback in teams have on team social outcomes?

Outline

As a first step in exploring these research questions, the next chapter provides a review of the extant literature on feedback in teams. This review will serve two purposes. First, the review will make apparent how little is currently known regarding the effects of

feedback in teams in general, but specifically, how little is known regarding the social and task performance implications of providing individual level feedback in teams. Second, the review will provide a framework from which the following discussion of the effects of individual level feedback in teams will be based. Later, I develop explicit hypotheses regarding the potential effects that both being directly provided with and observing the provision of individual level performance feedback in teams will have on team members' task performance. Chapter Three discusses the performance improvements that are likely to occur among individuals who are provided with performance feedback in a team context and could potentially occur among team members who are privy to the provision of individual level performance feedback to others in their team. Thus, while previous research has emphasized the direct effects that may result from receiving performance feedback, I place specific emphasis on both the effects that may result from the direct experience of receiving feedback on one's own performance in addition to the effects that may result from the indirect experience of observing another individual receive feedback on his or her performance. Chapter Four discusses the effects that providing individual level performance feedback may have on social outcomes in teams. Chapter Five describes the research method that is used to test the hypotheses developed in Chapters Three and Four while Chapter Six reports the results of the tests of the study's hypotheses. Finally, Chapter Seven discusses, more generally, the findings of the study and the study's limitations.

CHAPTER TWO: A REVIEW OF THE LITERATURE ON FEEDBACK INTERVENTIONS IN TEAMS

While feedback in teams can be provided at the team level, at the individual level, or both (Nadler, 1979), as mentioned in the previous chapter, researchers have overwhelmingly suggested that the feedback provided to those working in teams should only be manifested at the team level. Such recommendations are often made despite a lack of research evidence that actually demonstrates that providing individual level performance feedback has detrimental effects on those individuals working in teams and teams' social functioning. Presently, researchers have failed to systematically investigate the effects of both team level and individual level feedback in teams (Conlon & Barr, 1989), thus the current state of affairs raises the possibility that the provision of individual level feedback to those working in teams may represent an effective yet underutilized leverage point for increasing team effectiveness.

The study proposed here is an attempt to fill this void in the current state of knowledge regarding feedback interventions in teams. Specifically, I seek to determine what, if any, are the effects of providing individual level performance feedback in teams? Several types of outcomes are of particular interest. Clearly, performance improvements are of primary interest as it is often the goal of feedback interventions to improve employee performance (Kluger & DeNisi, 1996). As such, this study examines the effects of providing individual level performance feedback in teams on task performance (i.e., a behavioral outcome). However, as recently noted by Atwater, Waldman, Atwater, and Cartier (2000), performance improvements are not the only potential outcomes of feedback interventions. Social outcomes represent yet another particular type of outcome

that is also of interest here considering the social context in which the provision of individual level performance feedback in teams presents. Thus, the approach taken here is similar to that of Taylor et al. (1984) in that it recognizes the importance of both social (what they refer to as affective) and behavioral reactions to feedback. Moreover, this approach is also consistent with recent calls from organizational scholars to explore a broad range of outcomes including cognitive, affective, and behavioral reactions which are often associated with employee developmental activities like performance feedback (Kraiger, 1999; Kraiger, Ford, & Salas, 1993).

While there is currently some debate regarding the general effectiveness of providing performance feedback in organizations (e.g., Kluger & DeNisi, 1996), in this paper, I propose that individual level feedback interventions in teams should affect the subsequent task performance of the direct recipient of the feedback and those other team members who are observers of both the performance and the performance feedback that another team member has received. In addition, given the concerns that some scholars have raised regarding the provision of individual level performance feedback on team social outcomes, in this study, I also explore to what extent providing such feedback has on social dynamics and functioning in teams.

In accomplishing this end, the next several sections of the chapter provide a review of the extant literature on feedback interventions in teams. It is important, however, to note the boundaries of the literature review before proceeding. Similar to others (e.g., Kluger & DeNisi, 1996), of particular concern here are feedback interventions aimed towards specific persons or groups for the explicit purpose of influencing or, more specifically, improving performance. However, unlike Kluger and

DeNisi (1996), who exclude research on interventions that include self-generated and computer-generated feedback (e.g., feedback that comes from the actual task), the following review excludes research on self-generated feedback interventions while intentionally including research on computer-generated and other types of task-generated feedback. Research on this latter type of feedback intervention (i.e., that which comes from the task) is considered as both important and relevant here given recent advances in workplace technology that allow employees to gain knowledge of the results of their performance without reliance on some outsider but rather from the task itself. It is thus becoming more commonplace for employees to rely on their work tasks for performance feedback (e.g., consider the use of rejection rates or hourly output by self-managed, autonomous manufacturing teams).

In addition, the review excludes research on feedback directed specifically towards addressing interpersonal group processes (e.g., McLeod, Liker, & Lobel, 1992). It is recognized that interpersonal process feedback provided to groups and teams may indirectly impact group and team task performance, however, it is not the aim of such feedback to directly impact task performance. I focus only on task performance feedback and its direct and indirect effects on individual and team outcomes as task performance feedback is thought to have direct effects on task performance. The boundary specification of limiting my focus to task performance feedback is consistent with recommendations by Shea and Guzzo (1987) who advised that efforts towards creating and maintaining effective groups and teams should focus primarily on task-focused interventions rather than interpersonally-focused interventions, the latter of which generally have an uninspiring record as it relates to improving task performance. It

should be noted, however, that the review does not exclude research on process related task feedback (i.e., that which provides information regarding how the task is done) (see Schein, 1987 for an elaboration on task process versus interpersonal process interventions).

Summary of Previous Literature Reviews on Feedback Interventions in Teams

Nadler (1979) provided the first published review of the literature on feedback in groups in an attempt to solidify the amassed knowledge in an area he believed was fragmented and in desperate need of integration. From this review, he drew several conclusions. Nadler (1979) noted that there was mixed evidence that feedback in groups can influence behavior through its motivating effects, cueing effects, or both and further proposed a number of possible factors that may account for the variations he found across studies. Of these factors, Nadler suggested that the aggregation level of the feedback in addition to the nature of the team's task may influence whether the feedback has its desired effects on groups. He further concluded from his review that goal setting (i.e., the process of using feedback) works in tandem with the feedback itself to alter groups' performance. In addition, he concluded that individual differences moderate the effects of feedback in teams as they do the effects of feedback to individuals working alone. Interestingly, he also suggested that the evaluative information that is often a component of feedback, while potentially increasing performance and functioning, could also decrease performance, increase defensiveness, or increase negative attributions. Nadler's conclusions are summarized in Figure 2.

The most recent review of the literature on feedback interventions in groups and teams was provided by Conlon and Barr (1989). In their review, these authors explored a

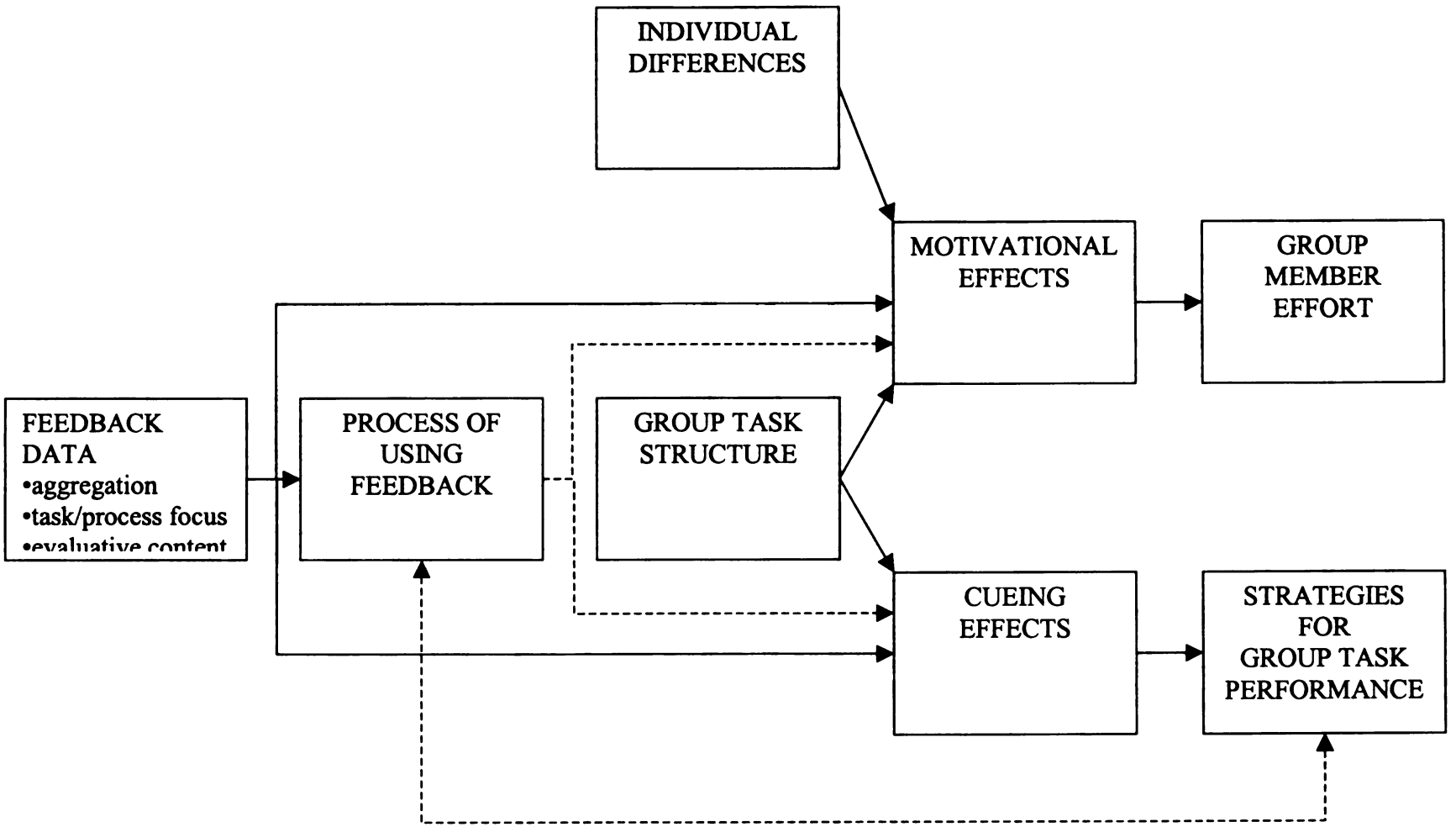

Figure 2. A Model of Task Group Feedback Effects. Adapted from Nadler (1979).

number of social phenomena likely to occur when feedback is provided to those working in social contexts on interdependent tasks and argued that these phenomena often work to obscure the reliability, or consistency, of the effects of such feedback. First, they suggested that aggregated team level feedback may have a detrimental effect on individual performance as individual performers are likely to have a difficult time separating out how they performed as an individual when only provided information regarding how the team as a whole has performed. Simply stated, they suggested that information about the performance of the team may be misleading for individual team members who use such information for determining how well they are performing. They further proposed that individual feedback may provide more accurate information about individuals' personal actions. Related to the informational problems associated with team level feedback, Conlon and Barr (1989) also noted that team level feedback may be less motivating than individual level feedback. Specifically, they cited research suggesting that aggregated feedback increases the likelihood of social loafing (i.e., the tendency for individuals to reduce their individual efforts when performing as part of a group rather than by themselves, Latane, Williams, & Harkins, 1979) among individuals working in teams and groups. While these authors did not discourage the use of team level feedback, they did however suggest that social loafing may be reduced by making individual team members' inputs more visible.

Conlon and Barr (1989) also proposed that the level of feedback provided should be determined, in part, by the nature of the team's task. Using Steiner's (1972) typology of group or team tasks (conjunctive, disjunctive, additive, and discretionary), they suggested that team level feedback may be most effective for those working on

conjunctive, additive, and discretionary tasks while individual level feedback may be most effective for those working on disjunctive tasks. The authors reasoned that when provided with aggregated feedback, those working on conjunctive tasks should all put forth effort since members would not know if they or some other team member was the lowest performing team member who therefore provided the basis for the team's performance. With additive and discretionary tasks, aggregated feedback should effectively motivate and direct behavior to the extent to which individual performance is captured in the aggregated team score. On the other hand, since the team's performance is determined by the best performing team member on disjunctive tasks, the authors reasoned that aggregated feedback would be likely to encourage social loafing among poor performers especially when poor performers know that the team's score is not dependent on their performance. Unfortunately, Conlon and Barr (1989) provided no data to support their propositions.

Of particular relevance to the present study, Conlon and Barr (1989) also proposed that there are two socially mediated outcomes that occur when individual level feedback is provided in groups and teams. Specifically, they first suggested that when team members have information by way of individual level performance feedback regarding each other's individual performances, they may use such information to classify themselves into majority and minority subgroups, or positions, in the team (what the authors refer to as social influence). The authors went on to cite an example from a mining study in which, based on information about the frequency in which individuals engaged in job switching, work group members classified each other as "switchers" or "non-switchers." The authors suggested that publicly provided individual level

performance feedback can have negative social effects in teams when team members use it to put each other into subgroups that have the potential for creating greater social distance among the team as a whole.

Second, Conlon and Barr (1989) proposed that when individual level performance feedback is provided to those in teams, it creates an opportunity for team members to make social comparisons with others in their team. In other words, when individual team members are aware of the feedback each other receives, as is the case when individual level performance feedback is provided publicly to those working in teams, team members can evaluate the feedback they receive relative to that received by others.

Clearly, the review by Conlon and Barr (1989) suggested that the provision of individual level performance feedback is not only important to, but can also have a significant impact on, team functioning. Their review highlighted two socially mediated outcomes (i.e., social influence and social comparisons) which the authors argued are important determinants of the effects of individual level feedback in teams. Unfortunately, as the following review reveals, little theoretical and empirical work has appeared in recent years that has significantly added to our knowledge about the general effectiveness of feedback interventions in teams and, more important to the present study, individual level performance feedback interventions in teams.

Figure 3 provides a general model of the effects of feedback interventions in teams that serves two purposes. First, the model presents a simple framework for understanding the effects of feedback in teams. As the model highlights, and also consistent with Nadler (1979), there are two types of feedback interventions that can be provided to those working in teams—team level performance feedback and individual

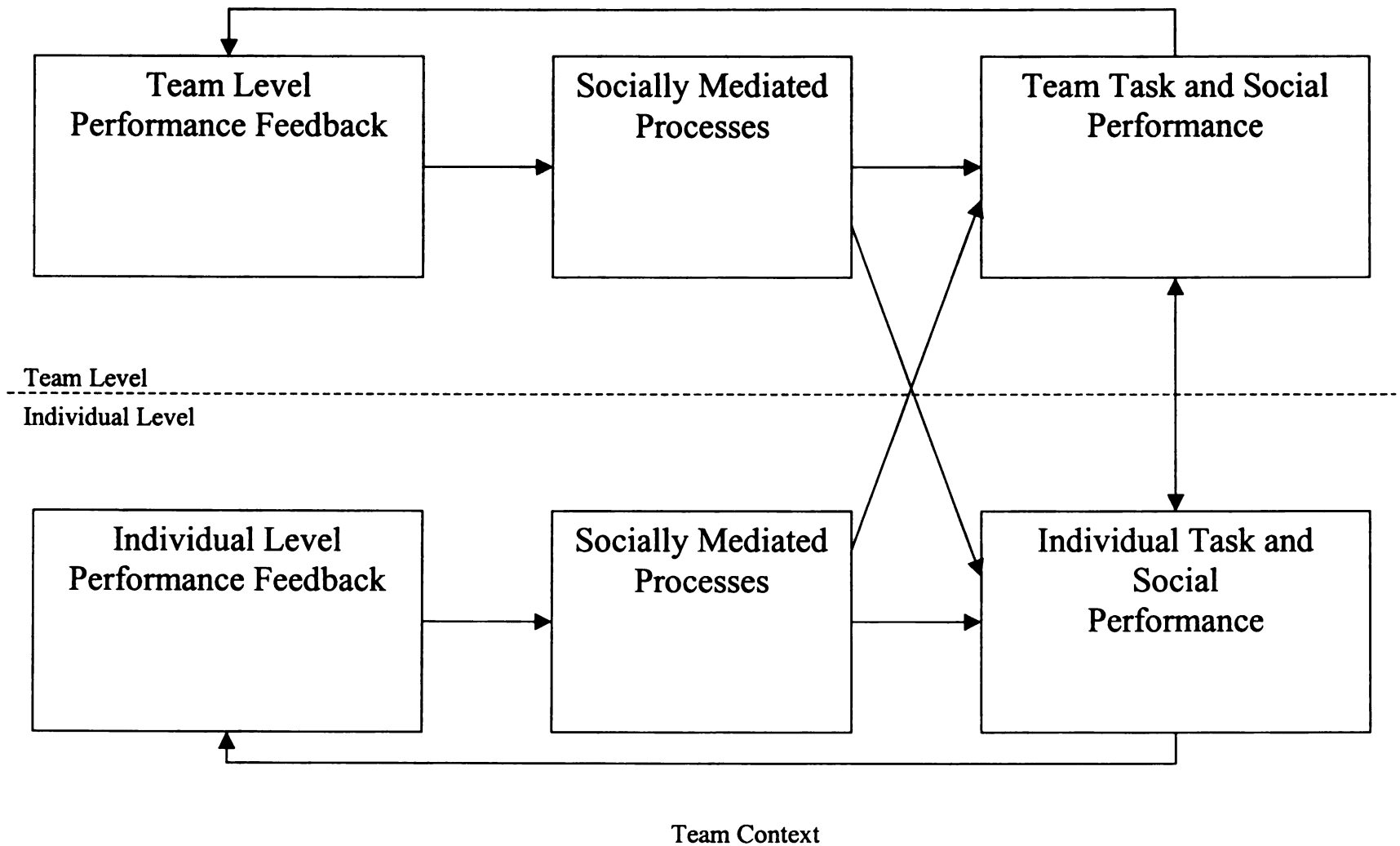

Figure 3. A Framework of the Effects of Feedback Interventions in Teams.

level performance feedback. As the model further suggests, it is through socially mediated processes that both team and individual level performance feedback have an influence on task and social outcomes in teams. The second purpose of the model is to provide an organizing framework for the following review of the literature on feedback in teams that has appeared since Conlon and Barr's (1989) review of the literature. Specifically, I discuss the effects of both team level and individual level performance feedback interventions on task performance and social outcomes in teams. Moreover, when possible, the socially mediated processes through which both team and individual level performance feedback interventions exert their effects will be highlighted and discussed.

The next several sections of the chapter first discuss previous research regarding the provision of team level performance feedback to those working in groups and teams, first on task performance and then on social outcomes. While the effects of providing individual level performance feedback in teams is of particular interest in the proposed study, the review of the empirical findings regarding the provision of team level performance feedback serves several purposes including demonstrating how little is actually known regarding feedback interventions in teams. Perhaps more important, this review also highlights several of the shortcomings of providing only team level performance feedback to those working in teams.

The provision of individual level performance feedback to those working in teams has already been suggested as having the potential to overcome several of these shortcomings. Following the discussion of team level performance feedback interventions in teams and groups, I move away from this area and focus specifically on the extant

literature on the effects of providing individual level performance feedback in teams on both task and social outcomes. From this review, several themes will emerge regarding the provision of individual level feedback in teams. In addition, the review will point to several questions regarding the effects of providing individual level feedback to those working in teams. These questions are further addressed and an empirical investigation that sought to explore the effects of individual level performance feedback in teams will be presented in later chapters.

Recent Literature on Team Level Feedback Interventions

Both Nadler (1979) and Conlon and Barr (1989) concluded that the empirical research to date has not been altogether clear with regard to the effects of team, or group level performance feedback on performance. Nevertheless, some recent theoretical and empirical work has emerged since Conlon and Barr's (1989) more recent review that may serve to provide some insight regarding the performance implications of providing group, or team, level performance feedback to those working in teams. As will be seen in the following review of this literature, while performance effects have been of primary interest to those studying the effects of group level feedback in teams, there is some recent evidence that seems to suggest that the provision of group level feedback in teams may also have some important social implications in teams as well. These effects will be discussed following the discussion of the task performance implications of group level feedback in teams. Similarly, recent work may also help promote understanding the social effects of providing group level feedback in teams.

Effects of Team Level Performance Feedback on Task Performance

Noting that most of the empirical work on the effects of feedback interventions on performance have been primarily concerned with individual performance, Pritchard et al. (1988) sought to explore the effects of feedback on group performance. These researchers specifically examined the influence of group level feedback, group goal setting, and group incentives on group productivity as measured using their ProMES methodology.

ProMES (Pritchard, Jones, Roth, Stuebing, & Ekeberg, 1986; 1987) is rooted in the theoretical perspective on work roles as outlined in the Naylor, Pritchard, and Ilgen (1980) model of organizational behavior and ProMES extends this perspective from individuals to organizational sections (Pritchard et al., 1988). ProMES is also based, in part, on the work of Tuttle and his colleagues (e.g., Tuttle, 1981; Tuttle & Weaver, 1986a; 1986b; Tuttle, Wilkerson, & Matthews, 1985) on productivity measurement. Simply stated, the ProMES methodology is based on four steps. First, one must identify products, or objectives, that must be accomplished by the groups. Second, indicators of the products must be identified. That is, indicators must be identified that represent the extent to which the group or team has produced units that reflect the products or objectives. Third, contingencies are established that represent the relationship between the amount of the indicators and the effectiveness represented by the indicator. In other words, the level of evaluation of outcomes is dependent, or contingent, on the amount of those outcomes (Naylor et al., 1980). Finally, after agreement is reached regarding the products, then indicators, and then the relevant contingencies, the entire system is put together by collecting the indicator data for a specified time period, assigning

effectiveness scores for each indicator based on the contingencies, and sending back performance data in terms of effectiveness to the groups.

After the creation of the ProMES system for five Air Force base units, Pritchard et al. (1988) first measured productivity for an eight to nine month period to establish baseline productivity scores for each unit. Next, they delivered group level feedback for five months, added goal setting to the feedback for an additional five months, and finally added incentives to the feedback and goal setting for an additional five month period. Overall, the results indicated a dramatic increase in productivity over the course of the study. Specifically, the researchers reported a 50% increase in productivity over the baseline period with the addition of the group level feedback intervention, a 75% increase over the baseline period for the feedback with goal setting intervention, and a 76% increase over the baseline period for the feedback, goal setting, and incentive intervention.

In a similar investigation, Jones, Buerkle, Hall, Rupp, and Matt (1993) used the ProMES methodology in a field experiment to examine the effects of productivity feedback on group productivity in a manufacturing company. However, unlike Pritchard et al. (1988) who examined groups as the unit of analysis, Jones et al. examined the effects of providing aggregated feedback to an entire department in the company.

Specifically, after measuring baseline productivity over thirteen months the authors examined changes in productivity over time in a manufacturing department that received feedback compared to a buying department that received no such feedback. The authors hypothesized and found support for a significant improvement in productivity in

the manufacturing department compared to no such improvement in the buying department.

Goltz, Citera, Jensen, Favero, and Komaki (1989), while primarily interested in the effects of individual level performance feedback over and above those of group level performance feedback examined the effects of providing group level feedback after a baseline period of no feedback and before the provision of individual level performance feedback. The authors reported that providing group level feedback to employees did in fact result in significant increases in the employees' product handling.

Tinsdale (1989) compared the effects of both group level outcome feedback provided to those working in groups to individual level outcome feedback to individuals working alone on a decision-making task involving promotion decisions in a hypothetical company. Participants worked either individually or in groups where consensus was required on the decision-making task and received either total, partial, or no feedback. Participants in the total feedback condition received feedback on how each of their decisions compared to those made by an assessment center regardless of whether they decided to promote the candidate. Those in the partial feedback condition received feedback on how each of their decisions compared to those made by an assessment center only when the participants made the decision to promote the candidate. Those in the no feedback condition received no information concerning the correctness of their decisions regardless of the nature (i.e., promote or not promote) of those decisions.

The results of the study indicated that performance generally increased over the decision-making trials for both groups and individuals and that groups performed as well as individuals. However, only those participants working in groups that received total

feedback experienced the most consistent performance improvements over individuals. Moreover, groups receiving total feedback experienced the most significant performance improvements over the trials while receiving partial feedback led to the most significant performance improvements over the trials for those working individually.

Tinsdale (1989) concluded that groups do perform differently than individuals under various feedback conditions and suggested that groups can socially process performance information (e.g., using majority decision rules) in ways that individuals cannot. It was further concluded that such social processing may allow groups to better utilize additional feedback effectively.

Using data from forty-one railway crews, Pearson (1991) examined the effects of receiving group level performance feedback on productivity. He found that crews that received group level performance feedback had higher levels of productivity compared to crews that received no such feedback.

Mesch, Farh, and Podsakoff (1994) examined the effects of feedback sign on both group goal setting and group performance from a control theory perspective. Of its many tenets, control theory proposes that individuals regulate their behavior in light of the feedback they receive (Carver & Scheier, 1981; Taylor et al., 1984). Specifically, individuals strive to minimize the gap between their performance and the internal standards, or goals, they have accepted. Mesch et al. hypothesized that control theory's predictions at the individual level regarding the effects of positive and negative feedback on individual level goals and individual level performance may also explain the effects of feedback sign on group goals and group performance. Specifically, they examined

whether the effects of feedback sign on group performance were mediated by group goal setting.

In their study, Mesch et al. (1994) had subjects work in groups on a group task that required group members to work interdependently to solve a number of word recognition problems. After the groups' first attempt on the task, they were provided with either positive or negative performance feedback. The groups were then allowed to strategize and set performance goals for the second attempt on the task. Groups then provided self-reports of their group goals.

Their analyses revealed that groups receiving negative performance feedback set significantly higher goals for the second task, spent more time strategizing, developed more strategies, and had higher levels of performance compared to groups receiving positive performance feedback. While the finding that positive performance feedback led to significantly lower levels of task performance is interesting, the authors could not rule out the possibility that the lower levels of task performance were the result of a more difficult post-feedback task. Results of their follow-up path analyses nevertheless lent strong support to the authors' hypothesis that the effects of feedback sign on group task performance are mediated by group goals. The results of this study provide additional support to the belief that providing aggregated performance feedback can influence group level task performance.

Effects of Team Level Performance Feedback on Social Outcomes

Pearson (1991), in addition to examining the effects of group level performance feedback on task performance, also examined the effects of group level performance feedback on satisfaction using his sample of railway work crews. Results of his

investigation showed that there were higher levels of satisfaction in crews that received feedback compared to those that did not receive feedback. Pearson concluded that the effect of receiving performance feedback on satisfaction may be due in part to the lower levels of role ambiguity and higher levels of motivation that resulted from receiving group level performance feedback.

While Mesch et al. (1994) were primarily interested in examining whether control theory's predictions regarding the effects of feedback sign on individual level goals and performance also explained the effects of feedback sign on group level goals and performance, they also tested control theory's predictions regarding the effects of feedback sign on group satisfaction. Results of their study revealed that receiving negative group level performance feedback led to significantly higher levels of dissatisfaction with the group compared to receiving positive group level performance feedback.

In a more recent investigation, Bradshaw and Stasson (1998) had participants complete a group decision-making task and then complete a questionnaire regarding their impression of their group. The participants then received non-veridical performance feedback indicating that the group was either successful or had failed and were then asked to complete questionnaires regarding their attributions of the group's performance and their affect. The authors were specifically interested in the causal attributions made by "shy" compared to "not shy" group members following feedback on their group's performance to determine if their attributions were different and whether their attributions were related to levels of satisfaction with being a member of their group.

Results of the study indicated that group level feedback did affect affective reactions among group members who were not shy with positive performance feedback having a positive influence on affective reactions. Shy group members did not report having more positive affective reactions after receiving positive feedback compared to after receiving negative performance feedback. There was no significant difference in affective reactions between shy and not shy group when the group level performance feedback was negative. The authors concluded that these results were likely a function of the tendency of shy group members to minimize their personal responsibility for both group success and group failure whereas not shy group members have the tendency to externalize the causes of group failure and internalize the causes of group success.

Conclusions on the Recent Work on the Provision of Team Level Feedback

A number of themes emerge as one examines the literature on the effects of group and team level performance feedback in teams. First, consistent with suggestions by Conlon and Barr (1989), it appears that the provision of aggregated performance feedback in teams can lead to social processing of the feedback. Tinsdale (1989) concluded that groups socially processed their performance feedback in a way that individuals who received performance feedback could not and attributed this processing to the increases in task performance that groups experienced over and above those that individuals experienced as a result of receiving performance feedback. Mesch and his colleagues (1994) found that groups were able to use aggregated feedback to set group performance goals and strategies which were both related to subsequent group performance.

Another conclusion that can be drawn from the recent empirical work on providing group and team level performance feedback in groups and teams is that aggregated feedback can influence performance at the group and team level. While there have been inconsistent findings regarding this effect (see Conlon & Barr, 1989 for a comprehensive review), a number of researchers (Goltz et al., 1989; Mesch et al., 1994; Pearson, 1991; Pritchard et al., 1988; Tinsdale, 1989) have all found evidence that group and team level feedback has significant effects on group and team performance and productivity. It should be noted, however, that positive aggregated feedback has been found to have less of an effect on the performance of groups and teams (e.g., Mesch et al., 1994).

Finally, the review of the literature above also suggests that the provision of aggregated performance feedback can influence social outcomes in groups and teams. Both Pearson (1991) and Mesch et al. (1994) found that group level performance feedback has an effect on satisfaction in groups, however Branshaw and Stasson (1998) recently found evidence suggesting that individual differences may moderate these effects.

Recent Literature on Individual Level Feedback Interventions in Teams

As previously mentioned, both Nadler (1979) and Conlon and Barr (1989) have suggested that individual level performance feedback is an important type of feedback that can be provided to those working in groups and teams. In recent years, researchers have begun to explore the effects of individual level performance feedback in teams on both task and social outcomes. In the following sections, I discuss these recent

investigations focusing first on the effects of such feedback interventions on task performance then on the effects on social outcomes.

Effects of Individual Level Performance Feedback in Teams on Task Performance

Goltz et al. (1989) examined the extent to which the provision of individual level performance feedback could yield increases in performance above that yielded from the provision of group level feedback alone. First, they observed employees' behavior during a baseline period in which no feedback was provided. They then provided group level feedback to the employees which, as mentioned above, resulted in a significant increase in employees' product handling. When individual level feedback was coupled with the group level feedback an increase in employees' performance was observed that was significantly higher than that resulting from the provision of group level feedback alone. When individual level feedback was no longer provided, there was a decrease in employees' behavior however the decrease was not significant which led the researchers to reluctantly conclude that providing individual level feedback did not enhance group feedback.

It should be noted, however, that Goltz et al. (1989) offered two alternative explanations for their results rather than dismissing the possibility that individual level feedback enhances the effects of group level feedback. First, they suggested that if the employees did in fact learn from the individual level feedback that was provided, it would be difficult to reverse that learning. Second, they suggested that in their study it may have been impossible to truly withdraw individual level feedback once it was introduced. In other words, there was no way they could have prevented employees from later working on problem areas that were identified when the individual level feedback

was being provided. In sum, the results of this study seem to suggest that providing individual level feedback can have a positive influence on work groups over and above that of group level feedback despite the design problems that prevented the researchers from obtaining a definitive answer to their research question.

Using thirty-two groups of undergraduates working on a cognitive conflict task, Harmon & Rohrbaugh (1990) explored the effects of providing individual level cognitive feedback in the context of a group on both individual and group performance. While much like decision-making tasks, rather than have the group make explicit decisions about particular options or courses of actions, cognitive conflict tasks require the group to establish a specific assessment technique or procedure/policy. Participants in this study either received individual level performance feedback that was fully shared among all the group members or feedback that was provided individually and not shared among the group. It should be noted that at the outset of the study, there was an additional no feedback condition however these groups were later combined with the individually provided/not shared feedback condition groups given that there were no significant differences between the two conditions.

The researchers hypothesized that there would be significantly better group and individual performance in groups that received shared feedback compared to groups that did not receive shared feedback however they found no significant differences at the group level in terms of group decision policies (i.e., group performance). On the other hand, they did find significantly better individual decision policies (i.e., individual performance) for those individuals in groups that received fully shared feedback. In sum,

the authors found that the provision of individual level performance feedback had a significant and positive effect on individual learning in groups.

Reilly, Smither, Vasilopoulis, and their colleagues (Reilly, Smither, Vasilopoulis, 1996; Smither, London, Vasilopoulis, Reilly, Millsap, & Salvemini, 1995) suggested that feedback itself may not be the most important variable for changing individual's behavior in organizations, but rather, exposure to prescriptive information (e.g., what behaviors are desired, strategies for performance) about performance is most important for changing employee behavior. Dominick, Reilly, and McGourty (1997) tested this hypothesis in a study of the effects of peer feedback on team members' performance. Specifically, they examined whether mere exposure to the appropriate behavior via the performance feedback instrument would influence the behavior of those who were not the direct recipients of feedback. In this study, students were randomly assigned to one of three group conditions—a feedback condition in which team members provided and received performance ratings from their peers, an exposure condition in which team members completed ratings on their peers but did not receive the any feedback from those ratings, and a control condition in which team members did not rate their peers nor did they receive feedback.

Results of their study revealed that teams in both the feedback and exposure conditions significantly outperformed teams in the control group following the experimental treatments. Furthermore, there was no significant difference in performance between teams in the feedback and exposure conditions. The authors went on to suggest that exposure to the feedback instrument both provided team members with a framework

for interpreting their own behavior and communicated to them what behaviors were important and valued.

While theoretically interesting in-and-of-itself, the results of this study seem to suggest yet another way that individuals working in teams may benefit from the provision of individual level feedback, namely through exposure to the desired behaviors and the outcomes they produce. While exposure in this study was in the form of a feedback instrument, observing the behaviors and outcomes of other team members may also represent yet another opportunity for team members to learn appropriate behaviors and strategies that will improve their own performance. In this way, the provision of individual level performance feedback may have functional value not only for those who experience the feedback directly (i.e., the feedback recipients), but it also may have effects on those who observe the provision of the feedback.

More recently, Hollenbeck, Ilgen, LePine, Colquitt, and Hedlund (1998) examined the effects of providing public, individual feedback on team performance on a decision-making task. The results of this study indicated that teams in which members were provided with individual feedback outperformed teams in which members did not receive feedback. Team leaders in this study used the individual level performance feedback regarding each of their team members' accuracy to determine which team member's information was most valid (what the authors referred to as individual validity). Thus, the feedback that team members received helped their team leaders better determine the value of those team members. The leaders of the teams that received feedback were able to better weigh the information provided by the members of their

teams (what the authors referred to as dyadic sensitivity) and thus made better team decisions.

Effects of Individual Level Performance Feedback in Teams on Social Outcomes

Roy, Gauvin, and Limayem (1996) explored the social loafing and social matching behaviors of individuals working in electronic brainstorming groups when individual level performance feedback was provided. Roy et al. (1996) defined social matching as attempts of team members to perform at levels consistent with those of others within their social setting. According to the authors, social matching can have dual effects—it leads high performers to reduce their effort on the task while it leads low performers to increase their effort on the task. Team members engage in such altering of inputs is order to obtain equity in contributions within the team. High performers seek to avoid being "suckers" while low performers seek to avoid being "loafers."

The researchers hypothesized that there would be less variance in the ideas generated by team members in teams in which individual level feedback was provided during the task compared to teams in which no feedback was provided or feedback was provided at the end of the task as high and poor performers would alter their inputs to seek equitable contributions within their teams. Results of their study supported their hypothesis and thus the authors concluded that individual level performance feedback in teams equalized performance. More important, this study suggests that individuals working in teams do in fact engage in social matching with others in their team lending some support to Conlon & Barr's (1989) proposition that social comparisons are an important socially mediated outcome of providing individual level feedback in teams.

Unfortunately, despite the authors' discussion of social matching from an equity perspective, they failed to measure justice perceptions thus they were unable to examine the extent to which perceived fairness may have influenced team member behavior in their study. Furthermore, the feedback provided to team members was outcome feedback only and provided only objective information (i.e., the number of ideas generated by each team member). Therefore, while subjects in their study could compare their inputs to the inputs of others, there was no reason for subjects to believe that their outcomes, or outputs (i.e., feedback) were inequitable. It is likely that in real work teams, team members make comparisons of both their inputs and outputs relative to others as opposed to just inputs. Furthermore, in real work settings the feedback that individuals receive is also not likely to be as accurate and objective as that provided to the subjects in Roy et al.'s study.

Conclusions on the Recent Work on the Provision of Individual Level Feedback in Teams

Similar to the recent findings regarding the effects of providing team level performance feedback to those working in groups and teams, recent examinations of the effects of providing individual level performance feedback have consistently shown that providing individual level performance feedback influences both individual (Dominick et al., 1997; Harmon & Rohrbaugh, 1990) and team (Goltz et al, 1989; Hollenbeck et al, 1998) performance. In fact, Goltz et al. provided limited evidence that individual level performance feedback may have more influence on performance than group level feedback. Their findings are consistent with Conlon and Barr's (1989) proposition that

feedback that is provided at the individual level should have more motivational and informational influence than feedback that is aggregated.

Another conclusion that can be drawn from this literature—one that is also consistent with propositions by Conlon and Barr (1989)—is that team members engage in social processing when individual level feedback is provided in the social context of a team. For example, Harmon and Rohrbaugh (1990) found that individuals were better able to utilize, and thus experience higher levels of performance improvements, when they were in teams in which each of their team members' performance feedback was fully shared compared to those in teams in which the feedback was not shared. More important, their findings suggest that individuals can benefit from feedback that they do not directly receive. Dominick et al. (1997) also found evidence that individuals can learn from being exposed to other's performance standards even when they do not directly receive performance feedback.

In regards to the social outcomes of providing individual level performance feedback in teams, the previously reviewed empirical studies suggest that team members do in fact engage in social comparisons with each other after being made aware of each others' performance as a result of individual level performance feedback. For example, while Hollenbeck and his colleagues found that providing individual feedback led to better team decision making and hence better team performance, they also found that team leaders were better able to weigh each team members' input based on the team member's performance feedback. In this study, team leaders became less sensitive to information provided by members of their team whose performance feedback indicated a history of invalidity. This suggests that perhaps both team leaders and members made

comparisons regarding the performance of others in the team. Unfortunately, Hollenbeck et al. (1998) were concerned primarily with and focused specifically on the performance effects of providing individual level performance feedback. What remains to be further examined are the potential social effects of such comparisons.

General Conclusions Regarding the Effects of Feedback Intervention in Teams

In sum, although some research on feedback in teams has emerged over the last twenty or so years since Nadler's (1979) initial review, many unanswered questions remain. Nevertheless, several themes emerge as one carefully considers the work that has been done.

Perhaps one of the more interesting conclusions that can be drawn from the existing literature on feedback in teams is that there is no ideal aggregation level (i.e., team or individual) for improving team effectiveness and performance. Clearly, the evidence is mixed regarding whether or not group, or team, level feedback alone can yield positive effects of the performance of individual team members. While some researchers have found that the provision of team level performance feedback can result in increased individual (Goltz et al., 1989) and team performance (e.g., Jones et al., 1993; Pearson, 1991; Pritchard et al., 1988, Tinsdale, 1989), Goltz et al. (1989) found evidence suggesting that team level feedback is not as effective in influencing individual performance as individual level performance feedback.

Similarly, there is only limited evidence regarding the mechanisms by which individual level feedback influences the behaviors of those in groups and teams. While models of the effects of group level feedback have recently emerged (i.e., O'Leary-Kelly, 1998), researchers have yet to develop models of the effects of individual level feedback

and the process by which it exerts its effects. Nevertheless, a number of suggestions have been offered as to why individual level performance feedback may have more influential effects on team members' performance than aggregated feedback including the ambiguity that group or team level feedback may present for individuals regarding their own individual performances in addition to the possibility that individuals in the group or team may fail to accept any responsibility for aggregated feedback (Conlon & Barr, 1989; Barr & Conlon, 1994).

A number of authors have noted that there are socially mediated processes and outcomes that occur when feedback is provided to those working in teams (Conlon & Barr, 1989; Roy et al., 1996). This seems to especially be the case when the feedback that is provided is at the individual team member level. In such cases, researchers have recognized that it is likely that team members will engage in social comparisons with one another. To date, only one study (Roy et al., 1996) has provided an empirical examination of these social processes.

Related to the social comparisons that are likely to occur when individual level feedback is provided to those working in teams is yet another socially mediated process that may occur when individuals are made aware of their own performance and outcomes and that of others with whom they are interdependent, namely performance improvements among observers. Social cognitive theory may provide a useful theoretical framework for guiding future thinking about performance improvements through both direct and vicarious experiences that should occur when individual level performance feedback is provided to those working in a team context.

The Present Research and Theoretical Model Overview

Figure 4 presents an initial attempt to develop a theoretical model of the effects of individual level performance feedback on the behavior of individual team members. As shown in the model, specific emphasis is placed on the socially mediated processes that occur as a result of individual team members becoming aware of both their own individual performance and the performance and outcomes of the others with whom they are interdependent. As previously discussed, despite the potential influence that these socially mediated processes may ultimately have on team members, the lack of a theoretical framework and systematic research on such processes has left an important void in the feedback in teams literature. The model proposed here addresses this issue. It focuses on two types of socially mediated processes that should occur as a result of the provision of individual level feedback in teams. First, individuals are believed to engage in a social comparison process once they are provided information about individual performances and outcomes within the team. As a result of these comparisons, team members are expected to form impressions regarding their feelings about being a member of the team. Socioemotional outcomes have been identified by a number of researchers (Campion et al., 1993; Campion et al., 1996; Cannon-Bowers et al., 1995; Hackman, 1987) as an important aspect of team effectiveness. Moreover, as the previous review of the literature on feedback interventions in teams suggests, it is believed that the provision of individual level performance feedback in teams will have social effects on teams as a result of the social comparisons that individual team members are likely to make following the provision of performance feedback at the individual level in teams.

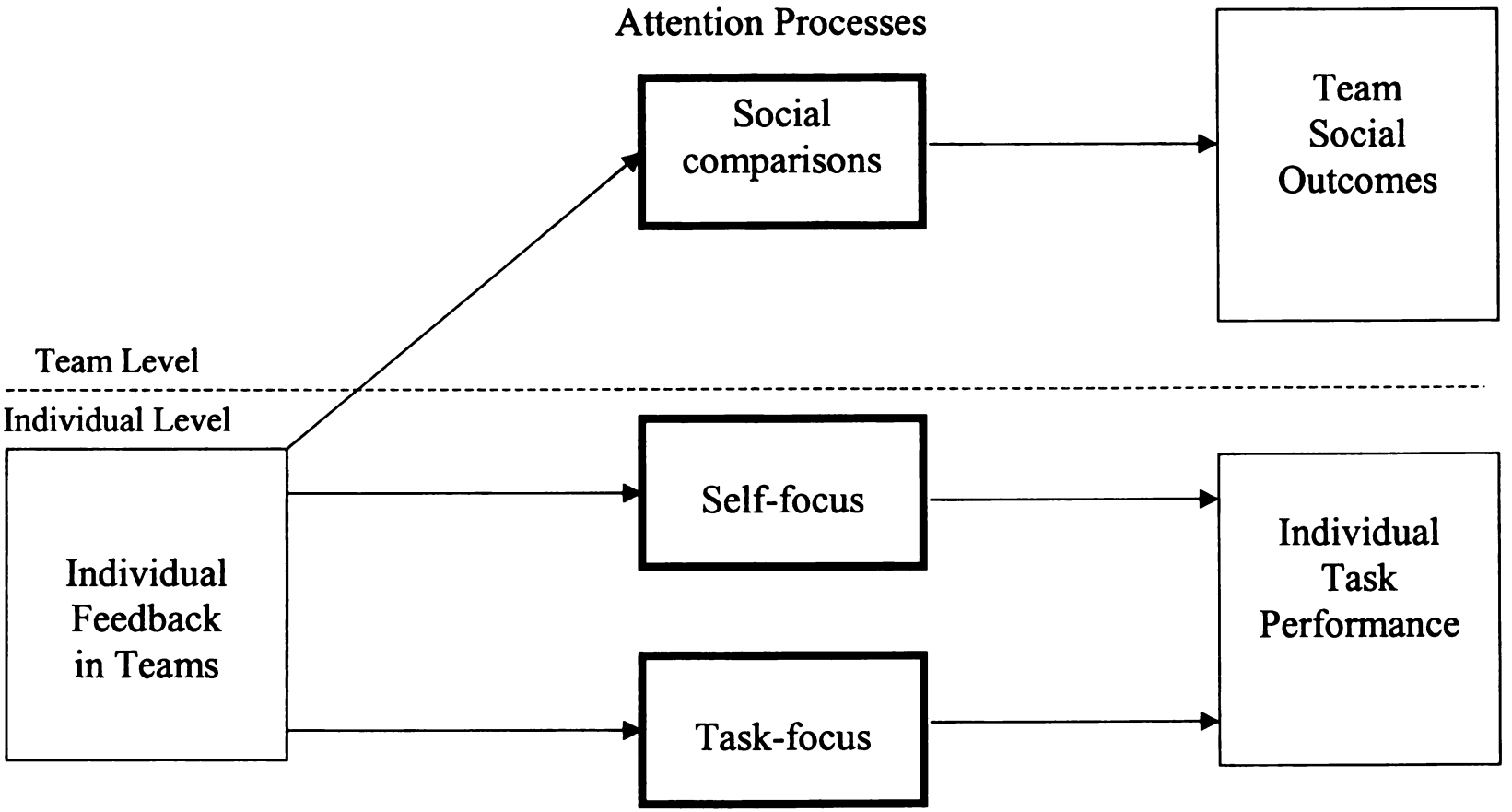

Figure 4. A Theoretical Model of the Effects of Individual Feedback in Teams on Team Member Behaviors.

In addition to the social effects that may result from social comparison processes when individual level performance feedback is provided in teams, the model also proposes that team members' performance will be influenced by the provision of individual level performance feedback. Directly provided individual level feedback should have an influence on the task performance of those who directly receive it as it should provide information to these individuals about their own previous performance. However, as the above review suggests, this is but one way in which individuals may be influenced by the provision of individual level performance feedback in team settings. Specifically, the review suggested that individuals might also benefit vicariously from the experiences of others. In the present case, observing the provision of individual level performance feedback to a team member should have an influence on the task performance of those other team members who observe its provision. These performance effects are predicted to be mediated by the attention it directs team members to both themselves and to the task itself (as elaborated on further in the chapter that follows). In sum, it is assumed that both the direct experience of receiving individual feedback in teams and the vicarious experience of observing the provision of individual level feedback to others in a team can have an effect on the social and task behavior of team members.

The present study explored the effects of providing individual level feedback in teams on direct feedback recipients and those other than the direct feedback recipient. The following chapters further develop and derive several hypotheses from the theoretical model as it relates to both the direct recipients and those who observe the provision of individual level performance feedback in teams. It is hoped that the model

will serve as a first step in guiding researchers seeking to understand the effects of providing individual level performance feedback in teams.

CHAPTER THREE. THE EFFECTS OF PROVIDING INDIVIDUAL LEVEL PERFORMANCE FEEDBACK IN TEAMS ON TASK PERFORMANCE

While Kluger and DeNisi (1996) provided strong evidence showing that many feedback interventions are in fact unsuccessful in having their desired effects on employee performance, as Hauenstein (1998) points out, they also took a proactive stance regarding feedback by proposing Feedback Intervention Theory (FIT) which suggests several reasons why attempts to improve employee performance through the provision of performance feedback succeed or fail. Perhaps the most useful suggestion derived from FIT concerns the level at which the feedback is both directed and interpreted. Specifically, Kluger and DeNisi proposed that feedback can be focused at three levels of linked processes—task-learning, task-motivation, and meta-task processes. Moreover, these levels of processes are organized in hierarchical fashion.

Task-learning processes reside at the lowest level of the hierarchy and focus on learning how to perform better. For example, feedback provided at the task-learning level may suggest to employees better performance strategies. Task-motivation processes reside in the middle of the hierarchy, above task-learning and below meta-task processes. The target is the exertion and direction of effort. An example of feedback that directs attention to task-motivation processes is feedback that indicates that an employee is performing well or poorly (i.e., positive and negative feedback). Finally, meta-task processes are at the highest level of the hierarchy and concern more abstract, general statements regarding the performer's personal characteristics and work-related tendencies (Hauenstein, 1998).

While task-learning and task-motivation process direct attention to the task itself, meta-task processes direct attention to individuals perceptions of self at a more general level. For example, feedback that directs attention to meta-task process may lead an employee to see him/herself as generally incompetent or inadequate or perhaps so competent that they can do no wrong or perhaps are irreplaceable. While these three processes are organized into distinct hierarchical levels, it should be noted that they can influence each other. Furthermore, there is no guarantee that feedback interventions directed any particular level will be successful.

Through meta-analytic procedures, Kluger and DeNisi tested several of the propositions derived from FIT. Of particular interest was their finding that feedback interventions in which cues were provided that focused attention on task-learning and task-motivation level processes had positive effects on performance while those in which cues were provided that focused attention on meta-task level processes had less positive (and in many cases negative) effects on performance. Simply stated, feedback interventions that direct attention to the self rather than the task often have debilitating effects on performance.

Effects of Directly Receiving Individual Level Performance Feedback on Task Performance

As FIT suggests, feedback interventions that direct attention to the self would seem to be particularly likely to have negative effects on performance in many of today's work settings which often can be characterized as presenting employees with tasks of increasing complexity. In teams, one might expect that the desire, or motive, to maintain or create a positive self-image in such a social setting would increase the likelihood that

those who directly receive feedback on their task performance would direct attention to the self, in particular self-enhancement and maintenance, rather than the actual task. In other words, feedback interventions that provide individual level performance feedback in the social context of a team, may affect meta-task rather than task-learning and task motivation processes. Moreover, this induced attention to meta-task processes is proposed to occur regardless of whether the performance feedback is positive or negative thus, FIT does not make clear that the effects of feedback interventions are different depending on the sign of the feedback.

Kluger and DeNisi (1996) tested several propositions derived from FIT regarding the effects of feedback interventions that may direct attention to meta-task processes, several of which are related to the public provision of individual level performance feedback in team settings. For example, they examined the effects of feedback interventions in which normative information is provided (i.e., information that can be used to make comparisons with others), norms are provided (i.e., information about the performance of others), those designed to discourage, those designed to praise, those in which the feedback is made public, and those in which reference to the group's performance is made. Of these aspects of the content of the feedback, only reference to a group's performance was proposed to enhance performance as feedback of this nature should divert attention from individual perceptions of self while the other aspects of the feedback content were proposed to have negative effects on task performance as theoretically they should all direct attention to the self.

Results of their meta-analytic moderator analyses revealed that consistent with both FIT and other models of self-attention (e.g., Carver & Scheier, 1981;Wicklund &

Gollwitzer, 1982; Zajonc, 1965) feedback interventions that focused attention on meta-task level processes had less positive (and in many cases negative) effects on performance. Specifically, they found support for seven out of thirteen variables used to test their propositions regarding the detrimental effects of inducing attention to meta-task processes. Of those related to the provision of individual level performance feedback in teams, they found that feedback interventions that provided normative information, norms, discouragement, praise, and were delivered verbally had negative effects on performance. Feedback interventions that referenced the performance of a group rather than individual performance, as expected, had positive effects on performance. Contrary to their propositions, they found that feedback that was provided publicly had positive effects on task performance. Thus, overall there seems to be strong support for FIT's proposition that feedback interventions that direct attention to the self rather than the task often have debilitating effects on both task performance and the effectiveness of feedback interventions.

Kluger and DeNisi's findings are particularly relevant to the present discussion given that individual level performance feedback provided in the context of teams is likely to provide normative information, may indirectly reference the performance of the group, is likely to be interpreted as praise or discouragement, and when provided publicly, may be verbal. Therefore, based on FIT and the previously mentioned findings regarding the negative effects of feedback interventions that direct attention to the self, one might expect that feedback interventions in which information is publicly given to an individual within the social context of a team regarding his or her individual performance may, by directing attention away from the task and towards the direct feedback

recipient's perceptions of self, have a negative effect on his or her task performance. It is important to also recognize that the attention to self rather than the task that results from directly receiving publicly provided individual level performance feedback in the social setting of a team should occur regardless of whether the feedback itself is positive or negative. This leads to the first of the study's hypotheses:

Hypothesis 1a: Regardless of the sign of the performance feedback, the direct experience of being publicly provided with individual level performance feedback will have a negative effect on task performance, an effect that will be partially mediated by both increased self-focused attention and decreased task-focused attention.

Hypothesis 1b: Regardless of the sign of the performance feedback, the direct experience of being privately provided with individual level performance feedback will have a positive effect on task performance, an effect that will be partially mediated by both decreased self-focused attention and increased task-focused attention.

It should be noted that FIT, unlike other major feedback theories (e.g., Carver and Scheier's (1981) control theory and Locke and Latham's (1990) goal-setting theory), fails to make explicit the different effects of feedback interventions in which the performance feedback is positive compared to those in which the performance feedback is negative. Perhaps the most widely recognized such theory is control theory (Carver & Scheier, 1981; 1998) as it has been applied to understanding reactions to performance feedback (Taylor et al., 1984). As described by Taylor et al. (1984), the theory maintains that there are four features to all control systems, whether the systems represent organizations or

individuals. First, there are inputs from outside the system's environment that initiate action within the system. Second, there is a processing of the inputs that are received from the system's environment. Third, some products, or outputs, result from the processing of the inputs. Finally, there is a feedback loop that provides the system with information about the nature of its products or outputs. The theory further maintains that it is the feedback loop that is essential for system functioning.

Taylor et al. (1984) applied such thinking to understanding individuals reactions to performance feedback and emphasized three processes as critical to control systems: 1) the organization of behavioral standards, 2) the comparison of behavior to the behavioral standard, and 3) the reaction to the discrepancy indicated by the performance feedback regarding the gap between behavior and the behavioral standard. It should be noted that the control theory perspective maintains that the feedback loop is perhaps the most important aspect of control systems. In the context of performance feedback, it is the feedback loop (or what Carver and Scheier, 1981 refer to as the test stage) that provides comparison information to individuals regarding the extent to which their behavior differs from that of the behavioral standard. In this way, the feedback loop regulates behavior relative to some comparison value.

Taylor et al. (1984) discussed, in detail, the three processes involved in individual reactions to feedback from the control theory perspective. As it relates to the organization of behavioral standards, they suggested that behavioral standards can originate from several different sources including the individual's values or attitudes, others, or higher-level standards. As it relates to the comparison process, they suggested that the frequency in which the individual engages in the comparisons and the extent to which the

comparisons were made either consciously or unconsciously were important. Finally, in regards to reactions to the feedback, the authors discuss a number of possible reactions including affective, behavioral, and cognitive reactions.

Of particular importance as it relates to the present study is control theory's emphasis on the sign of the feedback as a determinant of individuals' reactions to performance feedback. It follows from control theory that the sign of the feedback is critical for understanding individuals' reactions to feedback in that it indicates a discrepancy between their performance (or behavior) and the performance (or behavioral) standard. According to control theory, individuals are likely to adjust their behavior to reduce the discrepancy between their performance and the standard when there is a negative feedback loop, thus indicating that a discrepancy exists. On the other hand, individuals are not as likely to adjust their behavior when the feedback indicates that there is no such discrepancy, thus indicating that performance is consistent with the standard. However, more recent developments as it relates to individuals' reactions to performance feedback (i.e., Taylor et al., 1984) suggest that all negative feedback loops do not compel individuals to adjust their behavior to meet the standard. In other words, all negative feedback loops, even those indicating the same level of discrepancy, do not influence behavior in the same fashion.

It is in this way that sign becomes particularly important as it relates to the effects of performance feedback on individual task performance. Taylor et al. suggested that the receipt of positive feedback (i.e., information indicating that one has met or exceeded the performance standard) should be treated differently from the receipt of negative feedback

(i.e., information indicating that one has failed to meet the performance standard) as they lead to different cognitive, behavioral, and affective reactions among feedback recipients.

Take for example, the authors' discussion of behavioral responses to performance feedback. Taylor et al. (1984) suggested that upon receiving performance feedback, individuals can change the direction of their behavior, alter their levels of effort, change their levels of task persistence, and respond against the feedback system. According to the authors, the nature of these changes are contingent, in part, on the sign of the performance feedback received. As it relates to changes in the direction of their behavior, they suggested that following the receipt of negative feedback an individual may engage in a search for more effective alternative behaviors. As it relates to altering effort levels, they suggested that an individual who receives negative feedback may either increase or decrease their effort depending on the extent to which his or her expectancies remain strong. In regards to task persistence, they suggested that upon receiving negative feedback an individual is likely to quit, in particular if expectancies decrease. Finally, the authors suggested that, related to responding against the feedback system, an individual may attack the source of the feedback or the feedback system itself when provided with negative feedback, especially if the feedback is considered unfair.

The aforementioned reactions must be considered against those predicted to occur when the feedback is positive. As it relates to potential changes in the direction of behavior, Taylor et al. (1984) seemed to suggest that an individual who receives positive feedback would fail to look for more effective task behaviors. Related to altering effort, they suggested that the receipt of positive feedback would only lead to increased effort if the individual's goals were raised, but would more likely lead to decreased effort as

positive feedback would likely lower the intrinsic value of achieving the performance standard. This would also be the likely result if no additional rewards were associated with surpassing the performance standard. In regards to task persistence, the receipt of positive feedback, as discussed by the authors, would likely lead to quitting if the recipient sees the positive feedback as a reason to "try something more challenging." Finally, positive feedback is not likely to result in an individual retaliating against the feedback source or feedback system.

Similar to FIT, control theory would also predict that these effects are mediated, in part, by the attention that the feedback directs towards the self and the task. Control theory suggests that the discrepancies made apparent by a negative feedback loop leads directly to both self- and task-focused attention, however the theory differs from FIT in terms of the impact of these effects. According to control theory, self-focus (self-directed attention) is often of positive influence on performance as attention to self is likely to promote more engaged comparison processes or self-regulation. Such self-regulation is necessary as it leads to individuals' attempting to "match their behavior more to the established standard or goal" (Carver & Scheier, 1998, p. 182). Therefore, contrary to FIT, self-focused attention is predicted to be positively related to performance according to control theory. Control theory further suggests that self-focus often promotes task-focus (Carver & Scheier, 1998) and task-focus is seen as also critical to increased task performance. As such, both FIT and control theory make similar predictions about the effects of task-focus on task performance but opposite predictions regarding the effects of self-focus on task performance. Clearly, the theoretical predictions that are derived from

FIT and control theory differ and thus provide an interesting theoretical debate that could be addressed in the present study.

As the previous discussion of control theory and its application to performance feedback highlights, individual reactions to feedback are largely dependent on the sign of the feedback. Several researchers have provided empirical support for the some of the arguments presented by Taylor et al. (e.g., Anderson & Rodin, 1989; Kernan & Lord, 1991; Podsakoff & Farh, 1989). Even Kluger and DeNisi (1996) discuss the discrepancy reducing mechanisms individuals employ when presented with information that indicates that there is a difference between their performance and the performance standard. In their review of control theory, they discuss evidence that demonstrates that when feedback indicates that an individual has met or exceeded the performance standard, it often results in reduced or maintained effort, while feedback indicating that an individual has not met the performance standard often results in increased effort. Interestingly however, Kluger and DeNisi did not make much of a distinction between positive and negative feedback in their later discussion of FIT. Further, their meta-analytic examination of FIT's predictions, yielded no evidence supporting the need for a distinction between positive and negative feedback. In combination, this raises the possibility that FIT, in emphasizing to what individuals will focus their attention on as a result of the cues the feedback provides and by extension, the context in which the feedback is provided, may be deficient in that it fails to make explicit the differential effects of feedback of varying sign.

It remains clear that the most often experienced behavioral reaction to negative feedback is to increase levels of performance to meet performance standards (provided

that behavioral changes are possible), while decreasing or maintaining levels of performance following the receipt of positive feedback. Indeed, it is difficult to ignore the distinction control theory and findings regarding control theory and individual reactions to performance feedback make between the effects of positively framed and negatively framed performance feedback.

From a practical perspective, it is important to recognize that control theory, in combination with FIT provides a more complete picture of the options that are available for those considering what sort of feedback to provide to those working in team contexts. While FIT makes apparent the distinction in the various contexts in which the feedback could be provided, control theory adds the importance of the sign of the feedback. In their current form, each of the theories seems to ignore the other. The result is that not only are organizational practitioners left with questions about the appropriate context in which to provide individual level performance feedback to those working in teams, but also questions about the best sort of feedback to provide in those contexts. For example, if individual level performance feedback is to be provided to individuals working in teams, should it be provided publicly or privately? Further, if publicly provided, should the feedback be positively or negatively framed if it is to be effective? Does it matter whether the feedback is positive or negative?

In sum, it remains to be seen whether or not FIT's predictions hold across the various signs of the feedback. Similarly, it has yet to be seen whether or not control theory's predictions hold across the various contexts in which individual level performance feedback can be provided. As such, the present study sought to compare the predictions made by FIT to those made by control theory. It is believed that, for the

aforementioned theoretical and practical implications, this is an important contribution of this study. As such, what follows below are two hypotheses that run somewhat counter to those of FIT. These hypotheses are based on control theory in that they make explicit the role of the sign of the feedback yet at the same time, do not address the context in which the performance feedback is provided. In addition, these hypotheses also recognize the differential predictions control theory makes regarding the mediating influence of self- and task-focused attention. The next of the study's hypotheses directly test control theory's predictions:

Hypothesis 2a: Regardless of the public versus private context in which the performance feedback is provided, the direct experience of being provided with negative individual level performance feedback will have a positive effect on task performance, an effect that will be partially mediated by both increased self-focused attention and increased task-focused attention.

Hypothesis 2b: Regardless of the public versus private context in which the performance feedback is provided, the direct experience of being provided with positive individual level performance feedback will have a negative effect on task performance, an effect that will be partially mediated by both decreased self-focused attention and decreased task-focused attention.

Effects of Observing the Provision of Individual Level Performance Feedback on Task Performance

While organizations themselves can often be conceptualized as social systems (Morgan, 1997), work teams are also social systems, albeit on a smaller scale, in that they comprise an identifiable collection of individuals working in a specific place, over the same period of time, and on a unique task (Guzzo & Shea, 1992; Sundstrom et al., 1990). Team members are individuals who make up the social unit called a team and thus teams represent smaller social units that are distinguishable yet nevertheless are a subunit of larger social units (i.e., organizations).

When teams are conceptualized as social structures, social cognitive theory, in addition to what is currently known about feedback interventions (e.g., Kluger & DeNisi, 1996), provide an avenue for understanding how teams, and more specifically, the individuals who make up such teams, may be affected by the provision of individual level performance feedback. Specifically, social cognitive theory addresses observational learning. In other words, it calls attention to performance effects observers of the provision of individual level performance feedback may experience. This is particularly interesting since prior to the development of Bandura's (1977; 1986) social cognitive theory (i.e., social learning theory) much of the psychological literature on learning and performance, in emphasizing learning via personal experiences, and had almost ignored the learning and performance improvements that occur as a result of observing others within one's social setting. When one considers the informational and motivational role that learning from others' performances and the feedback that may result from those performances can have on observers, it further calls into question the commonly made

recommendation that feedback in teams should only be provided at the team level. In particular, it raises the possibility that observing a team member perform a task and receive individual level performance feedback regarding his or her performance may have an influence on the subsequent performance of other team members. Latham and Saari (1979) stated that, "social [cognitive] theory...acknowledges that human thought, affect, and behavior are influenced by observation as well as direct experience."

In vicarious learning, reinforcement plays a primary role as an antecedent influence. In other words, the reinforcement an individual receives signals to observers what outcomes they themselves may receive if they behave, or perform, in a manner consistent with that of the observed individual, or model. It is the learning and performance increases that can result from observing others publicly receive feedback that is believed to be of particular benefit for increasing the performance of those working in team settings. The following section further explores the effects of vicarious experiences and thus provides yet another step in the development of a model of the effects that may occur when those working in teams are afforded the opportunity to learn from the social cues provided from the provision of individual level performance feedback to others in their work teams.

An Overview of Vicarious Reinforcement Processes

How do vicarious processes such as the ones discussed above relate to the provision of feedback in teams? When one considers the functions that feedback serves, it becomes clear that providing feedback is likely to have effects similar to those of providing vicarious reinforcement and punishment. Ilgen et al. (1979) suggested that performance feedback serves a number of purposes including motivational and

informational functions. As a motivator, feedback provides information about the outcomes associated with rewards. In this capacity, feedback operates as an incentive, increasing motivation by acting as a promise of future rewards. Moreover, this motivational function is similar to the task-motivation processes identified by Kluger and DeNisi (1996). In serving its informational function, feedback clarifies roles in organizations by making specific those behaviors that should be performed (Ilgen et al., 1979). This is quite consistent with the task-learning processes Kluger and DeNisi (1996) identified. It should be noted that it is unlikely that these two interrelated functions of feedback can be separated as they work in tandem thus allowing feedback to operate by providing both motivation and information to individuals in organizations (Annett, 1969; Ilgen et al., 1979).

Vicarious reinforcement processes also serve both informational and motivational functions. In fact, both informational and incentive-motivational functions are among the five different mechanisms through which vicarious reinforcement effects behavior (Bandura, 1977). Bandura (1977, 1986) further suggested that consequences affect behavior primarily through their informative and incentive value. Like performance feedback, vicarious positive reinforcement/punishment has informational value in that it alerts observers to what behaviors should be matched or avoided to produce particular outcomes. In particular, observing models receive desired and/or undesired outcomes for specific behavior indeed signals to observers what behaviors are either valued or prohibited. Bandura suggested that observed outcomes can alter behavior just as can directly received outcomes (Bandura, 1986). Bandura (1977) also proposed that observers develop and confirm hypotheses about the types of responses that are required to obtain

and avoid rewards and punishment by observing the differential consequences that result from a model's behavior. Also like performance feedback, vicarious positive reinforcement/punishment has motivational value in that the outcomes models receive create expectations among observers as to the type, rate, and magnitude of the outcomes they will receive following similar performances (Bandura, 1977). This is particularly important as in work contexts feedback is often considered a valued outcome.

Following Bandura's social cognitive theory (1977; 1986) and its assertions regarding vicarious reinforcement processes, it is proposed here that individual level performance feedback provided to those working in a social setting such as a team, while likely to have some effects on the task performance of a direct feedback recipient, may have a positive vicarious influence on the task performance of other members of the teams (i.e., observers). In other words, in serving its informational and motivational function, individual level performance feedback provided to a direct feedback recipient, should positively influence the task performance of others in the team. Following FIT, such feedback should induce attention to task-learning and task-motivation processes while being less likely to induce attention to meta-task processes among observers since as indirect feedback recipients, they should not perceive the feedback as relevant to perceptions of themselves. Therefore, while direct recipients of such feedback are proposed to divert attention away from the task and to their self-perceptions, indirect recipients of such feedback are expected to direct their attention to the task and away from their self-perceptions as a result of observing the public provision of such feedback. Thus, while many team scholars discourage the provision of individual level performance feedback in teams, it nevertheless may have value in its ability to increase displays of

desired work behaviors among those who experience the feedback indirectly, or vicariously. Thus, the next of the study's hypotheses:

Hypothesis 3: The indirect experience of observing a team member publicly receive individual level performance feedback in teams will have a positive effect on observers' subsequent task performance, an effect that will be partially mediated by both decreased self-focused attention and increased task-focused attention.

The previous discussion has thus far focused on the potential costs and benefits in terms of increased levels of individual task performance that result from receiving performance feedback directly and indirectly in teams, respectively. What has yet to be discussed are the potential social effects that may also result from the provision of individual level performance feedback in teams. Related to the indirect learning that should follow the observation of an individual directly receiving individual performance feedback in teams, Bandura (1977) stated that vicarious reinforcement introduces comparative judgmental processes among observers. In other words, observing the consequences that others receive for their behavior provides a standard for judging one's own consequences and behavior. Indeed, a number of researchers (e.g., Conlon & Barr, 1989; Roy et al., 1996) have suggested that the provision of individual level feedback in teams raises the possibility that team members will engage in social comparisons with one another. The next chapter examines the potential social effects of the social comparisons that are likely to be made when individual level feedback is provided to those working in teams.

CHAPTER FOUR. THE EFFECTS OF PROVIDING INDIVIDUAL LEVEL PERFORMANCE FEEDBACK IN TEAMS ON SOCIAL OUTCOMES

Hackman (1987) suggested that team effectiveness is much more complex than simply task performance. According to Hackman, team effectiveness also includes other social or interpersonal criteria that have traditionally been ignored in the team's literature. In particular, Hackman identified three criteria for team effectiveness—the actual output of the group (task performance), the impact of the group experience on individual members (member satisfaction), and the state of the group as a performing unit (ability to remain as a group). Thus, Hackman's view of team effectiveness is consistent with some previous others (e.g., Gladstein, 1984; Goodman, 1979; Wall, Kemp, Jackson, & Clegg, 1986; Walton, 1972) who have defined effectiveness in work groups and teams in terms of both their productivity and their satisfaction with the experience (Campion et al., 1993).

More important, as scholars broaden their perspective of team effectiveness, it becomes clear that considering the social effects of providing individual level performance feedback should also be of critical importance in determining the impact of individual level performance feedback interventions on teams and their members regardless of their effects on task performance. The preceding chapter discussed specifically the effects of providing individual level performance feedback in teams on the individual task performance of both those who are the direct recipients of such feedback and those who are observers of the provision of such feedback. What remains to be discussed are the social effects of providing individual level feedback regarding how team members are performing on the team's task.

Clearly, recommendations against the provision of individual level feedback to those working in teams have been based on the belief that such feedback will have a negative impact on social interaction among those in teams. For example, Smither (1998) suggested that in team environments performance appraisals should be directed at the team level rather than the individual level.

However, as seen in the review of the feedback in teams literature provided above, with the exception of only a few researchers (Barr & Conlon, 1994; Roy et al., 1996), most have failed to empirically examine the social implications likely to occur when feedback is provided to those in teams. As such, researchers know little about the social effects of providing both team and individual level feedback in teams. In light of Hackman's more inclusive definition of team effectiveness, which includes such social criteria, this also seems to suggest that we really know little regarding the effects of providing performance feedback (both at the individual and team level) on team effectiveness.

In this chapter, I explicitly explore the social implications of providing individual level performance feedback in teams among both those who are the direct recipients of individual level performance feedback in teams and those who observe its provision. I focus on three social outcomes that are particularly important in teams in light of Hackman's (1987) explicit recognition that such social criteria are critical aspects of team effectiveness. In particular, I discuss the effects that receiving individual level performance feedback in a team context may have on team members' perceptions of the social dynamics and functioning in teams. Specific emphasis is placed on three social outcomes, namely perceptions of team cohesion, viability, and potency.

Effects of Providing Individual Level Performance Feedback on Cohesion, Viability, and Potency in Teams

Clearly teams provide a context that can be best described as a social setting—one that provides opportunities for individuals to make comparisons with each other regarding both their own individual performances in addition to the feedback they receive as a result of those performances (Conlon & Barr, 1989). Herein lies the potential problem for performance feedback provided at the individual level in teams.

A number of scholars have expressed the concern that providing individual level performance feedback is a useful mechanism for influencing task performance in teams (e.g., Campion et al., 1993, McIntyre & Salas, 1995), yet at the same time other scholars have suggested that doing so will have a detrimental effect on the social functioning of the team. For instance, in a recently published book entitled, Performance Appraisal: State of the Art in Practice, Reilly and McGourty (1998) emphasized the importance of individual level performance in teams, however several pages later Smither (1998) warned against the "contradictory" practice of providing individual level performance feedback in team environments (p. 538). Smither (1998) suggested that when using appraisals to increase team performance, the appraisal should be geared toward the team as a unit. Interestingly, he later stated that individual level competencies and contributions should still be measured (p. 542). He then suggested that as task interdependence increases, as is the case when individuals work in teams, "measuring individual contributions becomes more difficult and individual appraisal becomes less appropriate..." As evident by contradictions such as these, the state of affairs regarding

the social implications of providing individual level performance feedback and appraisals in teams has proven to be more confusing than helpful.

As previously mentioned, admonitions against the provision of individual level performance feedback in teams are based on the belief that individual level feedback will have detrimental effects on team social processes (e.g., coordination, cooperation, social attraction) and team outcomes. The quality management literature provides an exemplar of the thinking of many scholars on this issue, albeit focusing at a higher level of organizational functioning.

The quality management perspective promotes "the creation of an organizational system that fosters cooperation and learning..." (Anderson, Rungtusanatham, & Schroeder, 1994, pg. 473). Of the many tenets of the quality perspective, one is that providing individual level performance feedback is counterproductive for promoting and sustaining cooperative environments (such as teams) that are conducive for quality management (Deming, 1982, 1986; Walton, 1986). In other words, the quality perspective suggests that providing individual feedback in groups and teams distracts from cooperation in that it may lead feedback recipients to internalize their performance rather than accept that their performance is due, in part, to the total system in which they operate. In addition, since individual level performance feedback is often based on previous performance, quality proponents would argue against providing individual level feedback in teams and instead suggest forward-looking performance evaluations aimed at the group and team levels (Blackburn & Rosen, 1993).

However, it should be noted that no empirical evidence exists that demonstrates that the provision of individual level performance feedback in teams has such negative

effects on team social outcomes. The extant literature regarding the effects of individual level performance feedback in groups and teams does however suggest that team members can and often do attend to and socially process performance feedback that is provided to others (Conlon & Barr, 1989; Dominick et al., 1997; Harmon & Rohrbaugh, 1990). It also suggests that the provision of such feedback can also lead to social comparisons (Conlon & Barr, 1989) and judgments regarding each other's performances (Hollenbeck et al., 1998).

As a result, one might conclude that the ability to make such social comparisons as a result of providing individual level performance feedback in teams may be detrimental to team social dynamics, yet no empirical study has shown that the provision of individual level performance feedback has such negative effects on team social processes and outcomes. Moreover, it remains to be empirically demonstrated that any negative effects that the provision of individual level performance feedback in teams may have on team social dynamics are the direct result of the ability of team members to make social comparisons with each other regarding either each others' individual performances or the individual level performance feedback they receive for those performances. In this regard, the present study sought to empirically determine if such an effect actually exists. Of particular interest were three distinct, yet related social outcomes that have been identified as important in teams.

First is team cohesion. Team cohesion has long been considered critical to team functioning (Cannon-Bowers et al., 1995) and can be generally defined as the extent to which team members see themselves as one collective unit. Cannon-Bowers and her colleagues pointed out that it is often believed that the more cohesion there is in a team,

the more effective the team will be. They further pointed out that this is typically the case, however, only when the team also promotes social norms for effectiveness. In other words, cohesion is likely to support team effectiveness when members of the teams share social norms such as a commitment to the organization in which the team is a part rather than social norms for counterproductive behaviors.

A second social aspect of team effectiveness is what Hackman (1987) referred to as team viability. Team viability represents the potential for the team to stay intact (i.e., the extent to which members of a team could continue working together in the future). Hackman (1987) suggested that the ability of the team to continue functioning as a unit is particularly important, as it is critical that team members' experiences are not such that they would resist working together on future team tasks.

Finally, team potency represents a third social aspect of team effectiveness. Building on the work of Guzzo and Shea (1992) and Shea and Guzzo (1987), Campion and his colleagues (Campion et al., 1993; Campion et al., 1996) defined potency as the belief that a group can be effective. These researchers suggested that while similar to the concept of team spirit and efficacy, potency is particularly related to the extent to which individuals in a team are committed and willing to work hard for the team. Campion et al. (1993) also noted that little research has been conducted on the potency construct.

The study's hypotheses regarding the social effects of providing individual level performance feedback in teams follow the arguments presented by a number of scholars regarding the detrimental social effects of providing individual level performance feedback in teams in addition to recommendations made by quality management proponents against the provision of such feedback. In this sense, this study also attempted

to provide the first empirical test of whether providing individual level performance feedback in teams does in fact have negative effects on the social dynamics and functioning in teams. Thus, the final study hypotheses and the first concerning the social effects of providing individual level performance feedback in teams:

> *Hypothesis 4: The provision of individual level performance feedback will have a negative effect on team a) cohesion, b) viability, and c) potency, an effect that will be mediated by increased levels of social comparisons in teams.*

Table 1 provides a list of all of the study's hypotheses. As can be seen in the Table, Hypotheses 1a, 1b, 2a, and 2b concern the effect of providing individual level performance feedback on the task performance of those who directly receive the feedback. Hypothesis 3 concerns the effects of providing individual level performance feedback on the task performance of those who, rather than directly receive the feedback, observe its provision. Hypothesis 4 turns to the social implications of providing individual level performance feedback and concerns the effects of providing such feedback on team social outcomes.

Empirical Investigation

The next chapter describes an empirical study designed to test the hypotheses developed in the Chapters 3 and 4. The study explores the effects of individual level performance feedback on the direct and indirect feedback recipients in teams, as the provision of individual level performance feedback in teams may have an influence on the task performance of those who directly receive such feedback and those others who indirectly receive (i.e., observe the provision of) such feedback. The research employed

Table 1

List of Study Hypotheses

Hypothesis 1a:	Regardless of the sign of the performance feedback, the direct experience of being publicly provided with individual level performance feedback will have a negative effect on task performance, an effect that will be partially mediated by both increased self-focused attention and decreased task-focused attention.
Hypothesis 1b:	Regardless of the sign of the performance feedback, the direct experience of being privately provided with individual level performance feedback will have a positive effect on task performance, an effect that will be partially mediated by both decreased self-focused attention and increased task-focused attention.
Hypothesis 2a:	Regardless of the public versus private context in which the performance feedback is provided, the direct experience of being provided with negative individual level performance feedback will have a positive effect on task performance, an effect that will be partially mediated by both increased self-focused attention and increased task-focused attention.
Hypothesis 2b:	Regardless of the public versus private context in which the performance feedback is provided, the direct experience of being provided with positive individual level performance feedback will have a negative effect on task performance, an effect that will be partially mediated by both decreased self-focused attention and decreased task-focused attention.
Hypothesis 3:	The indirect experience of observing a team member publicly receive individual level performance feedback in teams will have a positive effect on observers' subsequent task performance, an effect that will be partially mediated by both decreased self-focused attention and increased task-focused attention.
Hypotheses 4a-4c:	The provision of individual level performance feedback will have a negative effect on team a) cohesion, b) viability, and c) potency, an effect that will be mediated by increased levels of social comparisons in teams.

an untreated control group design with pre- and post-test measures (Cook & Campbell, 1979) and examined the effects of providing individual level performance feedback in the context of a laboratory experiment in which individuals worked interdependently in teams on a computer simulated task. The procedures, measures, and approach for statistically analyzing the data are presented in the following chapter.

CHAPTER FIVE: METHOD

Research Design

The present investigation used an untreated control group design with pre- and post-test measures (Cook & Campbell, 1979) to empirically test the relationships depicted in Figure 4. Two variables were manipulated between teams. The first between team manipulation was the context of the feedback (public versus private) that was given to one team member in each team. The other between team manipulation was the sign of the feedback (positive versus negative). Thus, five types of teams were used—public positive, public negative, private positive, private negative, and a control group where no one received performance feedback.

In addition to the between team manipulation, the design also included one within team manipulation. Each team worked on a version of the team task twice thus task (task #1 versus task #2) was a level in the design. All feedback treatments were randomly assigned to teams; participants signed up for teams in an introductory management course and, to my knowledge, there were no systematic reasons that altered the convenience for their schedules.

Power Analysis

Following suggestions by Cohen (1977) and Cohen and Cohen (1983), power analyses were conducted to determine the appropriate sample size necessary to ensure that the statistical analyses, to be described later, had sufficient power to reject the null hypotheses if they were in fact false. Two independent power analyses were conducted to determine the sample size needed to detect the anticipated effects of the analyses requiring the greatest statistical power—the hypotheses that were tested using

hierarchical mediated regression and the hypotheses were tested at the team level. Specifically, the former concerned the hypothesized effects of providing individual level performance feedback on the subsequent task performance of direct (Hypotheses 1a, 1b, 2a, and 2b) and indirect feedback recipients (Hypothesis 3). The latter concerned the hypothesized effects of providing individual level performance feedback on team cohesion, viability and potency (Hypotheses 4a-4c).

Cohen and Cohen (1983) described three general strategies for determining the size of the population effects that a research project is trying to detect. First, one can determine what effect size to expect based on those reported in the relevant literature. Second, one can posit a minimum effect size based on what is believed to be practically or theoretically significant. Third, and finally, one can use conventional definitions of small, medium, and large effect sizes (Cohen, 1977). In regards to the first of the most conservative hypotheses (i.e., where hierarchical and hierarchical mediated regressions were used to examine the effects of the feedback conditions on either direct or indirect feedback recipients' task performance), an effect size was taken from Kluger and DeNisi's (1996) meta-analysis on feedback interventions in organizations. The authors reported a *d* of .38 for feedback interventions in general on task performance. The formula provided by Rosenthal and Rosnow (1991, p. 442) for converting *d* to *r* suggests that d = .38 is equal to r = .19 (r^2 = .04). Therefore, assuming that the standardized regression coefficients for the interaction terms could collectively explain an additional 4% of the variance in a regression that already explained 25% of the variance—25% of the variance due to prior individual task performance—it was determined that 188 participants (47 teams) would provide a power of .80 at the .05 level of significance.

In regards to the other analyses requiring the greatest statistical power (i.e., that which tested the hypothesized effects of providing individual level feedback on team cohesion, viability, and potency), it was determined that a small to moderate negative effect on levels of cohesion and potency in teams would be important to detect. Therefore the conventional estimate of a small to moderate effect size (i.e., $r = .30$ and alternatively $r^2 = .09$) was used. Assuming that the standardized regression coefficients for the final step in the regression analyses that tested these hypotheses could collectively explain an additional 9% of the variance in a regression that already explained 41% of the variance—40% of the variance due to previous levels of the dependent variable plus 1% of the variance being explained by team performance—it was determined that 68 teams would provide a power of .80 at the .05 level of significance.

The most conservative of the two power analyses was used to determine the minimum number of teams necessary to appropriately test the study's hypothesized relationships. As such, a sample of no less than 68 teams (272 participants) was sought for this study. Eighty teams (320 participants) were obtained for the final sample.

General Task Overview

Research participants worked on an interdependent team task. The task that was used was a modified version of the Distributed Dynamic Decision-making (DDD) Simulation developed for the Department of Defense for research and training purposes (see Miller, Young, Kleinman & Serfaty, 1998 for a complete description). DDD is a computer simulation of a military command-and-control context in which participants work interdependently to protect a restricted airspace from enemy targets. The participants were responsible for working as a team to detect, identify, and destroy any

enemies targets by using the bases and vehicles that they themselves occupied and operated while, at the same time, they were to avoid destroying any friendly targets. As such, DDD teams can be best described as "tactical decision-making teams" in which 1) team members must make decisions under time pressure and threat; 2) team members must interact, participate, and coordinate their inputs; and 3) teamwork is essential to effective team performance (McIntyre & Salas, 1995).

The specific variant of this task used in this research, MSU-DDD, was developed to be used in contexts where teams are comprised of anywhere from 2 to 5 members who have little or no military experience. In this version of the simulation, each participant had a networked PC at his or her workstation, and used a computer mouse to control various military sub-platforms such as tanks, helicopters, jets and AWACS reconnaissance planes. These sub-platforms were used in an effort to monitor and control a specific geographic area represented in a 20 by 20 grid.

While the participants were able to verbally communicate with one another, they were unable to see each others' computer screens. Moreover, depending on the location of a participant's particular portion of the restricted airspace and the location of the various vehicles he or she operated during the game, participants had very different perspectives of what was happening across the whole territory represented on the screen. For example, one participant may have seen many enemy vehicles in the restricted airspace while the other participants had little, or no, indication that enemy vehicles were even on the screen. As such, the task required high levels of interdependence among the four participants.

At the end of each task, participants were provided with their offensive and defensive scores that corresponded to the extent to which they successfully destroyed enemy targets and defended their individual quadrants. The task also provided aggregate team offensive and defensive scores, however participants within a single team have no way of interpreting the aggregated score without either further information from the experimenter or a comparison aggregated score from another team. Neither was provided thus there is little reason to believe that the presence of aggregated, team level scores confounded the individual level performance information that was provided at the end of the task.

Space Partitioning in MSU-DDD

A depiction of the grid used in MSU-DDD is shown in Figure 5. This grid is partitioned in several ways. First, in terms of the team member's physical location in the simulated geography, the grid is partitioned into four geographic quadrants of equal area (NW, NE, SW, SE), and each area is assigned to one of the team members (or in DDD terminology—decision makers or DMs). DM1 is located in the middle of the Southeast (SE) quadrant (see the small black rectangle), DM2 in the middle of the Northwest quadrant (NW), DM3 in the SW quadrant, and DM4 in the NE quadrant.

Within this overall geographic space, there are friendly and neutral areas depicted on the screen. In the centermost area of the screen is a 4 by 4 grid marked off in red that represented a highly restricted area. This highly restricted area is contained within a 12 by 12 grid that is demarcated in green that represented a restricted area. The area outside this green restricted area is considered neutral territory. As is apparent from the figure, the two

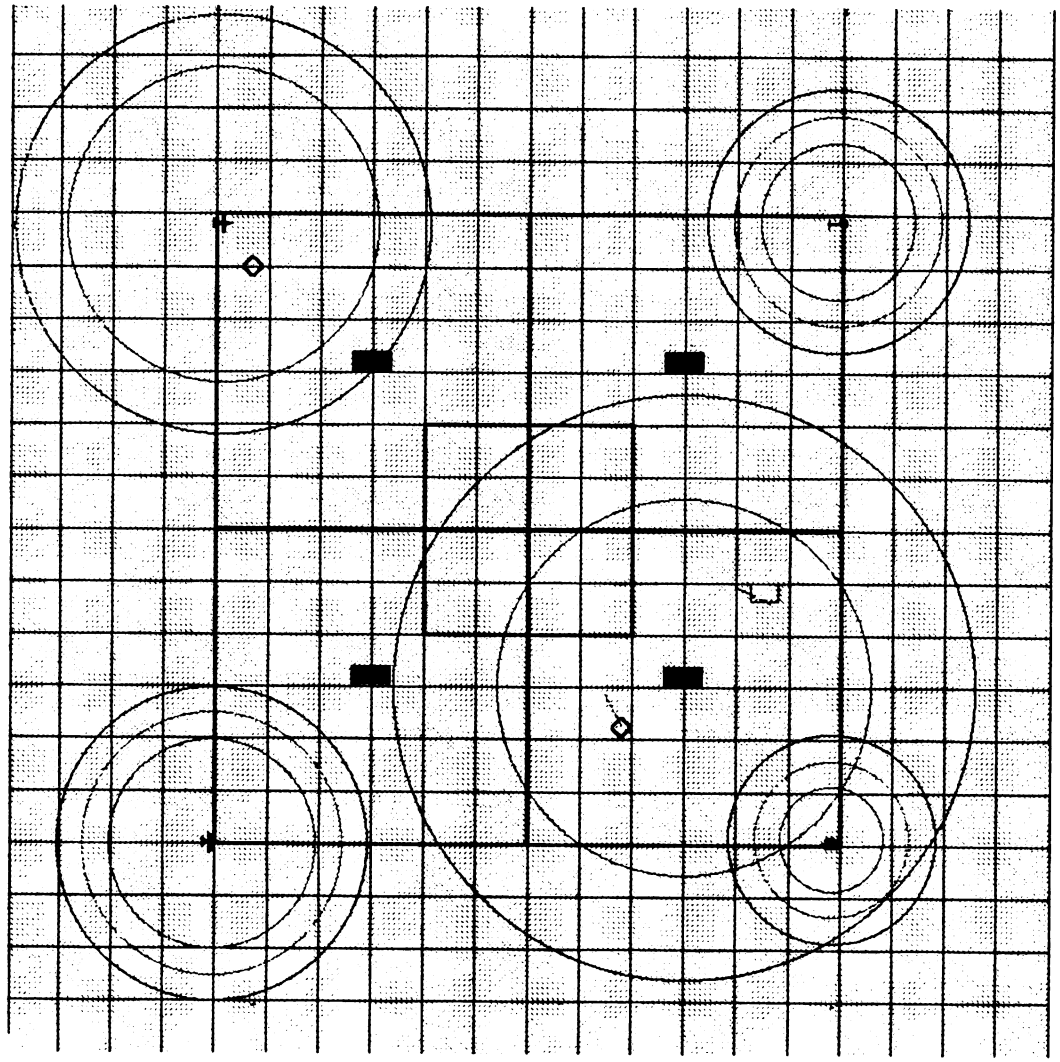

Figure 5. The MSU-DDD Task Screen.

types of geographical partitioning were such that each quadrant had an equal amount of space within it that represented neutral, restricted and highly restricted territory.

The object of the team's mission was to keep unfriendly vehicles from moving into the restricted and highly restricted areas, while at the same time, allowing friendly vehicles to move in and out of the same areas freely. The team's task, therefore, was to monitor the geographic space, identify all "tracks" (i.e., the radar report of a vehicle) in terms of their nature (friendly versus unfriendly), and then disable any unfriendly tracks that entered the restricted space. At the same time, the teams were to avoid disabling any friendly tracks.

Each team started with a set number of points, and lost points for each unit of time (seconds) that an unfriendly vehicle resided in a restricted or highly restricted zone. Teams also lost points whenever they disabled a friendly track in any area or an unfriendly track in neutral territory. The team with the most points left at the end of the experimental sessions were awarded the cash prizes.

Bases and Sub-Platforms

In terms of monitoring the geographic space, each team member's base (see the small black rectangles labeled DM1, DM2, etc. in Figure 5) had the same radar capacity as every other team member. Specifically, each base had a detection ring radius of roughly six grid units (demarcated by a black circle like the one shown in Figure 5). The team member could detect the presence or absence of any track within this radius track. Each base also had an identification ring radius of roughly 4 grid units (demarcated in blue) within which, he or she could discern the nature of the track in terms of friendly versus unfriendly status.

Any track outside the detection ring was invisible to the team members, and therefore they had to rely on their teammates to monitor regions of the space that were outside their own quadrant. However, as is clear from the figure, there were areas within each quadrant that could not be monitored from any of the bases. In these areas, the team member had to rely on his or her sub-platforms to monitor the area outside the base's detection ring.

Each DM had control of sub-platforms that represented various types of vehicles that could be launched from the base, and then moved to different areas of the screen. These sub-platforms were semi-intelligent agents that could automatically perform certain functions (e.g., return to base to refuel, etc.), and hence the DM was a manager of these semi-intelligent agents. Most of the MSU-DDD simulation is played via the sub-platforms, and hence understanding the unique characteristics of each sub-platform is critical to appreciating the complex nature of this task.

There were four different types of sub-platforms used in MSU-DDD; (a) AWACS planes, (b) tanks, (c) helicopters, and (d) jets. Each of these sub-platforms varied in its capacities on four different dimensions; (a) range of vision, (b) speed of movement, (c) duration of operability, and (d) weapons capacity.

The AWACS had the largest range of vision (radius of 4 grid units), followed by the jet, the helicopter and finally the tank (radius of 2 grid units). In terms of speed of movement, the jet moved the fastest (1 grid unit per second), followed by the AWACS, the helicopter, and finally the tank (.1 grid units per second). While the tank was limited in terms of speed and vision, it was the best asset in terms of duration of operation. It could be away from the base for 8 minutes without having to refuel. The AWACS could operate

away from the base for 6 minutes, followed by the helicopter at 4 minutes, and the jet at 2 minutes. The tank also had the most weapons capacity, and could disable any track that came within its attack radius (the third circle, demarcated in red, shown around each sub-platform). The helicopter had the second best weapons capacity, followed by the jet, followed by the AWACS which could not disable any track.

The various sub-platforms therefore constituted a complex set of assets that ranged widely in their capacities. Each team member controlled four such sub-platforms that could all be launched and operated concurrently. In this version of the task, each team member had equal assets in terms of sub-platforms such that each team member had one tank, one jet, one helicopter, and one AWACS. This was particularly important as providing each team member with equal assets in addition to equal levels of task demands allowed me to compare task performance across the members of the team.

Identifying and Engaging Tracks

Tracks were radar representations of vehicles moving through the geographic space monitored by the team. The tasks were configured such that there were 8 unique types of tracks that varied in terms of (a) being friendly or unfriendly, (b) air-based or ground-based, and (c) the amount of power it took to disable the track. All tracks originated from various points along the edge of the screen and proceeded inward. Again, the team had to maintain the integrity of the geographic space they were protecting by disabling (i.e., engaging) any unfriendly track that entered the restricted area.

First, it should be noted that prior to identification (e.g., when the track was close enough to be detected but not close enough to be identified) each track was represented by a question mark, followed by a number that was set above a diamond (e.g., see Figure 5). The

number reflected each track's unique identification number. Once the track came within the identification ring of either the base or a sub-platform, the DM had the opportunity to identify the track. Identification was not automatically performed by the sub-platform. Rather, the DM had to specifically direct the sub-platform to identify various tracks in a specific order and at a specific time. Once identified, the symbol representing the track changed from a diamond, to a rectangle with a letter-number combination.

The number referred to the level of power needed to disable the track (low = 1, medium = 3 and high = 5), and had implications for what platform could perform certain tasks. Tanks could disable all tracks, helicopters could disable those numbered 1 and 3, and jets could only disable tracks numbered 1. As previously mentioned, AWACSs could not disable any tracks. The number 0 next to a letter indicated that the track was friendly, and that it should not have been disabled. The letter indicated whether the track was air-based (A) or ground based (G). Air based tracks moved quickly, whereas ground-based tracks moved slowly.

Once identified, the team member could opt to share this information with other team members by clicking a "share information key." Although team members who were too far away from the track to detect it gained nothing immediately from such sharing, if the track moved within their own detection zone, sharing the ID eliminated the need to repeat the identification process. Thus, whereas the person who shared the identification with other team members lost some time in doing this (and personally gained nothing because the track was already identified on their own screen), this type of behavior helped increase the efficiency of the team. In the long run, it eliminated the need for multiple identifications of the same track.

Once a track was identified as an unfriendly, its status with respect to the restricted zone had to be monitored. If an unfriendly track moved into the restricted zone, the DM had to vector a weapons-bearing sub-platform with enough power over to the track and then engage it. The sub-platforms did not automatically engage unfriendly tracks that were violating the restricted zone, but rather, the DM had to give a specific order to disable a specific track at a specific time. Once a track was successfully engaged, it disappeared from the screen, and the sub-platform then had to return to base to refuel and reload. To maintain the integrity of the structures throughout the entire experiment, the sub-platforms could not be disabled by each other or by the unfriendly tracks.

In configuring the two team tasks, each was designed so that each team would experience 100 tracks during each task. Of the 100 tracks in each task, the majority of the tracks' (68 tracks) entry times were determined by a random number generator. Furthermore, the point of entry and exit of this subset of tracks was also randomly determined. While the entry and exit times for each of the tracks varied depending on the task (first or second), the point of entry and exit did not to ensure that the two tasks were essentially identical. Moreover, the power of the tracks was also determined by a random number generator. As with the point of entry and exit of these tracks, the power of each of the targets did not change from one task to the other to further ensure that the first and second tasks were identical.

There were however, a subset of the tracks (four waves consisting of 8 tracks per wave = 32 tracks) that were designed to originate near the corners of the Northwest, Northeast, Southwest, or Southeast quadrants and proceed in a straight line diagonally towards the opposite corner of the task screen. Thus, each of the quadrants for which the

DM's were responsible experienced one wave of tracks during each task. These waves consist of two of each type of air track (A0, A1, A3, A5). Of these eight tracks, five stopped once they reached the restricted zone of the quadrant from which they entered and stayed there for ten minutes, or until they were successfully engaged. In this way, each DM had primary responsibility for locating, identifying, and engaging if necessary, a disproportionately greater amount of tracks at some point during each task.

The entry of the wave tracks were not randomly timed, but rather configured so that no two DMs experienced a wave at the same time. As with the other tracks, the power and entry time (within each wave) of the eight tracks in each of the four waves was identical. Again, this ensured that task performance across each of the team members could be compared. The only difference between the first and second tasks regarding the waves of tracks was the order in which the DMs experienced their waves. In the first task, DM1 experienced the first wave, followed by DM3, DM4, and finally DM2. In the second task, DM4 experienced the first wave, followed by DM1, DM2, and finally DM3.

It was in regards to task performance during the attack of wave tracks that performance feedback was provided which referenced goals that were presented to the participants before the first task. The feedback was provided immediately after the first task. In this way, baseline performance measures of each of the team members was obtained prior to any experimental manipulation between the first and second tasks. Both the goal setting intervention and the individual level performance feedback intervention are described below.

In summarizing, in the computer simulation, the team members were to monitor a computer screen that presented a very complex and dynamic picture, filled with large

numbers of sub-platforms, rings, and tracks that were moving in different directions and at different rates. They were also to use a mouse to launch and move various semi-intelligent sub-platforms around the geographic area in an effort to identify all tracks, and engage those that are enemies and violating the restricted area. While they were doing this, they exchanged information with each other both electronically and verbally to more efficiently manage the task, coordinate actions, support one another. Each team member experienced a disproportional, heavy share of the workload relative to the other members of the team at some point during each of the tasks. It was the individual level performance of one of the DM's during the wave attacks in which the feedback intervention was directed. In this way, each four-person team had one direct feedback recipient and three indirect feedback recipients (i.e., observers).

Sample

Undergraduate business students currently enrolled in a human resource management course served as the participants for this study. Participation in the study was voluntary however participants were awarded course credit for their participation. In addition, participants were informed that they could win a large cash prize ($100 per person/$400 per team) based on the team's performance on the task.

Procedure

Immediately after entering the laboratory, participants were randomly assigned to a four-person work team in which to work interdependently on the computer simulated team task. The team was then escorted into a room in which they worked on the team task. Once in the room, each participant was randomly assigned to one of four computer stations (e.g., DM1, DM2, DM3, or DM4). After being seated at their respective stations,

participants received the Team Member Questionnaire that contains the study's survey measures in addition to several individual difference measures. These measures will be discussed further in the sections that follow.

Participants first completed Part I of the Team Member Questionnaire which contained some individual difference measures. Participants then received training on the team's task. The training lasted approximately one hour and it was during the training that participants became familiar with the team's task and each other.

Immediately following the training, the team's trainer set the goals for individual performance for the each of the participants in the team (discussed further below). The goals were publicly provided in the presence of the entire team and each team members' goals were identical. Participants in all of the teams, regardless of the experimental condition their team was assigned, received the same goals. Therefore, goals were a constant across all teams and all participants and were not confounded with the experimental manipulations. Finally, it should be noted that the goal setting intervention was not an experimental manipulation in-and-of-itself, but rather it was a component of the feedback intervention as the performance feedback provided information regarding the extent to which feedback recipients met the performance standards set forth during the goal setting intervention.

After the goal setting intervention, the trainer then provided several task strategies for the participants to keep in mind as they worked on the task. Participants were advised that the extent to which they employed the task strategies would affect the extent to which they would meet their performance goals. After hearing both the goals and the task strategies, participants received and completed the Part II of the Team Member

Questionnaire that contained several measures regarding their perceptions of their team, fellow team members, and the team's task.

Once all the participants completed the post-training questions section of the Team Member Questionnaire (Part II), they completed the first of the team's tasks. At the end of the first task, the trainer recorded the individual, group, and team scores. The trainer then instructed the participants to complete the post-task #1 section of the Team Member Questionnaire (Part IIIa). Once all of the team members completed the post-task #1 measures, the trainer provided performance feedback to the team member with the highest or lowest individual defense score either publicly or privately (the feedback intervention is furthered discussed below).

The performance feedback contained information regarding both the extent to which team member met the performance goals set during the goal setting intervention and the extent to which he/she utilized the task performance strategies discussed prior to the first task. On the other hand, in control teams there was no feedback provided to any team member regarding his or her performance on the wave tracks.

After the performance feedback was provided, the team completed Part IIIb of the Team Member Questionnaire. They then worked on the second team task. Upon completing the second task, team members completed the post-task #2 section of the Team Member Questionnaire (Part IV). Once all of the team members completed the post-task #2 measures, they were debriefed and dismissed.

Goal Setting and Task Strategies

At the end of the training for the team task, the trainer discussed the waves of tracks that they would encounter during the actual tasks. During the hands-on training,

there were no waves of tracks thus no teams or individual team members had any actual experience dealing with waves of tracks prior to the actual task. The experimenter explained that there would be tracks that would attempt to enter the highly restricted area in waves, or wave attacks, and that each team member could experience a wave in his or her quadrant during the either of the tasks. Participants were also told that once these targets reached the highly restricted area they would attempt to stay in that area as long as possible thus causing the team as a whole to many lose points as they would be penalized more severely for allowing tracks to reside in this area relative to other areas of the task screen. The experimenter explained that each team member's ability to effectively deal with their wave of tracks would be essential to the team's performing well and thus potentially winning the cash prize. Participants were assured that they had most of the skills required to handle a wave of tracks, and that some individual goals would be set regarding their dealing with the wave of tracks.

In regards to these goals, participants were told that they should try to a) identify all of the tracks before they reach the highly restricted area, b) begin engaging the tracks within one minute of the onset of the wave attack, and c) ensure that no enemy track resided in the highly restricted area for more than three minutes.

In addition to setting these three goals for each participant in regards to dealing with their waves of tracks, the experimenter provided some additional task strategies for participants to keep in mind as they attempted to meet the goals. These strategies were separate from the information provided during the training each team received prior to the task. Specifically, the experimenter informed participants that they should a) use their AWACS plane more effectively to meet the goals by positioning and keeping it in the far

corner of the quadrant they were to protect as it would allow them to detect the wave tracks more quickly since they would be entering the restricted areas from the corners of the screen, b) move their most powerful assets to the highly restricted area as soon as they became aware that they were experiencing a wave attack, and c) send their sub-platforms back to their base as soon as they had no more power (i.e., after having engaged an enemy track) so that the sub-platform could quickly be redeployed back to the highly restricted area after it had been used.

Finally, the trainer explained that the team member whose quadrant was under attack by a wave of tracks had the primary responsibility for making sure that the goals were met, however any member of the team could help if they wanted. The actual goal setting intervention can be found in Appendix A and again, the goals and task strategies were constant across all teams and all participants, thus they did not represent a study manipulation.

Feedback Intervention

Immediately following the end of the first task for the experimental teams, the experimenter provided the appropriate team member (based on the experimental condition assigned) with individual level performance feedback regarding his or her task performance as it related to the wave of tracks. Specifically, the experimenter provided individual level performance feedback regarding the extent to which the team member met the goals discussed prior to the first task. It should also be noted that for teams in the private feedback conditions, the experimenter told the appropriate feedback recipient that there was a problem with a response on his or her consent form that needed to be addressed outside of the presence of the rest of the team given the confidentiality of the

information. Once outside of the presence of the rest of the team, the experimenter explained that there was no problem with the consent form, but rather, he or she wanted to discuss the participant's performance on the first task. The experimenter then informed the feedback recipient about the extent to which he or she was effective in using the task strategies discussed with the goal setting intervention. Appendix B provides the script that was used to provide individual level performance feedback to the feedback recipients. Both the goal setting and feedback intervention provided in Appendices A and B, respectively, had been tested in a previous pilot investigation for this study.

It should be noted again that the feedback was provided at the end of the first task, thus providing an opportunity to obtain baseline performance measures for each team member prior to the provision of individual level performance feedback to the feedback recipient. Post-treatment performance measures were collected in the second task for comparison to the pre-treatment performance measures.

Measures

Table 2 provides a summary of the measures that were used in this study, as well as the timing of the completion of each of the measures. Appendix C presents the actual survey measures that were used. The following sections describe each of the measures that were used.

Information Collected During the First and Second Tasks

During the actual task, a number of individual level performance measures were recorded by the computers the participants used regarding their task performance (e.g., number of good attacks, number of wasteful attacks, number of times information about tracks was transferred to other team members, the number of times the participant cleared

Table 2

Study Procedure Timeline

	During the First Task	After the First Task (Pre-Feedback)	After the First Task (Post-Feedback)	During the Second Task	After the Second Task
Task Performance					
Ind. Task Performance	•			•	
Social Outcomes					
Team Cohesion		•			•
Team Viability		•			•
Team Potency		•			•
Attention					
Meta-task			•		
Task-motivation			•		
Task-learning			•		
Social Comparisons					•

an enemy track from a quadrant other than his or her own). A subset of these measures were used to create an overall task performance measure.

Individual Task Performance. A weighted composite of both the number of good attacks in addition to the number of waste attacks made by each participant was used to measure overall individual task performance. The weights were determined with principal components analysis in which a linear composite was constructed from the original variables (i.e., good attacks and waste attacks) that maximized the variance of the composite variable. The resulting principal component equation was PC = .734 (good attacks) + .704 (waste attacks).

Good attacks were attacks made on enemy tracks with a vehicle (or sub-platform) with the same amount of power as the enemy track the participant wanted to disable. Thus, good attacks represented the extent to which the participant cleared enemy tracks from the forbidden zones both effectively and efficiently. Good attacks also indicated that a participant had a conceptual understanding of the task. Waste attacks were attacks made on enemy tracks with a vehicle (or sub-platform) with more power than the enemy track the participant wanted to disable. Therefore, similar to good attacks, waste attacks represented the extent to which the participant was effective in clearing enemy tracks from the forbidden zones, however waste attacks are a less efficient use of the participants' resources as it related to randomly entering enemy tracks. On the other hand, waste attacks are not only effective, but also productive as it relates to disabling tracks that entered during wave attacks in which the object was to destroy the tracks as quickly as possible using whatever resources were available.

This overall task performance measure took into account how well the participant helped keep the forbidden zones free of enemy tracks by destroying them once they entered the forbidden zones. In addition, given the importance of, yet limited amount of time in the task, this measure therefore also provided a relatively complete picture of overall task performance as time spent making mistakes (i.e., disabling friendly tracks, having difficulty launching sub-platforms, launching the wrong sub-platform, losing sight of one's sub-platforms), is time that could not be spent making successful attacks, whether they were good attacks or waste attacks.

Information Collected in the Laboratory After the First Task-Before the Experimental Manipulation and After the Second Task

Team Cohesion. Perceptions of team cohesion were measured with a five-item scale adapted from Seashore's (1954) work on group cohesion. Previous research using adaptations of Seashore's original scale have shown good reliability and validity. The psychometric properties of the adapted items used in this study proved to have good psychometric properties as is discussed in the next chapter and the items can be found on page 184 of Appendix C.

Team Viability. Perceptions of team viability were measured with an eleven-item scale adapted from the Mowday, Steers, and Porter (1979) organizational commitment scale. The items were reworded such that they pertained to a work team rather than an organization and two items were dropped from the original thirteen-item scale as, even after rewording, they did not seem applicable to the teams used in this study. These items can also be found in Appendix C (page 184) and their psychometric properties in this study are discussed the chapter that follows.

Team Potency. Perceptions of team potency were measured with the three-item scale developed by Campion et al. (1993) in addition to a fourth item that asked about the extent to which the participant enjoyed working with his or her team. Campion et al. (1996) reported Cronbach alpha coefficient of .80 thus indicating that the scale has good reliability. The scale devised to measure potency in this study also proved to possess good psychometric properties, as discussed later in the results. The items can be found on page 184 of Appendix C.

Information Collected in the Laboratory After the First Task-After the Experimental Manipulation

Self-focused Attention. A scale was developed for this study that asked the extent to which the participants devoted attention to self. This design of the scale was based on the theoretical discussion of Kluger and DeNisi (1996) regarding attention to meta-task processes. The scale contained seven items that measured the extent to which participants attended to themselves, their own self-perceptions, and others' perceptions of them. The next chapter describes the psychometric properties of this newly created scale, however the items can be found on page 185 of Appendix C.

Task-focused Attention. Two scales were developed for this study that asked the extent to which the participants devoted attention to the task. Following Kluger and DeNisi's (1996) theoretical discussion of attention to task-learning and task-motivation processes, the scales' items measured the extent to which participants attended to learning and developing their skills on the task, and the extent to which participants attended to putting forth effort on the task and obtaining performance-based rewards, respectively. Each of the scales were originally composed of six items which can also be

found on page 185 of Appendix C. One item was dropped from the final task motivation scale. As with the other scales, the psychometric properties of both of these two scales will be discussed in the results that follow this chapter.

Information Collected in the Laboratory After the Second Task Only

Social Comparison Perceptions. A 6-item scale was developed for this study that asked about perceptions of social comparisons occurring in the team. The scale asked specific questions regarding the extent to which participants perceived that the members of teams made comparisons with each other. The items dealt with several different types of comparisons that team members could potentially make with each other when working on an interdependent task (e.g., effort, actual performance, outcomes for performances). The newly created scale demonstrated good psychometric properties as they are discussed in the next chapter. The actual items can be found on page 188 of Appendix C.

Manipulation Checks. A number of items were asked that measured the extent to which the manipulations used in the study were effective (e.g., At any point after the training, did you receive feedback from the experimenter on your task performance? and Was the feedback you received more positive or negative?). These items can be found on pages 188-189 of Appendix C.

Analyses

Multiple, hierarchical, and hierarchical mediated regression analyses were used to test the hypotheses presented in Chapters Three and Four. The next chapter discusses in more detail, psychometric properties of the study's measures and the nature and results of the hypotheses' tests.

CHAPTER SIX: RESULTS

Tables 3 and 4 present the results of two analyses that were first conducted to examine the factor structure of the items that were newly created for this study. Table 3 provides the results of a confirmatory factor analysis using all of the items designed to measure self- and task-focused attention. These items were created around theoretical discussions provided by Kluger & DeNisi (1996) on meta-task, task-motivation, and task-learning attention. As such, a confirmatory factor analysis of these items was appropriate given their a priori factor structure. The items did, in fact, load on to their predicted factors well. Results of the confirmatory factor analysis indicated that the three-factor model fit the data well ($\chi^2 = 363.80$, df = 149, $p < .01$; CFI = .95; TLI = 94; SRMR = .049; RMSEA = .07). Together, these three factors explained about 68 percent of the variance in responses to the items, as indicated in Table 3, with the meta-task, task motivation, and task learning factors each explaining 49.97, 12.24, and 5.48 percent of the variance, respectively. One item, however, was dropped from the task motivation scale as additional analyses revealed that the sixth item of the task motivation scale loaded highly on both the task motivation and task learning factors. Dropping this item only slightly improved the fit of the model ($\chi^2 = 323.40$, df = 132, $p < .01$; CFI = .95; TLI = 94; SRMR = .049; RMSEA =.07) but it did provide a more clear theoretical distinction among the three factors.

Table 4 provides the results of a principal components factor analysis with varimax rotation on the items designed to measure social comparisons in teams. As the table indicates, the six items used to measure this construct loaded together on only one factor which explained 60.45 percent of the variance in responses to the items.

Table 3

Confirmatory Factor Analysis Results for Self- and Task-Focus Items

Item Number	Eigenvalue	% of Variance Explained	Cumulative Variance Explained	Standardized Regression Weights		
				(1) Task Learning	(2) Meta Task	(3) Task Motivation
Factor (1)	9.49	49.97	49.97			
1				.82		
2				.76		
3				.85		
4				.87		
5				.87		
6				.82		
Factor (2)	2.33	12.24	62.21			
1					.57	
2					.77	
3					.83	
4					.86	
5					.79	
6					.71	
7					.54	
Factor (3)	1.04	5.48	67.69			
1						.83
2						.84
3						.85
4						.74
5						.56
6						.79

Table 4

Exploratory Factor Analysis Results for Social Comparisons Items

Item Number	Eigenvalue	% of Variance Explained	Cumulative Variance Explained	Unrotated Factor Loadings
				Social Comparisons
	3.63	60.45	60.45	
1				.71
2				.83
3				.83
4				.76
5				.79
6				.74

The reliabilities of all of the study's measures were determined by calculating the coefficient alpha for each scale. The alphas for each measure are presented in Table 5. As the table indicates, the coefficient alpha for each scale proved to be more than adequate for experimental purposes, with all being greater than .80 (Rosenthal & Rosnow, 1991, p. 50).

Following the theory developed throughout the previous chapters, there were a number of measures collected in the study that sought to examine team level constructs. While all of the study's variables were measured at the individual, team member level, Table 6 provides an examination of the extent to which there was support for aggregating the individual level measures into team level constructs. Specifically, Table 6 provides the ICC(1), ICC(2), ANOVA significance tests, and $r_{wg(j)}$ values for each of the proposed team level variables. ICC(1) indicates the extent to which individuals within the same team agree in their perceptions of a team characteristic. In team and group level research, it is the most often used measure for determining the extent to which there is sufficient agreement across the members of each team to justify aggregating the data from individual to higher levels of analyses. ICC(2) indicates the extent to which the aggregated, team level measures are reliable. The F-statistics and their associated significance test indicate the extent to which there is more between team agreement compared to within team agreement. In other words, it provides evidence regarding the extent to which there was more variability in responses to the scales between the teams compared to within the teams. Finally, $r_{wg(j)}$ provides yet another measure of the extent to which there was high agreement within the groups (i.e., teams) relative to the agreement between the groups or teams.

Table 5

Internal Reliabilities of Study Measures

Scale	Individual Level Coefficient Alpha	Final Number of Items
Meta-Task Attention	.89	7
Task Learning Attention	.93	6
Task Motivation Attention	.87	5
Social Comparisons	.87	6
Time 1		
Team Cohesion	.84	4
Team Potency	.82	4
Team Viability	.87	8
Time 2		
Team Cohesion	.85	4
Team Potency	.82	4
Team Viability	.90	8

Table 6

Aggregation Indices for Study's Team Level Constructs

Scale	ICC(1)	ICC(2)	F/p-value	$r_{wg(j)}$
Social Comparisons	.17	.45	1.82/.001	1.51
Time 1				
Team Cohesion	.30	.63	2.72/.001	1.42
Team Potency	.31	.64	2.79/.001	1.44
Team Viability	.14	.51	2.03/.001	1.19
Time 2				
Team Cohesion	.29	.62	2.64/.001	1.42
Team Potency	.28	.60	2.52/.001	1.44
Team Viability	.20	.40	1.68/.01	1.19

As can be seen in Table 6, there was strong support for aggregating most of the measures that sought to measure team level constructs to the team level. Most important, the ICC(1) provides what is perhaps the best evidence of whether or not individual level perceptions within each team are similar enough to be aggregated into team level perceptions that could then be used to determine the extent to which the study's manipulations had an effect on the teams. In addition, most of the scales' ICC(2) values were acceptable based on the criteria provided by Ostroff and Schmitt (1993) (i.e., greater than .60) and all of the ANOVA tests for the scales provided evidence that there was significantly more between team variance than within team variance. Unfortunately, the $r_{wg(j)}$ values for each of the scales were beyond the range acceptable for interpretation. This occurs when the obtained variance within a group exceeds the expected variance (James, Demaree, and Wolf, 1984), therefore only the ICC(1), ICC(2), and ANOVA tests were used to justify aggregating the data to the team level. Despite the strong evidence justifying aggregating the data, however, such procedures are not without at least one major limitation.

Specifically, while it is generally thought that aggregate perceptions may have important and powerful explanatory ability and thus be useful in organizational research (James, 1982), the fact remains that aggregating data is only appropriate when sufficient agreement can be demonstrated. Unfortunately this is often difficult to show. For example, despite the calculation of ICC(1) being the most often employed means of justifying data aggregation, there is no definitive guidelines on acceptable ICC(1) values (Ostroff & Schmitt, 1993). James (1982) reported that ICC(1) values typically range from .00 to .50 with a median of .12. Bliese (2000) argued that he believed James (1982)

provided overestimates of ICC(1) values and stated that in his own research on U.S. Army data, he typically encountered ICC(1) values ranging from .05 to .20. He further stated that he had never encountered an ICC(1) greater than .30 and that it would be unlikely to encounter an ICC(1) value greater than .30 in applied field research.

The aforementioned problem therefore provides a dilemma for team researchers who wish to provide evidence for aggregating individual level data to the team level of analysis. However, Bliese's experiences seem to suggest that one might expect ICC(1) values in experimental research to be close to, or even somewhat higher than, those in applied field research. In particular, one could argue that given the potential strength of experimental designs (McClelland, 1997), one should expect levels of within team agreement in between team experimental designs such as the one employed in this study that are at least similar to, if not higher than, levels of within team agreement in between team quasi-experimental and non-experimental designs. As such, the ICC(1) values presented in Table 6 appear to indicate that there is sufficient agreement for aggregating the individual level data to the team level of analyses. As can be seen in the Table, even where ICC(1) values are the lowest (e.g., time 1 team viability measures and social comparison measures), they are still higher than the median value reported by James (1982) which was likely an overestimated value. Based on the evidence presented in Table 6 that, in general, supports aggregating the individual level measures into team level constructs; social comparisons, cohesion, potency, and viability were aggregated to team level variables.

The means, standard deviations, and zero-order correlations of all of the study's individual and team level variables are presented in Tables 7 and 8, respectively. As can

Table 7

Means, Standard Deviations, and Zero-Order Correlations of Individual Level Study Variables

	M	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Overall Task Performance (Post-feedback)	13.82	3.65	—								
(2) Overall Task Performance (Pre-feedback)	14.01	4.21	.38*	—							
(3) Self-Focused Attention	2.90	.80	.11*	.09	(.89)						
(4) Task-Focused Attention	3.62	.75	.03	.13*	.58**	(.90)					
(5) DC DM Station 1	.25	.44	.14*	-.13*	.11*	.06	—				
(6) DC DM Station 2	.25	.44	-.21**	-.29**	-.15**	-.15**	-.33**	—			
(7) DC DM Station 3	.25	.44	.19**	.14*	.07	.03	-.33**	-.33**	—		
(8) DC Private/Positive Direct Recipient	.05	.22	.17**	.15*	-.01	-.04	.07	.00	.00	—	
(9) DC Public/Positive Direct Recipient	.05	.22	-.05	-.02	.13*	.07	.07	-.03	-.10†	-.05	—
(10) DC Private/Negative Direct Recipient	.05	.22	-.04	-.09	.02	-.02	.00	-.07	.20**	-.05	-.05
(11) DC Public/Negative Direct Recipient	.05	.22	.08	-.08	-.04	-.19**	.00	.03	.07	-.05	-.05
(12) DC Private/Positive Observer	.15	.36	-.14*	-.03	-.05	-.05	-.04	.00	.00	-.10†	-.10†
(13) DC Public/Positive Observer	.15	.36	.01	.01	.10†	.01	-.04	.02	.06	-.10†	-.10†
(14) DC Private/Negative Observer	.15	.36	-.01	.01	.03	.02	.00	.04	-.12*	-.10†	-.10†
(15) DC Public/Negative Observer	.15	.36	.10†	.02	-.07	.01	.00	-.02	-.04	-.10†	-.10†

Note. n = 320. Data in parentheses on the diagonal are coefficient alpha reliabilities. DC = Dummy Coded. † $p < .10$. * $p < .05$. ** $p < .01$

Table 7 cont'd

	(10)	(11)	(12)	(13)	(14)	(15)
(1) Overall Task Performance (Post-feedback)						
(2) Overall Task Performance (Pre-feedback)						
(3) Self-Focused Attention						
(4) Task-Focused Attention						
(5) DC DM Station 1						
(6) DC DM Station 2						
(7) DC DM Station 3						
(8) DC Private/Positive Direct Recipient						
(9) DC Public/Positive Direct Recipient						
(10) DC Private/Negative Direct Recipient	—					
(11) DC Public/Negative Direct Recipient	-.05	—				
(12) DC Private/Positive Observer	-.10†	-.10†	—			
(13) DC Public/Positive Observer	-.10†	-.10†	-.18**	—		
(14) DC Private/Negative Observer	-.10†	-.10†	-.18**	-.18**	—	
(15) DC Public/Negative Observer	-.10†	-.10†	-.18**	-.18**	-.18**	—

Note. $\underline{n}$ = 320. Data in parentheses on the diagonal are coefficient alpha reliabilities. DC = Dummy Coded. $^{\dagger}\underline{p} < .10$. * $\underline{p} < .05$. ** $\underline{p} < .01$.

Table 8

Means, Standard Deviations, and Zero-order Correlations of Team Level Study Variables

	M	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Team Cohesion (Post-feedback)	3.77	.49	(.62)										
(2) Team Viability (Post-feedback)	3.21	.36	.68**	(.40)									
(3) Team Potency (Post-feedback)	3.45	.42	.81**	.79**	(.60)								
(4) Team Cohesion (Pre-feedback)	3.70	.52	.91**	.66**	.75**	(.63)							
(5) Team Viability (Pre-feedback)	3.19	.36	.67**	.86**	.71**	.69**	(.51)						
(6) Team Potency (Pre-feedback)	3.39	.44	.78**	.80**	.83**	.81**	.87**	(.64)					
(7) Social Comparisons	2.63	.51	.47**	.57**	.56**	.47**	.43**	.46**	(.45)				
(8) DC Private/Positive Condition	.20	.40	-.09	-.03	-.11	-.08	-.05	-.09	-.09	—			
(9) DC Public/Positive Condition	.20	.40	.04	.06	.13	.04	-.00	.06	.21	-.25*	—		
(10) DC Private/Negative Condition	.20	.40	-.04	.05	-.05	-.08	.06	.01	-.01	-.25*	-.25*	—	
(11) DC Public/Negative Condition	.20	.40	-.16	-.16	-.08	-.08	-.17	-.11	-.14	-.25*	-.25*	-.25*	—

Note. n = 80. Data in parentheses on the diagonal are ICC(2) values. DC = Dummy Coded. * $p < .05$. ** $p < .01$.

be seen in both of Table 7 and 8, there were relationships among the experimental conditions (e.g., $r_{DC\ Private/Positive\ Recipient\text{-}DC\ Private/Positive\ Observer} = -.10$, $p < .10$). Such correlations were expected because the recipient and observer conditions were not independent. The relationships were a function of the study's design; persons selected to directly receive performance feedback could not be observers. More important, these correlations were not problematic as all participants were randomly assigned to both teams and experimental conditions.

Manipulation Checks

A number of analyses were conducted to examine the saliency of the experimental manipulations before going forward to analyze the data. The data demonstrate that the manipulations were relatively successful. Specifically, analyses of the manipulation check items revealed that 70.3% of those participants who actually received individual level performance feedback were aware of that fact, but it should also be noted that 43.8% of those who directly received individual level performance feedback perceived others in their team to have also received feedback. A closer examination of the data reveal that 78.1% of those directly receiving positively framed individual level performance feedback were aware that they received feedback and almost all (92.6%) were aware that the performance feedback was positive. Similarly, 62.5% of those participants who directly received negatively framed individual level performance feedback were aware that they received feedback and 86.4% of these participants were aware that the feedback was negative.

As for the effects of the manipulations on observers, most (72.9%) observers realized that they did not directly receive individual level performance feedback during

the experiment. As expected, about half (45.8%) of the observers believed that some other member of their team directly received feedback. Of those "observers" in the private feedback conditions, 84.4% were not aware that any member of the team received performance feedback thus lending support to the private nature of the performance feedback provided in these conditions. On the other hand, 75.8% of those observers in conditions in which a team member was publicly provided with individual level performance feedback realized that fact. Of these observers, all who observed the provision of positive feedback to one of their team members realized that the feedback was in fact positive, while 82.4% of those observing the provision of negative feedback to one of their team members realized that the feedback was negative.

While the manipulations could have been more effective (i.e., more salient to the research participants), overall these data suggested that I could proceed with the data analyses as planned. In the sections that follow, I describe each of the proposed tests and the results of the tests of the study's hypotheses. It should be noted that each of the study's hypotheses, predicted mediated effects of the feedback interventions on individual task performance and team social outcomes. As such, the description of the results from each test first describes the effects of the feedback interventions on the mediating variables (i.e., self- and task-focused attention or social comparisons). Next, I describe the effects of the feedback manipulations on the more distal outcomes (i.e., individual task performance or team social outcomes). In this way, the description of the results is consistent with the method of testing for mediation outlined by Baron and Kenny (1986). In addition, this method of describing the results allows me to discuss any direct effects that may have been found for the feedback interventions on the study's

outcome measures, whether or not there was support found for the full mediation hypotheses. In cases in which I could not justify testing the mediation aspect of the hypotheses, I discuss this and then go on to discuss the direct effects of the feedback interventions only.

Hypotheses 1a and 1b

Hypotheses 1a and 1b, the first set of hypotheses, sought to test predictions derived from feedback intervention theory and examined the effects of directly receiving individual level performance feedback in the context of a team on task performance, regardless of the sign of the feedback. Hypothesis 1a predicted that regardless of the sign of the performance feedback, the direct experience of being publicly provided with individual level performance feedback would have a negative effect on task performance, an effect that would be partially mediated by both increased self-focused attention and decreased task-focused attention. Hypothesis 1b predicted that regardless of the sign of the performance feedback, the direct experience of being privately provided with individual level performance feedback would have a positive effect on task performance, an effect that would be partially mediated by both decreased self-focused attention and increased task-focused attention.

The above hypotheses predicted that the effects of publicly and privately provided performance feedback on task performance are mediated, in part, by both self- and task-focused attention. As such, the test of these hypotheses employs the Baron and Kenny (1986) method of testing for mediation. Several multiple and hierarchical mediated regressions were used to test the above hypotheses. First, two multiple regressions analyses were conducted—one for self-focused attention and the other for task-focused

attention. The predictors were eight dummy-coded variables created to represent both the experimental condition of the participant and whether or not the participant was a direct feedback recipient, an observer, or in a control group. While each of the hypotheses independently concerned the effects of public (Hypothesis 1a) and private (Hypothesis 1b) feedback on direct recipients, the creation of the eight dummy-coded variables allowed me to obtain more information from the regression analyses (e.g., it allowed me to examine the effects of public feedback that is positively versus negatively framed). In addition, the dummy-coding scheme employed here made more efficient use of the regression technique and the study's sample.

The first regression, regressed self-focused attention on the eight dummy-coded predictors. Similarly, the second regression regressed task-focused attention on the eight dummy-coded predictors. Support for Hypothesis 1a would have been contingent on first finding evidence of the effect for being a direct recipient in both the public/positive feedback condition and the effect for being a direct recipient in the public/negative feedback condition was positive and significant on self-focused attention and negative and significant on task-focused attention. Support for Hypothesis 1b would have been contingent on first finding evidence of the effect for being a direct recipient in both the private/positive feedback condition and the effect for being a direct recipient in the private/negative feedback condition was negative and significant on self-focused attention and positive and significant on task-focused attention.

These analyses preceded the hierarchical mediated analyses described below, as suggested by Baron and Kenny (1986), which further examined the direct and indirect effects of the feedback interventions. Two sets of hierarchical mediated regressions, one

to test the mediating effects of self-focused attention, the other to test the mediating effects of task-focused attention, were used to further test these hypotheses. Specifically, in Steps 1a, post-feedback task performance was regressed on pre-feedback task performance. In Steps 2a, three dummy-coded variables constructed to indicate whether the participant was assigned to either the DM1, DM2, or DM3 station were entered into the regression as control variables. As previously mentioned, the task was designed so that each team member, would experience exactly the same tracks during each task (in terms of the number of tracks, the power of the tracks, and their point of entry within each quadrant) both within and between teams and between the first and second tasks. However given the random determination of both the tracks' entry times and the order of the waves in each task, depending on which station the team member was assigned, there was the possibility that there were differences across the stations in terms of opportunities to attack enemy tracks. In Steps 3a, eight dummy-coded variables created to represent both the experimental condition of the participant and whether or not the participant was a direct feedback recipient, an observer, or in a control group were entered into the regression to test whether or not the feedback interventions had an effect on subsequent task performance.

The mediation tests followed Steps 1a, 2a, and 3a. Steps 1a and 2a were first repeated in Steps 1b and 2b, respectively. Steps 3b added either self-focused or task-focused attention as a predictor while Steps 4b then added eight dummy-coded variables from Step 3a to test whether or not the various feedback interventions still had an effect on subsequent task performance. This method of testing for mediation was consistent with that proposed by Baron and Kenny (1986).

Support for Hypothesis 1a would have been indicated if a significant effect for being a direct feedback recipient in a public feedback condition, regardless of the positive versus negative nature of the feedback was found in Step 3a of the regressions and after controlling for self-focused attention the effect was reduced in Step 4b. In addition, the same significant effect for being a direct feedback recipient in the public feedback conditions found in Step 3a of the regressions would also have needed to be reduced in Step 4b of the regressions where task-focused attention served as a control.

Similarly, support for Hypothesis 1b would have been indicated if the effect for being a direct feedback recipient in a private feedback condition found in Step 3a of the regressions for self-focused attention was reduced in Step 4b and if the effect for being a direct feedback recipient in a private feedback condition found in Step 3a of the regression for task-focused attention was reduced in Step 4b.

Hypothesis 1a: Effects of Publicly Provided Individual Level Performance Feedback on Direct Recipients' Self- and Task-Focused Attention

Hypothesis 1a predicted, in part, that directly receiving individual level performance feedback publicly would have a positive effect on self-focused attention and a negative effect on task-focused attention. As can be seen in Table 9, in particular, the effect for being a direct feedback recipient in the public/positive and the public/negative feedback conditions, there was only partial support for this aspect of Hypothesis 1a. Consistent with FIT, the direct experience of publicly receiving individual level performance feedback on self-focused attention was positive and significant, however this was only the case for feedback that was positive ($\beta = .15$, $p < .05$). There was no such effect for directly and publicly receiving individual level performance feedback on

self-focused attention when the feedback was negatively framed. Also consistent with FIT, the effect of the direct experience of publicly receiving individual level performance feedback on task-focused attention was negative and significant but this was only the case when the feedback was negatively framed (β = -.23, $p < .05$). The effect of directly and publicly receiving individual level performance feedback on task-focused attention was positive and insignificant when the feedback was positive (β = .03, $p > .05$).

Hypothesis 1a: Effects of Publicly Provided Individual Level Performance Feedback on Direct Recipients' Task Performance

As can be seen in Table 10, Steps 1a and 1b regressed post-feedback task performance on pre-feedback task performance to remove any variance that could be explained in post-feedback task performance that was simply a result of practice from the first task to the second task. As expected, pre-feedback task performance explained a significant portion of post-feedback task performance (ΔR^2 = .15, $p < .05$). Steps 2a present the effects of the variables entered into the regression to serve as statistical controls for the station in which the team member was randomly assigned. As can be seen on Steps 2a, station assignment did, in fact, explain a significant portion of the variance in post-feedback task performance (ΔR^2 = .09, $p < .05$), thus supporting these variables inclusion in the regression analyses as controls. As indicated in Steps 3a of Table 10, overall the feedback interventions explained a significant, yet small amount of variance in post-feedback task performance (ΔR^2 = .04, $p < .05$). While this effect is small, it is

Table 9

Multiple Regression Effects of Individual Level Feedback Conditions on Self- and Task-Focused Attention

	Self-focused Attention			Task-focused Attention		
Step	R^2	ΔR^2	β	R^2	ΔR^2	β
(1)	.04	.04		.05*	.05*	
DC Private/Positive Direct Recipient			.02			-.08
DC Public/Positive Direct Recipient			.15*			.03
DC Private/Negative Direct Recipient			.05			-.06
DC Public/Negative Direct Recipient			.00			-.23*
DC Private/Positive Observer			.00			-.11
DC Public/Positive Observer			.13*			-.06
DC Private/Negative Observer			.07			-.06
DC Public/Negative Observer			-.02			-.06

Note. n = 320. DC = Dummy-Coded. † $p < .10$. * $p < .05$.

Table 10

Hierarchical Mediated Regression Effects of Individual Level Feedback Conditions and Self- and Task-Focused Attention on Individual Task Performance

Step		Task Performance (Post-feedback) Self-focused Attention			Task Performance (Post-feedback) Task-focused Attention		
		R^2	ΔR^2	β	R^2	ΔR^2	β
(1a)		.15*	.15*		.15*	.15*	
	Task Performance (Pre-feedback)			.38*			.38*
(2a)		.23*	.09*		.23*	.09*	
	DC DM Station 1			.32*			.32*
	DC DM Station 2			.11†			.11†
	DC DM Station 3			.28*			.28*
(3a)		.27*	.04*		.27*	.04*	
	DC Private/Positive Direct Recipient			.10†			.10†
	DC Public/Positive Direct Recipient			-.01			-.01
	DC Private/Negative Direct Recipient			-.04			-.04
	DC Public/Negative Direct Recipient			.11*			.11*

Note. n = 320. DC = Dummy-Coded. † p < .10 * p < .05.

Table 10 cont'd

Step		Task Performance (Post-feedback) Self-focused Attention			Task Performance (Post-feedback) Task-focused Attention		
		R^2	ΔR^2	β	R^2	ΔR^2	β
	DC Private/Positive Observer			-.07			-.07
	DC Public/Positive Observer			.03			.03
	DC Private/Negative Observer			.04			.04
	DC Public/Negative Observer			.12*			.12*
	Controlling for Attention						
(1b)	Task Performance (Pre-feedback)	.15*	.15*	.38*	.15*	.15*	.38*
(2b)		.23*	.09*		.23*	.09*	
	DC DM Station 1			.32*			.32*
	DC DM Station 2			.11†			.11†
	DC DM Station 3			.28*			.28*

Note. n = 320. DC = Dummy-Coded. † p < .10 * p < .05.

Table 10 cont'd

Step		Task Performance (Post-feedback) Self-focused Attention			Task Performance (Post-feedback) Task-focused Attention		
		R^2	ΔR^2	β	R^2	ΔR^2	β
(3b)		.23*	.00		.23*	.00	
	Attention			.04			-.01
(4b)		.27*	.04*		.27*	.04*	
	DC Private/Positive Direct Recipient			.10†			.10†
	DC Public/Positive Direct Recipient			-.02			-.01
	DC Private/Negative Direct Recipient			-.04			-.04
	DC Public/Negative Direct Recipient			.11*			.10*
	DC Private/Positive Observer			-.07			-.07
	DC Public/Positive Observer			.02			.03
	DC Private/Negative Observer			.04			.04
	DC Public/Negative Observer			.12*			.12*

Note. n = 320. DC = Dummy-Coded. † $p < .10$ * $p < .05$.

consistent with Kluger and DeNisi's (1996) assertion that feedback interventions have small, but important effects on performance. In fact, it is identical to the effect they reported in their own meta-analytic review.

Table 10 also reveals that there was no support found for the predicted effects of publicly provided individual level performance feedback on direct recipients' task performance. Specifically, there was no effect for publicly and directly receiving individual level feedback when it was positively framed ($\beta = -.01$, $p > .05$) and the effect for directly receiving individual level performance feedback when it was negatively framed was significant but in the direction opposite of that predicted ($\beta = .11$, $p < .05$).

It was necessary to find these predicted effects in addition to the effects of publicly provided performance feedback on self- and task-focused attention to test the full mediated hypothesis. As previously mentioned, there was a significant effect for directly and publicly receiving individual level performance feedback on self-focused attention, however, the failure to find the predicted effect of publicly provided individual level feedback on direct recipients' task performance in addition to the failure to find an effect of self-focused attention on task performance (as can be seen on Step 3b of Table 10) prohibited further tests for the mediating effects of self-focused attention on the relationship between directly and publicly receiving individual level performance feedback on task performance. Similarly, while directly and publicly receiving individual level performance feedback had both a significant effect on task-focused attention and task performance, task-focused attention did not have a significant effect on task performance (as can be seen on Step 3b of Table 10) thus prohibiting a complete test for the mediating effects of task-focused attention.

It should be noted that the failure to find significant effects between self-focused attention and task performance ($\beta = .04$, $p > .05$) and task-focused attention and task performance ($\beta = -.01$, $p > .05$) further prohibited a complete test of the remaining hypotheses regarding the mediating effects of both self-focused attention and task-focused attention on both the direct experience of receiving and the indirect experience of observing the provision of individual level performance feedback in teams on task performance. As such, only the direct effects of the feedback interventions will be addressed below in the discussion of the remaining hypotheses.

Hypothesis 1b: Effects of Privately Provided Individual Level Performance Feedback on Direct Recipients' Self- and Task-Focused Attention

Hypothesis 1b predicted, in part, that directly receiving individual level performance feedback privately would have a positive effect on task performance, an effect that would be partially mediated by both self- and task-focused attention. Table 9 also presents part of the results for the test of this hypothesis where it can be seen that the effect for being a direct feedback recipient in either the private/positive or private/negative feedback conditions had no significant effects on either self-focused attention or task-focused attention.

Hypothesis 1b: Effects of Privately Provided Individual Level Performance Feedback on Direct Recipients' Task Performance

As can be seen in Table 10, there was partial support found for the effects of privately provided individual level performance feedback on direct recipients' task performance. The regression analyses, which make a distinction between privately and directly provided feedback that is positive compared to that which is negative indicate

that, somewhat consistent with Hypothesis 1b, there is an positive and marginally significant effect of privately and directly receiving positively framed individual level performance feedback in teams on task performance ($\beta = .10$, $p < .10$) however this was not the case when the feedback was negatively framed.

Hypotheses 2a and 2b

Hypotheses 2a and 2b sought to test predictions derived from control theory and examined the effects of directly receiving individual level performance feedback in the context of a team on task performance, regardless the private versus public context in which the feedback was provided. Hypothesis 2a predicted that regardless of the private versus public context in which the feedback was provided, individual level performance feedback that was negatively framed would have a positive effect on task performance, an effect that would be partially mediated by increased self-focused attention and increased task-focused attention. Hypothesis 2b predicted that regardless of the private versus public content in which the feedback was provided, individual level performance feedback that was positively framed would have a negative effect on task performance, an effect that would be partially mediated by decreased self-focused attention and decreased task-focused attention. These hypotheses were also tested using the multiple and hierarchical mediated regressions in Tables 9 and 10, respectively.

Similar to Hypotheses 1a and 1b, these hypotheses also predicted that the effects of performance feedback on task performance were mediated, in part, by both self- and task-focused attention. As such, the tests of these hypotheses also employed the Baron and Kenny (1986) method of testing for mediation. Several multiple and hierarchical mediated regressions were used to test the hypotheses. First, two multiple regressions

analyses were conducted—one for self-focused attention, and the other for task-focused attention. As before, the predictors were eight dummy-coded variables created to represent both the experimental condition of the participant and whether or not the participant was a direct feedback recipient, an observer, or in a control group.

The first of these regressions, regressed self-focused attention on the eight dummy-coded predictors. Similarly, the second regression, regressed task-focused attention on the eight dummy-coded predictors. Support for Hypothesis 2a would have been contingent on first finding evidence of an effect for being a direct recipient in both the private/negative feedback condition and an effect for being a direct recipient in the public/negative feedback condition was positive and significant on self-focused attention and positive and significant on task-focused attention. Preliminary support for Hypothesis 2b would have been indicated if the effect for being a direct recipient in both the private/positive feedback condition and the effect for being a direct recipient in the public/positive feedback condition was negative and significant on self-focused attention and negative and significant on task-focused attention.

The remaining test of these hypotheses proceeded in a manner similar to that of the tests of Hypotheses 1a and 1b. Two sets of hierarchical mediated regressions, one to test the mediating effects of self-focused attention, the other to test the mediating effects of task-focused attention, were used. In Steps 1a, post-feedback task performance was regressed on pre-feedback task performance. In Steps 2a, three dummy-coded variables constructed to indicate whether the participant was assigned to either the DM1, DM2, or DM3 station was entered into the regression as control variables. Steps 3a added eight dummy-coded variables created to represent both the experimental condition of the

participant and whether or not the participant was a direct feedback recipient, an observer, or in a control group to test whether or not the feedback interventions had an effect on subsequent task performance.

The mediation tests followed Steps 1a, 2a, and 3a. Steps 1a and 2a were first repeated in Steps 1b and 2b, respectively. Steps 3b added either self-focused or task-focused attention as a predictor while Steps 4b then added the eight dummy-coded variables from Step 3a to test whether or not the various feedback interventions still had their hypothesized effects on subsequent task performance.

Support for Hypothesis 2a would have been indicated if the effect for being a direct feedback recipient in a negative feedback condition found in Step 3a of the regressions for self-focused attention was reduced in Step 4b and if the effect for being a direct feedback recipient in a negative feedback condition found in Step 3a of the regression for task-focused attention was reduced in Step 4b.

Finally, Hypothesis 2b would have been supported if an effect for being a direct feedback recipient in a positive feedback condition found in Step 3a of the regressions for self-focused attention was reduced in Step 4b and if the effect for being a direct feedback recipient in a positive feedback condition found in Step 3a of the regression for task-focused attention was reduced in Step 4b.

Again, according to the procedure outlined by Baron and Kenny (1986), to justify testing the full mediation hypotheses presented above, there would first have to be significant effects found in the first set of regressions (those examining the effects of the feedback interventions on self- and task-focused attention, in addition to significant effects for self-focused attention and task-focused attention on task performance in Steps

3b. As mentioned, this was not the case; therefore, for each of the hypotheses, I first describe the effects of the feedback interventions on self- and task-focused attention then I describe the effects of the feedback manipulations on individual task performance. Thus, I will discuss any direct effects that may have been found for the feedback interventions on direct recipients' task performance, as there was no evidence justifying tests of the full mediated hypotheses.

Hypothesis 2a: Effects of Negatively Framed Individual Level Performance Feedback on Direct Recipients' Self- and Task-Focused Attention

Hypothesis 2a implied that directly receiving negatively framed individual level performance feedback would have a positive effect on self-focused attention and a positive effect on task-focused attention. Table 9 shows that there was virtually no support for this hypothesis. Specifically, the effects of being a direct feedback recipient of negatively framed individual level performance feedback on self-focused attention was positive but not significant for feedback that was privately provided ($\beta = .05$, $p > .05$) and there was no effect of being a direct feedback recipient of negatively framed individual level performance feedback on self-focused attention for feedback that was publicly provided. Contrary to the predictions of Hypothesis 2a, the effects of directly receiving negative individual level performance feedback on task-focused attention on task-focused attention was negative regardless of whether the feedback was provided in private ($\beta = -.06$, $p > .05$) or in public ($\beta = -23$, $p < .05$).

Hypothesis 2a: Effects of Negatively Framed Individual Level Performance Feedback on Direct Recipients' Task Performance

As shown in Table 10, there was partial support found for the predicted positive effect of directly receiving negative feedback on task performance as negatively framed and publicly provided individual level performance feedback had a significant effect on task performance ($\beta = .11$, $p < .05$), however the effect was not significant when the feedback was privately provided ($\beta = -.04$, $p > .05$).

Hypothesis 2b: Effects of Positively Framed Individual Level Performance Feedback on Direct Recipients' Self- and Task-Focused Attention

Hypothesis 2b predicted, in part, that the direct experience of being provided with positive individual level performance feedback would have a negative effect on self-focused attention and a negative effect on task-focused attention. As can be seen in Table 9, this aspect of the hypothesis received no support. Specifically, while Hypothesis 2a implied that the effect of directly receiving positive individual level performance feedback would be negative on self-focused attention, there was no effect on self-focused attention when the feedback was provided in private ($\beta = .02$, $p > .05$) and a positive effect on self-focused attention when the feedback was provided in public ($\beta = .15$, $p < .05$). Positively framed individual level feedback that was directly experienced had no significant effects on task-focused attention, regardless of the context in which is was provided as can be seen in Table 9.

Hypothesis 2b: Effects of Positively Framed Individual Level Performance Feedback on Direct Recipients' Task Performance

Hypothesis 2b, the final hypothesis regarding the effects of directly received individual level performance feedback predicted that positively framed individual level performance feedback would have a negative effect on task performance, regardless of the context in which the feedback was provided. There was no support for this hypothesis as also indicated in Table 10, where it can be seen that positively framed individual level performance feedback that was privately provided actually had a marginally significant effect on task performance that was opposite of the predicted direction ($\beta = .10$, $p < .05$) and virtually no relationship on task performance when the feedback was publicly provided ($\beta = -.01$, $p > .05$).

Summary of Effects of the Feedback Interventions on Direct Recipients' Self- and Task-Focused Attention

In summary, there was limited support for the effects of directly receiving individual level performance feedback in a team context on self- and task-focused attention. Of the effects found, they appear to partially support the predictions derived from FIT. In particular, the public provision of individual level performance feedback had a significant, positive effect on self-focused attention, consistent with FIT, however this was only the case when the feedback was positively framed. Also consistent with FIT, the public provision of individual level feedback to a team member had a negative effect on that team member's task-focused attention. Both of these findings were found to be contingent on the sign of the feedback however. There was no support for control

theory's predictions in these data. A more thorough presentation of the implications of these findings will be presented later in the study's discussion.

Summary of the Effects of the Feedback Interventions on Direct Recipients' Task Performance

In summary, there was no support for the mediating effects of either self- or task-focused attention on the effects of directly receiving individual level performance feedback on task performance, contrary to all of the hypotheses. There was however, partial support for the hypotheses derived from feedback intervention theory and those derived from control theory. The results suggest a contingency with both theories. As hypothesized, privately provided individual level performance feedback had a positive effect on task performance, but only when it was positively framed. Also as predicted, negatively framed individual level performance feedback had a positive effect on task performance, but only when it was publicly provided. The theoretical and practical implications of these findings appear in the discussion that follows this chapter.

Hypotheses 3

Hypothesis 3 was the first of the study's hypotheses dealing specifically with the effects of individual level performance feedback on those who indirectly experienced (i.e., observed the provision of) feedback to another while working in the context of a team. This hypothesis was derived from both FIT and social cognitive theory and while ignoring the sign of the feedback, predicted positive effects of the indirect experience of observing the public provision of individual level performance feedback to another team member on observer's task performance, effects that would be partially mediated by both decreased self-focused attention and increased task-focused attention.

Since this hypothesis also predicted a mediated relationship between the feedback intervention and task performance, it was tested similar to the previous hypotheses and used multiple and hierarchical mediated regressions as shown in Tables 9 and 10. Unlike Hypotheses 1a, 1b, 2a, and 2b, which concerned the direct feedback recipients in the teams (of which there were 64 of them), Hypothesis 3 concerned only the observers in the teams. There were 192 actual observers total given that there were three observers in each of the experimental teams (3 multiplied by 64 experimental teams).

The first regressions used to test Hypothesis 3, regressed self-focused attention and task-focused attention on the eight dummy-coded variables created to represent both the experimental condition of the participant and whether or not the participant was a direct feedback recipient, an observer, or in a control group. Initial support for Hypothesis 3 would have been indicated if the effect for being an indirect feedback recipient (i.e., observer) in both the public/positive feedback condition and the public/negative feedback condition was negative and significant on self-focused attention and positive and significant on task-focused attention.

The remaining tests of this hypothesis were the same hierarchical and hierarchical mediated regressions used to test Hypotheses 1a, 1b, 2a, and 2b. As mentioned above, Steps 1a regressed post-feedback task performance on pre-feedback task performance. Steps 2a added three dummy-coded variables constructed to indicate whether the participant was assigned to either the DM1, DM2, or DM3 station. Steps 3a added eight dummy-coded variables created to represent both the experimental condition of the participant and whether or not the participant was a direct feedback recipient, an observer, or in a control group.

As also previously mentioned, in this set of regressions, mediation tests followed Steps 1a, 2a, 3a in subsequent Steps 1b, 2b, 3b, and 4b. While Steps 1b and 2b were identical to Steps 1a and Steps 2a, respectively, Steps 3b added either self-focused or task-focused attention as a predictor while Steps 4b then added the eight dummy-coded variables from Step 3a to test whether or not the various feedback interventions, and in particular, those concerning the effects of observing the provision of individual level feedback, still had an effect on subsequent task performance.

Further support for Hypothesis 3 would have been indicated if a significant effect for being an indirect feedback recipient in a public feedback condition, regardless of the private versus public nature of the feedback was found in Step 3a of the regressions and, after controlling for self-focused attention, the effect was reduced in Step 4b. In addition, the same significant effect for being a direct feedback recipient in the public feedback conditions found in Step 3a of the regressions would also have needed to be reduced in Step 4b of the regressions where task-focused attention served as a control. Again, to justify testing the full mediation hypotheses, however, there would first have to be significant effects for being an indirect feedback recipient found in the first set of multiple regressions, in addition to significant effects for self-focused attention and task-focused attention (Steps 3b) on task performance consistent with the mediation test proposed by Baron and Kenny (1986).

Hypothesis 3: Effects of Publicly Provided Individual Level Performance Feedback on Observers' Self- and Task-Focused Attention

Turning again to Table 9, it can be seen that there was no support for the predicted (and implied) direct effects of publicly provided individual level performance

feedback on observers' self- and task-focused attention. Contrary to FIT, the sign of the performance feedback did matter. As the table indicates, publicly provided individual level performance feedback had a significant, but positive effect on observer's self-focused attention ($\beta = .13$, $p < .05$), but only when it was positively framed. Publicly provided feedback had no effect on observer's self-focused attention when it was negatively framed ($\beta = -.02$, $p > .05$). As it relates to the effects of publicly provided individual level performance feedback on observer's task-focused attention, consistent with FIT, the sign of the feedback was unimportant, however, the effect was not significant and in the opposite direction from that predicted ($\beta = -.06$, $p > .05$).

Hypothesis 3: Effects of Publicly Provided Individual Level Performance Feedback on Observers' Task Performance

Hypothesis 3 predicted that regardless of the sign of the performance feedback, the effects of the indirect experience of observing the public provision of individual level performance feedback would have a positive effect on task performance that would be partially mediated by both decreased self-focused attention and increased task-focused attention. However, as previously mentioned, the failure to find significant effects between self-focused attention and task performance ($\beta = .04$, $p > .05$) and task-focused attention and task performance ($\beta = -.01$, $p > .05$) prohibited a full test of the mediated hypothesis. Thus, as with the effects of the feedback interventions on direct recipients' task performance, only the direct effects of the feedback interventions on observers are discussed below.

Turning back to Table 10, it can be seen on Steps 3a that there was partial support for this aspect of the hypothesis. In particular, observing the provision of publicly

provided individual level performance feedback did, in fact, have a positive effect on the task performance of observers when it was negatively framed ($\beta = .12$, $p < .05$). There was no significant effect for observing the provision of publicly provided individual level performance feedback on the task performance of observers when it was positively framed ($\beta = .03$, $p > .05$).

Supplemental Analyses

Finding so few effects regarding the effects of the experimental conditions (for both those who directly experienced the individual level performance feedback and those who indirectly experienced the feedback by observing its provision) on task performance, raised the possibility of two potential problems. First, there was the possibility that the task performance measure utilized in the above analyses might have been problematic. In particular, the overall task performance measure used in the previous analyses may have been too distal a performance outcome given that the feedback intervention dealt specifically with performance on the wave tracks only. Second, given that the manipulation checks revealed that the manipulation was only somewhat successful, it was possible that the predicted effects may have been found if I were to only analyze a subset of the study's participants—namely, only those who were successfully manipulated. The sections that follow describe, in detail, two sets of independent, supplemental (post-hoc) analyses that were conducted to evaluate these possibilities. The first set of supplemental analyses use wave track performance rather than overall task performance as the performance measure, or dependent variable. These analyses were conducted for each of the analyses in which overall task performance was regressed on the experimental conditions. The second set of supplemental analyses uses only those participants that

correctly (based on the condition in which they were randomly assigned) responded to the each of their manipulation check items.

Supplemental Analyses: Wave Track Performance as the Dependent Variable

Wave track performance, like overall task performance, was operationalized as the number of good attacks (i.e., attacks made on enemy tracks with a vehicle with the same amount of power as the enemy track) and waste attacks (i.e., attacks made on enemy tracks with a vehicle with more power than the enemy track) made by the participant, however this number was only calculated on the tracks that entered the participant's quadrant of the forbidden zone during his or her wave attack. In addition, an additional principal components analysis was conducted to obtain the appropriate weights for the variables used to calculate the composite. The resulting principal component equation was PC = .675 (good attacks) + .767 (waste attacks) which was similar to that of the planned analyses, however, it can be seen that waste attacks are even more predictive of performance during wave attacks. Moreover, waste attacks are more important than good attacks when participants experienced waves. This was expected given that the clear objective during wave attacks was to destroy the tracks as quickly as possible using whatever resources were available to prevent the wave tracks from occupying the highly restricted area for extended periods of time. It should be remembered that each DM had limited time and resources for accomplishing this end, so good performers recognized the need to deploy their most powerful resources to the forbidden zone during wave attacks and use less discretion with them as it related to which tracks to have the sub-platforms destroy.

The supplemental analyses yielded results almost identical to those in the initial analyses. In other words, the experimental conditions explained no more variance in task performance when task performance was operationalized as wave track performance than they did when task performance was operationalized as overall task performance (as originally planned). Specifically, the experimental conditions explained 4.5% of the variance in wave track performance compared to the 4% of the variance they explained in overall task performance.

As it relates to the effects of directly experiencing individual level performance feedback in the context of a team, the significant effect for directly receiving positively framed individual level performance feedback in the original analyses ($\beta = .10$, $p < .10$) was similar to that found in the supplemental analyses ($\beta = .11$, $p < .10$). There was a similar consistency in the effect of publicly receiving negatively framed individual level performance feedback in the original analyses compared to that found in the supplemental analyses ($\beta = .11$, $p < .05$ compared to $\beta = .16$, $p < .01$, respectively).

Turning to the effects of indirectly experiencing (i.e., observing the provision of) individual level performance feedback, the effect that was found in the original analyses for observing the public provision of negatively framed individual level performance feedback to another team member ($\beta = .12$, $p < .05$) was larger but consistent with that found in the original analyses when I used wave track performance as the dependent variable ($\beta = .20$, $p < .01$). In addition, there was only one additional effect found—a significant positive effect for being an "observer" in the feedback condition in which a fellow team member privately received negatively framed individual level performance feedback. In the original analyses, this effect was not significant as expected ($\beta = .04$, $p >$

.05), but it was marginally significant in the supplemental analyses ($\beta = .11$, $p < .10$). Given that the direct feedback recipient in this condition received his or her feedback in private, there is no clear explanation for performance improvements on the part of the other members of these teams (i.e., observers).

Supplemental Analyses: Reduced Sample

As previously mentioned, the study's manipulations were relatively successful however there was considerable room for improvement. A more extensive examination of the manipulation check items revealed that only 60% of the study's participants correctly answered all of the manipulation check items based on the condition in which they were randomly assigned. Take for instance, participants who were randomly assigned to a team in which the highest performing team member was to privately receive positive individual level performance feedback. Those who were feedback recipients should have indicated that 1) at some point after the training, they received feedback from the experimenter on their task performance, 2) the feedback they received was positive, and 3) no other person in their team received such feedback. On the other hand, observers in this condition should have indicated that 1) they did not receive any feedback from the experimenter at any point after the training and 2) no other person in their team received feedback. Another example is those participants in a team in which the highest performing team member was to publicly receive positive individual level feedback. In such case, those who were observers should have indicated that 1) they did not receive any feedback from the experimenter at any point after the training and 2) some other person in their team did in fact receive feedback after the training. Additionally, these

participants should have indicated the correct member of the team as the feedback recipient and correctly identified the positive or negative nature of the feedback.

Given that 40% of the participants failed to correctly answer all of their manipulation check items, I reexamined the data using a reduced sample of only those participants who were manipulated as intended. However, before conducting this analysis, I first determined how many participants correctly answered all of their manipulation check items. Next, I examined the data to determine what, if any patterns, account for the shortcomings of the manipulations. Specifically, I conducted analyses to determine whether or not differences across the study's four experimenters and/or differences across the experimental conditions could explain the apparent failed manipulations.

An examination of the data indicated that the manipulations were not successful for a large number of the study's participants. Of the 320 participants, 181 correctly answered each of their manipulation check items, 127 incorrectly answered at least one of the their manipulation check items, and 12 failed to provide an answer for at least one of their manipulation check items. In other words, according to this more stringent criteria for evaluating the success of the manipulation, only 60% of the study's participants were successfully manipulated.

When examined across the four experimenters, it seems that none of the experimenters were overly successful in manipulating the participants in the teams in which they were responsible with them each individually having 43%, 56%, 60%, and 66% of their participants correctly answer all of their relevant manipulation check items. Further there was considerable variance across the experimenters with the most

successful experimenter having 66% of his or her participants correctly answer all of their manipulation check items while the least successful experimenter having 43% of his or her participants correctly answer all of their manipulation check items. It should be noted though that while the percentage of successfully manipulated participants across the experimenters did in fact vary, the overall lack of success across all the experimenters (even the best experimenter successfully manipulated less than 2/3 of his or her participants) nevertheless suggests that the manipulations themselves, rather than the experimenters, might have been what presented the biggest problem in the study.

An additional analysis was conducted to determine what, if any, patterns in the data might explain the failure of the study's manipulations. For this analysis, I examined differences in the number of successfully manipulated participants across the study's conditions. These results seemed to suggest that the manipulations themselves were problematic, in particular those targeted to direct feedback recipients. Specifically, 56%, 31%, 31%, and 37% of the direct feedback recipients in the private/positive, public/positive, private/negative, and public/negative feedback conditions, respectively, correctly answered all of their manipulation check items. As for the observers, 74%, 57%, 70%, and 43% of the observers in the private/positive, public/positive, private/negative, and public/negative feedback conditions, respectively, correctly answered all of their manipulation check items. Finally, 73% of those participants in the control condition correctly answered each of their manipulation check items. These results suggest that the manipulations were not as effective as hoped.

It should be noted that one might be tempted to conclude that the seemingly unsuccessful nature of the study's manipulation might have been less a function of a

failing on the part of the manipulations, but rather a function of participants' fatigue or carelessness since all of the manipulation check items were given at the end of the study and were placed near the end of a relatively long, 248-item survey the survey instrument. For this study, the manipulation check items were intentionally placed near the end of the survey to eliminate the possibility that they would adversely affect the study's integrity by cueing participants to the study's purpose. Unfortunately, the placement of these items near the end of the survey in addition to the amount of time that participants had already devoted to the task itself does raise the possibility that participants may have simply rushed through the items or perhaps were tired of participating in the study, and thus took less care in answering the manipulation check items.

While this represented a reasonable guess as to why the responses could have been so inaccurate, I dismissed this possibility since if this was in fact the case, one would expect the accuracy to vary less across the experimental conditions. In other words, if either fatigue and/or carelessness led to the apparent lack of success of the manipulation, one would not expect the level of variation in the number of participants who correctly answered all of their manipulation check items to vary so much across the conditions as was observed in these data. For example, the least effective conditions (in terms of the accuracy on the participants assigned to these conditions on their manipulation check items) were those in which participants directly received public/positive and private/negative feedback (31% were accurate on all items). In comparison, the most effective condition was that in which the participants were assigned to the condition where the direct feedback recipient in their team privately received positive feedback (74% were accurate on all items).

Given the problems with the effectiveness of the manipulation, I therefore reduced the sample to just those participants who correctly answered each of their manipulation check items to better examine whether or not the provision of individual level performance feedback in teams had more of an impact on the task performance of those who both directly received it and those who observed its provision. In addition, I sought to determine if using only the reduced sample might eliminate the unanticipated and unexplainable significant correlation found between post-feedback overall task performance and being an "observer" in a team in which the direct feedback recipient privately received positively framed individual level performance feedback ($r = -.14$, $p < .05$, see Table 7). The reduced sample was composed of 181 participants that were accurate on all of their manipulation check items. As for the supplemental analyses of the data, I reran the hierarchical regression presented in Table 10 and unfortunately gained no additional insight into the data and the effects of the manipulations.

While using just the reduced sample eliminated the significant correlation between post-feedback task performance and being an "observer" in a team in which the direct feedback recipient privately received positive individual level performance feedback (from $r = -.14$, $p < 05$ to $r = -.04$, $p > .05$), the regression results proved to be no real improvement over that of the original analyses. In particular, the regression using the reduced sample explained 36% of the variance in overall task performance compared to 27% explained in the original analysis and this additional variance explained was attributed primarily to a larger effect for being a direct recipient of publicly provided, negatively framed individual level performance feedback ($\beta = .27$, $p < .01$ compared to $\beta = .11$, $p < .05$ from the original analysis). Moreover, no effects were found for any of the

other experimental conditions on participants' overall task performance and the two previous steps of the regression (i.e., that predicting post-feedback task performance with pre-feedback task performance and that predicting post-feedback task performance with DM station assignment as control variables) yielded identical results.

In sum, while it was fruitful to adjust the sample size by taking into consideration only those participants that were successful recipients of the manipulation, the results of the supplemental analyses did not provide any additional insights into the lack of effects for the experimental conditions beyond the conclusion that the effects were simply small in nature. Moreover, all of these analyses were conducted post-hoc and given the small, and arguably insignificant, differences in the results yielded from the original analyses compared with that of the supplemental analyses, only the original, planned analyses are discussed in the chapter that follows. The remaining a priori hypotheses are presented in the sections below. These hypotheses go beyond more object task performance measures and concern the effects of the experimental conditions on social outcomes in the teams.

Hypotheses 4a, 4b, and 4c

The study's final hypotheses predicted that providing individual level performance feedback in teams would have a negative effect on levels on cohesion (Hypothesis 4a), viability (Hypothesis 4b), and potency (Hypothesis 4c) in teams and that these effects would be mediated by increased levels of social comparisons in teams. As such, these hypotheses implied that there would be a significant, positive effect of providing individual level performance feedback in teams on levels of social comparisons in teams. This aspect of the hypotheses, while addressing a theoretically interesting relationship in-and-of-itself, sets the stage for the full test of the hypotheses which sought

to examine the mediating effects, if any, that social comparisons in teams have on the relationship between the provision of individual level performance feedback in teams and team social outcomes.

To test these hypotheses, a multiple regression and hierarchical mediated regression analysis was employed using the eighty teams. The multiple regression predicted social comparisons levels in the teams. Given that the level of social comparisons in each team was the dependent variable of interest, the predictors were the experimental conditions in which each team experienced. As such, four dummy-coded variables were created to represent the experimental condition in which the team was randomly assigned. That is, four dummy-coded variables were constructed that accounted for the study's four experimental conditions. There was no dummy-coded variable for the effects of being in the control condition as these teams served as the reference group in the regression analysis.

The regression contained one step in which social comparisons were regressed on the four dummy-coded predictors. Support for Hypotheses 4a, 4b, and 4c would have been contingent on there first being evidence of positive and significant effects found for being in the experimental conditions on levels of social comparisons in the teams.

The hierarchical mediated regressions followed. Steps 1a regressed post-feedback measures of each team social outcome on each of their respective pre-feedback measures. Steps 2a added four dummy-coded variables created to represent the experimental condition in which the team was assigned. Given the hypothesized mediating effects of social comparisons on the effects of the feedback conditions on the team social outcomes, the mediation tests followed Steps 1a and 2a in subsequent Steps 1b, 2b, and 3b. Steps 1b

are identical to Steps 1a. Step 2b added social comparisons to the analyses while Steps 3b then added the four dummy-coded variables from Step 2a to test whether or not the various feedback conditions still had an effect on subsequent task performance.

Support for Hypothesis 4a, 4b, and 4c would have been further indicated if there was a significant effect for each of the various feedback conditions on team cohesion (Hypothesis 4a), team viability (Hypothesis 4b), and team potency (Hypothesis 4c) in Steps 2a of the regressions and those effects were no longer significant in Steps 3b after controlling for social comparisons in Step 2b of the regression. Consistent with Baron and Kenny's (1986) method of testing for mediation, there would first have had to be significant effects found in the first multiple regressions, in addition to significant effects for social comparisons on team cohesion, viability, and potency, Hypotheses 4a, 4b, and 4c, respectively, to justify testing the full mediation hypotheses.

Hypothesis 4: Effects of the Feedback Interventions on Social Comparisons in Teams

As can be seen in Table 11, there was no support for the implied effects of the feedback interventions on levels of social comparisons in teams. Overall the provision of individual level performance feedback in teams, did not explain a significant amount of variance in social comparisons ($\Delta R^2 = .06$, $p > .05$).

Hypothesis 4: Effects of the Feedback Interventions on Team Cohesion, Viability, and Potency

Given that there was no support for the predicted effects of the feedback interventions on social comparisons in teams, there was no support for testing for the mediating effects of social comparisons on the relationship between the provision of

individual level performance feedback in teams and team social outcomes. In other words, the failure to find support for the more proximal effects of the feedback interventions precludes a full test of the remainder of the study's hypotheses. As a result, only the direct effects of the feedback interventions on team social outcomes are discussed below.

Table 12 presents the results of three hierarchical mediated regression analyses that were used to test each of the hypotheses. Steps 1a regressed post-feedback levels of each of the social measures on each of their respective pre-feedback levels. In Steps 2a, the four dummy-coded variables created to represent the experimental condition the teams were assigned were entered into the regression analyses. As mentioned, the mediation tests followed in Steps 1b, 2b, and 3b however they will not be discussed given the inability to support any mediation given the lack of effects of the feedback conditions on social comparisons discussed above.

Hypothesis 4a: Team Cohesion. As can be seen in Table 12, pre-feedback levels of team cohesion predicted almost all of the variance in post-feedback levels of team cohesion ($\Delta R^2 = .83$, $p < .05$). Overall, the feedback interventions only predicted an additional 1% of the variance in post-feedback levels of team cohesion ($\Delta R^2 = .01$, $p > .05$). While all of the effects were in the predicted direction only the public provision of negatively framed individual level performance feedback had a significant effect on post-feedback levels of team cohesion ($\beta = -.13$, $p < .05$). Therefore there was very limited support for Hypothesis 4a.

Hypothesis 4b: Team Viability. Turning to Hypothesis 4b, which predicted negative effects of providing individual level performance feedback on levels of team viability,

there was no support for this hypothesis as also seen in Table 12. Similar to team cohesion, pre-feedback levels of team viability explained almost all of the variance in post-feedback levels of team viability ($\Delta R^2 = .73$, $p < .05$) (Step 1a). The addition of the dummy-coded variables representing the various feedback conditions in Step 2a yielded almost no additional variance explained in post-feedback levels of team viability ($\Delta R^2 = .01$, $p > .05$). Table 12 further shows that of the effects of providing individual level performance feedback to a member of the teams, none were significant.

Hypothesis 4c: Team Potency. Finally, Hypothesis 4c which predicted that providing individual level performance feedback in teams would have a negative effect on team potency received no support. Pre-feedback levels of team potency explained much of the variance in post-feedback levels of team potency ($\Delta R^2 = .68$, $p < .01$) as seen in Step 1a of Table 12, while the addition of the dummy-coded variables representing the feedback conditions explained only an additional 1% of the variance in post-feedback levels of team potency. Further, none of the effects were significant.

Summary of Effects of the Feedback Interventions on Team Social Outcomes

In summary, there was no support for the mediating effects of social comparisons on the effects of the provision of individual level performance feedback on team social outcomes. In addition, there was virtually no support for any direct negative effects of providing individual level performance feedback to a member of the team on social outcomes. The only support found was a significant, negative effect of publicly providing a team member with negative individual level performance feedback on team cohesion.

Table 11

Multiple Regression Effects of Individual Level Feedback Conditions on Social Comparisons

Step		Social Comparisons		
		R^2	ΔR^2	β
(1)		.06	.06	
	DC Private/Positive Condition			-.09
	DC Public/Positive Condition			.14
	DC Private/Negative Condition			.03
	DC Public/Negative Condition			.13

Note. n = 80. DC = Dummy-Coded. † $p < .10$ * $p < .05$.

Table 12

Hierarchical Mediated Regression Effects of Individual Level Feedback Conditions and Social Comparisons on Team Social Outcomes

		Social Measures								
		Team Cohesion (Post-feedback)			Team Viability (Post-feedback)			Team Potency (Post-feedback)		
Step		R^2	ΔR^2	β	R^2	ΔR^2	β	R^2	ΔR^2	β
(1a)		.83*	.83*		.73*	.73*		.68*	.68*	
	Social Measure (Pre-feedback)			.91*			.86*			.38*
(2a)		.84*	.01		.74*	.01		.69*	.01	
	DC Private/Positive Condition			-.08			.07			-.02
	DC Public/Positive Condition			-.06			.10			.08
	DC Private/Negative Condition			-.04			.05			-.04
	DC Public/Negative Condition			-.13*			.05			.01

N = 80. DC = Dummy-Coded. † $p < .10$ * $p < .05$.

Table 12 cont'd

		Social Measures								
		Team Cohesion (Post-feedback)			Team Viability (Post-feedback)			Team Potency (Post-feedback)		
Step		R^2	ΔR^2	β	R^2	ΔR^2	β	R^2	ΔR^2	β
	Controlling for Social Comparisons									
(1b)		.83*	.83*		.74*	.74*		.68*	.68*	
	Social Measure (Pre-feedback)			.91*			.86*			.83*
(2b)		.83*	.00		.79*	.05*		.72*	.04*	
	Social Comparisons			.06			.25*			.22*
(3b)		.84*	.01		.79*	.00		.73	.01	
	DC Private/Positive Condition			-.08			.07			-.02
	DC Public/Positive Condition			-.07			.05			.04
	DC Private/Negative Condition			-.04			.05			-.04
	DC Public/Negative Condition			-.12*			.05			.02

N = 80. DC = Dummy-Coded. † $p < .10$ * $p < .05$.

CHAPTER SEVEN: DISCUSSION

This study sought to explore the effects of individual level performance feedback on the direct and indirect feedback recipients in teams by testing several hypotheses derived from a number of theoretical frameworks, all of which seemed to suggest the implications of providing individual level performance in teams. Kluger and DeNisi's (1996) Feedback Intervention Theory (FIT) in addition to Carver and Schier's (1981) control theory provided the theoretical frameworks for examining the effects of directly receiving such feedback in teams. FIT and control theory both predicted that feedback interventions influence task performance through the attention that the feedback interventions direct to both the self and the task, however, the nature of these effects differed dependent on the theoretical framework.

FIT predicted that, dependent on the public versus private nature of the performance feedback, more or less attention would be directed to both the self and the task. Specifically, FIT predicted that public feedback interventions would increase attention to the self and decrease attention to the task while private feedback interventions would decrease attention to the self and increase attention to the task. FIT further predicted that increased attention to the self would have a detrimental effect on task performance and increased attention to the task would have positive effect on task performance. Moreover, since FIT makes no explicit mention of the sign of the feedback, the aforementioned predictions did not take into consideration the positive versus negative nature of the feedback.

Control theory, on the other hand, focused primarily on the sign (positive versus negative nature) of the feedback, with negatively framed performance feedback directing

more attention to the self and to the task and positively framed performance feedback directing less attention to the self and the task. Control theory further predicted a positive relationship between both self- and task-focused attention and task performance (i.e., increased attention to the self and increased attention to the task both positively influence task performance while decreased attention to the self and decreased attention to the task both have detrimental effects on task performance).

The control theory predictions, however, are based on what the theory would predict for those who directly receive the performance feedback and ignore the potential effects that observing the provision of individual level performance feedback to a fellow team member may have on the task performance of those who indirectly experience the feedback by observing its provision. Turning to these effects (i.e., those on the observers), social cognitive theory and an extension of FIT provided some insight into how being privy to the provision of individual level performance feedback might influence the task performance of observers—a situation that is made possible when individuals work in a social context such as a team and when individual level performance feedback is publicly provided. Social cognitive theory suggested that individuals do not have to directly experience feedback in order to learn from it (or in this case experience performance improvements). In fact, social cognitive theory suggested that much of the learning (and performance improvements) that occurs in social contexts occurs from learning indirectly from the experiences of others. Further, FIT predicted that the indirect experience of observing a fellow team member receive individual level performance feedback would influence the task performance of observers, through its direct effects on observers' self- and task-focused attention. Specifically, FIT predicted

that observing the public provision of individual level performance feedback, regardless of the sign of the feedback, would decrease attention to the self and increase attention to the task. Again, FIT further predicted that decreased attention to the self would have a positive effect on task performance and increased attention to the task would have positive effect on task performance. Again, since FIT makes no explicit mention of the sign of the feedback, these aforementioned effects did not take into consideration the positive versus negative nature of the feedback.

Finally, the study here attempted to explore what effects, if any, the provision of individual level performance feedback would have on the social dynamics and functioning in teams, as a number of scholars have insisted that singling out the individual performance of an individual who is working in a social context such as a team would have negative effects on the team's social outcomes. It has further been suggested that the negative effects of providing individual level performance feedback on team social outcomes would occur through its direct effects on the extent to which the team members engage in social comparisons with one another.

The theoretical model presented in Figure 4, which was based on the theoretical relationships described above between individual level feedback interventions and task performance and social outcomes, received very limited support in the test of the data presented in the previous chapter. As expected, it appears that the effects of feedback interventions on the task performance of those who directly receive them is small however the effects that were found do not provide overwhelming support for one theoretical foundation over another. Moreover, the provision of individual level performance feedback had very few effects on direct feedback recipients' self- and task-

focused attention therefore suggesting that whatever effects the direct provision of performance feedback had on team members' task performance is not completely mediating, if mediated at all, by self- and task-focused attention. There was only little support found for the hypothesized effects of observing the provision of individual level performance feedback on observers' task performance and these effects were not mediated by either self- or task-focused attention. Finally, there was almost no support found for the hypothesized negative effects of providing individual level performance feedback in teams on teams' subsequent social dynamics. Each of these effects will be discussed in more detail below. The one effect that was found was not mediated by social comparisons.

Effects of Feedback Interventions on Self-Focused Attention

Effects on Direct Feedback Recipients

Following both FIT and control theory, the model predicted that directly receiving individual level performance feedback in the context of a team would influence direct feedback recipients' self-focused attention, however the nature of this effect differed depending on the theoretical framework. FIT predicted that public feedback interventions would increase direct feedback recipients' attention to self while private feedback interventions would decrease their attention to self. These predictions placed no emphasis on the sign of the feedback. Control theory, on the contrary, placed specific emphasis on the sign of the feedback, and predicted that regardless of the public versus private context of the feedback, self-focused attention would be increased when the feedback was negative and decreased when the feedback was positive.

Neither of these two conflicting theories received overwhelming support in these data, as the feedback interventions had almost no effects on direct recipient's self-focused attention, however the one effect that was found was found suggests that both theories ignore an important component of the feedback as it relates to the provision of individual level performance feedback in teams.

In particular, it was found that the public provision of individual level performance feedback increased attention to the self however this was only the case when the feedback was positive. In other words, team members who were singled out in the presence of the rest of their team, commended on their performance, and told that the performance strategies they used were critical in improving the team's overall performance, focused more attention on demonstrating their skills and abilities and thus maintaining other's perceptions of themselves. This finding is consistent with FIT, however is it contrary to control theory as these individuals did not decrease their attention to self. Control theory predicted that these individuals would become "de-motivated" so-to-speak and disengage from the process of devoting attention to demonstrating their competence on the task (i.e., fail to maintain a particular perception of themselves and their performance), which control theory goes on to predict can be harmful to task performance.

Interestingly, the positive effect of publicly receiving individual level performance feedback on self-focused attention was not found for those who publicly received negatively framed feedback, as the public provision of negative feedback had no effect whatsoever on direct feedback recipients' self-focused attention. This finding was inconsistent with both FIT and control theory and has some important theoretical

implications. Clearly, it suggests that not all publicly provided feedback increases self-focused (or what Kluger & DeNisi, 1996 would refer to as meta-task attention). Further, it suggests that only publicly provided positive feedback leads team members to try to maintain that impression of themselves and consequently, devote attention to their selves. In other words, it appears that positively framed public feedback leads individuals to perceive that they are accountable for maintaining the perception of being competent on the task in front of others. In this study, negatively framed public feedback did not have the same effects. Team members who received such feedback did not appear to devote attention to creating better impressions of themselves and their task-related skills and abilities. More important, this finding suggests that FIT may be limited in its predictability, at least in its current form, as it fails to make explicit the importance of the sign of the feedback. The differential effects of positively and negatively framed performance feedback highlight this potential deficiency.

Effects on Observers

The model proposed here also predicted that observing the provision of individual level performance feedback to another team member would influence the extent to which the observers directed attention to self. The hypotheses developed in regards to the potential effects of the observing provision of performance feedback to a fellow team member were based on both social cognitive theory and FIT and suggested that observing another team member receive individual level performance feedback would influence the observer via the decreased attention it would direct toward the observers own self (i.e., meta-task) attention. Very little support was found that supported this hypothesis.

Contrary to FIT, observing the provision of individual level performance feedback to another member significantly increased observers' self-focused attention when the feedback was positively framed. Only when the feedback was negatively framed did it affect observer's attention in the predicted direction, however this effect was not significant. Thus, again, these data seem to suggest that an important future direction for the development of FIT is to place more importance on the sign of the feedback as positively and negatively framed individual level performance feedback had different effects on self-focused attention in this study.

Beyond the theoretical contributions that these findings make towards the development of FIT, these findings also suggest some interesting practical implications. In particular, it appears that even those team members who are not the direct feedback recipients of individual level performance feedback when one individual in the team is singled out and provided such feedback are, to at least a small extent, affected by the feedback. In this study, those team members who observed a team member being commended for their good performance, directed their attention to creating their own perceptions of being a competent performer. This seems to suggest that rewarding one individual in a team for his or her performance may result in fostering self-consciousness among the other members of the team. Observing a team member being singled out for his or her poor performance, on the other hand, apparently had no effect on team members' need to prove themselves to be competent performers suggesting that perhaps the absence of directly received individual performance feedback when a fellow team member is singled out for his or her poor performance leads others to perceive that they are performing well.

Effects of Feedback Interventions on Task-focused Attention

Effects on Direct Feedback Recipients

The model also predicted, following both FIT and control theory, that directly receiving individual level performance feedback in the context of a team would influence direct feedback recipients' task-focused attention. Again, the nature of this effect differed depending on the theoretical framework. Turning first to FIT, FIT predicted that, regardless of the sign of the feedback, public feedback interventions would decrease direct feedback recipients' attention to the task while private feedback interventions would increase their attention to self. Control theory, on the other hand, specifically addressed the sign of the feedback and predicted that task-focused attention would be increased when the feedback was negative and decreased when the feedback was positive, regardless of the context in which the feedback was provided.

The predictions derived from FIT were partially supported, while none of control theory's predictions were supported in these data. Specifically, only one significant effect was found for directly receiving individual level performance feedback on task-focused attention. In particular, only publicly provided negatively framed feedback influenced direct feedback recipients' task-focused attention, and this effect was negative. Again, this finding suggests that any theory that seeks to determine how the provision of individual level performance feedback affects those working in team contexts must consider both the sign of the feedback and the context in which it is provided.

Consistent with FIT, the public provision of individual level performance feedback led to decreased attention to the task, however this was only the case when the feedback was negatively framed. Thus, in this study, those who, while in the presence of

others, directly received performance feedback that indicated that they were performing poorly, focused less on the task-at-hand. These individuals appeared to become less concerned with the amount of effort they put toward the task and less concerned with better learning the appropriate task performance strategies. This effect was not found when the feedback was positively framed.

The negative effect of publicly receiving negatively framed performance feedback on task-focused attention was opposite of control theory's predictions as was the finding that privately provided, negatively framed performance feedback had a negative, although not significant effect on task-focused attention. These findings suggest that the context in which the feedback is provided might offer some important boundary conditions for the predictions made by control theory, in that control theory clearly suggested that negative feedback loops that indicate that performance standards are not being met should have led feedback recipients to direct more attention to the task, and thus minimizing the gap between their performance and their performance standards. As such, the findings of this study provide interesting insights regarding both control and FIT theories.

Effects on Observers

Based on social cognitive theory and FIT, the model predicted that observing the provision of public individual level performance feedback would lead observers to direct more attention to the task. While social cognitive theory predicted that team members would learn from feedback even when were not the direct recipients of that feedback, this prediction was based primarily on the FIT and what it suggests about the effects of feedback that is publicly provided in a social context such as a team. Specifically, FIT

predicted that feedback observers would be more likely to divert attention to the task when they merely observed its provision unlike those who directly received it who would be more likely to have their attention diverted to creating and maintain perceptions of their selves.

These data provided no support for this prediction as all of the observers in this study directed less attention to the task after being privy to the public provision of individual level performance feedback to a singled out member of the team. This, in combination with the previously discussed findings, suggests that the public provision may not only direct attention away from the task for those who directly receive the feedback but also those who observe its provision. As such, these data raise some questions regarding the validity of some of FIT's predictions.

As an aside, it is interesting to note the empirical relationship between self- and task-focused attention observed in these data. As shown in Table 7, self-focused attention and task-focused attention were positively and significantly correlated ($r = .58$, $p < .01$). While the positive nature of their relationship is consistent with Carver and Scheier's (1998) theoretical discussions of the self- and task-focused attention (e.g., the authors stated that self-focus is often associated with task-focus and that increases in self-focus can promote increases in task-focus), it should be noted that there was no a priori reason to believe that empirically the relationship between the two would be so strong. Moreover, the positive nature of this relationship is inconsistent to the theoretical discussions of Kluger and DeNisi (1996) in that their discussion of FIT, namely their discussion of meta-task, task-learning, and task-motivation processes, suggested that the relationship between self-focused attention and task-focused attention is negative.

Specifically, FIT argues that attention devoted to the self takes away attention that can be devoted to the task. The conflicting predictions regarding the relationship between self-focus and task-focus are interesting and there are a number of possible reasons why such a strong positive relationship was found between the two in these data.

First, it is possible that one or both of the measures (self- or task-focused attention) were not accurate, or valid, measures. Fortunately, I included an additional measure of self-focused attention, one that was adapted from a measure designed by Fenigstein, Scheier, and Buss (1975). The Festigstein et al. measure is a commonly used self-focus scale that purports to measure self-focused attention as a stable and dispositional difference (Hollenbeck & Williams, 1987). There was no other, backup, measure of task-focused attention used in this study. When self-focus was measured with the Fenigstein et al. (1975) measure, the relationship between self-focused attention and task-focused attention, while lower ($\underline{r}$ = .43 compared to $\underline{r}$ = .58) was no less statistically significant. While this finding does not eliminate the possibility that the task-focused attention measure was problematic in this study, it more likely suggests that self- and task-focused attention are in fact positively related to each other.

The possibility that there is in fact a positive relationship between self- and task-focused attention deserves even more support in light of the fact that, in these data, there appears to be at least some support for the discriminant validity between the two constructs as they were measured in this study. For example, while self- and task-focused attention were highly related to one another, only self-focused attention was significantly affected by the direct and public receipt of positively framed feedback ($\underline{r}$ = .13, $\underline{p}$ < .05) while there was no effect on task-focused attention ($\underline{r}$ = .07, $\underline{p}$ > .05). Similarly, only task-

focused attention was significantly affected by the direct and public receipt of negatively framed feedback ($r = -.19$, $p < .01$) while there was no effect on self-focused attention ($r = -.04$, $p > .05$). Taken together, it appears that the results of this study lend support to Carver and Scheier's (1998) notion that self-focused attention, rather than interfering with task-focused attention, actually promotes it, contrary to FIT.

Carver and Scheier (1998) suggested that researchers should take care to distinguish between discussions of self-focus in which self-focus is used to represent negative rumination (i.e., a focus on self-doubt and perceptions of inadequacy) from those in which self-focus is used to represent attention directed inwards as in self-regulation. Thus, it appears that either 1) the present study failed to clearly distinction such rumination from FIT's meta-task attention, 2) FIT should better articulate how meta-task attention is distinct from Carver and Scheier's notion of self-focus, or that 3) FIT may make some incorrect theoretical predictions regarding the relationships between attention to meta-task processes, task-learning processes, and task-motivation. Nevertheless, it is clear that this subject deserves more empirical attention, as a review of the literature on self-focused attention and task-focused attention failed to produce any published studies that have explicitly examined the empirical relationship between the two constructs.

Effects of Feedback Interventions on Task Performance

Effects on Direct Feedback Recipients

As seen in Figure 4, the model also predicted that directly providing individual level performance feedback to a member of a team would influence the team members task performance. These effects were predicted to be mediated by the attention directed to

both self- and task-focused attention. There was no support whatsoever for the mediated effects of either self- or task-focused attention, however the provision of such feedback did have some direct effects on direct recipients' task performance.

FIT predicted that, regardless of the sign of the feedback, publicly provided feedback would negatively influence direct recipients' task performance, while privately provided feedback would positively influence direct recipients' task performance. These hypotheses (Hypotheses 1a and 1b) received partial support in this study. As predicted by FIT, privately provided individual level performance feedback did, in fact, have a marginally significant, positive effect on direct recipients' task performance. However, this was only the case when the feedback was positive. There was no support found for FIT's prediction that publicly provided individual level performance feedback would have a negative effect on direct feedback recipient's task performance.

The above findings, however, must be examined in light of the findings regarding control theory's predictions that, regardless of the context in which the feedback is provided, negatively framed individual level performance feedback would have a positive effect on direct feedback recipients' task performance while positively framed individual level performance feedback would have a negative effect on direct feedback recipients' task performance. In this study, contrary to control theory, positively framed feedback had a marginally significant, positive effect on direct recipient's task performance when it was privately provided. On the other hand, consistent with control theory, negatively framed individual level performance feedback had a significant, positive effect on direct feedback recipients' task performance when it was publicly provided.

Taken together, these data suggest that neither FIT nor control theory present a complete picture of the effects of feedback interventions as it relates to the provision of individual level performance feedback in team contexts. Specifically, FIT's failure to address the sign of the performance feedback, and control theory's failure to speak to the context in which the feedback is provided, limit both of the theories' predictability. The results of this study, clearly suggest that there is an interaction among the predictions of the two theories in regards to the effects of feedback interventions on task performance in teams. Privately provided individual level performance feedback had a positive effect on direct feedback recipients' task performance, however this was only the case when it was positively framed. Negatively framed individual level performance feedback had a positive effect on direct feedback recipients' task performance, however only when the feedback was publicly provided. In fact, publicly provided, negative individual level feedback had the most significant effects on direct recipients' task performance during task #2.

The theoretical implications of these findings are clear. FIT and control theory both have boundary conditions that each ignores. Moreover, the theories have the ability to inform each other, in that when one takes into account the factors that each of the theories ignore, significant insight is gained into the effects that individual level feedback interventions have on the individual task performance of those working in team based work structures. These data make clear the fact that neither theory has a monopoly on valid predictions as it regards the effects of feedback in teams. Future attempts towards understanding the implications of providing individual level performance feedback in teams should therefore take into account, at the least, both the sign of the feedback in

addition to the context in which it is provided. The fact that these effects (those for privately provided, positive framed feedback and for publicly provided, negatively framed feedback) were not mediated by either self- and task-focused attention however, highlights that there remains aspects of both FIT and control theory that deserve further empirical attention and perhaps even theoretical refinement.

As for what happened in these data, in particular the effects found for the feedback interventions on performance, it is important to note that these effects were not mediated by either self- or task-focused attention. In fact, the results of this study failed to provide support for partially mediated effects for either self- or task-focused attention. This finding, while unexpected, suggests that the provision of individual level performance feedback can have some effects on direct recipients' task performance in teams however the effects are due to some other mediating mechanism or mechanisms not measured in this study.

In light of the specific effects that were found in regards to those who directly received the individual level performance feedback in this study (i.e., those direct feedback recipients in the private/positive and public/negative conditions), there are a number of potential mediators that might have played some role in affecting, more proximally, the task performance of direct feedback recipients. Those participants who received positive feedback in private, while not necessarily trying to maintain positive perceptions of their performance with the other members of their group, might have attempted to maintain those positive perceptions with regards to their experimenter. While the experimenter did present somewhat of an audience, thus potentially triggering some of the negative effects of social facilitation (Zajonc, 1965) and other forms of self-

maintenance, the fact that there was only an audience of one for these participants (i.e., one experimenter who was not an actual member of the team) might have led to a situation unlike that created when one is attempting to maintain a perception, or impression, with a larger group of vested others. Stated another way, the effort put into managing impressions in front of a group of others might not be detrimental to task performance when the "others" are smaller in number and less connected to the actual task and its outcomes.

Unfortunately, the failure to find any significant effects of this experimental condition on direct feedback recipients self-focused attention in addition to the unsuccessful nature of the manipulation makes it difficult to draw such a conclusion (only 56% of these participants correctly answered each of their manipulation check items), however it is worth noting that the private/positive condition was the most successful of the experimental manipulations on direct feedback recipients. Thus, it appears that directly receiving private/positive feedback had no significant effects on self-maintenance activities therefore future research should examine other potential mediators of the effects of individual level performance feedback on task performance on individuals working in groups beyond those typically considered when examining the effects of performance feedback on individuals working alone.

At the least, the findings of this study reaffirm the importance of the feedback context in that effects that one might expect to find when studying individuals working were not found when studying individuals working in teams despite strong theoretical arguments and empirical support at the individual level. Again, and as previously discussed, the majority of what scholars and practitioners know about the effects of

performance feedback on task performance has been learned in contexts in which individuals worked alone, unlike the context studied here. The theoretical frameworks used to develop the theoretical model tested in this study, in particular FIT, may not readily apply to situations in which one is dealing with teams of interdependent individuals rather than individuals working alone. Further, given the relative newness of FIT, it might be worthwhile for researchers to first test its predictions at the individual level prior to testing it at the team level. This would seem especially appropriate given that there are currently no published empirical studies that set out, a priori, to test FIT's predictions.

As for the direct recipients of negative feedback that was given publicly, the increases in their task performance might be attributed to increased perceptions of accountability. Clearly, these participants found out first hand that there were unpleasant repercussions for performing poorly. Specifically, they were singled out in front of the rest of their team and told how unsuccessfully they had performed. Oddly, this seemed to have no effect on their levels of self-focused attention despite strong theoretical hypotheses to the contrary. Moreover, receiving such feedback had a significant, negative effect on their task-focused attention. Thus, while it appears that these individuals disengaged from the task, they nevertheless improved perhaps since they felt an obligation to the team, rather than themselves, the experimenter, or the task itself. Future research should explicitly examine the potentially mediating role of accountability on the relationship between individual level feedback and task performance in teams. This finding suggests that researchers should consider whether the predictions made by both FIT and control theory hold across multiple levels of analysis.

Beyond the theoretical questions and implications raised by the results of this study, the data also suggest some interesting practical implications as well. Contrary to popular belief, it appears that providing positively framed feedback is not the de-motivator that it has historically been believed to be. This is particularly the case when the feedback is privately provided, as individuals who directly received privately provided and positively framed individual level performance feedback in this study improved in task #2. This finding was inconsistent with control theory in that it predicted that these individuals would have not reason to improve as the discrepancy between their performance and their performance standards would indicate that they have already met or exceeded their performance standard. Yet in this study, these individuals still experienced performance improvements that could not be explained simply by practice effects.

Effects on Observers

Social cognitive theory in addition to FIT provided the theoretical underpinnings of the model's predictions regarding the effects of observing the provision of individual level performance feedback to a fellow team member on the task performance of other members of the team who were privy to its provision. The model predicted that when publicly provided, individual level performance feedback directed to another member of the team would lead to increased levels of task performance among those who observed its provision. This hypothesis was partially supported in these data, yet the results of this study again bring to light the fact that there are boundary conditions that FIT fails to address, namely the sign of the performance feedback. In this study, observers experienced the largest effect of the provision of individual level performance feedback

in teams, however this effect was found only when the feedback was negatively framed and publicly provided. Observers in this condition significantly improved during task #2, an effect that could not be accounted for solely by practice effects on the task. While this provides both some support and theoretical insights for FIT, perhaps what is most interesting are the practical implications of this finding.

A number of scholars have suggested that singling out an individual team member for his or her individual task performance can have debilitating effects on a team as a whole while they have failed to consider the performance improvements that can potentially occur among those who are privy to the provision of such feedback. The results of this study demonstrate that observers can in fact experience increases in their own performance, simply from being present when such feedback is provided. This is particularly the case when the feedback is negative. As discussed in previous chapters, this is an important oversight, as it fails to consider the learning, and subsequent performance improvements, that can occur via indirect experiences. Social cognitive theory places specific emphasis on these opportunities and these data highlight the benefits of this indirect experience.

Further, since these effects were not mediated by either self- or task-focused attention, it might again be fruitful for researchers to consider other potential mediators such as accountability since it would seem reasonable to believe that observers, having observed a fellow team member receive negatively framed performance feedback, which as discussed in previous chapters operates as a form of punishment, felt it necessary to improve themselves if they believed that they themselves might be singled out for their performance in the future. It also seems plausible that these observers, rather than

perceiving increased accountability for their own performance, may have felt the need to maintain perceptions of themselves as adequate, if not good, performers since the absence of their own individual level feedback may have led them to believe that their performance was, at the least, satisfactorily. However, in these data, these observers' self-focused attention was not affected by having observed the provision of individual level performance feedback to another member of their team. Thus, accountability seems to again be a potential mediator that deserves future attention from researchers. Finally, it deserves mention that while it seems very possible that accountability is a likely mediator of the effects of having observed a team member publicly receive negatively framed performance feedback, it is difficult to make specific predictions about what might have happened given the unsuccessful nature of the study's manipulations.

Effects of Feedback Interventions on Social Comparisons

Turning now to the team level effects of providing individual level performance feedback in teams, this study sought to test whether or not the provision of individual level performance feedback in teams actually has negative effects on social dynamics and functioning in teams as often suggested by a number of scholars (e.g., Smither, 1998). One particular goal of this study was to examine whether the hypothesized negative effects on team social outcomes were actually mediated by increased levels of social comparisons among the members of the teams in which a member of the team received individual level performance feedback. As a first step, the study examined the effects of providing individual level performance feedback on levels of social comparisons in teams.

The model predicted, in part, that the provision of individual level performance feedback to a member of the team would lead to increased levels of social comparisons in teams, in particular when the feedback was publicly provided. While these data showed that there were, in fact, higher levels of social comparisons in teams in which individual level performance feedback was publicly provided, the effects were not significant, thus failing to provide empirical support for this prediction. This finding precluded a test for the mediating effects of social comparisons in teams on the relationship between the provision of individual level performance feedback and team social outcomes, however it does suggest that publicly providing such feedback does in fact lead to, at least some, increased levels of social comparisons in teams. The fact that these effects were not statistically significant, however, demonstrates that scholars may be overly concerned with the effects of providing individual level performance feedback on subsequent social comparisons made in teams. Further support that scholars may have unfounded concerns about social comparisons is provided in these data which reveal that social comparisons are positively, rather than negatively related to team social outcomes (see Table 8).

Effects of Feedback Interventions on Team Social Outcomes

Finally, the model predicted that the provision of individual level performance feedback would have detrimental effects on various aspects of social functioning in teams. These effects, as previously mentioned, were hypothesized to be mediated by social comparisons in teams, however the failure to find significant effects of the feedback interventions on social comparisons precluded a full test of these hypotheses. Therefore, only the direct effects of the feedback interventions on team social outcomes are discussed below.

The model predicted that the provision of individual level performance feedback would negatively affect team cohesion, team viability, and team potency. These data reveal that there was virtually no support for any of these hypotheses. The only significant effect found was for the influence of publicly providing negatively framed individual level performance feedback to a team member on the teams' sense of cohesion. This effect was negative as hypothesized however the feedback interventions as a whole only predicted an additional one percent of the variance in team cohesion. Further it should be noted that almost all of the variance in team cohesion, team viability, and team potency during task #2 was explained by previous levels of team cohesion, team viability, and team potency, respectively thus indicating that there was little, if any, changes in these team outcomes that could be explained by the experimental manipulations. Therefore, the provision of individual level performance feedback to a member of the teams, in this study, had no effect on team social outcomes. Thus, it appears that the admonitions of team scholars who recommend against the provision of individual level performance feedback to those working in teams are largely unwarranted. In this study, team social outcomes were not affected by the provision of individual level performance feedback to a member of their team.

It should be noted, however, that in this study attempts to elucidate the effects of providing individual level performance feedback on team social outcomes is further complicated by the fact that overall there were no changes in team social outcomes from task #1 to task #2. While this may have been due to stability in these outcomes across the two tasks, one cannot dismiss the possibility that it was due to the teams not being able to accurately perceive any measurable differences in the team social outcomes from task #1

to task #2. In other words, the inability to explain any significant incremental variance in team cohesion, viability, and potency, while potentially due to there simply being no effect for the provision of individual level performance feedback in teams, might have been a result of the teams' inability to discriminate between high and low levels of each of these outcomes in the teams.

Moreover, it is very likely that participants in this study were unable to discriminate not only between high and low levels of team cohesion, viability, and potency, but also among the three constructs altogether. While a confirmatory factor analysis of the data revealed that the three team social outcomes all loaded on separate factors, the fact remains that they were all highly correlated (see Table 8). Such high correlations among each of the team social outcomes suggests that one should be cautious in interpreting the results of this study as it relates to the effects of the feedback manipulations on team social outcomes.

Unfortunately, this is a potential problem of research of this nature—team level research using participants who are working together for a short duration of time on a hypothetical task (e.g., laboratory teams). As such, it would be wise for this hypothesis to receive further empirical examination under more realistic and longitudinal conditions. Indeed, it may have been the case that when working together for a period of only three hours the participants of this study had little information to base their responses to questions about the extent to which they share a common fate, their potential for working together in the future, and their perceptions of the extent to which their teams would be effective. This clearly raises some concern about the finding that the provision of individual level performance feedback has no effects on team cohesion, viability, and

potency, respectively. Other potential study limitations are considered and discussed in the section below.

Study Limitations

While the findings of this study, or lack thereof, suggest both some interesting theoretical and practical implications, the study was not without some limitations. One potential limitation of this study was the laboratory context in which it occurred. In this study, the individual task performance and team social implications of providing a team member with individual level performance feedback was examined using undergraduate student participants working on a computerized military simulation. The research method allowed for the examination of both objective individual and subjective team outcomes under conditions of high realism without sacrificing experimental control (Ilgen, 1999). Unfortunately however, the laboratory setting in which the study occurred raises some concerns regarding the generalizability of the findings to settings outside of the laboratory. This is only a potential limitation for several reasons.

First, despite working in the context of a laboratory in which participants may not develop an overwhelming concern for their team or their individual roles, the participants worked on a realistic team task with performance-based rewards. In fact, the teams utilized in this study could be best described as "tactical decision-making teams" in which 1) team members must make decisions under time pressure and threat; 2) team members must interact, participate, and coordinate their inputs; and 3) teamwork is essential to effective team performance (McIntyre & Salas, 1995). The teams therefore were quite similar to many teams that actually exist in a number of real-world contexts (e.g., police and military organizations, hospitals, and airline crews). The laboratory

context, nevertheless, is one in which one cannot simulate the exact same psychological processes associated with the levels of urgency that may be involved with such real-world teams. However, observations of the research participants suggest that they did in fact take their individual and team roles seriously as indicated by participants' enthusiasm regarding the task and participants' verbally expressed concerns about the rewards.

It is also important to consider the research question when evaluating the generalizability of the study's findings. The focus here was on the predictability of individual task performance and team social outcomes using various types of individual level feedback interventions. While the teams utilized in this study worked on a computer-simulated team task in a laboratory setting, there is nothing about the model and the predictions derived in the previous chapters that would suggest that they would not hold in a laboratory context. In other words, given the nature of the research questions, the laboratory provided an appropriate context for theoretically driven, preliminary examinations of what might happen in the field (Ilgen, 1986).

One final limitation of the present study that deserves mention is that fact that give the nature of the study's design, only one team member in each of the experimental teams was actually provided individual level performance feedback. As such, the results of this study cannot speak to the effects of providing individual level performance feedback to all members of the team. This is an important limitation since providing individual level performance feedback to all members of a team may have very different effects on individual task performance among the team members and team social outcomes.

However, given that the purpose of the study was to examine not only the effects of the provision of individual level performance feedback on those who directly received the feedback, but also those who indirectly experienced the feedback by observing its provision, it was necessary to provide the performance feedback to only a subset of the members in each of the experimental teams. In this case, one team member directly received the performance feedback while three team members observed it provision. In this way, it was possible to test the predictions derived from social cognitive theory as it relates to observational learning via vicarious experiences.

This latter limitation, while limiting the generalizability of the findings to only teams in which one team member is provided with individual level performance feedback, provided a "strong manipulation" (McClelland, 1997) for examining the effects of the provision of individual level feedback on team social outcomes. One might expect that whatever negative effects that providing individual level performance feedback to team members that indicates that they are exceptionally poor or exceptionally good performers may have on team social outcomes might be more dramatic when only one member of the team directly receives such information in the presence of others. In this way, the fact that only one team member in the teams studied here received individual level performance feedback, while limited the generalizability of the study's findings, does not invalidate the experimental manipulations.

Finally, the deficiencies of the manipulations deserve further mention here as only 60% of the study's participants correctly answered each of their manipulation check items. In future studies of this nature, it will be critical for researchers to closely examine the extent to which the manipulations are in fact effective, consistency across the study's

experimenters, and just as important, clarity of the manipulation check items. Clearly, the failings of this study's manipulation make it difficult to both draw conclusions from the study's results and hypothesize about what might explain whatever effects were found.

Summary of Findings Related to the Model

The current debate that exists in the literature regarding the provision of individual level performance feedback to those working in teams has unfortunately raised more questions than answers about how to provide feedback to those working in team based work structures. A number of scholars have suggested that performance feedback provided to teams should be provided at the team level. Nevertheless, there remains many reasons for providing individual level performance feedback as well. Current theoretical developments provide conflicting recommendations about the nature of the feedback that should be provided, however they also suggest a number of options available regarding the feedback that could be provided to at the individual level to those working in teams, namely positive feedback, negative feedback, privately provided feedback, and publicly provided feedback.

This study sought to explore the influence of each type of feedback on both individual level task performance and team level social dynamics and functioning. The findings from the research conducted here suggest that individual level performance feedback interventions provided in teams have small, yet significant, effects on the task performance of both those who directly receive them and those other in teams who observe their provision. There was partial support for Feedback Intervention Theory's predictions regarding the nature of these effects on task performance, however, inconsistent with the theory, the sign of the feedback was found to be important in

explaining the nature of these effects. There was also partial support for control theory's predictions regarding the nature of the effects of the feedback interventions on task performance, however, inconsistent with this theory, the context in which the feedback was provided proved to be an important factor in explaining the nature of these effects. As such, it appears that FIT and control theory have the potential to inform each other.

While there were some significant direct effects found for the provision of individual level performance feedback in teams on the task performance of both those who directly received the feedback and those who simply observed its provision, there was no support found for the model's predictions that these effects were mediated by self- and task-focused attention. This is a particularly interesting finding in that it suggests that, at least in team settings, there are other mechanisms operating that influence the effects of singling out a team member for his or her performance on other members of the team, individually and the team as a whole. For example, and as previously mentioned, perceived accountability seems to be one potentially mediating mechanism. It would be fruitful for future research to explore the existence of other potential mediating mechanisms. In this way, one might gain additional insight as to how the provision of individual level performance feedback in teams affects task performance and perhaps even why the effects are so small.

The study also examined the effects of singling out a team member and providing him or her with individual level performance feedback on team social outcomes as a number of researchers have previously suggested that this would have negative effects on team social functioning. Generally, there was no support for this prediction and overall the provision of individual level performance feedback had no effects on team cohesion,

team viability, or team potency. This finding is particularly interesting as the social outcomes examined in the study are thought to be of critical importance to teams (Campion, et al., 1993; Hackman, 1987). The results of this study suggest that researchers' admonitions regarding the social implications of providing individual level performance feedback in teams might be largely overstated.

This study had two purposes: 1) to determine the effects of providing individual level performance feedback on the task performance of both direct feedback recipients and observers and 2) to determine what, if any, negative effects result from providing individual level performance feedback in teams on team social outcomes. While the model of the effects of individual level performance feedback on task performance and social outcomes received limited support, the findings were nevertheless insightful as they pointed to some important deficiencies in the theoretical frameworks that the study compared. As such, this study should provide a useful foundation for future theoretical development and further research in this area.

APPENDICES

Appendix A

Discussion of Wave Targets and Goal Setting

Discussion of Wave Targets and Goal Setting

We are almost ready to start the actual task. Before we do, there is one other thing that we have yet to discuss regarding the task—targets that come into the forbidden zone in waves, or wave attacks in which targets head for the really forbidden zone where they will sit causing you and your team to lose the maximum amount of points possible. Effectively dealing with the wave attacks is essential to performing well and is perhaps the most difficult aspect of this task. Moreover, how well you handle the wave targets will have a big impact on both your individual and team scores and consequently whether or not your team will be one of the teams that will eventually earn a prize.

What occurs when wave targets enter the forbidden zone is somewhat similar to what you have already seen during the training. As before, targets will enter the forbidden zone, however you have only seen targets enter your quadrant of the forbidden zone one at a time. During a wave attack, several targets will enter a particular quadrant of the forbidden zone at the same time thus making it more difficult to identify the targets, transfer information about those targets if necessary, and then clear them from the forbidden zone quickly as to prevent you and your team from losing a lot of points.

You already have been trained on all of the skills required to effectively handle a wave attack. You should expect several wave attacks during each game and wave attacks can occur from any direction. In other words, wave attacks can come from any one of your team's four quadrants therefore any member of your team may be hit with a wave of targets. To effectively deal with the attack, the team member whose quadrant is the source of the attack must identify the targets then quickly work to clear them from the really forbidden zone. Remember, you do not want targets to stay in the really forbidden zone too long. The longer the wave targets stay in the really forbidden zone, the worst the impact on your individual and team scores.

To help you be more effective at the task, I'm going to set three goals related to performance with the wave targets. If you keep these goals in mind, and try to meet them, it should help your team perform well.

These goals are as follows:

You should:

1. try to identify all (i.e., 100%) of the wave targets that come through your quadrant before they reach the really forbidden zone.

You should also:

2. begin attacking the wave attack targets within 1 minute of the onset of the attack

Finally, you should:

35. make sure that no wave attack targets remain in the really forbidden zone longer than 3 minutes.

The team member whose quadrant is the source of the wave attack has primary responsibility for making sure that these goals are met but others can help. Keep in mind that while somewhat difficult, all of the above goals are achievable.

Now, there are a couple of things you should do to help ensure that you meet these goals.

The first is regarding your AWACS radar plane. Remember that during the hands-on training many of the targets came from the corner of the screen. By keeping your AWACS near the corners of the task screen, you will be able to see much further than if you relied only on the detection rings around your bases. The more of the corner that you can see, the sooner you can tell whether you are being attacked by a wave of targets. You will find that the sooner you are able to detect a wave of targets entering your quadrant, the sooner you can begin identifying the targets. Obviously, the sooner you begin identifying these targets, the more likely that you will have them all identified before they reach the really forbidden zone.

Another thing you should do is quickly begin sending your most powerful vehicles (i.e., your helicopter and tank) to the really forbidden zone as soon as you realize that you are experiencing a wave attack. Remember, these vehicles are the slowest so the sooner they are launched, the quicker they can be ready to clear the wave targets from the really forbidden zone. You do not want to wait until the wave targets have stopped before getting these vehicles out on the screen or back into your quadrant to attack the wave targets. They will be particularly useful for removing wave targets from the screen.

Finally, you should send your vehicles back to your base immediately after you use them to attack wave targets so that they can refuel and reload. You should relaunch them immediately after the have returned to the base. Again, they are somewhat slow and the sooner they go back to the base, the sooner they will be ready to use again to clear more wave targets. I suggest that you send them back to the base as soon as you use them to attack.

I've seen several teams work at this task since I've been working in the lab and have gotten a feel for what constitutes good versus poor performance in dealing with wave attacks when they occur in your quadrants. Just keep in mind that good performers identify and attack the wave targets quickly. Good performers also use their own vehicles to clear enemy targets from the screen once they have been identified. If you focus on doing the things I just mentioned, then you should each do well.

Appendix B

Feedback Intervention

Feedback Intervention

Scripted Positive Performance Feedback

INSERT NAME, you did a good job dealing with the wave targets. Your performance in particular probably helped improve the team's score. The positioning of your AWACS plane near the corner of your quadrant which helped you have more time to identify the wave targets as they moved toward your quadrant. It seems as if you were able to identify about 80 percent of targets before they reached the really forbidden zone which is pretty close to the goal we set of 100 percent.

Being able to anticipate the wave attack early also seemed to help you to begin attacking the wave targets sooner and you did appear to begin attacking the targets within 1minute of the onset of the attack as we discussed. I also noticed that you were quick to move your attacking vehicles to the really forbidden zone when you realized that your quadrant was experiencing a wave attack. And you sent them back to your base to refuel and reload immediately. Doing these things appeared to help you clear the really forbidden zone of the wave targets within 3 minutes of the targets stopping in it.

Scripted Negative Performance Feedback

INSERT NAME, you did not do well with the wave targets. Your performance in particular probably hurt the team's score. By not positioning your AWACS plane near the corner of your quadrant you did not have as much time to identify the wave targets as they moved toward your quadrant. It seems as if you were able to identify about 20 percent of targets before they reached the really forbidden zone which is pretty far from the goal we set of 100 percent.

Not being able to anticipate the wave attack early also seemed to keep you from attacking the wave targets sooner and you did not appear to begin attacking the targets within 1 minute of the onset of the attack as we discussed. I also noticed that you were slow to move your attacking vehicles to the really forbidden zone when you realized that your quadrant was experiencing a wave attack. And you sent them back to your base to refuel and reload rather slowly. Not doing these things appeared to keep you from clearing the really forbidden zone of the wave targets within 3 minutes of the targets stopping in it.

Appendix C

Team Member Questionnaire

Team Member Questionnaire

Instructions:
The following survey contains several items regarding your attitude towards your team, your teammates, and the task you will complete. This survey contains several parts, each of which you will complete only when instructed by your team's experimenter. Some of the items appear in more than one part of the survey. This is because your answers to some of the items may change over time as you spend more time with your team and more time working on the task. There are no right or wrong answers to any of these questions. It is expected that there will be differences in attitudes among members of the same team therefore you should not share your answers with any other members of your team. Any answers you provide are confidential, have no impact on your team's performance, and will not affect your eligibility for the cash prizes.

Part I. Pre-Training Questions

Use the following 5-point scale to answer questions #1 - 13.

1	2	3	4	5
Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

The following questions concern your attitude towards achievement situations.

1. I am willing to select a challenging work assignment that I can learn a lot from.
2. I often look for opportunities to develop new skills and knowledge.
3. I enjoy challenging and difficult tasks at work where I'll learn new skills.
4. For me, development of my work ability is important enough to take risks.
5. I prefer to work in situations that require a high level of ability and talent.

6. I'm concerned with showing that I can perform better than my coworkers.
7. I try to figure out what it takes to prove my ability to others at work.
8. I enjoy it when others at work are aware of how well I am doing.
9. I prefer to work on projects where I can prove my ability to others.

10. I would avoid taking on a new task if there was a chance that I would appear rather incompetent to others.
11. Avoiding a show of low ability is more important to me than learning a new skill.
12. I'm concerned about taking on a task at work if my performance would reveal that I had low ability.
13. I prefer to avoid situations at work where I might perform poorly.

Continue on the next page.

Use the following 5-point scale to answer questions #14 - 29.

1	2	3	4	5
Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

The following questions concern your attitude towards achievement situations.

14. The things I enjoy most are the things I do best.
15. The opinions others have about how well I can do certain things are important to me.
16. I feel smart when I do something without making any mistakes.
17. I like to be fairly confident that I can successfully perform a task before I attempt it.
18. I like to work on tasks that I have done well on in the past.
19. I feel smart when I can do something better than most other people.
20. Even if I know that I did a good job on something, I'm satisfied only if others recognize my accomplishments.
21. It's important to impress others by doing a good job.

22. The opportunity to do challenging work is important to me.
23. When I fail to complete a difficult task, I plan to try harder the next time I work on it.
24. I prefer to work on tasks that force me to learn new things.
25. The opportunity to learn new things is important to me.
26. I do my best when I'm working on a fairly difficult task.
27. When I have difficulty solving a problem, I enjoy trying several different approaches to see which one will work.
28. On most jobs, people can pretty much accomplish whatever they set out to accomplish.
29. Your performance on most tasks or jobs increases with the amount of effort you put into them.

Do not go on to the next page until instructed.

Part II. Post-Training Questions

Listed below are a number of events that are related to your development at the task. For each one, please indicate how desirable it is to you. Use the following scale to respond to questions #30 - 34.

1	2	3	4	5
Undesirable		**Neutral**		**Desirable**

30. Improving task performance
31. Improving my self confidence
32. Getting a cash prize
33. Gaining respect from my teammates
34. Achieving success on the task

Please indicate the degree to which you agree with the following statements regarding your task skills. Use the following scale to respond to questions #35 - 38.

1	2	3	4	5
Disagree		**Neutral**		**Agree**

35. I will exert considerable effort to develop my skills.
36. Developing my skills is important to me.
37. I will try hard to develop my skills.
38. It is very important to me to develop my skills.

Use the following 5-point scale to answer questions #39 - 45.

1	2	3	4	5
Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

The following questions concern your beliefs in your team's ability to perform and achieve the goals that were set for its performance on the first task. When responding to the following items, answer in reference to the entire team's task-related ability.

39. The team I work with has above average ability.
40. This team is probably poor compared to other teams working on similar tasks.
41. This team is not able to perform as well as it should.
42. The members of this team have excellent task skills.
43. The members of this team should be replaced due to lack of ability.
44. This team is not very effective.
45. Some members in this team cannot complete the task well.

Continue on the next page.

Use the following 5-point scale to answer questions #46 - 64.

1	2	3	4	5
Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

The following questions concern your beliefs in your own personal ability to perform and achieve the goals that were set for your performance on the first task. When answering the following questions, answer in reference to your own personal task skills and ability to perform your role.

46. I have confidence in my ability to perform my role.
47. There are some tasks required by my role that I cannot do well.
48. When my performance is poor, it is due to my lack of ability.
49. I doubt my ability to perform my role.
50. I have all the skills needed to perform my role very well.
51. Most people who complete this task, can perform this role better than I can.
52. I am an expert at my role.
53. My future in this team is limited because of my lack of skills.
54. I am very proud of my skills and abilities as it relates to this task.
55. I feel threatened when others watch me work at this task.

The following questions concern the goals that were set for your performance on the first task.

56. It's hard to take these goals seriously.
57. It's unrealistic for me to expect to reach these goals.
58. It is quite likely that these goals may need to be revised, depending on how things go.
59. Quite frankly, I don't care if I achieve these goals or not.
60. I am strongly committed to pursuing these goals.
61. It wouldn't take much to make me abandon these goals.
62. I think these goals are good goals to shoot for.
63. I am willing to put forth a great deal of effort beyond what I'd normally do to achieve these goals.
64. There is not much to be gained by trying to achieve these goals.

Use the following numbers to represent different feelings about how often the first word leads to the second for questions #65 - 71.

1	2	3	4	5
Rarely		**Sometimes**		**Usually**

Below you will see a number of pairs of factors that look like this:

Example: **Warm weather → Sweating**

Please indicate how true you feel that it is for you personally that the first word leads to the second word.

65. Trying hard → Developing skills
66. Putting forth effort → Developing skills
67. Developing skills → Improving task performance
68. Developing skills → Improving my self-confidence
69. Developing skills → Getting the cash prize
70. Developing skills → Gaining respect from my teammates
71. Developing skills → Achieving success on the task

Do not go on to the next page until instructed.

Part III. Post-Task #1 Questions (A)

Use the following 5-point scale to answer questions #72 - 86.

1	2	3	4	5
Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

The following questions concern your attitudes about the team with whom you just completed the first task.

72. I am willing to put in a great deal of effort beyond that normally expected in order to help this team be successful.
73. I would talk up this team to my friends as a great team to work with.
74. I feel very little loyalty to this team.
75. I would accept almost any type of task assignment in order to keep working with this team.
76. I would be proud to tell others that I am part of this team.
77. I could just as well be working with a different team as long as the type of task was similar.
78. This team really inspires the very best in me in the way of task performance.
79. I am extremely glad that I was placed into this team rather than another.
80. I really care about the fate of this team.
81. For me this is the best of all possible teams for which to complete the task.
82. Getting myself placed into this team was a definite mistake on my part.

The following questions concern your attitude about your team during the first task.

83. Members of my team have great confidence that the team can perform effectively.
84. My team can take on nearly any task presented while in the laboratory and complete it.
85. My team has a lot of team spirit.
86. I enjoyed working with this team on the task.

Use the following 5-point scale to answer questions #87 - 91.

1	2	3	4	5
To a small extent		**To a moderate extent**		**To a large extent**

The following questions concern the interaction among your team members during the first task.

87. To what extent did you feel that you are really a part of your team?
88. To what extent would you be willing to work with a different team that was working on the same task?
89. To what extent did the members of your team get along with each other well?
90. To what extent did the members of your team stick together?
91. To what extent did the members of your team help each other out?

Do not go on to the next page until instructed.

Part III cont'd. Post-Task #1 Questions (B)

Use the following 5-point scale to answer questions #92 - 116.

1——————2——————3——————4——————5
To a small extent To a moderate extent To a large extent

At this moment, to what extent are you concerned about each of the following:

92. Your general ability and skills.
93. Demonstrating your abilities to the experimenter.
94. Demonstrating your abilities to your team members.
95. Other's perceptions of your task abilities.
96. Creating a particular perception of yourself and your general abilities.
97. What your task performance says about you personally.
98. Demonstrating your abilities on something other than this task.

99. Learning the strategies necessary to perform the task.
100. Your understanding of the task.
101. Developing your own strategies for improving your task performance.
102. Increasing your knowledge of the task.
103. Determining the best way to work on the task.
104. The use of appropriate performance strategies.

105. Putting forth the effort necessary to perform the task effectively.
106. The challenge of doing well on the task.
107. Doing the best you can on the task.
108. Motivating yourself to perform well on the task.
109. The rewards associated with successful task performance.
110. Meeting your performance goals for the task.

The following questions concern what your thoughts and feelings at this point in the experiment. Please respond to each item based on how you are feeling right now.

At this moment, to what extent are you...

111. concerned about the way your performed?
112. concerned about the way your performance appears to others?
113. self-conscious about the way your performed?
114. concerned about making a good impression in front of others?
115. concerned about what other people think of you?
116. aware of your performance?

Continue on the next page.

Use the following 5-point scale to answer questions #117 - 142.

1	2	3	4	5
Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

The following questions concern your beliefs in your team's ability to perform and achieve the goals that were set for its performance on the second task. When responding to the following items, answer in reference to the entire team's task-related ability.

117. The team I work with has above average ability.
118. This team is probably poor compared to other teams working on similar tasks.
119. This team is not able to perform as well as it should.
120. The members of this team have excellent task skills.
121. The members of this team should be replaced due to lack of ability.
122. This team is not very effective.
123. Some members in this team cannot complete the task well.

The following questions concern your beliefs in your own personal ability to perform and achieve the goals that were set for your performance on the second task. When answering the following questions, answer in reference to your own personal task skills and ability to perform your role.

124. I have confidence in my ability to perform my role.
125. There are some tasks required by my role that I cannot do well.
126. When my performance is poor, it is due to my lack of ability.
127. I doubt my ability to perform my role.
128. I have all the skills needed to perform my role very well.
129. Most people who complete this task, can perform this role better than I can.
130. I am an expert at my role.
131. My future in this team is limited because of my lack of skills.
132. I am very proud of my skills and abilities as it relates to this task.
133. I feel threatened when others watch me work at this task.

The following questions concern the goals that were set for your performance on the second task.

134. It's hard to take these goals seriously.
135. It's unrealistic for me to expect to reach these goals.
136. It is quite likely that these goals may need to be revised, depending on how things go.
137. Quite frankly, I don't care if I achieve these goals or not.
138. I am strongly committed to pursuing these goals.
139. It wouldn't take much to make me abandon these goals.
140. I think these goals are good goals to shoot for.
141. I am willing to put forth a great deal of effort beyond what I'd normally do to achieve these goals.
142. There is not much to be gained by trying to achieve these goals.

Do not go on to the next page until instructed.

Part IV. Post-Task #2 Questions

Use the following 5-point scale to answer questions #143 - 157.

1	2	3	4	5
Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

The following questions concern your attitudes about the team with whom you just completed the second task.

143. I am willing to put in a great deal of effort beyond that normally expected in order to help this team be successful.
144. I would talk up this team to my friends as a great team to work with.
145. I feel very little loyalty to this team.
146. I would accept almost any type of task assignment in order to keep working with this team.
147. I would be proud to tell others that I am part of this team.
148. I could just as well be working with a different team as long as the type of task was similar.
149. This team really inspires the very best in me in the way of task performance.
150. I am extremely glad that I was placed into this team rather than another.
151. I really care about the fate of this team.
152. For me this is the best of all possible teams for which to complete the task.
153. Getting myself placed into this team was a definite mistake on my part.

The following questions concern your attitude about your team during the second task.

154. Members of my team have great confidence that the team can perform effectively.
155. My team can take on nearly any task presented while in the laboratory and complete it.
156. My team has a lot of team spirit.
157. I enjoyed working with this team on the task.

Use the following 5-point scale to answer questions #158 - 162.

1	2	3	4	5
To a small extent		**To a moderate extent**		**To a large extent**

The following questions concern the interaction among your team members during the second task.

158. To what extent did you feel that you are really a part of your team?
159. To what extent would you be willing to work with a different team that was working on the same task?
160. To what extent did the members of your team get along with each other well?
161. To what extent did the members of your team stick together?
162. To what extent did the members of your team help each other out?

Continue on the next page.

Use the following 5-point scale to answer questions #163 - 173.

1----------2----------3----------4----------5
To a small extent To a moderate extent To a large extent

The following questions concern any comparisons that may have been made among members of your team while working on the second task.

163. To what extent did the members of your team show a concern about how much effort each other put into the task?
164. To what extent did the members of your team compare the effort each other put into the task?
165. To what extent did the members of your team show a concern about how each other perform on the task?
166. To what extent did the members of your team monitor each other performances during the task?
167. To what extent did the members of your team compare how they individually performed?
168. To what extent did the members of your team seem concerned about their individual outcomes relative to other members of the team?
169. To what extent did the members of your team ask about each other individual scores?

170. To what extent were you acquainted with DM1 before the experiment?
171. To what extent were you acquainted with DM2 before the experiment?
172. To what extent were you acquainted with DM3 before the experiment?
173. To what extent were you acquainted with DM4 before the experiment?

Use the scales below each item to respond to questions #174 - 180. MAKE SURE ALL OF YOUR ANSWERS ARE ON THE CORRECT LINE OF YOUR SCANTRON.

174. During the training, did you receive feedback from the experimenter on your task performance?

1=yes
2=no **(if you answer no, leave question #175 blank and go to question #176)**

175. Was the feedback you received more positive or negative?
1=positive
2=negative

176. At any point after the training, did you receive feedback from the experimenter on your task performance?

1=yes
2=no **(if you answer no, leave question #177 blank and go to question #178)**

177. Was the feedback you received more positive or negative?

1=positive
2=negative

Continue on the next page.

178. At any point after the training, did any of your fellow team members receive feedback regarding their task performance?

1=yes
2=no **(if you answer no, leave questions #179 and #180 blank and go to question #181)**

179. Which team member received the feedback?

1=DM1
2=DM2
3=DM3
4=DM4
5=more than one DM received feedback

180. Was the feedback he or she received more positive or negative?

1=positive
2=negative

Use the following 5-point scale to answer questions #181 - 190.

1	2	3	4	5
Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

The following questions concern your attitudes regarding seeking feedback on your performance during the experiment.

181. I think my experimenter would have thought worse of me if I had asked him/her for feedback.
182. I would not have been nervous about asking my experimenter how he/she evaluated my behaviors.
183. It is not a good idea to ask your teammates for feedback; they might think you are incompetent.
184. It would have been embarrassing to ask my teammates for their impression of how I was doing on the task.
185. It would not have bothered me at all to ask my experimenter for feedback
186. It is not a good idea to ask your experimenter for feedback; he/she might think you are incompetent.
187. It would have been embarrassing to ask my experimenter for feedback.
188. I think my teammates would have thought worse of me if I asked them for feedback.
189. I would not have been nervous about asking my teammates how they evaluated my behaviors.
190. It is better to try and figure out how you are doing on your own rather than ask your teammates for feedback.

Continue on the next page.

Use the following 5-point scale to answer questions #191 - 212.

1	2	3	4	5
Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

The following questions concern your attitude about working in groups.

191. I prefer to work with others in a group rather than working alone.
192. Given the choice, I would rather do a job where I can work alone rather than doing a job where I have to work with others in a group.
193. Working with a group is better than working alone.
194. People should be made aware that if they are going to be part of a group then they are sometimes going to have to do things they don't want to do.
195. People who belong to a group should realize that they're not always going to get what they personally want.
196. People in a group should realize that they sometimes are going to have to make sacrifices for the sake of the group as a whole.
197. People in a group should be willing to make sacrifices for the sake of the group's well-being.
198. A group is more productive when its members do what *they* want to do rather than what the group wants them to do.
199. A group is most efficient when its members do what *they* think is best rather than doing what the group wants them to do.
200. A group is more productive when its members follow their own interests and concerns.

The following questions concern how you tend to view stressful situations.

201. I am not a worrier.
202. I often feel inferior to others.
203. When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.
204. I rarely feel lonely or blue.
205. I often feel tense and jittery.
206. Sometimes I feel completely worthless.
207. I rarely feel fearful or anxious.
208. I often get angry at the way people treat me.
209. Too often, when things go wrong, I get discouraged and feel like giving up.
210. I am seldom sad or depressed.
211. I often feel helpless and want someone else to solve my problems.
212. At times I have been so ashamed I just wanted to hide.

Continue on the next page.

Use the following 5-point scale to answer questions #213 - 248.

1	2	3	4	5
Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

The following questions concern how you tend to interact with others.

213. I try to be courteous to everyone I meet.
214. I often get into arguments with my family and co-workers.
215. Some people think I'm selfish and egotistical.
216. I would rather cooperate with others than compete with them.
217. I tend to be cynical and skeptical of others' intentions.
218. I believe that most people will take advantage of you if you let them.
219. Most people I know like me.
220. Some people think of me as cold and calculating.
221. I'm hard-headed and tough-minded in my attitudes.
222. I generally try to be thoughtful and considerate.
223. If I don't like people, I let them know it.
224. If necessary, I am willing to manipulate people to get what I want.

The following questions concern how you tend to be socially.

225. I like to have a lot of people around me.
226. I laugh easily.
227. I don't consider myself especially "light-hearted."
228. I really enjoy talking to people.
229. I like to be where the action is.
230. I usually prefer to do things alone.
231. I often feel as if I'm bursting with energy.
232. I am a cheerful, high-spirited person.
233. I am not a cheerful optimist.
234. My life is fast paced.
235. I am a very active person.
236. I would rather go my own way than be a leader of others.

The following questions concern how you tend to go about completing tasks and your work habits.

237. I keep my belongings clean and neat.
238. I'm pretty good about pacing myself so as to get things done on time.
239. I am not a very methodical person.
240. I try to perform all the tasks assigned to me conscientiously.
241. I have a clear set of goals and work toward them in an orderly fashion.
242. I waste a lot of time before settling down to work.
243. I work hard to accomplish my goals.
244. When I make a commitment, I can always be counted on to follow through.
245. Sometimes I'm not as dependable or reliable as I should be.
246. I am a productive person who always gets the job done.
247. I never seem to be able to get organized.
248. I strive for excellence in everything I do.

End of survey. Thanks for your participation!
Make sure your last response is on #248 on your Scantron.

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