

**PREDICTORS OF EMPLOYEE GROUP COHESION AND GROUP
PERFORMANCE: A STUDY OF PRIMARY CARE PRACTICES**

A Dissertation

by

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ABSTRACT

Research regarding organizational workgroups has substantially increased over the past two decades given that successful groups and teams are associated with having several important attributes, including group cohesion and group performance. The researcher of the current study examined the relationship between group cohesion and performance as well as among several other key factors (including communication/cooperation, quality decision making, perceived organizational support, supportive supervision, task interdependence, and goal commitment) based on the perceptions of selected primary health care organizational staff members. A 45-item survey was used to collect the data. Both electronic as well as printed copies were distributed throughout a 12 month period from September 2011 through August 2012. The sample included 207 respondents representing Pediatric, Family Medicine, and Specialty practices in Texas. Descriptive statistics, ANOVA's, Cronbach's alpha reliability analysis, confirmatory factor analysis, exploratory factor analysis, and structural equation modeling were the analytical methods used in the study.

The results from the analyses suggested that quality decision making was a strong predictor of social cohesion and that perceived organizational support (POS) was also a strong predictor of both goal commitment and social cohesion. Task interdependence was a large and significant predictor of goal commitment.

Regarding mediation effects, neither goal commitment nor social cohesion mediated the relationship between POS and group performance. Also, goal commitment did not mediate the relationship between task interdependence and group performance.

Goal commitment and social cohesion were not strong predictors of group performance. Rather, task interdependence and supportive supervision were the best direct predictors of group performance.

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CHAPTER I

INTRODUCTION

For the past two decades, researchers in organizational settings have shown a growing emphasis on group processes, structures, and effectiveness (Bettenhausen, 1991; Campion et al., 1993; LePine et al., 2008; Richter et al., 2011). The use of work groups or teams has increased in a dramatic fashion for the reason that effective groups and teams are associated with positive outcomes such as increased service or product quality, greater employee commitment to organizational goals, and higher consumer satisfaction. Although the term “group” is frequently used in academic literature and empirical researchers frequently use the word “team,” the terms “group” and “team” are used interchangeably in this study.

Group cohesion is considered the bond or tie that keeps the work group together (Carron, 1982). Although group cohesion has been traditionally viewed as a unitary construct, recent researchers have provided considerable support for a two-dimensional construct that includes both the social and task aspects of cohesion (Carless & De Paola, 2000; Dyce & Cornell, 1996; Zaccaro & Lowe, 1988). For example, Zaccaro and Lowe (1988) found that task cohesion predicted group performance on an additive group task whereas social cohesion impeded productivity by generating task-interfering exchanges among group members. Similarly, Zaccaro’s (1991) study on a student military organization provided evidence that task cohesion was more strongly associated with group performance than social cohesion. However, Zaccaro and McCoy (1988) found that both social and task cohesion are needed when groups require interaction to succeed.

Task cohesion has also been more closely associated with diverse groups whereas social cohesion has been closely related to homogeneous groups (Cox, 1993; Knouse 2006). According to Knouse (2006), “By focusing upon the task, rather than interpersonal and social aspects of the group, the group may cultivate the benefits of the diversity of its members without suffering many of the social problems associated with subgroup identities” (p. 589). It is also not uncommon for work groups to have varying degrees of both task and social cohesion. As Carron & Brawley (2000) suggested, “one work team might be highly united around its task objectives and yet be in open conflict from a social perspective. Conversely, a second apparently similar work team might be very cohesive socially but completely lack task unity” (p. 96).

Group Processes

Communication and cooperation are also essential key components of effective teams (Gladstein, 1983; Campion et al., 1993; Lester & Meglino, 2002). For example, models of work group effectiveness are used to depict that communication and cooperation facilitate information flow and coordinate collective efforts as well as promote openness and interpersonal relationships (Gladstein, 1984; Stasser, 1992). Researchers of communication and cooperation in groups suggest that effective communication and cooperation not only promote problem solving, but also allow groups to coordinate efforts towards a common purpose, thereby increasing the group’s performance (Lester et al., 2002; Campion et al., 1993). According to Jones and George (1998), “Many organizations have sought to increase cooperation between people and

groups by reengineering their structures into flatter, more team-based forms, in which authority is decentralized to empowered lower level employees” (p. 531).

Although communication and cooperation are considered to be important key concepts to effectiveness within work groups, they have not been extensively empirically tested and reported in the literature.

Decision making in groups is another important factor that impacts both group cohesion and group performance (Mullen et al., 1994; Thompson et al., 1998; Chansler et al., 2003). For example, many organizations have complex organizational structures that require input and participation from employees at multiple levels within the organization. In addition, the decision making process allows group members to take ownership of the decision made and can produce high quality or innovative ideas (Akdere, 2011). Mishra and Morrissey (1990) provided evidence that employee participation in decision making processes leads to increased levels of trust and group cohesion. According to Akdere (2011), the group decision making process also “eliminates to some degree the top-down management style and employee resistance to change” (p. 1318). Chansler et al. (2003) suggested:

If a team member is to participate usefully in the consensus decision-making process, he or she must understand the technical nature of the tasks assigned to the group....Understanding of the technical processes and adherence to specific rules in performing assigned responsibilities leads to improved group cohesion, and ultimately team performance. (p.106)

Despite the growing emphasis on group decision making processes in organizations, there remain relatively few researchers who have explored the relationship between quality group decision making and group cohesion, and in this limited number of studies, the primary focus has been on an extreme form of group cohesion, i.e., group think, as an antecedent of poor quality decision making in groups. Inconsistent findings have been reported in these studies (Mullen et al., 1994; Callaway, 1984).

Supportive supervision is another key factor affecting work groups. According to Steinhardt et al. (2003), “the significance of studying interactions between supervisors and workers and relationships among coworkers is reflected by the increasing reliance on team-based work groups in organizations” (p. 383). Supportive supervision has been extensively studied in relation to individual job stress, job satisfaction, and employee creativity. For example, researchers have supported the notion that higher levels of supportive supervision are associated with lower levels of stress (Terry et al., 1993; Cummins, 1990), higher levels of job satisfaction, employee creativity (West, 1989; Scott & Bruce, 1994), and individual performance (Weed et al., 1976). Other researchers have argued that supportive supervision is key in promoting proactive behaviors such as employee initiative and motivation (Crant, 2000). Researchers that have performed studies on leadership behaviors have also reported that certain supervisor characteristics serve as predictors of task and social cohesion (Callow, 2009; Carless et al., 1995) and group performance (DeGroot et al., 2000; Lowe et al., 1996; Patterson et al., 1995). For example, Bass and colleagues (2002), in their leadership study of military platoons,

reported that the relationship of leadership to group performance was partially mediated by the unit's cohesion and potency levels.

Although perceived organizational support has been studied extensively at the individual level, it has not been widely studied within work groups. Perceived organizational support (POS) has become increasingly important as many organizations of today are investing resources into POS programs (Riggle et al., 2009; Pfeffer, 2005). According to Rhoades and Eisenberger (2002), POS compels employees who feel supported to, in turn, demonstrate organizational commitment and performance.

Several researchers have reported a significant positive relationship between POS and organizational commitment. With respect to work groups, Vardaman et al. (2009) found that strong work group level POS strengthened the relationship between individual POS and affective organizational commitment. Vardaman and colleagues (2009) suggested that "treating workgroups in ways that create shared positive perceptions of support may enhance individuals perceived organizational support by social influence processes. That is, when support is widespread, employees may convince one another of the organization's support" (p. 115- 116).

Many researchers have studied the relationship between perceived organizational support and group performance but with inconsistent results. Although some researchers have demonstrated a positive relationship between POS and group performance (Shanock & Eisenberger, 2006; Randall et al., 1999), others have found weak to moderate associations (Byrne & Hochwarter, 2008; Riggle et al., 2009), suggesting that certain

mediators or moderators may affect the relationship between *POS* and group performance.

Bishop and colleagues (2000), in their study on support, commitment, and employee outcomes in a team environment, reported that support stemming from the work team was both significant and positively related to group performance and was mediated by team commitment but noted a weak association between organizational commitment and group performance.

Goal commitment is another key variable that has been linked to cohesion, supportive supervision, and group performance. In his study of small committee faculty groups, Whiteoak (2007) demonstrated that individual perceptions of group cohesion were positively related to individual goal commitment. Klein and Mulvey (1995) also reported that goal commitment mediated the relationship between cohesion and group performance among college students in natural occurring groups. Hollenbeck and Klein (1987) suggested that “the level of goal commitment shown by others may influence the individual’s level of goal commitment” (p. 216).

Task interdependence is another construct that has been linked to both cohesion and group performance (Gully et al., 1995; Saavedra et al., 1993). As Gully et al. (1995) suggested: “In highly interdependent tasks, cohesion operates to affect individual motivational factors, group processes, and group outcomes. The result should be a strong cohesion-performance relationship for interdependent tasks” (p. 502).

According to Widmeyer et al. (1992), the relationship between cohesion and group performance in groups with high task interdependence should be much stronger

compared to groups with limited task interdependence. In their study of groups of students, Allen et al. (2003) found that helping behavior was the strongest in groups with high task interdependence. In several studies, researchers have provided evidence that task interdependence has a direct and significant relationship with group performance (Allen, Sargent, & Bradley, 2003; Campion, Papper, & Medsker, 1996; Saavedra, Earley, & Van Dyne, 1993; Shea & Guzzo, 1987; Wagemen, 1995).

The relationship between group cohesion and group performance is perhaps the most widely studied phenomenon in the group cohesion literature. Researchers that have conducted meta-analytic studies have attempted to shed light on the relationship between cohesion and group performance. In a meta-analytic study conducted by Evans and Dion (1991), cohesion and performance were significantly positively correlated and cohesive groups significantly outperformed non-cohesive groups. However, the studies used in their meta-analysis included experimental groups, military groups, and sports teams. Evans and Dion (1991) cautioned against the generalizability of their findings in the performance of work groups in organizations: “as anyone who has studied work groups within real organizations can attest, the development of meaningful and measurable performance criteria is extremely difficult” (p. 180). Although Evans and Dion (1991) reported a significant and positive relationship between the two constructs, Mullen and Copper (1994) reported a small, but significant relationship between cohesion and group performance. Unlike many previous studies, Mullen and Copper (1994) provided evidence that high levels of group performance lead to higher levels of cohesion. Mullen and Cooper (1994) also demonstrated that task cohesion was significantly linked to group

performance but did not find the same association between social cohesion and group performance. Beal et al. (2003) reported a significant relationship between cohesion and group performance, although unlike Mullen and Copper (2004), they provided evidence for a strong and significant link between social cohesion and group performance; and they also reported a stronger correlation between cohesion and behavioral performance versus cohesion and outcome performance. Further, they also reported a stronger relationship between cohesion and efficiency compared to cohesion and effectiveness. Further, Beal et al. (2003) focused on the behavioral aspects of group performance rather than the outcomes of group performance. According to Chiochio and Essiembre (2009), outcome group performance is related to factors such as profit measures, sales, grades, and costs whereas behavioral group performance includes both task and contextual group performances. Chiochio and Essiembre (2009) further suggested that “Task performance involves activities usually described in formal job descriptions and is specific to jobs. Contextual performance relates to behaviors promoting organizational effectiveness by acting on the psychological, social, and organizational features of work” (p. 389). Beal et al. (2003) maintained, “Our arguments supporting moderating roles for behavior versus outcome and efficiency versus effectiveness are based on the assumption that interpersonal attraction, task commitment, and group pride are all important aspects of group cohesion” (p. 991). Both Mullen and Copper (1994) and Beal et al. (2003) used different types of groups in each of their meta analyses that included student, military, sports, and work groups.

A longitudinal study performed by Chang and Bordia (2001) provided evidence that cohesion was a predictor of and an antecedent of group performance in student work groups. Although there is considerable support for the association between group cohesion and performance, there are conflicting findings in the literature with regard to whether or not group performance serves as an antecedent or consequence of cohesion.

Group Structure

Work group diversity and group size are factors that may impact both group cohesion and group performance. Pelled and colleagues (1999) were among the first researchers to differentiate between various diversity characteristics and their effects on the performance of work groups. Specifically, Pelled et al. (1999) argued that *highly job-related* work group diversity characteristics such as functional and educational background are more related to performance in work groups than *less job-related* characteristics such as race, gender, and age. However, Pelled et al. (1999) reported that neither type of diversity was related to group performance. Webber and Donahue (2001) reported similar results in their study. While Webber and Donahue (2001) provided evidence that neither highly job-related diversity nor less job-related diversity affected cohesion or group performance, the authors suggested that the type of work group may moderate the relationship between cohesion and group performance.

Some researchers have provided evidence that too many team or group members reduces performance and other researchers have reported that increasing group size in work teams actually increased performance. For example, Vinokur-Kaplan (1995) reported that group size had a negative relationship with performance in a study

conducted in hospital work teams. Another researcher, who studied primary care work teams, reported that teams with more than twelve members were too large to be effective (Starfield, 1998). In contrast, Magjuka and Baldwin (1991) found that increasing group size also increased group performance in employee involvement groups since larger groups required less coordination and fewer leaders that needed to be trained. Campion et al. (1993) also found that increasing group size improved group performance.

The factors addressed above, that is, communication/cooperation, quality decision making, supportive supervision, perceived organizational support, task interdependence, task cohesion, social cohesion, and group performance are the focus of this study. These factors were selected based on an extensive review of the literature as well as each of their theoretical underpinnings. Other important factors of this study were organizational status diversity as well as group size. A more detailed explanation of these factors is presented in *Chapter II: Review of the Literature*.

Problem Statement

Group cohesion is central to understanding work group processes, behaviors, and effectiveness. However, there is a lack of consensus in the literature regarding how to define and measure the construct of group cohesion. The wide variety of definitions and measures of group cohesion include perspectives from various fields of study, including political science, sociology, military psychology, and organizational psychology (Campbell and Martins, 2009). Thus, group cohesion has been studied among diverse groups, including athletic teams, students, psychotherapy groups, and workgroups, but with no consistent results.

Conflicting results in the group cohesion literature may be due to the wide array of definitions and instruments used as well as the diverse populations being studied.

Reported research regarding group cohesion for service work groups is limited at best.

Primary health care groups are underrepresented in the cohesion literature yet are of primary concern due to the growing emphasis on team based care in health care practices and the patient centered medical home emphasis in the past decade (Medves, 2010; Goldman et al., 2010; Grumbach & Bodenheimer, 2004). Researchers who have studied patient care work groups have provided evidence that greater cohesion among patient care teams is associated with improved clinical outcomes and higher patient satisfaction (Stevenson et al., 2001; Campbell et al., 2009; Goni, S. 1999). In a study regarding healthcare teams, Mickan and Rodger (2005) found the following characteristics of effective health care teams: mutual respect, leadership, goals, communication, cohesion, and purpose. Further, improved system productivity, patient satisfaction, clinical quality, and job satisfaction/employee morale have been associated with group performance among health care teams (Roblin et al., 2002).

Purpose of Study

The purpose of this study was to examine group cohesion and group performance at participating primary care practices to: 1) determine which variables are predictors of group cohesion; 2) observe the relationship between group cohesion and group performance; and 3) establish if *organizational status diversity* and *practice size* serve as moderators of the cohesion-performance relationship. For the purpose of the present study, organizational status diversity encompassed tenure or length of service.

Research Questions and Research Hypotheses

The researcher attempted to answer the following research questions:

1) What are the antecedents and consequences of group cohesion in primary clinic practices?

Specifically, this research question was addressed with the following hypotheses:

1.1) Task cohesion would fully mediate the relationship between the exogenous variables (communication/ cooperation, quality decision making, supportive supervision, and perceived organizational support) and group performance.

1.2) Social cohesion would fully mediate the relationship between perceived organizational support (POS) and group performance.

1.3) Social cohesion would partially mediate the relationship between task cohesion and group performance.

1.4) The relationship between perceived organizational support and social cohesion would be partially mediated by task cohesion.

1.5) Task interdependence would serve as a predictor of group performance.

1.6) Goal commitment would partially mediate the relationship between task cohesion and group performance.

1.7) Goal commitment would fully mediate the relationship between perceived organizational support and group performance.

2) *Organizational status diversity* and *practice size* would serve as moderators of the group cohesion- group performance relationship.

The conceptual framework of the current study is presented below:

Conceptual Framework

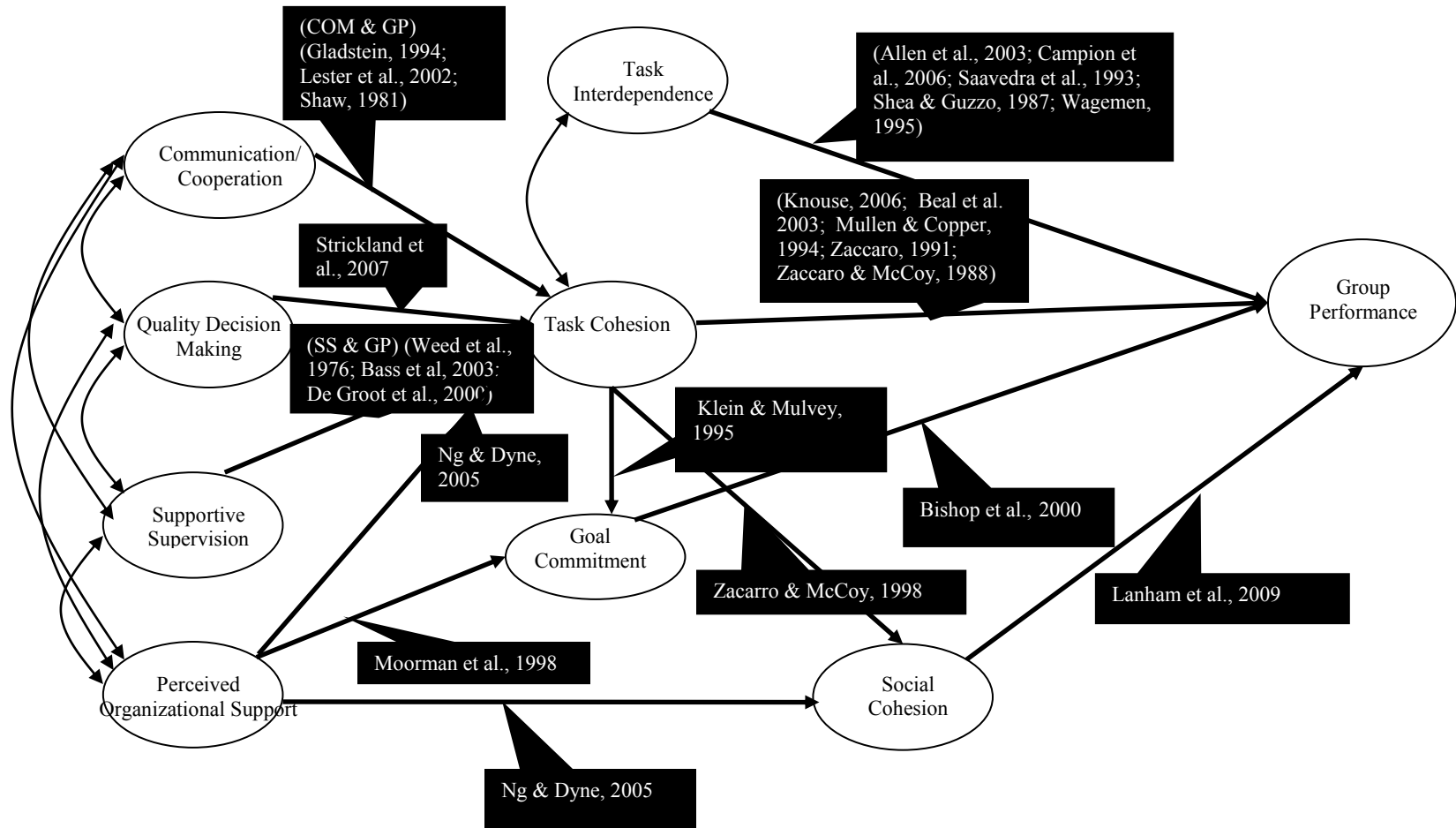
The conceptual framework of the proposed study is presented in **Figure 1 (pg. 15)** and is based on the following theoretical assumptions:

- 1) Task cohesion and social cohesion have been reported as both positively and significantly related to group performance in several studies (Lanham et al., 2009), although a stronger association has been reported between task cohesion and group performance than social cohesion and group performance (Knouse, 2006; Beal et al., 2003; Mullen & Copper, 1994; Zaccaro, 1991; Zaccaro & McCoy, 1988);
- 2) Task interdependence has been reported to predict group performance (Allen, Sargent, & Bradley, 2003; Campion, Papper, & Medsker, 1996; Saavedra, Earley, & Van Dyne, 1993; Shea & Guzzo, 1987; Wagemen, 1995). Although the relationships between communication/cooperation and task cohesion; and supportive supervision and task cohesion have been understudied, both communication/ cooperation (Shaw, 1981; Gladstein, 1994; Lester et al., 2002) and supportive supervision (Weed et al., 1976) have been demonstrated to have positive relationships with group performance;
- 3) The relationship between quality decision making and task cohesion is also understudied. However, researchers who explored the perceptions of family physician practice employees found that effective teamwork was

related to high levels of participatory decision making (Strickland et al., 2007);

- 4) Although the mediation effects of goal commitment, social cohesion, and task cohesion on the relationship between perceived organizational support and group performance were not reported in the literature, perceived organizational support has been positively linked to organizational commitment and team commitment (Bishop et al., 2000) as well as helping behavior in workgroups (Moorman et al., 1998). Helping behavior in work groups, in turn, has been strongly linked to group cohesion (Ng and Dyne, 2005); and
- 5) Goal commitment has been shown to mediate the relationship between task cohesion and group performance (Klein & Mulvey, 1995).

Figure 1
Conceptual Framework



Operational Definitions

Group Cohesion: A dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its goals and objectives —(Carron, 1982, p. 124).

Human Resources Development (HRD): A continuous process of learning and performance improvement for individuals, groups, organizations, and multiple stakeholders within systems through various areas of expertise such as training and development, employee development, organizational development, and organizational learning (Ruona, 2002, 2001; Swanson & Holton, 2001).

Social Cohesion: A characteristic that reflects motivation to develop and maintain bonds within a group (Carless & De Paola, 2000).

Task Cohesion: A shared commitment and motivation to coordinate group efforts to achieve common work-related tasks or goals (Hackman, 1976; MacCoun, 1996; Widmeyer et al., 1985).

Work Group/Work team: A collection of employees who are established formally, are assigned some autonomy, share responsibility for outcomes, and are also interdependent (Cohen & Bailey, 1997; Rasmussen & Jeppesen, 2006; Sundstrom, 1999).

Group Performance: The perception that the workgroup is very competent, gets its work done very effectively, and has performed its job well (Lam et al., 2004).

Assumptions of Using a Survey Questionnaire

1. Participants understand the questions and are competent to answer the questions.

2. Participants that respond to the survey reflect the staff for which the survey is intended (primary care clinic staff). For a more detailed explanation, see *Section III, Methodology*.
3. Participants are honest and forthcoming when answering the questions on the survey.

Limitations

1. Given that the survey is a self-reported measure, it may be difficult for participants to recall information or to be honest about a contentious question.
2. The survey is used to measure group cohesion at the individual level, not the group level.
3. As with any likert type scale, there may be central tendency bias, acquiescence bias, and social desirability bias. Central tendency bias may occur when participants avoid selecting extreme response categories. Acquiescence bias can occur when participants agree with statements in order to satisfy or please the experimenter and social desirability bias takes place when participants depict themselves in a more socially favorable manner rather than being honest.

Significance of the Study

High levels of cohesion have been associated with positive group behaviors and group outcomes. Toseland and Rivas (2001) suggested that high levels of cohesion lead to the following among group members: 1) greater diligence toward achieving group goals; 2) more willingness to accept responsibility for group functioning; 3) willingness

to express opinions; 4) readiness to listen; and 5) ability to provide feedback. According to Toseland, Jones, and Gellis (2004), positive outcomes associated with cohesion include:

Greater satisfaction with the group experience; 2) higher levels of goal attainment by individual group members and the group as a whole; 3) greater commitment to the sponsoring organization; 4) increases in members' feelings of self-confidence, self-esteem, and personal adjustment; and 5) higher levels of meeting attendance and an increased length of participation. (p. 18)

Much of the recent focus in primary health care research has been on building teamwork. For example, researchers have provided evidence that high levels of teamwork and team climate were related to superior access to care, continuity of care, and patient satisfaction as well as improved processes of care for diabetic patients in England (Stevenson et al., 2001). Another researcher in Spain reported that primary care cohesive groups with clear goals and effective communication performed better on patient perceived quality and patient satisfaction than less cohesive groups (Goni, 1999). According to Grumbach and Bodenheimer (2004), health care teams that are cohesive have the five following characteristics: 1) successful communication; 2) clearly defined, measurable goals; 3) training and development of all team members; 4) both clinical and administrative systems; and 5) clearly articulated task assignments and roles. It is important to examine cohesion in primary health care groups because groups with high

levels of teamwork are associated with high levels of cohesion (Grumbach & Bodenheimer, 2004).

Summary

In *Chapter I*, an introduction to the research study and a brief explanation of the mitigating factors involved in the study were presented by the researcher. The problem was then discussed and arguments were made in support of the need for the study. Next, the purpose of the study and the research questions and hypotheses were provided followed by the conceptual model and conceptual framework of the study. The definition of terms used in the study, assumptions for using a survey, and limitations of the study design were presented next. Further, the significance of the study was discussed. In *Chapter II*, a review of the literature on the nine factors involved in the study is presented as well as the theoretical framework of the study.

CHAPTER II

REVIEW OF THE LITERATURE

A growing inclination for increased teamwork in the workplace and specifically increased cohesion in groups within organizations has propelled many researchers to explore the effects of group cohesion on group processes and performance. The main factors that were the focus of this study included group cohesion (including task cohesion and social cohesion) and performance. The relationships between the antecedents of task and social cohesion, mainly communication/cooperation, quality decision making, supportive supervision, and perceived organizational support as well as the mediator variable goal commitment and the predictor variable task interdependence were all examined in relationship to group performance.

The next section includes a review of the scholarly literature on group cohesion. First, an overview of the process in the selection and collection of the literature is presented, followed by the theoretical frameworks that explain the various approaches used by researchers. Next, the various definitions of group cohesion found in the literature are presented. The relationships between and among group cohesion, group performance and other variables are further examined and themes from the research were used to develop the researcher's theoretical model. Further, implications of HRD research, theory, and practice are provided.

The Literature Review Process

The researcher performed a thorough review of the literature that included the following process: 1) search and collection of articles; 2) summarize articles relevant to

the study; and) integrate summaries and relevant information pertaining to the study.

With regard to the selection of articles for the nine key constructs of the study, *task cohesion, social cohesion, communication /cooperation, quality decision making, supportive supervision, perceived organizational support, task interdependence, goal commitment, and group performance*, the following criteria were used:

- Journal articles pertinent to all nine constructs, *task cohesion, social cohesion, communication /cooperation, quality decision making, supportive supervision, perceived organizational support, task interdependence, goal commitment, and group performance*.
- The search for articles included both simple and advanced searches using the nine key constructs and/or a combination of related constructs. The electronic databases that were used were limited to the following: *Academic Search Complete, Business Search Complete, PsychInfo, and Science Direct*.
- The search period criteria included articles and books dating from 1950 until 2011 and there were many formative publications that were related to the constructs under investigation in this study.
- The primary journals selected in this study included the following: *Academy of Management Journal, Academy of Management Review, Journal of Applied Psychology, Journal of Management, Journal of Organizational Behavior, Organizational Behavior and Human Decision Processes, Organizational Behavior and Human Performance, Small Group Behavior, and Small Group Research*. These journals include disciplines such as human relations, business

and management, organizational behavior, sociology, and psychology that pertain to the study topic.

The criteria used in the selection of foundational works that influenced the theoretical framework of the study included the following:

- The significance of the article's focus to the study's theoretical framework and to the constructs in the study
- The relevance of the article's empirical or theoretical implications
- Articles that pertained to instruments found in the book *Taking the Measure of Work* (Fields, 2002). These articles were relevant to the following study constructs: *supportive supervision, goal commitment, perceived organizational support, and task interdependence*. The Academy of Management Journal and Journal of Applied Psychology were the primary sources of these articles.

Health Research and Organizational Trust, Organizational Behavior and Human Decision Processes, and Small Group Research were the sources of the communication/cooperation, quality decision making, social cohesion, task cohesion, and group performance latent variables.

The Texas A&M University online library search engine was the primary resource used to search for articles and the University of Texas Health Science Center at San Antonio (UTGHSC-SA) was the secondary search engine used to find articles related to primary health care. Academic Search Complete was used to search for articles on the UTHSC-SA library database. The sources of these articles included *Health Policy,*

International Journal of Evidence Based Health Care, *Journal of the American Medical Association*, and *Journal of Interprofessional Care*. The articles selected were each downloaded and printed and were stored in both separate electronic folders and hard copy file folders. The final step in the literature review process included summarizing books, articles, and other relevant literature and synthesizing key information from each of these, which involved the evaluation, interpretation, and integration of works collected.

Theoretical Frameworks of Group Cohesion

Three theoretical frameworks, *social cognitive theory* (Bandura, 1986), *social identity theory* (Tajful & Turner, 1981), and *social exchange theory* (Emerson, 1976; Lawler, Thye, & Yoon, 2000) direct much of the group cohesion literature.

Social cognitive theory (Bandura, 1986, 1991) posits that both individual and group behavior are shaped by reciprocal causality as behaviors, personal characteristics, and environmental factors interact. As such, social cognitive theory may offer a fitting model for the causal individual socio-psychological processes that influence the level of group cohesion (Campbell & Martens, 2009). Thus, group cohesion may be influenced by *enactive attainment*, *vicarious experience*, *verbal persuasion*, and *physiological state*. According to Bandura (1977), performance or task attainment is based on one's personal accomplishments and is the most influential source of information, followed by vicarious experiences, i.e., observing others while they perform a task, and persuasion, in which motivation or positive feedback is given. According to Campbell and Martin (2009), ~~Enactive attainment~~, repeated positive performance, when combined with verbal

persuasion between group members would conceivably lead to increases in group cohesion, while repeated failures would lower beliefs about group cohesion” (p. 237). Social cognitive theory is an important concept that applies to groups because it may be used to explain how individuals learn while they’re in social situations by interacting with and observing other individuals (Swanson & Holton, 2001). *Socialization* can be defined as “the process by which organizations pass on the culture of the organization to new employees and teach them how to be effective in the organization” (Swanson & Holton, 2001, p.156).

Social identity theory has also been used as a theoretical framework to explain group cohesion. Social identity theory was developed by Tajfel and Turner (1981) and is used to explain *when* and *why* individuals identify and behave within social groups. There are three psychological processes of social identity theory: 1) social categorization-- individuals often place themselves and others into categories; 2) identification-- individuals relate to certain groups (in-groups) that emotionally impact their self-concept; and 3) social comparison—group members compare their groups (the in-group) to other relevant groups (out-group) and usually favor the group to which they belong (in-group) over other groups (Tajfel & Turner, 1986).

Self-categorization theory, a sub-set of self identity theory, has also been used as a theoretical framework for group cohesion. For example, Hogg (1992) used identification with a group to define cohesion. Self-categorization is the process by which individuals self-identify as a member of a social group (Turner, 1985). Self-categorization in a particular group depends both on the prominence of the group and the

context or situation surrounding the categorization. In other words, the context of the group forms the self-concept or categorization of each group member.

Social Exchange theory is “joint activity in which two or more actors attempt to produce a flow of benefits better than they can achieve alone or in other relationships” (Lawler, Thye, & Yoon, 2000, p. 616-617). There are four types of social exchange identified in the social exchange theory literature. These include *reciprocal*, *negotiated*, *generalized*, and *productive exchange*. *Reciprocal exchange* includes a series of one-sided giving among two actors over time and *negotiated exchange* involves unequivocal actor-to-actor flows of benefit and binding agreements completed within a single point in time. *Generalized exchange*, similar to reciprocal exchange, is a one-sided form of exchange, although it involves givers and receivers who are not matched in pairs (Lawler et al., 2000). For example, “A gives to B who gives to C who gives to A” (Lawler et al., 2000, p. 617). *Productive exchange* is an indirect and generalized type of social exchange in that it involves a person-to-group and group-to-person exchange (Lawler et al., 2000).

Productive exchange mainly represents the group-oriented form of social exchange and involves higher degrees of interdependence compared to other forms of exchange (Molm, 1994; Molm & Cook, 1995). As Lawler et al. (2000) explained, “productive exchange is a group-oriented, coordination task in which actors seek to produce a valued result through their joint collaboration” (p. 619).

Theoretical Framework of Study

This study was based on social cognitive theory (Bandura, 1986, 1991) and was

also based on **social cognitive theory** (Bandura, 1986, 1991) and was also based on **social exchange theory** for the reason that it aims to observe the reciprocal and behavioral relationships between the employee and the group. Specifically, the productive exchange aspect of social exchange theory may offer an explanation for the high levels of commitment and interdependence often found in cohesive groups (Molm, 1994; Lawler et al., 2000).

Group Cohesion Defined

An excessive number of group cohesion definitions, from those that focus on interpersonal attraction among group members, to others that address various components that comprise group cohesion, can be found in the literature. As a result, defining the construct has caused confusion, inconsistency, and lack of uniformity among many researchers (Mudrack, 1989). However, the different perspectives from different fields may account for the multitude of definitions and measures of group cohesion.

Although a large variation of group cohesion definitions is found in the literature, **group cohesion** in this study was defined as —A dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its goals and objectives” (Carron, 1982, p. 124). This definition of group cohesion has been chosen for the reason that it applies to work groups in particular and encompasses both task and social cohesion. **Task cohesion** was defined as *a shared commitment and motivation to coordinate group efforts to achieve common work-related tasks or goals* (Hackman, 1976; MacCoun, 1996; Widmeyer et al., 1985) and **social cohesion** was defined as *motivation to develop and maintain bonds within a group* (Carless & De Paola, 2000).

Also, *work group* referred to a group of employees who were established formally, are assigned some autonomy, and are also interdependent (Rasmussen & Jeppesen, 2006; Sundstrom, 1999).

Researchers who have examined cohesion have primarily focused on the following: the structure of cohesion, i.e., cohesion as a unidimensional construct versus a multidimensional construct, level of analysis (individual versus group versus both), and the relationship between cohesion and performance. Before presenting the different theoretical frameworks from which most of the scholarly research on group cohesion is derived, it is important to present the different views that have dominated much of the literature on group cohesion for a clearer understanding.

Unitary Construct versus Multidimensional Construct

Two distinct views have shaped the research of group cohesion in workgroups. Most of the research in early studies has primarily focused on cohesion as a unitary construct (Lewin, 1935; Seashore, 1954; Van Bergen and Koekebakker (1959). For example, Seashore (1954), defined cohesion as a member's "attraction to the group or resistance to leaving" (p. 11). Consequently, Van Bergen and Koekebakker (1959) modified Seashores' definition by asserting that attraction to the group is on a lower level than cohesiveness is, and therefore, attraction to the group can be much more easily defined and measured than cohesion. A more contemporary one-dimensional model of group cohesion, was presented by Piper et al. (1983, p.95). Although Piper and colleagues developed a five-item measure that was used to indicate some level of construct validity, their sample may have been too small given that they used factor

analysis (Comrey, 1978) and as other researchers have pointed out, their model did not describe cohesion of many types of groups (Mudrack, 1989). Goodman, Ravlin, and Schminke (1987) also provided a unidimensional model of group cohesion in organizations and defined cohesion as “the commitment of members to the group task” (p. 149). A problem with Goodman and colleagues’ definition is that it may not represent cohesion in certain types of groups. As Cota et al. (1995) suggested, “this model may not describe the cohesiveness of groups in which members have a commitment to the group but not the task” (p.574). The most widely used unidimensional measure of cohesion is Seashore’s (1954) group cohesion scale.

Unidimensional Models: Advantages and Disadvantages

An advantage of one-dimensional models is that they are more parsimonious than multidimensional models and perhaps “such models may help to delineate the parameters of cohesion from those of other, related constructs” (Cota, 1995, p. 575). However, one-dimensional models are often limited since they only apply to certain types of groups, and their restricted definitions impede the integration of results from other unidimensional studies. For example, findings from Goodman et al. (1987) and Piper et al. (1983) would probably differ due to the contrasting definitions of cohesion from each of these models.

Festinger, Scachter, and Back (1950) were among the first researchers to suggest that cohesion is more than just a unidimensional construct. According to Festinger et al. (1950), group cohesion consisted of “the total field of forces which act on members to remain in the group” (p.164). These researchers identified two causes that contribute to

group cohesion: 1) the individual's attraction to the group; and 2) the group's capacity to help its members accomplish their goals. Gross and Martin (1952) critiqued Festinger and colleagues (1950) definition, and presented the following alternative definition of cohesion, "the resistance of a group to disruptive forces" (p.553). Gross and Martin maintained that their definition was superior to Festinger and colleagues' definition because it focused on what keeps the group together. According to Campbell and Martins (2009), "Festinger's (1950) and Gross and Martin's (1952) definitions proposed a shift from investigating the causes to focusing on the effects of group cohesiveness had a major impact on the conceptual and experimental approaches adopted by later researchers" (p. 232).

Although the notion of attraction to the group has been widely used to define cohesion, some researchers argue that cohesion to the group and attractiveness to the group are two different constructs. For example, Evans and Jarvis (1980) maintained that although group attraction is a variable that is related to cohesion, it is a distinct concept from cohesion. Campbell and Martins (2009) suggested that:

The difference between these two phenomena suggests that there is more to group cohesion than simple attraction by group members to the group. One such additional aspect to the construct of cohesion is means control, the degree to which the group decides what goals are important for its members. This suggests a focus on task, while attraction to the group suggests a focus on the social aspect to cohesion. (p.231)

Beginning in the 1980's, several multidimensional models were proposed and introduced in the literature (e.g., Stokes, 1983a, 1983b; Yukelson et al., 1984; Drescher et al., 1985; Carron et al., 1985; Griffith, 1988). For example, in the sport psychology literature, Carron et al. (1985) developed a multidimensional model of cohesion based on task-social and individual-group dimensions. As Cota et al. (1995) explained:

The individual-group distinction reflects the fact that a member can be committed to other members and the group itself. The task-social distinction reflects the fact that a member can be interested in the goals of a group and/or the social relationships in the group. (p. 575-576)

Carron et al. (1985) have made important contributions to the field of research on cohesion for the reason that both the individual-group and task-social dimensions are instrumental to understanding cohesiveness for several different types of groups that have been studied independently by other researchers (Cota, 1995; Tziner, 1982a, 1982b). In addition, the Group Environment Questionnaire (GEQ), developed by Carron et al. (1995), has been tested in several empirical studies with impressive results (e.g., Carron et al., 1988; Westre & Weiss, 1991). Specifically, researchers in the sports literature have reported that GEQ subscale scores are highly correlated with group functioning and performance variables in sports teams. However, researchers that have attempted to apply the GEQ in organizational settings have not reported promising findings when applied to work groups. For example, Carless and De Paola (2000), in their study, were not able to replicate the GEQ's four factor structure.

Griffith (1988), outlined a two dimensional structure of cohesion, using *direction* and *functions*. *Direction* addressed both vertical (superior-subordinate relations) and horizontal (peer relations) facets of cohesion and *functions* included task and affective aspects of cohesion. Griffith (1988), using factor analysis, developed 7 subscales that provided evidence of internal consistency and validity when used with 93 companies. According to Zaccaro (1991), “splitting the cohesion construct enhances the possibility of stronger associations with theoretically connected variables than have been previously reported” (p. 388).

Multidimensional Models: Advantages and Disadvantages

Models composed of more than one factor have shown more promise than one-dimensional models to address what is empirically and theoretically known about cohesion, given that many researchers have demonstrated the usefulness of the construct as consisting of distinct aspects that are independent of one another (Cota, 1995). However, a problem that arises with multidimensional models is that they can be derived empirically without any theoretical basis. As Cota et al. (1995) explained:

Relying on empirical criteria to define a construct can be problematic. The choice of items may be too wide and may include core aspects of the construct as well as aspects that are highly correlated with, but extraneous to, the construct. (p. 576)

Although there appears to be more consensus in the literature advocating for a multidimensional model of cohesion, which dimensions to use as well as which can be applied to a variation of groups remains unclear.

In this particular study, a two dimensional model of group cohesion consisting of task and social cohesion was utilized for the reason that there is considerable support for the distinction between group cohesion and group attraction (Carron & Brawley, 2000; Dobbins & Zaccaro, 1986; Evans & Jarvis, 1980; Mikalachki, 1969; Zaccaro & Lowe, 1988). It is important to note, however, that many researchers often fail to include both task and social cohesion in their studies. As Campbell and Martens (2009) suggested, “investigators who ignore the potential impact of both social and task concepts on the group cohesiveness construct risk generating yet more confusion in the literature” (p. 231).

Level of Analysis

There is also disagreement in the literature regarding the appropriate level of analysis for group cohesion. “Level of analysis refers to the unit to which the data are assigned for hypothesis testing and statistical analysis. There are many possible levels of analysis, including individual, dyad, group, and organization” (Gully et al., 1995). Many researchers argue that group cohesion should only be measured at the group level since it is a group construct (Chiocchio & Essiembre, 2009; Dion, 2004; Carless & De Paola, 2000; Klein et al., 1994). However, the methods used to assess group level constructs are limited at best. As Gully et al. (1995) explained:

Unfortunately, researchers have often operationalized the cohesion construct at the individual level of analysis and generalized findings to the group level. Alternatively, in an attempt to assess cohesion as a group-level construct, many researchers have measured cohesion

by aggregating individual responses. (p. 501)

Cota et al. (1995) maintained that although the individual unit of analysis is often used in research studies, there is no level that is more advantageous than the other. However, it is important for the level of analysis to match the theoretical definition and level of interest. For example, Gully et al. (1995) stated that “failure to explicitly consider levels-of-analysis issues in previous studies may have contributed to the inconsistent findings obtained in the literature” (p. 502). Dion (2000) further suggested that the research hypothesis or question should direct the level of analysis for group cohesion. Thus, considering the theoretical approach is imperative when designing the study as well as determining the methodology and statistical procedures to be used (Campbell and Martens, 2009). In this particular study, the individual unit of analysis was used to assess group cohesion for the reason that it would be logistically difficult to obtain group analysis within primary care settings.

Antecedents of Group Cohesion

Most researchers of empirical studies have focused on the consequences of cohesion rather than the antecedents of cohesion. As Campbell and Martens (2009) explained: “Identifying the antecedents of group cohesion is somewhat more difficult than assessing its consequences, possibly because most empirical studies measure cohesion after a certain level of interaction between group members has already occurred” (p. 225).

Consequently, very few antecedents have been identified in the literature other than structural antecedents such as the size of the group. Another problem that researchers

have encountered is making the distinction between concrete antecedents and antecedents that are included in operational definitions of cohesion (Carron & Brawley, 2000; Mullen & Copper, 1994). As Campbell and Martens (2009) suggested, “Definitions of cohesiveness generally include the same antecedents, thereby confounding the predictors and outcomes” (p. 226).

The hypothesized **antecedents** of task cohesion for the proposed theoretical model included *communication/cooperation*, *quality decision making*, *supportive supervision*, and *perceived organizational support*. *Perceived organizational support* was the hypothesized antecedent of *social cohesion*. In addition, *task interdependence* was hypothesized as a direct predictor of *group performance*. Hypothesized **mediators** included *task cohesion* as a full mediator of the relationship between all of the antecedents (i.e., exogenous variables) with *group performance*; and as a partial mediator for the *perceived organizational support to social cohesion effect* and *goal commitment* as a full mediator for the relationship between *task cohesion* and *group performance*. *Social cohesion* was hypothesized as a full mediator of the relationship between *perceived organizational support* and *group performance*. Hypothesized **moderators** of the relationship between task cohesion and group performance included *organizational status diversity*, and *practice size* (**please refer to Figure 1: Conceptual Model**). The literature with regard to the antecedents, mediators, and moderators is presented below.

Communication/Cooperation. Many researchers who have conducted studies on work group effectiveness suggest that *communication and cooperation* serve as group capabilities in and of themselves, and operate as both group maintenance and task related

functions (Campion et al.; 1993; Gladstein, 1994; Lester et al., 2002). According to Lester et al. (2002), communication and cooperation operate as a group maintenance function in that they promote openness and fulfill interpersonal relationships. As a task-related function, communication and cooperation organize collective efforts and facilitate information sharing (Gladstein, 1994; Shaw, 1981; Stasser, 1992). Several researchers have reported that communication and cooperation have a positive significant relationship with group performance (Gladstein, 1994; Lester et al., 2002; Shaw, 1981). Mesmer-Magnus and DeChurch (2009), in their meta-analysis of information sharing and team performance, provided evidence that openly sharing information promoted group cohesion, which in turn, increased performance. In the present study, task cohesion was expected to play a role in mediating the effect of communication and cooperation on group performance.

Quality Decision Making. An exhaustive search of the literature resulted in research studies with an emphasis of group cohesion as a precursor of group quality decision making (Callaway & Esser, 1984; Mullen & Copper, 1994). Mullen & Cooper (1994) performed a meta analysis of the group cohesion-quality decision making relationship testing the hypothesis that group cohesion leads to decreased quality group decisions. The researchers reported that group cohesion did not have a significant effect on the quality of group decisions. However, the directional relationship of quality decision making to group cohesiveness was not tested in their study and was not found to be empirically tested in the literature. Strickland and colleagues (2007), in their research of community health organizations, found a positive and statistically significant

relationship between participatory decision making and teamwork. Thus, it is plausible that quality decision making is an antecedent of cohesion.

Supportive Supervision. There are a number of researchers who have examined the relationship between supportive supervision and other job related outcomes. For example, several researchers have reported that supportive supervision serves as a coping resource that reduces stress (Cummins, 1990; Schirmer & Lopez, 2001). Other researchers have focused on supportive supervision as a predictor of individual job satisfaction and performance (Abdel-Halim, 1981; Cummins, 1990; Terry et al., 1993; Weed et al., 1976). For example, Abdel-Halim (1981) showed that supportive supervision influenced employee job satisfaction even when employees were given complex duties. Weed and colleagues (1976) found that employees with low tenacity performed well when their supervisors were supportive. However, a comprehensive review of the literature did not yield any results for the influence of supportive supervision at the group level, nor the effects of task cohesion on the supportive supervision-group performance relationship.

Perceived Organizational Support. Several researchers have studied perceived organizational support from a social exchange perspective, wherein “employees’ commitment to the organization is strongly influenced by their perception of the organization’s commitment to them” (Eisenberger et al., 1986). Although many of these researchers have examined the impact of perceived organizational support on employee organizational commitment, they have done this at the individual level, not the group level, for the reason that it is often more difficult to measure at the group level.

Specifically, organizational commitment has been studied from economic and affective attachment perspectives. From an economic view, researchers have focused on economic costs, benefits, and anticipated promotions that influence an employee's commitment to the organization (Farrell & Rosbult, 1981; Gould, 1979). From an affective attachment standpoint, many researchers have investigated the relationship between the employee's emotional bond to the organization and their level of commitment (Meyer & Allen, 1984; Mowday et al., 1982). Moorman, Blakely and Niehoff (1998) reported a positive, significant relationship between perceived organizational support and interpersonal helping, which the authors defined as "helping co-workers in their jobs when such help is needed" (p.353). Ng and Dyne (2005), in their multilevel analysis of helping behavior in work groups, provided evidence that there was a significantly positive relationship between helping behavior and group cohesion. However, the authors did not distinguish between task and social cohesion. The effects of social cohesion and task cohesion on the relationship between perceived organizational support and group performance were investigated in the present study.

Task Interdependence. *Task interdependence* is an important factor which impacts work groups (Campion, 1996; Saavedra et al., 1993). As Saavedra et al. (1993) asserted, "Generally, group members have different roles and often are specialists with different expertise; they perform different parts of the task in a flexible order. Thus, group performance requires coordination among members" (p. 63).

According to Campion et al. (1996), task interdependence is related to group performance because interdependent tasks can be completed more efficiently in groups.

Due to the high degree of coordination required in service organizations, such as primary care practices (Mickan & Rodger, 2005), it was hypothesized that task interdependence would serve as a predictor of group performance.

Mediators

Social Cohesion and Task Cohesion. From the various studies found in the literature, many researchers have explored the direct relationships between cohesion and other variables (Campbell & Martens, 2009) yet have failed to make the distinction between task cohesion and social cohesion. Mikalachki (1969) was the first to distinguish between task and social cohesion and while this notion has drawn attention from several researchers, many of the two-dimensional instruments of cohesion just focus on the social aspects of cohesion, i.e., attraction to the group (Bollen & Hoyle, 1990; Friedkin, 2004; Zaccaro and McCoy, 1988). As Campbell and Martens (2009) suggested, “investigators who ignore the potential impact of both social and task concepts on the group cohesiveness construct risk generating yet more confusion in the literature” (p. 231). Although most empirical researchers who have studied the task cohesion-social cohesion distinction suggest that there is a stronger relationship between task cohesion and performance than social cohesion and performance, (Mullen & Copper, 1994; Zaccaro, 1991), a positive and significant relationship with group performance has been reported for both task cohesion and social cohesion. For example, Zaccaro and McCoy (1988) suggested that when groups necessitate interaction to accomplish a group task, both task cohesion and social cohesion are essential. Another reason for these differences may be due to the varied way cohesion has been defined and measured. As Campbell

and Martens (2009) stated, “It appears that the equivocal results in the group cohesion-performance research may primarily be the result of the dissimilarities regarding the definition of cohesion and subsequently, its measurement” (p. 228).

In a recent study on health care organizations where data was gathered from four large National Institute of Health (NIH) funded studies (Lanham et al., 2009), researchers found that social cohesion and task cohesion are both needed for primary care practices to deliver high quality care and are also both important in practice relationships. Further, Lanham et al. (2009) suggested:

The data from the four studies indicated that practices with relationships that were too socially oriented (conversations were dominated by personal topics) and practices with relationships that were too task oriented (conversations were dominated by work topics) tended to perform more poorly than practices with a mixture of social and task relatedness. (p. 461)

Goal Commitment. With regard to the literature on goal commitment and other goal processes, researchers have primarily focused on the level of goal difficulty (Hollenbeck & Klein, 1987; Hollenbeck et al., 1989; Klein & Mulvey, 1995) and personal as well as situational variables that affect goal commitment. For example, publicness, wherein goal commitment is higher when goals are made public rather than kept private, was proposed by Salancik (1977). Volition, i.e., the extent to which an individual has the freedom to engage in goal commitment, is identified as a second situational variable impacting goal commitment (Salancik, 1977). A third situational

factor, social influence, was identified by Hollenbeck and Klein (1987) as likely to influence goal commitment with regard to (a) others' performance (b) others' goals, and c) others' goal commitment" (p. 216). As Hollenbeck and Klein (1987) explained:

The level of goal commitment shown by others may influence the individual's level of goal commitment. It is unlikely that an individual will maintain goal commitment when the majority of his or her co-workers are perceived as quickly abandoning goals. (p. 216)

Other researchers have ascribed task characteristics as being related to goal commitment (Earley, 1985; Steers & Porter, 1974). For example, Klein and Mulvey (1995) maintained that cohesion is one of the main factors that differentiates group goal processes from individual ones. Klein and Mulvey (1995) investigated the relationships between group cohesion, group processes (difficulty and commitment), and performance on college students divided into working groups. Their results from regression and correlational analysis revealed that goal commitment and goal difficulty served as mediators on the effect of cohesion on group performance. As Klein and Mulvey (1995) suggested, "the strong relationships between goal variables and cohesion suggest that cohesion can be highly efficacious in getting groups to set difficult goals and remain committed to those goals" (p. 48).

Klein and Mulvey's findings are limited in that: 1) they only included student workgroups; and 2) their results were not replicated in a similar follow-up study (Mulvey & Klein, 1998). Further, Klein and Mulvey (1995) used Shore's (1954) definition of

cohesion, i.e., a member's "attraction to the group or resistance to leaving" (p. 11) and they did not consider task cohesion in their analysis. As Whiteoak (2007) stated, "limited research has specifically addressed cohesion as an antecedent of group-level goal commitment in 'real' organizational groups" (p. 13). It was hypothesized that goal commitment would mediate the relationship between perceived organizational support and group performance in this study.

Moderators

Organizational Status Diversity. Scholarly researchers who have examined the relationship between diversity and workgroups have included the following types of diversity: demographic diversity such as gender, race, and age; organizational status diversity such as tenure or length of service; functional diversity such as knowledge, information, expertise, and education differences; differences in norms, attitudes, and beliefs; and sometimes differences in personalities (Millikan & Martens, 1996). In this study, organizational status diversity (Jackson, 1996), and practice size were examined to determine if these serve as moderators to the group cohesion-performance relationship. The employee's length of service and tenure can have a major impact on his/her sense of belonging to the group, and therefore can impact the level of task and social cohesion (Keller, 2001). In addition, practice size can also serve as a moderator between cohesion and performance since larger groups tend to be less cohesive than smaller groups (Bachay, 2005; Grumbach & Bodenheimer, 2004).

Practice Size. In a study in which the focus was primary care staff size, a researcher reported that primary care teams with more than 12 members were less

cohesive and that teams of about 6 were most favorable (Starfield, 1998). However, some researchers have provided evidence that increasing the size of groups has led to improved performance. For example, Campion et al. (1993) reported that group size was positively correlated with productivity, employee satisfaction, and manager perceptions of effectiveness. Magjuka and Baldwin (1991) also found group size to be a significant positive predictor of group performance among continuous improvement organizational teams.

The Relationship between Cohesion and Performance

The relationship between group cohesion and group performance has been studied extensively among many researchers and has also produced conflicting results. In early studies of the two constructs, researchers have reported a nonsignificant direct relationship between them. For example, both Seashore (1954) and Mikalachki (1969) did not find a significant relationship between group cohesion and group performance, even though they each had distinct definitions of group cohesion. Stogdill (1972) suggested that the reason for these findings may be due to group cohesion being impacted by different variables other than group performance. Littlepage et al. (1989) also found that the variables that predict cohesion are distinct from those that predict group performance, and did not find that cohesion increases performance. Another reason for these differences may be due to the way cohesion has been measured (Campbell & Martens, 2009).

Mullen and Copper (1994) also conducted a meta-analysis of the relationship between group cohesion and group performance. In their review, they divided studies

with regard to the operationalization of group cohesion into two distinct paradigms: 1) the correlational paradigm, which included studies where the researcher examined the cohesiveness-performance effect by measuring the level of cohesiveness as perceived by members of the group and examining whether this measurement correlated with group performance (Mullens & Copper, 1994, p. 212); and 2) the experimental paradigm, wherein the group cohesion-performance effect was observed in experimentally designed studies inducing either high or low cohesion in ad hoc groups and then determining which group performed better, the low or high cohesive group (Mullens & Copper, 1994). Mullen and Copper (1994) also considered the following group attributes that contribute to the group cohesion-performance effect: nature of the group (including group size, and real groups versus ad hoc groups); level of group interaction; contributions of interpersonal attraction, task commitment, and group pride on cohesion; and the direction of the effect between group cohesion and performance. Specifically, Mullen and Copper's (1994) three goals of their "meta analytic integration" included: 1) to provide an accurate review of the whole significance and potency of the group cohesion-performance effect; 2) to consider whether the paradigm (correlational versus experimental), degree of interaction, nature of the group, size, interpersonal attraction, task commitment, and group pride served as moderators to the group cohesion-performance relationship; and 3) to examine the directional or temporal patterns of the group cohesion-performance relationship (Mullen & Copper, 1994).

In their meta-analytic study, Mullen & Copper (1994) included studies that met the following criteria: 1) the participants in the study had to include adolescents or adults

sampled from normal populations; 2) the studies had to include investigations of the relationship between cohesion and performance; cohesion could be operationalized as belonging to either the correlational paradigm or the experimental paradigm; and only performance had to be objectively measured, i.e., “either actual productivity or performance ratings made by someone who was not a group member” (Mullen & Copper, 1994, p. 215). Additionally, correlational studies that included more than one synchronous correlation between group cohesion and group performance were collapsed across time to provide a single effect. In the end, 49 out of 200 published studies were examined, resulting in 8,702 subject responses and 66 separate examinations of the group cohesion-performance effect (Mullen & Copper, 1994).

The results of Mullen and Copper’s meta-analytic study with 66 tests performed on the group cohesive-performance general effect revealed a 92% positive group cohesion- performance effect (Mullen & Copper, 1994). Although statistically significant results were obtained, the effect size was small in magnitude, which contradicted previous meta analytic study results where the researchers reported a moderate effect size. Mullen and Copper (2004) also compared the effects of correlational versus experimental studies and found a statistically significant difference between the magnitudes of the group cohesion-performance effect, with correlational paradigm studies showing stronger effect than experimental paradigm studies. With regard to degree of interaction, the researchers reported that there were no statistically significant differences between high and low interaction groups and the group cohesion-performance effect. Both groups revealed statistically significant results with small

effects (Mullen & Copper, 1994). In addition, the group cohesion-performance effect was significantly stronger in natural or real groups compared to experimental or artificial groups and was also stronger in smaller groups compared to larger ones in both correlational and experimental groups.

Mullen and Copper (1994) also tested the group cohesion-performance effect on different types of real or natural occurring groups that they classified as sports, non-sports, military, and nonmilitary and compared them to artificial groups (i.e, groups that were formed as part of the research), although the authors did not describe the classification process for the artificial groups. The researchers provided evidence that “all types of real groups exhibited stronger effect than artificial groups” (p. 220).

Although Mullen and Copper (1994) did not directly distinguish between social cohesion and task cohesion, they did study the following components of cohesion: attraction to the group, task commitment, and group pride; and reported mixed results of each of these components with regard to their effect on the group cohesion-performance relationship. In experimental paradigm studies, the group cohesion-performance effect increased as a function of attraction to the group, task commitment, and group pride. However, in the correlational paradigm studies, the group cohesion-performance effect decreased as group cohesion involved attraction to the group and group pride but increased as a function of task commitment (Mullen & Copper, 1994). Further, temporal patterns of the group cohesion-performance relationship were examined, and the results from 10 cross-lagged panel correlations performed by the researchers indicated that the directional group performance to group cohesion effect was significantly stronger than

the group cohesion to group performance effect. One of the limitations of Mullen and Copper's (1994) study is that the authors failed to provide an operational definition of group cohesion and appeared to be measuring it as a tridimensional construct rather than a two dimensional construct; even though there appears to be more support in the group cohesion literature for a two-dimensional construct (Carless & De Paola, 2000; Dyce & Cornell, 1996). Also, Mullen and Copper (1994) used a combination of studies that varied with regard to the operational definitions of group cohesion and type of group. For example, the researchers did not separate or distinguish between type of group in their study with the exception of groups in the correlational paradigm, that included sports, non-sports, military, and nonmilitary and even though they compared these groups to artificial or experimental groups, they did not identify which groups comprised the non-sports groups or non-military groups. Even within work groups, for example, different types of groups exist, including but not limited to service groups, project groups, and self-directed groups. Also, Mullen and Copper (1994) did not explain the type of groups that they labeled under "artificial" groups.

In addition, Mullen and Copper (1994) included additional components of group cohesion that some researchers did not consider as operational factors that impact group cohesion such as attraction to the group and group pride (Evans & Jarvis, 1980; Carron & Brawley, 2000), which may explain why these variables negatively impacted the group cohesion-performance effect. Further, the results of the cross-lagged panel correlation technique may have revealed a stronger relationship for the group performance to group cohesion direction. However, their findings may suggest that the directional group

performance to group cohesion effect may be stronger than the group cohesion to group performance one because group cohesion may be stronger after successful group performance. In order to investigate the group cohesion-performance effect on groups, it is important to compare studies that define cohesion in similar terms and that compare homogeneous groups. Otherwise, interpretation of findings is limited. Unfortunately, there has been little consensus among researchers regarding how to define group cohesion as well as a scarcity of meta analytic studies that appropriately differentiate between type of groups.

Beal, Cohen, Burke, and McLendon (2003) specifically conducted a meta-analysis of the relationship between group cohesion and group performance in organizational groups. The main purposes of their analysis included: 1) re-examine the functionality of criteria used in group cohesion studies; 2) re-test the group cohesion to group performance effect with refined criterion categories; 3) re-evaluate the independent contributions of the following variables in group cohesion studies: interpersonal attraction, group pride, and task commitment; and 4) investigate the impact of work flow patterns on the group cohesion-performance relationship (Beal et al., 2003).

Beal et al. (2003) suggested that performance can be viewed as both a behavior and an outcome but that most researchers focus on performance as an outcome domain. According to Beal et al. (2003), “performance is in the doing, not in the result of what has been done” (p. 990). Thus, the authors hypothesized that performance behaviors are more strongly related to group cohesion than performance outcomes. Beal et al. (2003) also distinguished between effectiveness and efficiency and suggested that cohesive

groups are more efficient than effective because of their familiarity with the members of the group and their motivation to successfully complete a task. Therefore, the authors also hypothesized that efficiency measures are more strongly related to group cohesion than effective measures (Beal et al., 2003). Further, the authors used Tesluk et al.'s (1997) taxonomy of work flow between group members to test their hypothesis that group member attraction, shared task commitment, and sense of pride in belonging to the group had a greater influence on performance as the workflow between members increases (Beal et al., 2003). Tesluk et al.'s (1997) workflow taxonomy included the following ranked components (from lowest to highest): pooled workflow wherein individual performance is aggregated to the group level; sequential work flow involves tasks that flow from one member of the group to another, but without any exchange; next, reciprocal workflow entails bidirectional work exchange between two or more members of the group; and further, intensive workflow takes place when the entire group must collaborate with each other to accomplish a task (as cited in Beal et al., 2003).

Beal et al. (2003) included 64 articles out of 145 studies after excluding irrelevant studies. Sample sizes in the studies averaged 45.3 and group sizes averaged 6.2 (Beal et al., 2003). Beal et al. (2003) reported the following: both domains of performance (outcome and behavior) were positively related to group cohesion although performance behavior accounted for more variability of group cohesion. Similar conclusions were found for the efficiency versus effective measures in that mean correlations for efficiency ($M = .310$) were higher than effectiveness ($M = .175$), although both measures were statistically significant at the $p < .05$ level (Beal et al., 2003). As Beal et al. (2003)

explained, “Efficiency measures better reflected the benefits of cohesion, but cohesive groups also were more effective” (p. 997). With regard to the components of cohesion, interpersonal attraction, group pride, and task commitment each correlated strongly with both performance behaviors and outcomes. Further, the researchers suggested that “as team workflow increased, the cohesion-performance relation became stronger” (p. 998).

Similar to Mullen and Copper (1994), Beal et al. (2003) appeared to combine cohesion into a tri-dimensional measure. In addition, the authors provided separate definitions for efficiency and effectiveness, yet their definition of efficiency includes the word “effectiveness” twice. According to Beal et al. (2003), performance efficiency is defined as “the effectiveness of a group with some consideration of the cost of achieving that effectiveness.” (p. 995). If these are to be considered two separate concepts, effectiveness should not be used to describe efficiency. Like Mullen and Copper (1994), the researchers did not separate or distinguish between type of group in their study. In addition, Beal et al.’s (2003) work taxonomy categories may apply to certain groups but not others. For example, the workflow in project groups may only be categorized as intensive whereas the workflow in service or production groups may be categorized as either pooled, sequential, and reciprocal depending on the nature of the task and the job duties of the staff involved in performing a particular task.

In a recent meta-analysis, Chiochio and Essiembre (2009) addressed the group cohesion (social and task), performance (behavioral and performance), type of team (production, service, project) and team setting (academic and organizational) aspects of the group cohesion-performance relationship. The authors pointed out that previous meta

analytic researchers have not addressed project teams and suggested that project teams in both academic and organizational settings differ from other teams. Chiochio and Essiembre's (2009) hypotheses included the following: 1) project teams will have more positive correlations with task cohesion and performance than production or service teams; 2) project teams will show larger positive task cohesion-outcome performance correlations, followed by social cohesion-outcome performance, task cohesion – behavioral performance, and finally social cohesion-behavioral performance correlations” (p. 394); 3) project teams will indicate stronger positive cohesion-outcome performance correlations than service or production teams. In addition, the researchers tested the following two competing hypotheses: 4a) organizational project teams have larger positive social cohesion correlations than student project teams; and 4b) student project teams indicate larger positive social cohesion correlations than organizational project teams (Chiochio & Essiembre, 2009).

The authors performed an online literature search of group cohesion- performance studies that first resulted in 157 studies (Chiochio & Essiembre, 2009). Studies were then carefully examined and were included if at least one of the following criteria were met: 1) they included self-assessment measures of cohesion by team members without any outside performance assessments; 2) studies that included outside performance assessments (e.g., managers, teachers) and did not include any self-reported assessments; 3) studies that assessed task performance of participants 18 years of age and over in either organizational or academic settings; 4) studies that corresponded with project, production, and service teams; 5) studies whose members had been familiar with each

other for at least 4 weeks prior to being measured; 6) studies which presented t-tests, correlations, or F values on the authors' variables of interest; and 7) studies that were performed at the group level (Chiocchio & Essiembre, 2009). In the end, 29 studies with 9,416 participants and 1,598 groups were included in their meta analysis (Chiocchio & Essiembre, 2009).

Chiocchio and Essiembre (2009) reported the following results: The authors did not find sufficient evidence to support their first hypothesis, i.e., project teams have larger positive correlations with task cohesion and performance than production or service teams. Similarly, Chiocchio and Essiembre (2009) found insufficient data to support their second hypothesis. Although they indicated that ~~the~~ only case in which this (hypothesis 2) could be tested involves projects undertaken in academic settings," the authors did not provide an explanation for the reason given (Chiocchio & Essiembre, 2009, p. 404). On the other hand, the authors did find strong support for their third hypothesis, i.e., project teams indicate stronger positive group cohesion-outcome performance correlations than service or production teams and found moderate support for hypothesis 4a in that heterogeneity of group members played a positive and significant role in social cohesion and outcome performance relationship in organizational project teams; and the social cohesion – behavioral performance relationship appeared unaffected by homogeneity or heterogeneity of groups (Chiocchio & Essiembre, 2009). Although Chiocchio and Essiembre (2009) provided groundbreaking research in that they were the first to differentiate between types of groups and settings in a group cohesion-performance meta analytic study, they focused

primarily on both student and organizational project teams and minimized the importance of other types of teams, i.e., service and production teams. In fact, even though the researchers reported that findings did not support their first two hypotheses, Chiocchio and Essiembre (2009) maintained that the group cohesion-performance relationship is “Very important in project teams and arguably much less important in other teams” (p. 406). In addition, the authors combined different components of behavioral performance in their analysis, although they acknowledge this as a limitation in their study. Further, Chiocchio and Essiembre (2009) did not consider self-managed work teams in the work place that may overlap as both project and production/service teams. For example, self-managed work teams are often involved in both project related tasks and in providing enhanced service and product quality (Chansler et al., 2003).

Thus, these mixed findings reported by researchers conducting meta analytic studies could be the result of the combination of the different types of groups or teams as well as group contexts studied, which are important considerations that effect the cohesion and performance relationship. In reviewing 27 meta-analyses, Campbell and Martins (2009) stated, “Caution should be exercised when interpreting these findings, as the 27 studies included in the meta analysis used different operationalizations and differing group types” (p. 228). Thus, more empirical studies on homogeneous group types and settings are required to examine and shed light on the relationship between group cohesion and group performance.

Significance of Topic to HRD

The effect of group cohesion on group processes and performance in an organization is a compelling human resource development (HRD) issue of practice for the reason that it may contribute to understanding the impact of group dynamics on organizational outcomes. As Swanson and Holt suggested (2001), “The practice of HRD is dominated by positive intentions for improving the expertise and performance of individuals, work groups, work processes, and the overall organization” (p. 12). Specifically, group cohesion involves observing and studying the following: 1) work-based relationships between group members in an organization; 2) how the processes of an organizational workgroup impact the cohesiveness and performance of the group within certain contexts. The effect of group cohesion on workgroup processes and performance is also a complex issue of HRD practice because there are many intervening variables that interact with cohesion at the individual, group, and organizational levels, that in turn, affect workgroup processes and performance. By investigating the dynamics that take place in work groups within certain contexts, HRD practitioners can be better prepared to understand, identify, and explain processes that impede or improve the cohesion and performance of groups in organizations.

Implications for HRD Theory, Research, and Practice

Thus far, the different types of research approaches, underlying theories, and the various researchers and study findings of cohesive workgroups in organizations have been presented. What do these studies imply for HRD theory, research, and practice? These studies are important to HRD theory, research, and practice for the reason that

investigators have made attempts to understand and explain *how*, *when*, and *why* cohesion (both task and social cohesion) affects group processes and group performance. Thus, they contribute to the growing knowledge of the group cohesion-performance literature. Specifically, the scholarly research, and the theoretical foundations from which they are derived, provide knowledge and direction to HRD scholars and professionals regarding the past and present state of cohesion in organizational workgroups. Also, much of the research that has been conducted in this area is based on psychology theory, one of the foundational theories of HRD (Swanson & Holton, 2001). It is important for HRD professionals to be familiar with a variety of theories and research studies in order to apply each approach and/or a combination of these approaches into practice, such as in the performance and improvement of workgroups. It would be foolish to incorporate work practices that increase group cohesion in an organization without being able to identify and understand *how*, *when* and *why* cohesive groups are effective and outperform non-cohesive groups. As Swanson and Holton (2001) suggested, “If humans are not viewed as motivated to develop and improve, then some of the core premises of HRD disappears” (p. 156).

Conclusion of the Review of the Literature

Overall, the literature review above was used to demonstrate that task cohesion and social cohesion should be considered distinct constructs. However, study results of the group cohesion-performance relationship have been mixed. In some studies, there has been no significant direct relationship between group cohesion and group performance. In other studies, task cohesion has shown a stronger link with group

performance than social cohesion, although under certain contexts, both task and social cohesion can be positively linked to group performance. The lack of consensus among researchers regarding how to both define and measure group cohesion may be one reason for the inconsistent results. Another reason may be due to the diverse type of groups and situations studied in the literature, which limits generalizability of findings. Most of the existing literature includes cohesive sports teams and student groups with very few studies applied to work groups. As Campbell and Martens (2009) suggested, “researchers need to search for and include more studies that examine groups within companies to provide more generalizability and bring more relevance to the group cohesion literature” (p. 241). Moreover, most researchers have focused on the consequences of group cohesion rather than its antecedents and many have failed to identify the moderators of the group cohesion-performance associations. The researcher of this study explored the predictors and consequences of group cohesion with regard to group type and group setting and investigated the underlying factors that influence the group cohesion-performance relationship.

Summary

In Chapters I and II, the research relative to the nine constructs involved in the study: *task cohesion*, *social cohesion*, *communication/cooperation*, *quality decision making*, *supportive supervision*, *perceived organizational support*, *task interdependence*, *goal commitment*, and *group performance* was presented. The theoretical frameworks of group cohesion and this particular study were also discussed, followed by the advantages and disadvantages of both unidimensional and multidimensional models of group

cohesion. Further, the level of analysis (individual versus group); moderators of the cohesion/performance association; the relationship between cohesion and performance; and the significance of the topic to human resource development (HRD) were also discussed.

CHAPTER III

METHODOLOGY

The methodology section includes a brief explanation of the study design, the instruments used to collect the data, the procedures and data collection process, the sample of the study and demographic structure, and the methods used for data analyses.

Study Design

The purpose of this study was to answer the research questions (please refer to *Chapter I*, Research Hypotheses, pg. 11) by examining the relationships between and among task cohesion, social cohesion, communication/ cooperation, quality decision making, perceived organizational support, supervisory support, task interdependence, goal commitment, and group performance based on the perceptions of primary care staff in various primary care practices. A cross-sectional survey design was used and administered at a single point in time (Bhattacharjee, 2012).

Target Population and Sample

The target population of the current study was approximately 2,000 primary care staff and the response rate was about 10% even though the targeted sample size was five hundred. There were originally 210 respondents who filled out the survey (40 hard copies and 170 online entries). However, 3 of the online surveys were removed because the respondents only filled out the demographic portion of the survey. Therefore, the usable sample size included 207 participating clinic staff (schedulers, medical assistants, office managers, physicians assistants, nurses, and physicians; see Table 1) ages 18 and over. The ages of participants ranged from 22 years of age to 68 years of age, with an average

age of 39.5 ($s = 11.0$). Of the 207 respondents, 153 (73.9%) answered the last question of the survey that asked the participant to enter the name of the practice at which they worked; however, these data were not reported for confidentiality reasons.

Participants were predominately Hispanic (see Table 2) and female (84% female & 15% male), with a few respondents ($n = 3$, 1%) not responding to the gender question. With regard to education level, most participants had either some level of college education ($n = 82$) or professional degrees ($n = 49$) as seen in Figure 2.

Table 1
Primary Care Staff Type

| Staff Type | <i>n</i> | % |
|---------------------------------------|----------|------|
| Administrative Assistant | 32 | 15.5 |
| Medical Assistant | 47 | 22.7 |
| Nurse (LVN, RN or Nurse Practitioner) | 20 | 9.7 |
| Office Manager/Supervisor | 14 | 6.8 |
| Physician | 52 | 25.0 |
| Other | 26 | 12.6 |
| Unknown (Missing) | 16 | 7.7 |
| Total | 207 | 100 |

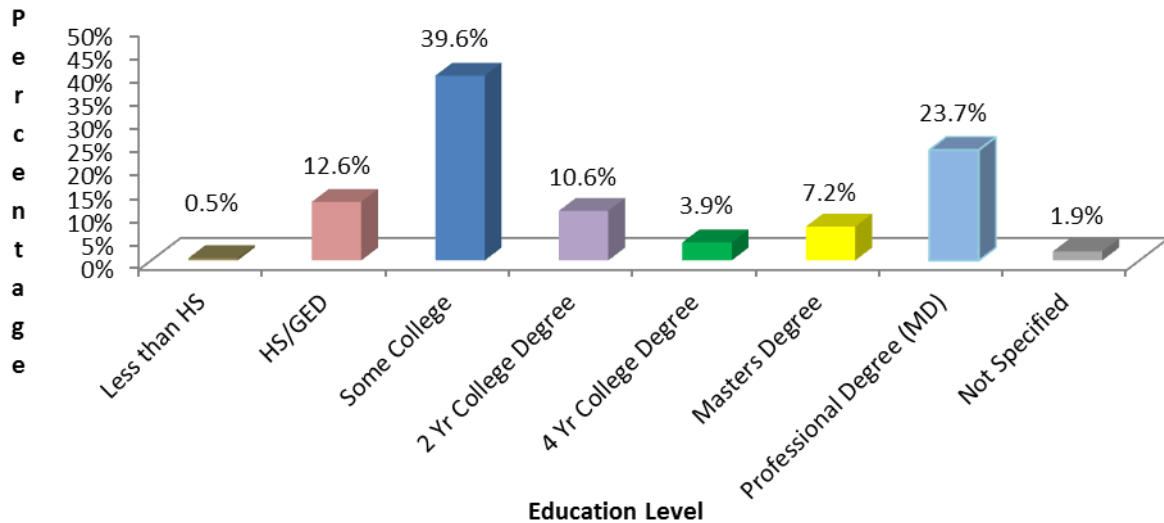
**Note: Administrative assistant included schedulers, clerical, and patient registrar*

Table 2
Ethnic Composition of Participants

| Ethnicity | <i>n</i> | % |
|---|----------|------|
| African American | 11 | 5.3 |
| Asian | 6 | 2.9 |
| Hispanic | 133 | 64.3 |
| Native American | 0 | 0.0 |
| White | 46 | 22.2 |
| Other (Including Multiracial or Biracial) | 8 | 3.9 |
| Unknown (Missing) | 3 | 1.4 |
| Total | 207 | 100 |

The distribution of level of education among participants is illustrated in Figure 2.

Figure 2
Participant Level of Education



Of the clinic staff, 79 participants worked in pediatric clinics (38.2%). An additional 35.7% represented family practices ($n = 74$) and 19.3% ($n = 40$) worked at specialty practices (including geriatric/internal medicine and pediatric endocrinology practices). The remaining 4.3% and 1.4% represented internal medicine ($n = 9$) and community based practices such as federally qualified health centers (FQHC's) ($n = 3$) and 1% ($n = 2$) did not answer the question.

With regard to the number of years or tenure at the practice, of the 207 subjects, 125 of them had been at their practice 5 years or less (60.4%), 34 had been at their practice 6 to 10 years (16.4%), 14 had worked at their practice between 11 to 15 years

(6.8%), and 20 had worked at their respective practices 16 years or more (9.7%).

Fourteen respondents did not answer the question (6.8%).

Instrumentation

The survey included: 1) demographic questions; 2) practice organizational profile items; and 3) a work environment instrument (derived from several scales with internal consistency reported in the literature), which included several scales of organizational culture and behavior, including *communication/cooperation*, *quality decision making*, *perceived organizational support*, *supportive supervision*, *task cohesion*, *social cohesion*, *task interdependence*, *goal commitment* and *group performance*.

The order of the self-reported survey included four demographic questions at the beginning that were used to ask participants about their age, gender, ethnicity, and level of education. A few organization profile questions followed, and these included questions regarding the participant's job title, type of practice, tenure, practice description, patient satisfaction, and the estimated number of clinic staff at the practice. The next set of 45 questions were used to measure nine constructs: 1) communication/cooperation; 2) quality decision making; 3) task cohesion; 4) social cohesion; 5) task interdependence; 6) group performance; 7) supportive supervision; 8) goal commitment; and 9) perceived organizational support. The last question of the survey was used to ask the participant to fill in the name of the practice at which they worked. Thus, the instrument included a total of 56 questions (a total of 4 demographic questions; 45 work environment questions, and 7 organizational characteristic type questions). An explanation of each scale, along with the internal consistency reliability

(ICR) coefficients for the nine constructs from previous studies, are presented below. The ICR (aka, coefficient alpha) and factorial validity (or factor analysis results) of the present study are provided in *Chapter IV: Results and Findings*.

Measuring Communication/Cooperation. *Communication/cooperation* was operationally defined as *expressing or talking out situations and conflicts that result in easing/resolving problems successfully, having constructive work relationships, and operating as a real team* (Strickland et al., 2007).

The Communication/Cooperation scale is a 4 item, 5-point response scale. It was derived from the Organizational Attributes for Primary Care (SOAPC) scale (Strickland et al., 2007), which was developed to measure attributes relevant to primary care practices from the perspective of clinicians, nurses, and staff. Three items were positively worded and one item was negatively worded (item 3). The internal consistency reliability (ICR) was .81 in Strickland et al.'s (2007) study.

Measuring Quality Decision Making. *Quality decision making* was operationally defined as *the act of encouraging initiative, input and participation from all staff for making important decisions, including practice improvement, changes, and developing quality improvement plans as well as providing leadership for consultation on problems; and defining success as teamwork and concern for people* (Strickland et al., 2007). The Quality Decision Making scale (Strickland et. al. 2007) is an 8 item, 5-point response scale that also came from the Organizational Attributes for Primary Care (SOAPC) scale. Five of the items were positively worded and 3 items (3, 4, and 5) were

negatively worded. Strickland et al. (2007) reported a high internal consistency reliability (ICR = .88) in their study.

Measuring Supportive Supervision. *Supportive Supervision* was defined as *leadership that is provided to employees which helps them solve work related problems, encourages them to develop new skills and participate in important decisions as well as leadership that praises good work and keeps informed about how employees think and feel about things* (Oldham & Cummings, 1996). The Supportive Supervision subscale (shortened version) contains 5 items and is a 7-point response scale. It was derived from Oldham and Cummings' (1996) original 12-item Supportive and Non-Controlling Supervision scale. This shortened version was used to obtain employee perceptions regarding the extent of which they receive supervisory/ leader support. All items of this scale were positively worded. The ICR for the supportive supervision subscale was .86 in Oldman and Cummings' (1996) study.

Measuring Goal Commitment. *Goal commitment* was operationally defined as *putting forth a great deal of effort to achieve the realistic and attainable goals of an organization* (Hollenbeck et al., 1989).

The Goal Commitment scale contains 5 items on a 7-point response scale and was derived from Hollenbeck, Williams, and Klein's (1989) study. It is important to note that Hollenbeck et al. (1989) used this self-report measure on student workgroups. Therefore, the wording was changed to reflect workgroups in primary care practices. For example, "I am strongly committed to pursuing this GPA goal" was replaced with "I am strongly committed to pursuing the goal(s) of this practice." In addition, one item that stated "It is

quite likely that this GPA goal may need to be revised, depending on how things go this quarter” was dropped due to the reason that it did not apply to workgroups. Three items were positively worded and 2 items were negatively worded (items 2 and 3). Hollenbeck, Williams, and Klein’s (1989) reported an ICR of .88 for their Goal Commitment scale.

Measuring Perceived Organizational Support. The operational definition of *perceived organizational support (POS)* was *an employee’s perception that the organization they work for shows concern for and cares about his/her well-being, opinions, and general satisfaction at work; and considers his/her goals and values, notices a job well done, and takes pride in the employee’s accomplishments* (Eisenberger et al., 1986; Bishop et al., 2000). The Perceived Organizational Support scale abbreviated version has 7 items on a 7-point response scale (Eisenberger et al., 1986). Items in this scale are used to measure an employee’s perceptions about the degree to which the organization values them as an employee and items about the actions that an organization may consider that would impact the employee’s well-being (Fields, 2002). Five items on this scale were positively worded and 2 items were negatively worded. ICR values for the Perceived Organizational Support scale have ranged from .74 to .95 in past research (Moorman et al., 1998; Wayne, Shore, & Liden, 1997).

Measuring Task Cohesion. *Task cohesion* was defined as *a shared commitment and motivation to coordinate group efforts to achieve common work-related tasks or goals* (Hackman, 1976; MacCoun, 1996; Widemeyer et al., 1985). The Task Cohesion subscale, developed by Carless and De Paola (2000), contains 4 items on a 7-point response scale. It was derived from Widemeyer, Brawley, and Carron’s (1985) Group

Environment Questionnaire (GEQ), which was originally developed for use in sports psychology. One item was positively worded and three items were negatively worded. When measured on a sample of organizational workgroups, ICR for the Task Cohesion subscale was .74 (Carless & De Paola, 2000).

Measuring Social Cohesion. *Social cohesion* was operationally defined as motivation to develop and maintain bonds within a group (Carless & De Paola, 2000). The Social Cohesion scale was also developed by Carless and De Paola (2000) and has 4 items measured on a 7-point response scale. One item in the social cohesion scale was positively worded and three items were negatively worded. When measured on a sample of organizational workgroups, ICR for the Social Cohesion scale was .81 (Carless & De Paola, 2000).

Measuring Task Interdependence. *Task interdependence* was defined as working closely, coordinating, and consulting with other co-workers to perform a job duty wherein an employee's performance is dependent on receiving accurate information from others (Pearce & Gregersen, 1991). Task interdependence was measured with Pearce and Gregersen's (1991) 5 item, 7-point response scale. Pearce and Gregersen's (1991) scale was tested on a sample of 290 health care and administrative hospital employees and is a measure of reciprocal interdependence. All items in this scale were positively worded. The ICR for this scale was .76 in Pearce and Gregersen's (1991) study.

Measuring Group Performance. *Group performance* was operationally defined as the following: *The perception that the workgroup is very competent, gets its work done*

very effectively, and has performed its job well (Lam et al., 2004). Lam, Schaubroeck, and Brown's (2004) 3 item, 7-point response scale group performance measure, adapted from Heilman, Block, and Lucas (1992), was used to measure group performance. In their study, Lam and colleagues (2004) administered this 7-point response scale measure to the supervisors of 252 working groups at a large multinational bank. All 3 items in the group performance scale were positively worded. The ICR for this scale was reported at .92 by Lam et al. (2004).

Data Collection Procedures

A pilot test was first implemented with nine respondents to test for understanding, readability and accessibility prior to survey distribution. Pilot participants included both primary care and non-primary care staff. The following changes were made to the survey as a result of feedback received from pilot test subjects: 1) an additional statement was added to the introduction of the online version of the survey requesting participants to click on the right arrow tab at the bottom of the page to begin taking the survey; and 2) a word that was accidentally repeated twice in the instructions was removed. Pilot test participants reported that it took approximately 15 to 20 minutes to complete the entire online survey.

The data collection period was between September 2011 and August 2012, with a total of 161 electronic surveys and 46 hard copy surveys being collected. During this time period, the researcher used Qualtrics to develop the online survey and hard copies were also generated from the online version of the survey in PDF format. Although the researcher obtained approval from the Institutional Review Board (IRB) at Texas A&M

University prior to data collection, the researcher was also required to obtain approval at several academic practices. For those clinics that did not require IRB approval, the researcher contacted each clinic's practice manager, director, or owner to obtain permission for electronic and/or hard copy distribution of the survey.

The participants for this study included various staff from primary care practices primarily located in South Texas. The type of primary care practices included family, internal medicine, pediatric, geriatric, and multispecialty practices.

In June of 2011, the researcher first contacted two large pediatric practice groups located in Fort Worth and Dallas, along with a family practice group located in Houston, to obtain permission for staff participation in the study. However, that was unsuccessful. At the pediatric group of practices located in Fort Worth, the researcher contacted the director of research who in turn met with the president and board of directors, and collectively they decided not to participate for the reason that it would add undue stress among physicians. The researcher also contacted the director of the Dallas pediatric primary care group of practices who was interested in participating in the study. However, the Dallas pediatric group was required to obtain IRB approval through UT Southwestern Medical Center, which required the researcher to obtain sponsorship from a UT Southwestern faculty member and the researcher was not successful in obtaining sponsorship. The researcher also contacted a lead physician at a family medicine center in Houston for sponsorship. Although the physician was initially interested and considered sponsoring the researcher, she later declined.

In August of 2011, there were two private pediatric practices located in the Rio Grand Valley whose owners agreed to allow staff to participate in the study although staff at both practices had limited access to onsite computers. Therefore, the researcher mailed hard copies of the survey along with a pre-stamped return envelope to the office managers of each practice. The office managers, in turn, distributed the surveys to their staff and returned anonymously completed surveys to the researcher. There were a total of 24 hard copies returned from one practice in Weslaco and 22 copies returned from a practice in Harlingen. The researcher entered the data online and ran quality assurance checks on 10% of the data entered to check for submission errors.

In addition, Internal Review Board (IRB) directors at three academic medical centers in San Antonio were also contacted by the researcher. Separate IRB applications were submitted to all three health systems. However, the director for one of the academic medical centers refused to allow staff to participate, citing that participation by employees would take up time from their busy work schedules. Therefore, the researcher obtained approval from two academic medical centers in San Antonio to survey clinic staff. The type of academic clinics included family practice, internal medicine, pediatric, geriatric, and multispecialty practices.

The researcher e-mailed each clinic's office manager or director with the link to the survey and the office managers/directors, in turn, distributed the link to their clinic staff. Despite these efforts, there were only 28 participants from the two participating academic medical centers who completed the online survey by mid October 2011. The researcher made several attempts to increase participation rates, including the following:

the researcher contacted the chair of the Family and Community Medicine department at one of the academic medical centers who invited her to present at the Family Medicine Clinic meeting on October 17th, 2011. The researcher also contacted the president of the San Antonio Pediatric Society (SAPS) to discuss the study and the president invited the researcher to present her study at the SAPS meeting held in the evening of October 20th 2011.

In February 2012, the researcher contacted the director of an academic family practice in Bryan, who agreed to participate in the study and distributed the survey to clinic staff via the online survey link provided by the researcher.

Despite the outreach efforts of the researcher to obtain more participants, there were only an additional 81 participants that participated in the survey from mid October 2011 through April 2012. As a result, the researcher consulted with her advisor and they collectively decided to offer an incentive to increase survey participation in the form of a \$200 visa gift card drawing and the drawing would be held on August 31, 2012, the final day of data collection that was decided in advance between the researcher and her advisor. Therefore, the researcher submitted an amendment to the Texas A&M IRB office that was approved in June 2012 and an additional 52 participants participated in the survey through August 31, 2012. A total of 155 surveys were completed prior to the incentive offer (from September 2011 through May 2012) and 52 surveys were completed after the incentive offer (June 2012 through August 2012). Statistical analyses were used to determine if there were any respondent differences between participants that

took the survey prior to the incentive offer and those that took the survey after the incentive offer. Results of the comparison are reported in *Chapter IV*.

Both electronic and hard copies of the survey included a cover letter that explained why the research study was being performed and introduced the researcher, as well as instructions on completing the survey, benefits and risks of participation in the survey, contact information for the researcher, the researcher's advisor, and the Institutional Review Board at Texas A&M University. In addition, assurances of confidentiality and voluntary participation were also included in the cover letter. The researcher followed Trochim's (2006) ethical guidelines for conducting research in this study. Specifically, the informed consent process included providing prospective participants with information about the study and the types of questions that would be asked within the survey. Individuals were also informed that at any point in time, they could discontinue participation in the survey or decline to answer any questions. In addition, potential risks associated with participation in the study were addressed by the researcher. Some of the potential risks included: Survey questions could have caused some clinic staff distress if they perceived that their responses would be shared with other members of the clinic. Prospective participants were assured that their answers on the survey could not be traced to individual names or job titles and that all information would be kept anonymous and stored in a secure, password protected software program.

Data Analysis

Data analysis included item and scale reliability analyses, regression analyses, confirmatory factor analysis (CFA), exploratory factor analysis (EFA), and structural

equation modeling (SEM). SPSS was used to perform item and scale analyses as well as regression analyses to test the moderation effects of organizational status diversity and practice size on the group cohesion-performance relationship. Mplus (Muthén & Muthén, 1998-2010) was used to perform the CFA, EFA, and SEM. To supplement the aforementioned statistical analyses related to the primary research questions, analysis of variances (ANOVAs) were also conducted to examine group differences on the final set model's mean scale scores. Specific details related to the statistical analyses are presented below.

Factor Analyses

CFA and EFA were both used to understand the factor structure, as the hypothesized factor model (tested with CFA) produced a poor model fit and suggested the existence of a more complex data structure. Recall, EFA and CFA are both based on the common factor model, thus share the same goal of uncovering the latent factors that account for the variation and covariation between the observed variables (i.e., items) and latent factors. EFA differs from CFA in that models are data driven (i.e., the data are used to generate theory or evaluate more complex data structures), whereas CFA is theory driven and used to test specific hypothesized factor structures (Schmitt, 2011). In the case of this study, the hypothesized CFA factor structure was not supported by the data (i.e., multicollinearity problems emerged and several items cross-loaded, thus producing a poor model fit), so EFAs were performed to purify the factor structure prior to testing the final CFA and SEM models.

To determine the number of factors and identify items that cross-loaded (and may have needed to be removed), an EFA was conducted after the initial CFA. The following criteria are used to determine the number of factors: 1) the Kaiser-Guttman rule, where factors are selected if eigenvalues are greater than one; 2) the scree plot; and 3) the model fit test. An oblique Geomin rotation was selected as it allows for complex factors, while still providing an interpretable pattern matrix (Sass & Schmitt, 2010).

Structural Equation Modeling (SEM)

SEM (aka, latent variable modeling) was used to examine overall model fit and estimate model parameters simultaneously. The two step SEM approach (Anderson & Gerbing, 1988) was used. Thus, the measurement model (or CFA) was estimated first to ensure adequate factorial validity followed by testing the hypothesized structural model. Stated differently, the measurement model was performed first to specify the relationship between the latent and observed variables, followed by the SEM that is used to assess the relationships between and among the latent variables.

Tests for Model Fit

The researcher used different measures, including absolute, incremental, and parsimony fit indices to test for CFA, EFA, and SEM model fit. Absolute fit indices included Chi-square (χ^2), and standardized root mean residual (SRMR) fit indices. Incremental and parsimony fit included the comparative fit index (CFI), Tucker-Lewis index (TLI) and root mean square error of approximation (RMSEA), respectively.

CFI and TLI values greater than .95 are considered as a “good” model fit, whereas CFI and TLI statistics closer to .90 are deemed an “adequate” model fit. RMSEA and

SRMR less than 0.08 and 0.06, respectively, are deemed as “good” fit indices, whereas RMSEA and SRMR statistics between .08 and .10 are considered as “mediocre” model fit (Hu & Bentler, 1999). For models with adequate or better model fit, the researcher also examined the model parameters estimates (i.e., factor loadings, structural coefficients, R^2 statistics, etc.).

Model Estimation

EFA, CFA, and SEM models were estimated using a weighted least squares mean and variance (WLSMV) estimator given that it has been shown to perform best with ordered categorical data (Flora & Curran, 2004; Beauducel & Herzberg, 2006). Model specification for the CFA and SEM was obtained by fixing the first unstandardized factor loading on each factor to one.

Missing Data

Unlike many other statistical software programs, Mplus does not exclude cases using listwise deletion. Instead, Mplus uses all the available data to estimate the model using WLSMV pairwise deletion (WLSMV-PD, Asparouhov & Muthen, 2010). Thus, no respondents were omitted from the EFA, CFA, or SEM analyses. Nevertheless, the percent of missing data was rather small, as the greatest proportion of missing data on a variable and covariance was 6.4% (POS7) or 8.6% (POS7 with both TC2 and TC3), respectively. However, the listwise deletion procedure in SPSS was used for ANOVAs.

Tested CFA, EFA, and SEM Models

CFA Model 1 (i.e., the hypothesized factor model) and SEM Model 1 (i.e., the hypothesized factor and structural model) were tested first and were based on research

and theory. Due to the poor measurement model fit and model specification concerns, several EFA models were performed to better understand the factor structure and remove those items or latent factors that produced the aforementioned concerns. The initial EFA analysis (EFA Model 1) was used to decide on the number of factors and examine the correlation patterns among the observed variables to determine a better fitting factor structure. After this initial EFA, items were removed one at a time until a clean factor structure with the appropriate number of factors was obtained (called EFA Model 2). After deciding on the best EFA model, CFA Model 2 was tested to confirm the adequacy of the model, which was then used to test the revised structural model (SEM Model 2). Unfortunately, SEM Model 2 still suggested a high degree of multicollinearity between two latent factors. To remove this multicollinearity concern one of the latent factors was removed, thus resulting in a final EFA (EFA Model 3), CFA (CFA Model 3), and structural model (SEM Model 3) that were tested.

ANOVAs

Analysis of Variance's (ANOVAs) were performed by the researcher to test for respondent group differences (including staff type, gender, pre- and post-incentive survey takers, ethnicity, level of education, practice type, and years at the practice) with regard to the organizational profile questions in the survey. In order to reduce the likelihood of type I errors, the Bonferroni correction was performed and each p value (α) was divided by the number of comparisons being made.

Summary

The design of the study as well as the population and sample were presented in *Chapter III*. In addition, the procedures used for data collection and the instruments used to collect the data were also explained in detail. Further, the various types of analyses that were conducted by the researcher to test the research hypotheses of the study were also presented. The results of the analyses performed by the researcher are discussed in *Chapter IV*.

CHAPTER IV

RESULTS AND FINDINGS

Reliability Results

As previously mentioned in the *Methods section, Chapter III*, the original survey contained a total of 4 demographic questions; 45 work environment questions, and 7 organizational characteristic questions. The 45 work environment questions included 9 scales (*communication, quality decision making, supportive supervision, perceived organizational support, task cohesion, social cohesion, task interdependence, goal commitment, and group performance*), with the ICR (labeled Original ICR) provided in Table 3. The final measurement model contained six scales (*supportive supervision, perceived organizational support, social cohesion, task interdependence, goal commitment, & group performance*) and a total of 24 items. The final scale's ICR was also provided in Table 3.

Descriptive Statistics

SPSS 13.0 was used to compute descriptive statistics for all 45 work environment survey related items. The item stem, number of responses for each item, and item mean and standard deviation are presented in Table 4. The descriptive statistics for the nine original and six revised mean scale scores are included in Table 5.

Table 3
Internal Consistency Reliability Estimates for Current Study

| Variable | <i>Original ICR</i> | <i>Final ICR</i> |
|----------------------------------|---------------------|------------------|
| Communication/ Cooperation | .71 | *.71 |
| Quality Decision Making | .87 | *.87 |
| Task Cohesion | .75 | *.75 |
| Social Cohesion | .71 | .73 |
| Task Interdependence | .63 | .61 |
| Group Performance | .85 | *.85 |
| Supportive Supervision | .93 | *.93 |
| Goal Commitment | .82 | .80 |
| Perceived Organizational Support | .92 | .88 |

*Note: *Final ICR remained unchanged.*

Table 4
Items and Descriptive Statistics for Each of the Nine Scales

| | Item stem | n | M | SD |
|------|---|-----|------|------|
| COM1 | <i>When there is conflict in this practice, the people involved usually talk it out and resolve the problem successfully.</i> | 205 | 3.60 | 0.95 |
| COM2 | <i>Our staff has constructive work relationships.</i> | 207 | 3.64 | 0.99 |
| COM3 | <i>*There is often tension between people in this practice.</i> | 206 | 3.21 | 1.10 |
| COM4 | <i>The staff and clinicians in this practice operate as a real team.</i> | 207 | 3.80 | 0.88 |
| DM1 | <i>The practice encourages <u>staff</u> input for making changes and improvements.</i> | 196 | 3.81 | 0.91 |
| DM2 | <i>The practice encourages <u>nursing and clinical staff</u> input for making changes and improvements.</i> | 202 | 3.82 | 0.89 |
| DM3 | <i>All the staff participates in important decisions about the clinic operation.</i> | 204 | 3.20 | 1.03 |
| DM4 | <i>*Practice leadership discourages nursing staff from taking initiative.</i> | 205 | 3.61 | 0.92 |
| DM5 | <i>*This is a very hierarchical organization; decisions are made at the top with little input from those doing the work.</i> | 203 | 3.14 | 1.05 |
| DM6 | <i>The leadership in this practice is available for consultation on problems.</i> | 205 | 3.70 | 0.94 |
| DM7 | <i>The practice defines success as teamwork and concern for people.</i> | 201 | 3.85 | 0.90 |
| DM8 | <i>Staff are involved in developing plans for improving quality.</i> | 203 | 4.06 | 1.22 |
| TC1 | <i>Our practice team is united in trying to reach its goals for performance.</i> | 202 | 5.42 | 1.31 |
| TC2 | <i>*I'm unhappy with my practice team's level of commitment to the task.</i> | 201 | 5.01 | 1.64 |
| TC3 | <i>*Our practice team members have conflicting aspirations for the team's performance.</i> | 200 | 4.57 | 1.64 |
| TC4 | <i>*The practice team does not give me enough opportunities to improve my personal performance.</i> | 198 | 5.07 | 1.60 |
| SC1 | <i>Our practice team would like to spend time together outside work hours.</i> | 199 | 4.09 | 1.49 |
| SC2 | <i>*Members of our team do not stick together outside of work time.</i> | 201 | 4.06 | 1.48 |
| SC3 | <i>*Our practice team members rarely party together.</i> | 201 | 3.66 | 1.47 |
| SC4 | <i>*Team members of our practice would rather go out on their own than get together as a team.</i> | 197 | 3.91 | 1.44 |
| TI1 | <i>I work closely with others in doing my work.</i> | 199 | 5.53 | 1.35 |
| TI2 | <i>I frequently coordinate my efforts with others.</i> | 198 | 5.13 | 1.36 |
| TI3 | <i>My own performance is dependent on receiving accurate information from others.</i> | 199 | 5.46 | 1.37 |
| TI4 | <i>The way I perform my job has a significant impact on others.</i> | 200 | 6.00 | 1.09 |

Table 4
Continued

| | Item stem | n | M | SD |
|------|--|-----|------|------|
| TI5 | My work requires me to consult with others fairly frequently. | 199 | 5.52 | 1.40 |
| GP1 | This practice team is very competent. | 200 | 5.63 | 1.20 |
| GP2 | This practice team gets its work done effectively. | 200 | 5.56 | 1.26 |
| GP3 | This practice team has performed its job well. | 198 | 5.64 | 1.23 |
| SS1 | My supervisor/leader helps me solve work related problems. | 190 | 5.59 | 1.48 |
| SS2 | My supervisor/leader encourages me to develop new skills. | 191 | 5.78 | 1.51 |
| SS3 | My supervisor/leader keeps informed about how employees think and feel about things. | 189 | 5.13 | 1.65 |
| SS4 | My supervisor/leader encourages employees to participate in important decisions. | 191 | 5.12 | 1.62 |
| SS5 | My supervisor/leader praises good work. | 191 | 5.72 | 1.36 |
| GC1 | I am strongly committed to the goal(s) of this practice. | 196 | 6.06 | 1.05 |
| GC2 | *Quite frankly, I don't care if I achieve the goal(s) of this practice. | 197 | 6.32 | 0.99 |
| GC3 | *It wouldn't take much for me to abandon the goal(s) of this practice. | 195 | 6.03 | 1.25 |
| GC4 | *It's unrealistic for me to expect to reach the goal(s) of this practice. | 197 | 5.67 | 1.37 |
| GC5 | <i>I think this practice's goal(s) is/are good goal(s) to shoot for.</i> | 196 | 5.69 | 1.22 |
| POS1 | <i>The practice strongly considers my goals and values.</i> | 195 | 5.18 | 1.38 |
| POS2 | The practice really cares about my well-being. | 197 | 5.28 | 1.43 |
| POS3 | *Even if I did the best job possible, the practice would fail to notice. | 197 | 5.13 | 1.59 |
| POS4 | The practice cares about my general satisfaction at work. | 197 | 5.25 | 1.43 |
| POS5 | *The practice shows very little concern for me. | 195 | 5.41 | 1.55 |
| POS6 | <i>The practice cares about my opinions.</i> | 195 | 5.24 | 1.42 |
| POS7 | The practice takes pride in my accomplishments at work. | 193 | 5.33 | 1.40 |

Note: * indicates items that were reverse scored. Items that are italicized are those that were later removed from the analyses. For Com and DM, a response range scale of 1 to 5 whereas the other items used a 1 to 7 response range scale.

Table 5
Means, Standard Deviations, and Skew: Nine and Six Mean Scale Scores

| Variable | <i>M</i> | <i>SD</i> | <i>Skew</i> |
|----------------------------------|----------|-----------|-------------|
| <i>Original scales</i> | | | |
| Communication/ Cooperation | 3.56 | .72 | -0.31 |
| Quality Decision Making | 3.64 | .74 | -0.72 |
| Task Cohesion | 5.02 | 1.17 | -0.44 |
| Social Cohesion | 3.93 | 1.07 | -0.09 |
| Task Interdependence | 5.53 | 0.84 | -0.58 |
| Group Performance | 5.61 | 1.08 | -1.18 |
| Supportive Supervision | 5.47 | 1.34 | -1.24 |
| Goal Commitment | 5.96 | 0.89 | -1.09 |
| Perceived Organizational Support | 5.27 | 1.19 | -1.15 |
| <i>Revised scales</i> | | | |
| Social Cohesion | 4.13 | 1.17 | 0.05 |
| Task Interdependence | 5.53 | 0.84 | -0.58 |
| Group Performance | 5.61 | 1.08 | -1.18 |
| Supportive Supervision | 5.47 | 1.34 | -1.24 |
| Goal Commitment | 5.96 | 0.89 | -1.08 |
| Perceived Organizational Support | 5.32 | 1.23 | -1.15 |

Testing for Common Method Variance

Many researchers assert that common method variance (CMV), which is also often referred to as common method bias (CMB), occurs in self-reported measures (Campbell, 1982; Organ & Ryan, 1995; Podsakoff & Todor, 1985). According to Ylitalo (2009), “Common method variance refers to variance that is attributable to the measurement method rather than to the constructs the measures are supposed to represent” (p.2). In order to control for CMV in this study, the researcher used Harman’s single factor method to test if the majority of the variance can be explained by just one factor. Miles, Patrick, and King (1996) explained this method: “According to this approach [Harman’s single factor method], if common method variance accounts for the

relationship among variables, factor analyzing the items of these variables should yield a single, global factor” (p. 283). Thus, after the researcher constrained the number of fixed factors to a single factor with no rotation, the variance explained by a single factor was 34% and 8% for the 45 and 24 item scales, respectively. This indicates that CMV was not an issue, as a single factor did not explain the majority of the variance.

Model Specification and Research Hypotheses

A two-stage SEM (CFA followed by SEM) was initially performed on a pre-specified nine factor model with 45 items that included estimated and fixed parameters.

The original hypothesis, as stated in Chapter 1 are as follows:

- 1.1) Task cohesion would fully mediate the relationship between the exogenous variables (communication/ cooperation, quality decision making, supportive supervision, and perceived organizational support) and group performance.
- 1.2) Social cohesion would fully mediate the relationship between perceived organizational support (POS) and group performance.
- 1.3) Social cohesion would partially mediate the relationship between task cohesion and group performance.
- 1.4) The relationship between perceived organizational support and social cohesion would be partially mediated by task cohesion.
- 1.5) Task interdependence would serve as a predictor of group performance.
- 1.6) Goal commitment would partially mediate the relationship between task cohesion and group performance.

1.7) Goal commitment would fully mediate the relationship between perceived organizational support and group performance.

2) *Organizational status diversity* and *practice size* would serve as moderators of the group cohesion- group performance relationship.

Proposed Models

The proposed CFA and SEM models (CFA Model 1 & SEM Model 1, respectively) were based on a theoretical framework. Recall, the first step in the process of CFA involved examining model fit, followed by an evaluation of the model parameters (e.g., factor loadings & interfactor correlations). Similar to CFA, the first step in the SEM process included examining the model fit followed by the evaluation of the model parameters (e.g., factor loadings & structural coefficients).

CFA: Model 1. The results of the initially proposed measurement model (i.e., CFA) revealed an adequate model fit, $\chi^2(908) = 1659.40, p < .001, CFI = .94, TLI = .94, RMSEA = .06$, with standardized factor loadings that were large and statistically significant (see Table 6).

Table 6
Proposed Measurement/CFA Model Factor Loadings (Model 1)

| | COM | DM | TC | SC | TI | GP | SS | GC | POS |
|------|------|------|------|------|------|------|------|------|------|
| COM1 | 0.81 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| COM2 | 0.42 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| COM3 | 0.70 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| COM4 | 0.81 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| DM1 | ---- | 0.77 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| DM2 | ---- | 0.91 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| DM3 | ---- | 0.71 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| DM4 | ---- | 0.66 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| DM5 | ---- | 0.60 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |

Table 6
Continued

| | COM | DM | TC | SC | TI | GP | SS | GC | POS |
|------|------|------|------|------|------|------|------|------|------|
| DM6 | ---- | 0.81 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| DM7 | ---- | 0.82 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| DM8 | ---- | 0.81 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| TC1 | ---- | ---- | 0.82 | ---- | ---- | ---- | ---- | ---- | ---- |
| TC2 | ---- | ---- | 0.75 | ---- | ---- | ---- | ---- | ---- | ---- |
| TC3 | ---- | ---- | 0.55 | ---- | ---- | ---- | ---- | ---- | ---- |
| TC4 | ---- | ---- | 0.70 | ---- | ---- | ---- | ---- | ---- | ---- |
| SC1 | ---- | ---- | ---- | 0.55 | ---- | ---- | ---- | ---- | ---- |
| SC2 | ---- | ---- | ---- | 0.69 | ---- | ---- | ---- | ---- | ---- |
| SC3 | ---- | ---- | ---- | 0.59 | ---- | ---- | ---- | ---- | ---- |
| SC4 | ---- | ---- | ---- | 0.77 | ---- | ---- | ---- | ---- | ---- |
| TI1 | ---- | ---- | ---- | ---- | 0.87 | ---- | ---- | ---- | ---- |
| TI2 | ---- | ---- | ---- | ---- | 0.35 | ---- | ---- | ---- | ---- |
| TI3 | ---- | ---- | ---- | ---- | 0.28 | ---- | ---- | ---- | ---- |
| TI4 | ---- | ---- | ---- | ---- | 0.66 | ---- | ---- | ---- | ---- |
| TI5 | ---- | ---- | ---- | ---- | 0.62 | ---- | ---- | ---- | ---- |
| GP1 | ---- | ---- | ---- | ---- | ---- | 0.83 | ---- | ---- | ---- |
| GP2 | ---- | ---- | ---- | ---- | ---- | 0.87 | ---- | ---- | ---- |
| GP3 | ---- | ---- | ---- | ---- | ---- | 0.95 | ---- | ---- | ---- |
| SS1 | ---- | ---- | ---- | ---- | ---- | ---- | 0.93 | ---- | ---- |
| SS2 | ---- | ---- | ---- | ---- | ---- | ---- | 0.86 | ---- | ---- |
| SS3 | ---- | ---- | ---- | ---- | ---- | ---- | 0.81 | ---- | ---- |
| SS4 | ---- | ---- | ---- | ---- | ---- | ---- | 0.93 | ---- | ---- |
| SS5 | ---- | ---- | ---- | ---- | ---- | ---- | 0.86 | ---- | ---- |
| GC1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 0.83 | ---- |
| GC2 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 0.81 | ---- |
| GC3 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 0.79 | ---- |
| POS2 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 0.83 |
| POS3 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 0.73 |
| POS4 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 0.89 |
| POS5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 0.78 |
| POS6 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 0.90 |
| POS7 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 0.84 |

Note: All factor pattern loadings that were statistically significant after the Bonferroni adjustment ($\alpha = \alpha/n$, i.e., $.05/(45 + 36) = .000617$). Thus, $\alpha^* = .000617$ ($Z_{\alpha} = 3.23$), the new critical value for the first CFA model. *COM* = communication/cooperation; *DM* = quality decision making; *SS* = supportive supervision; *POS* = perceived organizational support; *SC* = social cohesion; *TC* = task cohesion; *TI* = task interdependence; *GC* = goal commitment; and *GP* = group performance.

Table 7 includes the interfactor correlations for the initially proposed measurement model. With the exception of the relationship between social cohesion and

task interdependence ($r = .13$), all other interfactor correlations for the first measurement model were statistically significant and ranged from .34 (SC with GC) to .92 (TC with COM). As may be seen in Table 7, there were some multicollinearity concerns between the factors communication/cooperation and task cohesion ($r = .92$), communication/cooperation and quality decision making ($r = .86$) and quality decision making and perceived organizational support ($r = .80$). Given that these factors should not be that highly correlated based on theory, this implied that the factor structure was more complex (i.e., several larger cross-loadings) and an EFA model was more appropriate (Schmitt & Sass, 2012). Given that the end goal was to test the theoretical model (i.e., SEM model), EFA was used to purify the factor structure (i.e., remove items or factors that caused model fit or specification issues) before testing another CFA model.

Despite these measurement concerns, the proposed SEM model was still tested to provide readers with an evaluation of the structural model and answer the research questions.

However, these results should be interpreted with extreme caution due the measurement related concerns, especially the large amount of multicollinearity between several of the predictor variables.

Table 7
Measurement Model 1 Interfactor Correlations

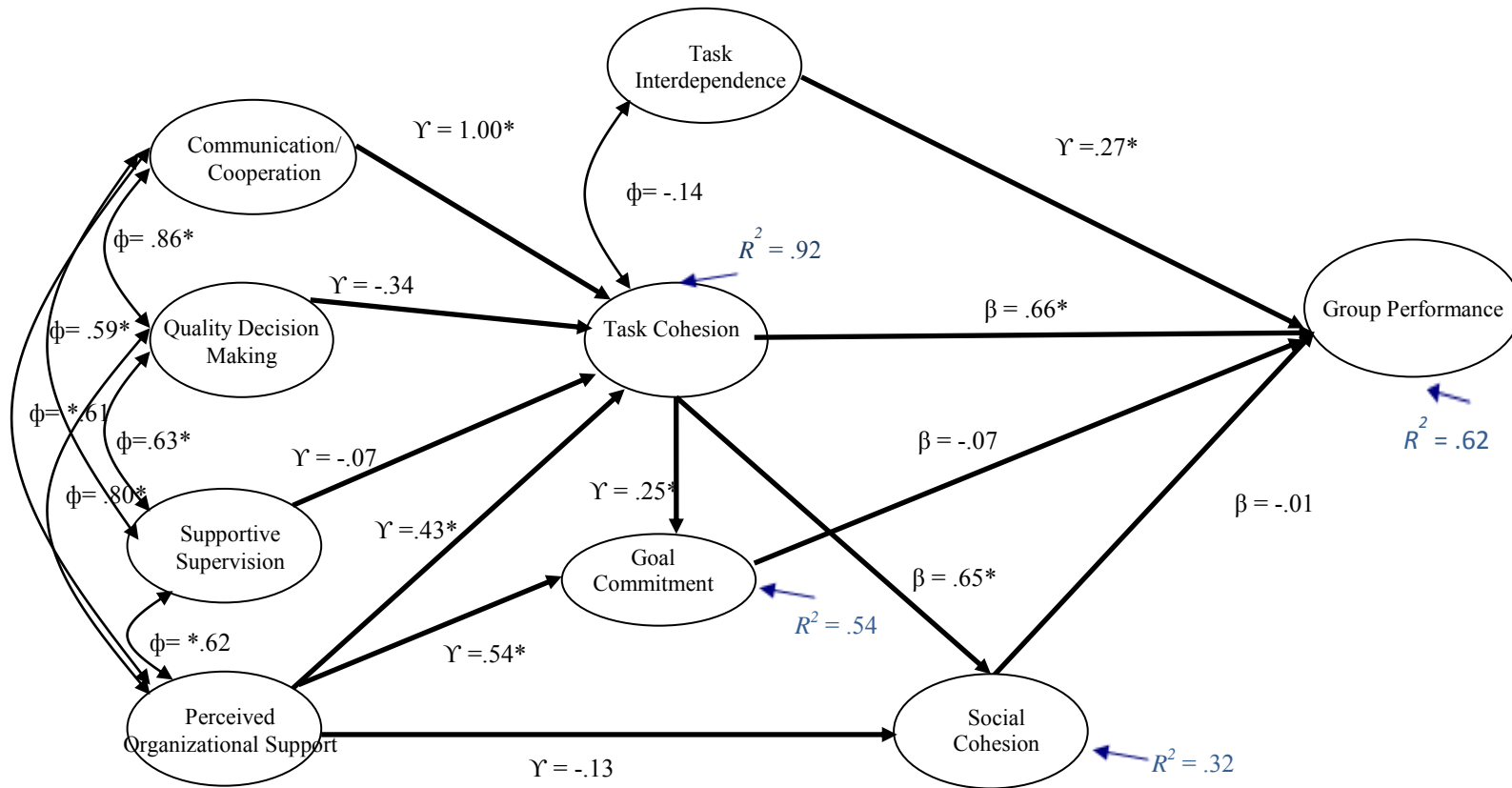
| Measure | COM | DM | SS | POS | TC | SC | TI | GC | GP |
|---------|------|------|------|------|------|------------|------|----|----|
| COM | ---- | | | | | | | | |
| DM | .86 | ---- | | | | | | | |
| SS | .59 | .63 | ---- | | | | | | |
| POS | .61 | .80 | .63 | ---- | | | | | |
| TC | .92 | .86 | .59 | .78 | ---- | | | | |
| SC | .53 | .52 | .33 | .34 | .54 | ---- | | | |
| TI | .50 | .55 | .44 | .57 | .50 | .13 | ---- | | |

| | | | | | | | | | |
|----|-----|-----|-----|-----|-----|-----|-----|------|------|
| GC | .53 | .61 | .42 | .69 | .78 | .34 | .57 | ---- | |
| GP | .78 | .54 | .45 | .53 | .84 | .38 | .65 | .52 | ---- |

*Note: Bolded correlations were not statistically significant at $p < .001$ using a Bonferroni adjustment (.05/81). *COM* = communication/cooperation; *DM* = quality decision making; *SS* = supportive supervision; *POS* = perceived organizational support; *SC* = social cohesion; *TC* = task cohesion; *TI* = task interdependence; *GC* = goal commitment; and *GP* = group performance.

SEM: Model 1. The proposed structural model (see Figure 3) produced an adequate model fit, $\chi^2(921) = 1752.96, p < .001, CFI = .94, TLI = .93, RMSEA = .07$, that was also comparable to the CFA model fit. Although the model fit results were promising, the large structural coefficient between task cohesion and communication ($\gamma = 1$) was a major concern. The large correlation coefficients between the exogenous variables, along with the previously mentioned measurement concerns, were also troubling and suggested that model modifications should be made before proceeding to interpret the structural coefficients. Therefore, EFAs were conducted next to attempt to create a cleaner factor solution for future SEM models.

Figure 3
Structural Model 1



Exploratory Factor Analysis (EFA)

The initial EFA (EFA1) was performed on all 45 items to determine the suitable number of factors and improve the factor structure by eliminating items that did not measure the appropriate factor and/or significantly cross-loaded on other factors. Factors that were highly correlated with other factors, and deemed to be of less theoretical importance than the other factor, were also removed in cases of high multicollinearity between factors.

EFA:Model 1. EFA models with 7, 8, and 9 factors were evaluated to determine the best solution. Model fit results suggested that the *7 Factor*, $\chi^2(554) = 1570.18, p < .001$, CFI = .99, TLI = .98, RMSEA = .09, and SRMR = .04, *8 Factor*, $\chi^2(520) = 1274.86, p < .001$, CFI = .99, TLI = .98, RMSEA = .08, and SRMR = .03, and *9 Factor*, $\chi^2(621) = 1308.11, p < .001$, CFI = .99, TLI = .99, RMSEA = .07, and SRMR = .03, all fit the data well. This was further supported based on the eigenvalues, which suggested that some of the factors (F) were much weaker. The eigenvalues were as follows for each factor: F1 = 16.10, F2 = 3.51, F3 = 3.08, F4 = 2.26, F5 = 2.02, F6 = 1.81, F7 = 1.50, F8 = 1.35, and F9 = 1.16. The factor pattern loading matrix of the nine factor EFA model solution (EFA Model 1) is presented in Table 8. It is clear from these factor loading results that few items loaded on factors 8 and 9. Instead, several proposed factors loaded on the same factor (e.g., COM, TC, and GP items loaded on Factor 2).

Based on the model fit statistics, eigenvalues, and the factor loadings matrix, items and factors were examined and eliminated to purify the factor structure. Items (or in some cases factors) were removed one at a time until a clearer EFA factor structure

was obtained. The elimination of items or factors was based both on statistical and theoretical justifications.

Table 8
Summary of Items and Factor Loadings: Oblique Geomin Nine-Factor Solution

| Factor | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---------------------------|--------------|--------------|-------|--------------|--------------|--------------|-------|--------------|--------------|
| Communication/Cooperation | | | | | | | | | |
| COM1 | <u>0.47*</u> | 0.30* | 0.18* | -0.04 | 0.03 | -0.01 | -0.00 | 0.13* | -0.10 |
| COM2 | 0.18* | 0.21* | 0.09 | -0.07 | 0.18* | -0.01 | 0.02 | -0.08 | 0.07 |
| COM3 | 0.19 | 0.42* | 0.12 | 0.02 | 0.02 | -0.03 | -0.08 | 0.20* | 0.19* |
| COM4 | <u>0.52*</u> | 0.49* | -0.05 | -0.11 | 0.10 | 0.06 | 0.05 | -0.02 | -0.08 |
| Quality Decision Making | | | | | | | | | |
| DM1 | 0.94* | -0.06 | -0.01 | 0.02 | -0.14 | 0.01 | 0.00 | 0.13 | 0.02 |
| DM2 | 0.90* | -0.00 | -0.03 | 0.19* | -0.11 | -0.05 | 0.04 | 0.05 | 0.13* |
| DM3 | 0.73* | 0.00 | -0.03 | 0.12 | 0.03 | -0.03 | -0.17 | 0.05 | 0.05 |
| DM4 | <u>0.33*</u> | 0.08 | 0.08 | -0.01 | 0.09 | 0.06 | -0.00 | <u>0.47*</u> | 0.18 |
| DM5 | 0.33* | 0.03 | 0.07 | <u>0.34*</u> | 0.03 | 0.09 | -0.31 | 0.21 | -0.06 |
| DM6 | 0.50* | -0.04 | 0.18* | 0.22* | 0.01 | 0.06 | 0.15* | -0.01 | 0.01 |
| DM7 | 0.53* | 0.20* | 0.04 | 0.02 | 0.24* | 0.00 | 0.29* | -0.10 | -0.07 |
| DM8 | 0.55* | 0.15 | 0.04 | 0.25* | 0.07 | 0.07 | -0.01 | -0.01 | -0.19 |
| Task Cohesion | | | | | | | | | |
| TC1 | <u>0.47*</u> | 0.53* | 0.02 | 0.02 | -0.08 | -0.11 | 0.18 | 0.00 | -0.323 |
| TC2 | 0.07 | 0.50* | 0.04 | 0.17* | 0.06 | -0.03 | 0.06 | 0.23* | 0.061 |
| TC3 | 0.16 | 0.34* | -0.00 | -0.00 | -0.02 | -0.12 | 0.11 | <u>0.36*</u> | 0.029 |
| TC4 | 0.01 | 0.36* | -0.02 | 0.48* | 0.08 | -0.10 | -0.06 | 0.16* | 0.017 |
| Social Cohesion | | | | | | | | | |
| SC1 | <u>0.31*</u> | 0.03 | -0.06 | -0.05 | 0.38* | 0.21* | -0.14 | -0.08 | 0.011 |
| SC2 | 0.01 | 0.02 | 0.06 | 0.05 | 0.67* | -0.13 | 0.06 | 0.06 | -0.034 |
| SC3 | 0.01 | -0.18 | 0.01 | 0.08 | 0.80* | -0.02 | -0.04 | 0.10 | 0.020 |
| SC4 | 0.15* | 0.10 | -0.04 | -0.00 | 0.53* | 0.01 | 0.02 | 0.10 | 0.045 |
| Task Interdependence | | | | | | | | | |
| TI1 | 0.23* | 0.17* | 0.22* | 0.06 | -0.01 | 0.19* | 0.26* | -0.13 | 0.00 |
| TI2 | 0.03 | -0.04 | 0.18* | 0.03 | 0.02 | 0.57* | -0.10 | -0.18 | 0.02 |
| TI3 | 0.00 | -0.27 | -0.00 | 0.15 | -0.14 | 0.72* | 0.11 | 0.02 | -0.04 |
| TI4 | -0.04 | 0.19* | -0.03 | 0.00 | -0.06 | <u>0.44*</u> | 0.25* | 0.10 | <u>0.38*</u> |
| TI5 | 0.09 | 0.05 | 0.06 | -0.05 | 0.05 | <u>0.59*</u> | 0.08 | -0.00 | <u>0.37*</u> |

Table 8
Continued

| Factor | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
|--------|----------------------------------|--------------|--------------|--------------|--------------|-------|-------|--------------|--------------|--------------|
| | Group Performance | | | | | | | | | |
| GP1 | | -0.00 | 0.65* | -0.01 | 0.03 | 0.00 | 0.34* | 0.00 | 0.13* | 0.03 |
| GP2 | | 0.02 | 0.97* | -0.05 | 0.00 | -0.08 | 0.14* | -0.07 | -0.03 | 0.01 |
| GP3 | | -0.07 | 0.82* | 0.08* | 0.09 | 0.00 | 0.02 | 0.06 | -0.01 | 0.17* |
| | Supportive Supervision | | | | | | | | | |
| SS1 | | -0.03 | 0.23* | 0.83* | 0.03 | -0.01 | 0.01 | 0.06 | 0.02 | -0.16 |
| SS2 | | -0.03 | 0.10 | 0.79* | 0.01 | 0.09 | 0.05 | 0.15* | -0.06 | -0.11 |
| SS3 | | 0.11 | -0.03 | 0.88* | -0.05 | -0.06 | -0.08 | -0.05 | 0.01 | 0.02 |
| SS4 | | 0.20* | -0.03 | 0.84* | 0.03 | -0.04 | -0.06 | -0.15 | 0.07 | 0.12 |
| SS5 | | -0.03 | 0.01 | 0.80* | 0.06 | 0.07 | 0.07 | 0.01 | 0.01 | 0.15* |
| | Goal Commitment | | | | | | | | | |
| GC1 | | -0.03 | 0.05 | -0.05 | <u>0.36*</u> | 0.06 | 0.07 | 0.56* | 0.06 | 0.25* |
| GC2 | | 0.03 | 0.01 | -0.02 | 0.28* | -0.06 | -0.05 | 0.59* | <u>0.40*</u> | -0.00 |
| GC3 | | 0.10 | -0.04 | 0.15* | -0.07 | 0.02 | 0.04 | 0.73* | <u>0.35*</u> | 0.03 |
| GC4 | | -0.01 | 0.09 | 0.03 | 0.05 | 0.01 | 0.01 | 0.59* | <u>0.40*</u> | 0.03 |
| GC5 | | 0.24* | -0.04 | -0.02 | <u>0.40*</u> | -0.04 | 0.05 | 0.48* | -0.06 | -0.00 |
| | Perceived Organizational Support | | | | | | | | | |
| POS1 | | <u>0.38*</u> | 0.18* | -0.01 | 0.55* | -0.08 | 0.04 | -0.06 | -0.05 | 0.05 |
| POS2 | | 0.10 | 0.22* | 0.10* | 0.65* | -0.09 | 0.06 | -0.04 | 0.02 | -0.11 |
| POS3 | | -0.11 | -0.03 | -0.04 | 0.76* | 0.09 | 0.18* | -0.03 | <u>0.33*</u> | -0.06 |
| POS4 | | 0.07 | 0.15* | 0.04 | 0.75* | -0.11 | -0.00 | 0.10* | -0.00 | 0.07 |
| POS5 | | -0.02 | -0.05 | 0.01 | 0.76* | 0.02 | -0.01 | 0.07 | <u>0.32*</u> | -0.08 |
| POS6 | | 0.26* | -0.05 | 0.04 | 0.69* | 0.08 | -0.02 | 0.01 | -0.03 | 0.26* |
| POS7 | | 0.02 | 0.04 | 0.08 | 0.77* | 0.02 | -0.07 | 0.09 | -0.19 | <u>0.36*</u> |

Note: * shows factor pattern loadings that were statistically significant after the Bonferroni adjustment. COM = communication/cooperation; DM = quality decision making; SS = supportive supervision; POS = perceived organizational support; SC = social cohesion; TC = task cohesion; TI = task interdependence; GC = goal commitment; and GP = group performance. Bolded factor loadings include those factor loadings greater than .30, whereas underlined factor loadings were those that also had large cross-loadings (i.e., factor loadings $\geq .30$).

After careful consideration, the Communication/Cooperation scale was removed due to its cross-loadings with another factor and high interfactor correlations with Quality Decision Making, Task Cohesion, and Group Performance. From a theoretical standpoint, communication/cooperation is a key aspect of task cohesion, quality decision making, and group performance and since the Communication/Cooperation scale contained items

that were worded similarly to those in the Task Cohesion, Quality Decision Making, and Group Performance Scales, it was removed.

In addition, there were a few items with either low factor loadings or high cross-loadings with other factors. Specifically, TI1: *I work closely with others in doing my work* had a low factor loading ($\lambda = .39$) on its primary factor. DM4: *Practice leadership discourages nursing staff from taking initiative* had a higher loading on Factor 8 than its primary factor (Factor 6). DM5: *This is a very hierarchical organization; decisions are made at the top with little input from those doing the work*, also had a higher loading on Factor 4 than its primary factor (Factor 1). SC1: *Our practice team would like to spend time together outside work time*, also had high cross-loadings on another factor (Factor 5) and GC5: *I think the practice's goal(s) is/are good goal(s) to shoot for* cross-loaded on another factor as well. POS1: *The practice strongly considers my goals and values* had high cross-loadings with Factor 1. POS6: *This practice cares about my opinions* was also related to items from the Quality Decision Making scale and therefore, was removed as well. Thus, after further analysis, items DM4, DM5, SC1, TI1, POS1, POS6, and GC5 were removed from the survey.

More importantly, a problem that occurred in both the nine factor EFA model and the eight factor EFA model was that *Task Cohesion* items and *Goal Performance* items loaded on the same factor, demonstrating inadequate discriminant validity. From both a theoretical and content perspective, task cohesion and group performance are two different concepts. However, they most likely loaded on the same factor for the reason that task cohesion and group performance items were similarly worded. After careful

statistical and theoretical considerations, the researcher decided that group performance was a more important construct to keep. The reasons include: 1) From a statistical standpoint, group performance had high internal consistency and higher factor loadings compared to task cohesion and 2) From a content perspective, group performance is essential in determining the success of organizations and organizational groups.

After making these modifications, a second EFA (called EFA Model 2) was performed with the removed Communication/Cooperation and Task Cohesion scales and the elimination of several items (DM4, DM5, SC1, TI1, GC5, POS1, & POS6).

EFA: Model 2. This EFA model evaluated a 6 Factor, $\chi^2(270) = 697.19, p < .001, CFI = .96, TLI = .93, RMSEA = .09,$ and SRMR = .04, 7 Factor, $\chi^2(246) = 492.83, p < .001, CFI = .98, TLI = .96, RMSEA = .07,$ and SRMR = .03, and 8 Factor, $\chi^2(223) = 422.13, p < .001, CFI = .98, TLI = .96, RMSEA = .09,$ and SRMR = .03, solution. Based on these results, it appeared that a seven factor solution was best given that a 6 factor solution did not fit the data consistently well (e.g., TLI was lower than desired) and the eight factor solution did not fit noticeably better than the 7 factor solution.

There was also support for a prevailing seven factor solution based on the eigenvalues (see Table 9) and the factor loading matrix (see Table 10). As seen in Table 9, Factor 8 did not possess an eigenvalue greater than 1 nor did it explain significantly more variance than Factor 7. The factor pattern loading matrix suggested a much cleaner solution, with only three items that had larger cross-loadings. Based on theory, and to maintain the integrity of the original scales, these three items were not removed from the

scales. However, the Goal Commitment scale was of concern given that two of the four items presented discriminate validity concerns (i.e., they load on more than one factor).

Table 9
Eigenvalues and Percentages of Variance explained for EFA: Model 2 with Seven Factors

| Factor | Eigenvalue | % of variance | Cumulative % variance |
|--------|------------|---------------|-----------------------|
| 1 | 11.724 | 39.08 | 39.08 |
| 2 | 2.823 | 9.41 | 48.49 |
| 3 | 2.137 | 7.12 | 55.61 |
| 4 | 1.886 | 6.29 | 61.90 |
| 5 | 1.693 | 5.64 | 67.54 |
| 6 | 1.363 | 4.54 | 72.08 |
| 7 | 1.217 | 4.06 | 76.14 |
| 8 | 0.788 | 2.63 | 78.77 |

Table 10
Summary of Items and Factor Loadings: Oblique Geomin Seven Factor Solution

| Factor | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------------------|--------------|--------------|-------|--------|--------------|-------|--------------|
| Quality Decision Making | | | | | | | |
| DM1 | 0.98* | -0.03 | -0.04 | -0.09 | 0.01 | -0.01 | 0.04 |
| DM2 | 0.96* | -0.06 | -0.02 | 0.02 | -0.03 | 0.10* | 0.04 |
| DM3 | 0.79* | 0.07 | -0.00 | 0.02 | -0.04 | 0.01 | -0.11 |
| DM6 | 0.52* | 0.04 | 0.17* | 0.03 | 0.09 | 0.19* | 0.05 |
| DM7 | 0.48* | 0.16* | 0.07 | 0.21* | 0.04 | 0.02 | 0.15* |
| DM8 | 0.53* | 0.10 | 0.05 | 0.16* | 0.03 | 0.21* | -0.09 |
| Social Cohesion | | | | | | | |
| SC2 | 0.01 | 0.67* | 0.07 | 0.12 | -0.10 | -0.01 | 0.02 |
| SC3 | 0.02 | 0.82* | 0.01 | -0.04 | 0.01 | 0.02 | -0.05 |
| SC4 | 0.16* | 0.50* | -0.04 | 0.22* | -0.03 | -0.04 | 0.06 |
| Task Interdependence | | | | | | | |
| TI2 | 0.01 | 0.03 | 0.16* | -0.01 | 0.58* | 0.05 | -0.19* |
| TI3 | -0.05 | -0.05 | -0.05 | -0.24* | 0.71* | 0.26* | -0.01 |
| TI4 | 0.02 | -0.06 | -0.04 | 0.28* | 0.44* | -0.03 | <u>0.35*</u> |
| TI5 | 0.14* | 0.01 | 0.07 | 0.12 | 0.65* | -0.10 | 0.14 |
| Group Performance | | | | | | | |

Table 10
Continued

| Factor | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|----------------------------------|--------|-------|--------------|--------------|-------|--------------|--------------|
| GP1 | 0.00 | 0.08 | -0.03 | 0.65* | 0.25* | 0.11 | 0.02 |
| GP2 | 0.05 | -0.01 | -0.05 | 0.97* | 0.04 | -0.02 | -0.08 |
| GP3 | -0.01 | -0.01 | 0.11* | 0.85* | -0.04 | 0.01 | 0.11 |
| Supportive Supervision | | | | | | | |
| SS1 | -0.06* | 0.01 | 0.79* | 0.26* | -0.03 | 0.10* | -0.01 |
| SS2 | -0.07* | 0.03 | 0.76* | 0.19* | 0.01 | 0.06 | 0.07 |
| SS3 | 0.15* | -0.06 | 0.87* | -0.05 | -0.04 | -0.08 | -0.02 |
| SS4 | 0.27* | -0.01 | 0.84* | -0.06 | 0.01 | -0.03 | -0.05 |
| SS5 | 0.04 | 0.04 | 0.79* | 0.02 | 0.14* | 0.03 | 0.04 |
| Goal Commitment | | | | | | | |
| GC1 | -0.01 | -0.06 | 0.01 | 0.15* | 0.08 | <u>0.31*</u> | 0.54* |
| GC2 | 0.05 | 0.00 | -0.03 | -0.03 | -0.07 | <u>0.35*</u> | 0.70* |
| GC3 | 0.06 | 0.06 | 0.13* | -0.04 | 0.06 | -0.00 | 0.84* |
| GC4 | -0.06 | 0.09 | 0.02 | 0.08 | -0.00 | 0.14 | 0.70* |
| Perceived Organizational Support | | | | | | | |
| POS2 | 0.13* | 0.03 | 0.11* | 0.20* | 0.03 | 0.63* | -0.11* |
| POS3 | -0.06 | 0.26* | -0.03 | -0.03 | 0.13* | 0.80* | -0.01 |
| POS4 | 0.13* | -0.11 | 0.08 | 0.20* | -0.02 | 0.72* | 0.03 |
| POS5 | 0.02 | 0.22* | -0.01 | -0.10 | -0.03 | 0.85* | 0.06 |
| POS7 | 0.11* | -0.10 | 0.18* | 0.16* | -0.01 | 0.57* | 0.06 |

Note: * shows factor pattern loadings that were statistically significant after the Bonferroni adjustment. COM = communication/cooperation; DM = quality decision making; SS = supportive supervision; POS = perceived organizational support; SC = social cohesion; TC = task cohesion; TI = task interdependence; GC = goal commitment; and GP = group performance. Bolded factor loadings include those factor loadings greater than .30, whereas underlined factor loadings were those that also had large cross-loadings (i.e., factor loadings $\geq .30$).

CFA: Model 2. Based on the seven factor measurement model from EFA: Model 2 results, the CFA: Model 2 produced a good model fit, $\chi^2(383) = 809.12$, $p < .001$, CFI = .96, TLI = .95, RMSEA = .07, with large and statistically significant standardized factor loadings (see Table 11). Perhaps more importantly, the interfactor correlations were much smaller (see Table 12) than in the initial CFA (see Table 7). The only concern was between the Quality Decision Making and Perceived Organizational Support factors,

which resulted in a larger correlation coefficient ($r = .72$). Note, with the exception of the relationship between social cohesion and task interdependence ($r = -.03$), all other interfactor correlations were statistically significant.

Table 11
The Standardized Factor Loadings from CFA: Model 2

| | DM | SS | POS | SC | TI | GC | GP |
|------|------|------|------|------|------|------|------|
| DM1 | 0.78 | ---- | ---- | ---- | ---- | ---- | ---- |
| DM2 | 0.92 | ---- | ---- | ---- | ---- | ---- | ---- |
| DM3 | 0.72 | ---- | ---- | ---- | ---- | ---- | ---- |
| DM6 | 0.85 | ---- | ---- | ---- | ---- | ---- | ---- |
| DM7 | 0.79 | ---- | ---- | ---- | ---- | ---- | ---- |
| DM8 | 0.81 | ---- | ---- | ---- | ---- | ---- | ---- |
| SS1 | ---- | 0.92 | ---- | ---- | ---- | ---- | ---- |
| SS2 | ---- | 0.87 | ---- | ---- | ---- | ---- | ---- |
| SS3 | ---- | 0.82 | ---- | ---- | ---- | ---- | ---- |
| SS4 | ---- | 0.93 | ---- | ---- | ---- | ---- | ---- |
| SS5 | ---- | 0.87 | ---- | ---- | ---- | ---- | ---- |
| POS2 | ---- | ---- | 0.84 | ---- | ---- | ---- | ---- |
| POS3 | ---- | ---- | 0.75 | ---- | ---- | ---- | ---- |
| POS4 | ---- | ---- | 0.91 | ---- | ---- | ---- | ---- |
| POS5 | ---- | ---- | 0.81 | ---- | ---- | ---- | ---- |
| POS7 | ---- | ---- | 0.84 | ---- | ---- | ---- | ---- |
| SC2 | ---- | ---- | ---- | 0.73 | ---- | ---- | ---- |
| SC3 | ---- | ---- | ---- | 0.64 | ---- | ---- | ---- |
| SC4 | ---- | ---- | ---- | 0.76 | ---- | ---- | ---- |
| TI2 | ---- | ---- | ---- | ---- | 0.41 | ---- | ---- |
| TI3 | ---- | ---- | ---- | ---- | 0.41 | ---- | ---- |
| TI4 | ---- | ---- | ---- | ---- | 0.86 | ---- | ---- |
| TI5 | ---- | ---- | ---- | ---- | 0.77 | ---- | ---- |
| GC1 | ---- | ---- | ---- | ---- | ---- | 0.87 | ---- |
| GC2 | ---- | ---- | ---- | ---- | ---- | 0.84 | ---- |
| GC3 | ---- | ---- | ---- | ---- | ---- | 0.83 | ---- |
| GC4 | ---- | ---- | ---- | ---- | ---- | 0.75 | ---- |
| GP1 | ---- | ---- | ---- | ---- | ---- | ---- | 0.83 |
| GP2 | ---- | ---- | ---- | ---- | ---- | ---- | 0.86 |
| GP3 | ---- | ---- | ---- | ---- | ---- | ---- | 0.96 |

Note: All factor pattern loadings that were statistically significant after the Bonferroni adjustment ($\alpha = \alpha/n$, i.e., $.05/(30 + 21) = .000980$). Thus, $\alpha^* = .000980$ ($Z_{\alpha} = 3.10$), the new critical value for the second CFA model. *DM* = quality decision making; *SS* = supportive supervision; *POS* = perceived organizational support; *SC* = social cohesion; *TI* = task interdependence; *GC* = goal commitment; and *GP* = group performance.

Table 12
Interfactor Correlations for CFA: Model 2

| Measure | DM | SS | POS | SC | TI | GC | GP |
|---------|------|------|------|-------------|------|------|------|
| DM | ---- | | | | | | |
| SS | .62 | ---- | | | | | |
| POS | .72 | .62 | ---- | | | | |
| SC | .44 | .33 | .31 | ---- | | | |
| TI | .37 | .27 | .43 | -.03 | ---- | | |
| GC | .55 | .40 | .64 | .26 | .56 | ---- | |
| GP | .54 | .45 | .51 | .34 | .55 | .52 | ---- |

Note: Bolded correlations were not statistically significant at $p < .001$ using a Bonferroni adjustment (.05/ 54). DM = quality decision making; SS = supportive supervision; POS = perceived organizational support; SC = social cohesion; TI = task interdependence; GC = goal commitment; and GP = group performance.

SEM: Model 2. Due to the adequate CFA: Model 2 model fit, the large standardized factor loadings, and the acceptable interfactor correlations, it was deemed appropriate to evaluate the structure model (i.e., SEM: Model 2). This SEM model also revealed a good model fit, $\chi^2(391) = 880.20, p < .001, CFI = .95, TLI = .95, RMSEA = .08$, which indicated that the model adequately represented the data. Using the DIFFTEST procedure within Mplus, the $\Delta\chi^2$ between the CFA: Model 2 and SEM: Model 2 was statistically significant, $\Delta\chi^2(8) = 62.08, p < .001$, which implied that the SEM model fit significantly worse than the CFA model.

A review of the modification indices indicated that Task Interdependence also significantly predicted Goal Commitment, which would considerably reduce the $\Delta\chi^2, \Delta\chi^2(7) = 27.27, p = .0003$, and was justifiable based on theory. Because the $\Delta\chi^2$ remained statistically and practically significant, the modification indices were evaluated again and the researcher estimated the path from Quality Decision Making to Social Cohesion to reduce the $\Delta\chi^2$ to a practically insignificant value $\Delta\chi^2(6) = 13.59, p = .0354$. As expected,

this final model produced a better model fit, $\chi^2(389) = 797.37, p < .001$, CFI = .96, TLI = .95, RMSEA = .07, than the previous model and appeared to be more correctly specified (i.e., the paths added were both statistically and practically significant).

Table 13
The Standardized Factor Loadings from SEM: Model 2

| | DM | SS | POS | SC | TI | GC | GP |
|------|------|------|------|------|------|------|------|
| DM1 | 0.78 | ---- | ---- | ---- | ---- | ---- | ---- |
| DM2 | 0.91 | ---- | ---- | ---- | ---- | ---- | ---- |
| DM3 | 0.72 | ---- | ---- | ---- | ---- | ---- | ---- |
| DM6 | 0.85 | ---- | ---- | ---- | ---- | ---- | ---- |
| DM7 | 0.79 | ---- | ---- | ---- | ---- | ---- | ---- |
| DM8 | 0.81 | ---- | ---- | ---- | ---- | ---- | ---- |
| SS1 | ---- | 0.92 | ---- | ---- | ---- | ---- | ---- |
| SS2 | ---- | 0.87 | ---- | ---- | ---- | ---- | ---- |
| SS3 | ---- | 0.82 | ---- | ---- | ---- | ---- | ---- |
| SS4 | ---- | 0.93 | ---- | ---- | ---- | ---- | ---- |
| SS5 | ---- | 0.87 | ---- | ---- | ---- | ---- | ---- |
| POS2 | ---- | ---- | 0.83 | ---- | ---- | ---- | ---- |
| POS3 | ---- | ---- | 0.75 | ---- | ---- | ---- | ---- |
| POS4 | ---- | ---- | 0.91 | ---- | ---- | ---- | ---- |
| POS5 | ---- | ---- | 0.81 | ---- | ---- | ---- | ---- |
| POS7 | ---- | ---- | 0.84 | ---- | ---- | ---- | ---- |
| SC2 | ---- | ---- | ---- | 0.73 | ---- | ---- | ---- |
| SC3 | ---- | ---- | ---- | 0.64 | ---- | ---- | ---- |
| SC4 | ---- | ---- | ---- | 0.77 | ---- | ---- | ---- |
| TI2 | ---- | ---- | ---- | ---- | 0.40 | ---- | ---- |
| TI3 | ---- | ---- | ---- | ---- | 0.40 | ---- | ---- |
| TI4 | ---- | ---- | ---- | ---- | 0.85 | ---- | ---- |
| TI5 | ---- | ---- | ---- | ---- | 0.77 | ---- | ---- |
| GC1 | ---- | ---- | ---- | ---- | ---- | 0.87 | ---- |
| GC2 | ---- | ---- | ---- | ---- | ---- | 0.84 | ---- |
| GC3 | ---- | ---- | ---- | ---- | ---- | 0.83 | ---- |
| GC4 | ---- | ---- | ---- | ---- | ---- | 0.75 | ---- |
| GP1 | ---- | ---- | ---- | ---- | ---- | ---- | 0.83 |
| GP2 | ---- | ---- | ---- | ---- | ---- | ---- | 0.86 |
| GP3 | ---- | ---- | ---- | ---- | ---- | ---- | 0.96 |

Note: All factor pattern loadings that were statistically significant after the Bonferroni adjustment. *DM* = quality decision making; *SS* = supportive supervision; *POS* = perceived organizational support; *SC* = social cohesion; *TI* = task interdependence; *GC* = goal commitment; and *GP* = group performance.

As expected from the CFA: Model 2, the SEM: Model 2 factor loadings were all large and statistically significant (see Table 13). Note, SEM: Model 2 (see Figure 4) differed theoretically from SEM: Model 1 in that the constructs Communication/ Cooperation and Task Cohesion were removed, thus eliminating one of the multicollinearity concerns. Similar to SEM: Model 1, there was still a somewhat high correlation between some of the exogenous latent variables, with the most noticeable being between Quality Decision Making and Perceived Organizational Support ($\Phi = .73$).

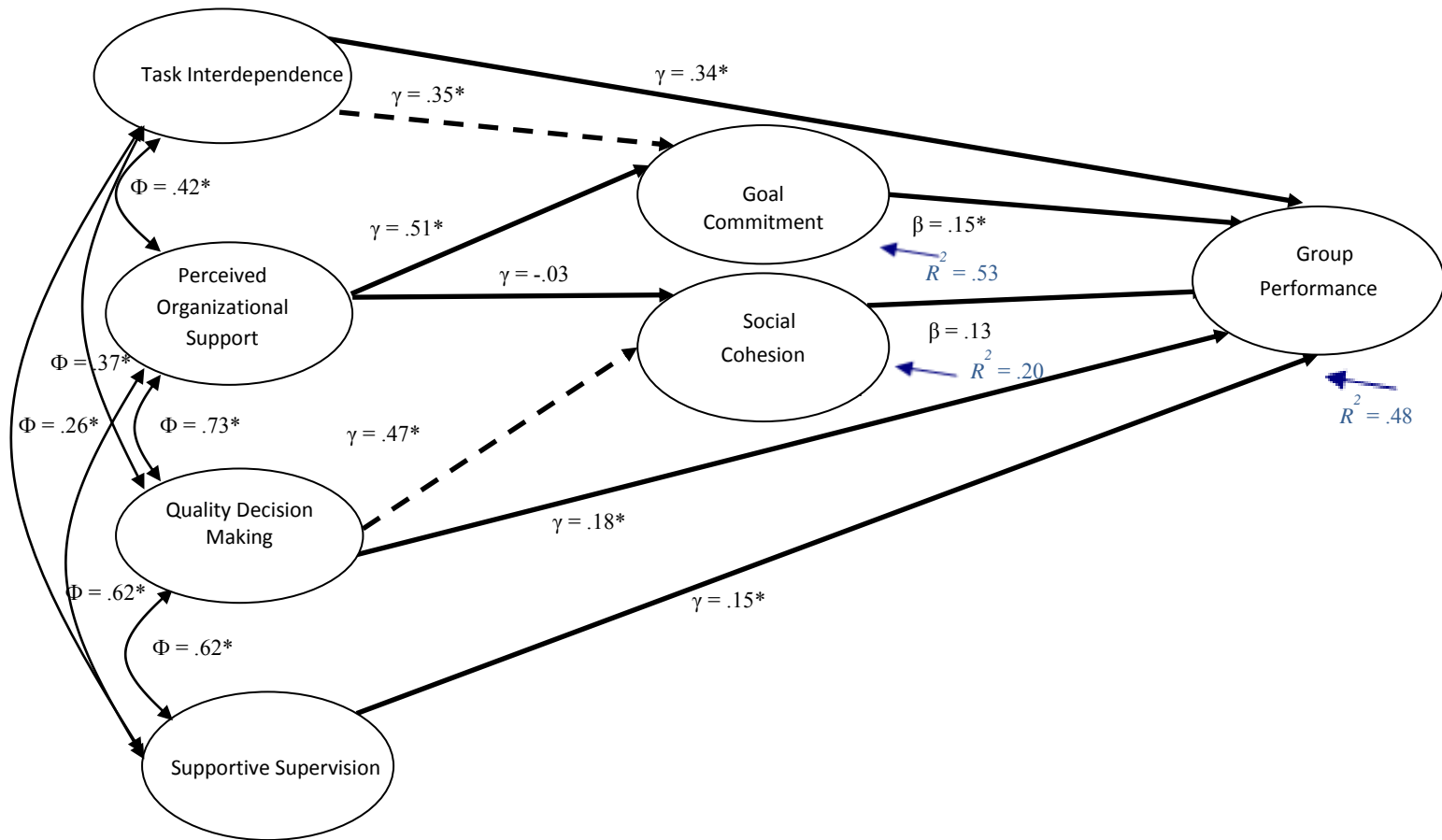
Focusing more on the “causal” part of the model, these results suggested that Perceived Organization Support was a strong predictor of Goal Commitment ($\gamma = .51$) but not a strong predictor of Social Cohesion ($\gamma = -.03$). Also, there was not much evidence that these two variables (i.e., Goal Commitment and Social Cohesion) mediated the relationship between Perceived Organization Support and Group Performance. The reason being that the regression of Goal Commitment and Social Cohesion on Group Performance was rather small after adjusting for the Task interdependence, Quality Decision Making, and the Supportive Supervision latent variables. Instead, Task Interdependence appeared to be the best predictor of Group Performance after controlling for the other variables in the model, with neither Quality Decision Making nor Supportive Supervision being good predictors of Group Performance.

Despite several of the structural coefficients being rather small, R^2 statistics (see Figure 4) were all moderate to large in magnitude based on Cohen’s effect size standards of small ($R^2 = .02$), medium ($R^2 = .13$), and large ($R^2 = .26$). These results indicate that most of the hypothesized predictor latent variables explained a moderate to large

percentage of the criterion latent variable's variance. Notice that 20% of the variance in social cohesion, is explained by perceived organizational support and task interdependence; and 53% of the variance in goal commitment is explained by perceived organizational support and quality decision making. More importantly, 48% of the variance in group performance is explained by task interdependence, quality decision making, supportive supervision, goal commitment, and social cohesion.

Despite these rather positive results, the large R^2 statistics and rather small structural coefficients suggest that a more parsimonious model could be estimated, as the large degree of covariance between the exogenous variables was reducing the perceived impact of each predictor variable. Recall, if two or more predictor variables are highly correlated, the effect of each predictor variable on the criterion variable will be smaller after adjusting for the other predictor variables.

Figure 4
Structural Model 2



Parsimonious Model (EFA: Model 3, CFA: Model 3 and SEM: Model 3)

Due to the multicollinearity concerns associated with the Quality Decision Making factor, along with the fact that it did not predict Group Performance, this factor was removed from the model to produce a more parsimonious model. Therefore, a more practical model consisting of six factors was tested (see Figure 5): Task Interdependence, Supportive Supervision, Perceived Organizational Support, Goal Commitment, Social Cohesion, and Group Performance. Thus, a third and final EFA (called EFA Model 3) was performed with the removed factors Quality Decision Making, Communication/Cooperation and Task Cohesion scales and the elimination of several items (DM4, DM5, SC1, TI1, GC5, POS1, & POS6).

EFA: Model 3. The final EFA model evaluated a 5 Factor, $\chi^2(166) = 562.62, p < .001, CFI = .95, TLI = .92, RMSEA = .11,$ and $SRMR = .05,$ 6 Factor, $\chi^2(147) = 357.25, p < .001, CFI = .97, TLI = .95, RMSEA = .08,$ and $SRMR = .03,$ and 7 Factor, $\chi^2(129) = 271.45, p < .001, CFI = .98, TLI = .96, RMSEA = .07,$ and $SRMR = .03,$ solution. Based on these results, it appeared that a six factor solution or seven factor solution was best given that a 5 factor solution did not fit the data consistently well (e.g., TLI was lower than desired and RMSEA was higher than desired). Note, the EFA: Model 3 factor loading matrix was not presented here given that the factor loadings are nearly identical to those of the EFA: Model 2 factor loading matrix (see Table 10).

Nevertheless, there was more underlying support for a six factor solution based on the eigenvalues (see Table 14). As seen in Table 14, Factor 7 did not possess an eigenvalue greater than 1 nor did it explain significantly more variance than Factor 6.

Table 14

Eigenvalues and Percentages of Variance explained for EFA: Model 3 with Six Factors

| Factor | Eigenvalue | % of variance | Cumulative % variance |
|--------|------------|---------------|-----------------------|
| 1 | 9.003 | 37.51 | 37.51 |
| 2 | 2.744 | 11.43 | 48.95 |
| 3 | 2.052 | 8.55 | 57.50 |
| 4 | 1.825 | 7.60 | 65.10 |
| 5 | 1.379 | 5.75 | 70.85 |
| 6 | 1.231 | 5.13 | 75.98 |
| 7 | 0.766 | 4.06 | 79.17 |

CFA: Model 3. As expected and based on the six factor measurement model from EFA: Model 3 results, the CFA: Model 3 displayed a good model fit, $\chi^2 (236) = 563.80$, $p < .001$, CFI = .96, TLI = .95, RMSEA = .08, with large ($\lambda > .40$) and statistically significant standardized factor loadings. In any case, these results suggested that each item was measuring primarily a single construct/factor, as the model fit statistics and modification indices did not suggest otherwise. Of primary interest from the CFA: Model 3 results were the interfactor correlations (see Table 15), as these findings revealed considerably less associated multicollinearity between the exogenous latent variables. In fact, the largest interfactor correlation was between Perceived Organizational Support and Supportive Supervision ($r = .63$). Note, the CFA: Model 3 standardized factor loadings were not presented here given that they are nearly identical to those of the SEM: Model 3 (see Table 16). Collectively, these results suggest good construct validity based on the following: 1) good model fit; 2) high magnitude of the factor loadings (all standardized factor loadings were moderate to large); and 3) uncorrelated residuals.

Table 15
CFA: Model 3 Interfactor Correlations

| Measure | SS | POS | SC | TI | GC | GP |
|---------|------|------|-------------|------|------|------|
| SS | ---- | | | | | |
| POS | .63 | ---- | | | | |
| SC | .33 | .31 | ---- | | | |
| TI | .27 | .44 | -.03 | ---- | | |
| GC | .40 | .65 | .26 | .56 | ---- | |
| GP | .45 | .52 | .34 | .55 | .52 | ---- |

Note: Bolded correlations were not statistically significant at $p < .001$ using a Bonferroni adjustment (.05/40). SS = supportive supervision; POS = perceived organizational support; SC = social cohesion; TI = task interdependence; GC = goal commitment; and GP = group performance.

SEM: Model 3. This model produced a good model fit, $\chi^2(241) = 555.96, p < .001$, CFI = .96, TLI = .96, RMSEA = .08, with a statistically significant, although small, difference between the CFA and SEM models, $\Delta\chi^2(5) = 15.64, p < .05$. From a practical standpoint, these results suggest that the structural model is adequately estimated and that model misfit is more a result of the measurement model (i.e., CFA). Notice, the only difference between SEM: Model 2 and SEM: Model 3 was the removal of Quality Decision Making. The additional path between Task Interdependence and Goal Commitment was also included in SEM Model 2. This path was added based on both theoretical and statistical (i.e., the modification indices) justification. In previous research, task interdependence has been a significant predictor of both organizational commitment and team commitment (Campion et al., 1993, 1996; Hackman & Oldham, 1980; Van Der Vegt et al., 2000). In any case, the model fit provided substantial support for this model based on the large standardized factor loadings (see Table 16) and structural coefficients (see Figure 5).

Table 16
The Standardized Factor Loadings from SEM: Model 3

| | SS | POS | SC | TI | GC | GP |
|------|------|------|------|------|------|------|
| SS1 | 0.92 | ---- | ---- | ---- | ---- | ---- |
| SS2 | 0.87 | ---- | ---- | ---- | ---- | ---- |
| SS3 | 0.83 | ---- | ---- | ---- | ---- | ---- |
| SS4 | 0.91 | ---- | ---- | ---- | ---- | ---- |
| SS5 | 0.87 | ---- | ---- | ---- | ---- | ---- |
| POS2 | ---- | 0.83 | ---- | ---- | ---- | ---- |
| POS3 | ---- | 0.70 | ---- | ---- | ---- | ---- |
| POS4 | ---- | 0.92 | ---- | ---- | ---- | ---- |
| POS5 | ---- | 0.75 | ---- | ---- | ---- | ---- |
| POS7 | ---- | 0.84 | ---- | ---- | ---- | ---- |
| SC2 | ---- | ---- | 0.75 | ---- | ---- | ---- |
| SC3 | ---- | ---- | 0.66 | ---- | ---- | ---- |
| SC4 | ---- | ---- | 0.72 | ---- | ---- | ---- |
| TI2 | ---- | ---- | ---- | 0.40 | ---- | ---- |
| TI3 | ---- | ---- | ---- | 0.42 | ---- | ---- |
| TI4 | ---- | ---- | ---- | 0.87 | ---- | ---- |
| TI5 | ---- | ---- | ---- | 0.75 | ---- | ---- |
| GC1 | ---- | ---- | ---- | ---- | 0.87 | ---- |
| GC2 | ---- | ---- | ---- | ---- | 0.83 | ---- |
| GC3 | ---- | ---- | ---- | ---- | 0.83 | ---- |
| GC4 | ---- | ---- | ---- | ---- | 0.76 | ---- |
| GP1 | ---- | ---- | ---- | ---- | ---- | 0.83 |
| GP2 | ---- | ---- | ---- | ---- | ---- | 0.86 |
| GP3 | ---- | ---- | ---- | ---- | ---- | 0.96 |

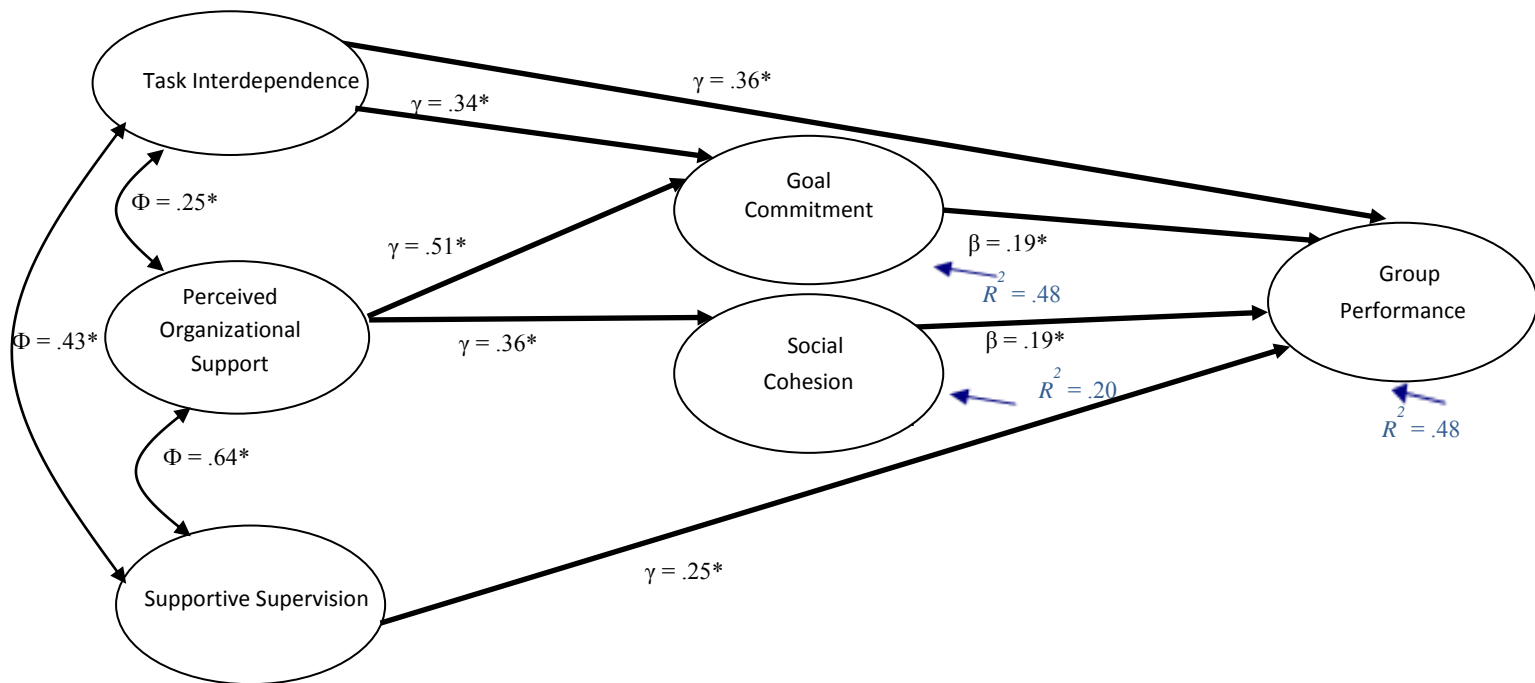
Note: All factor pattern loadings that were statistically significant after the Bonferroni adjustment. SS = supportive supervision; POS = perceived organizational support; SC = social cohesion; TI = task interdependence; GC = goal commitment; and GP = group performance.

As may be seen in Figure 5, there was considerable support for this model, as most of the standardized structural coefficients were statistically significant and large in magnitude. Starting with the exogenous variables, these factors were all moderately correlated as expected. When focusing on the endogenous variables, Perceived Organizational Support and Task Interdependence were both strong predictors of Goal Commitment, with Perceived Organizational Support also being a strong predictor of Social Cohesion. Unfortunately, neither Goal Commitment nor Social Cohesion were

strong predictors of Group Performance after adjusting for the other predictor latent variables in the model. Essentially, this implies that neither Goal Commitment nor Social Cohesion mediated the relationship between the two exogenous latent variables (i.e., Perceived Organizational Support & Task Interdependence) and Group Performance. Instead, it appeared that the direct effects of Task Interdependence and Supportive Supervision were the best predictors of Group Performance.

In terms of the percent of variance in each endogenous variable explained, R^2 statistics (see Figure 5) were all moderate to large in magnitude when using Cohen's effect size standards of small ($R^2 = .02$), medium ($R^2 = .13$), and large ($R^2 = .26$). In fact, 46% of the variance in Group Performance can be explained by Task Interdependence, Supportive Supervision, Goal Commitment, and Social Cohesion. Perceived Organizational Support and Task Interdependence also explained a large percent of variance in Goal Commitment. The smallest R^2 statistics was for the Social Cohesion scale, which was expected given that only Perceived Organizational Support was used to explain variance in that variable.

Figure 5
Structural Model 3



Moderation of Organizational Status Diversity and Practice Size

Although the researcher hypothesized that practice size would moderate the group cohesion-performance relationship and that organizational status diversity would also serve as moderator to the group cohesion-performance relationship, neither relationship was statistically significant in the current study when tested using regression analysis in SPSS.

ANOVAs

The researcher performed ANOVAs to determine if there were any subgroup differences on perceptions of supportive supervision, perceived organizational support, task interdependence, goal commitment, social cohesion and group performance. The subgroups tested included the following: pre- and post-incentive survey takers, staff type, gender, ethnicity, level of education, practice type, and years at the practice. The results are presented below. As previously mentioned in *Chapter III*, the Bonferroni correction (alpha divided by the number of comparisons: $\alpha/6$) was performed on all ANOVAs in order to control for the probability of type I errors.

Pre-Incentive and Post-Incentive Differences. ANOVA's were used to determine if there were any differences between participants who took the survey from September 2011 through May 2012 (n =155) before an incentive was offered, and participants who took the survey after the incentive was offered, June 2012 through August 2012 (n = 52). A summary of the comparison is presented in Table 17. A comparison of the two groups was significant for two of the latent variables. This meant

that pre-incentive participant average scores differed significantly from post-incentive average scores with regard to goal commitment and group performance.

On average, participants that answered the survey post-incentive reported higher levels of goal commitment and group performance compared to pre-incentive participants. Although statistically significant, eta squared values (η^2) were small for the two latent variables and the power for goal commitment was low, indicating that these differences did not vary much from a practical standpoint (Brown, 2008).

Table 17
Summary ANOVA Between Pre-and-Post Incentive Survey Respondents for the Six DVs

| Construct | <i>Sum of Squares</i> | <i>df</i> | <i>Mean Square</i> | <i>F</i> | <i>p</i> | η^2 | <i>Power</i> |
|------------------------|-----------------------|-----------|--------------------|----------|----------|----------|--------------|
| Supportive Supervision | 10.75 | 1 | 10.75 | 5.75 | .02 | .03 | .38 |
| Task Interdependence | 0.34 | 1 | 0.34 | 0.42 | .52 | .00 | .02 |
| Perceived Org. Support | 5.12 | 1 | 5.12 | 3.45 | .07 | .02 | .20 |
| Goal Commitment | 8.24 | 1 | 8.24 | 10.14 | *.00 | .05 | .68 |
| Social Cohesion | 5.50 | 1 | 5.50 | 4.06 | .05 | .02 | .24 |
| Group Performance | 18.31 | 1 | 18.31 | 16.87 | *.00 | .08 | .92 |

Note: * indicates statistical significance ($p < .0083$). Alpha level adjusted at .05/6.

Staff Type Differences. An analysis of variance (ANOVA) was also performed to test if there was a significant difference in responses between selected type of staff who took the survey for any of the six factors: supportive supervision, task interdependence, perceived organizational support, social cohesion, goal commitment, and group performance. Due to small subsample sizes, the type of staff only included administrative assistants, medical assistants, nurses, office managers, and physicians in the analysis. A summary of the ANOVA results is provided in Table 18.

Table 18
Summary ANOVA Between Staff Type Groups for the Six DVs

| Construct | <i>Sum of Squares</i> | <i>df</i> | <i>Mean Square</i> | <i>F</i> | <i>p</i> | η^2 | <i>Power</i> |
|------------------------|-----------------------|-----------|--------------------|----------|----------|----------|--------------|
| Supportive Supervision | 12.97 | 4 | 3.24 | 1.63 | .17 | .04 | .22 |
| Task Interdependence | 10.22 | 4 | 2.56 | 3.38 | .01 | .08 | .60 |
| Perceived Org. Support | 11.70 | 4 | 2.93 | 1.99 | .10 | .05 | .30 |
| Goal Commitment | 6.50 | 4 | 1.63 | 2.02 | .09 | .05 | .31 |
| Social Cohesion | 6.57 | 4 | 1.64 | 1.16 | .33 | .03 | .13 |
| Group Performance | 9.16 | 4 | 2.29 | 1.91 | .11 | .05 | .28 |

Note: * indicates statistical significance ($p < .0083$). Alpha level adjusted at .05/6.

As may be seen in Table 18, the differences between the means of staff type who responded to the survey were not significant for any of the factors, meaning that the type of practice staff that responded to the survey did not differ significantly from each other in terms of their levels of supportive supervision, task interdependence, perceived organizational support, social cohesion, goal commitment, and group performance.

Gender Differences. ANOVA's were used in order to determine if there were gender differences in response to the final six constructs measured: supportive supervision, task interdependence, perceived organizational support, social cohesion, goal commitment, and group performance. As illustrated in Table 19, a comparison of the two groups, males ($n = 32$), and females ($n = 175$) was not significant for any of the constructs, meaning that male average scores on the six constructs did not differ significantly from female average scores. Effect sizes using eta squared (η^2) were small for all six constructs. Based on these findings, there was no gender bias in terms of perceptions of supportive supervision, task interdependence, perceived organizational support (POS), social cohesion, goal commitment, and group performance.

Table 19
Summary ANOVA Between Gender for the Six DVs

| Construct | <i>Sum of Squares</i> | <i>df</i> | <i>Mean Square</i> | <i>F</i> | <i>p</i> | η^2 | <i>Power</i> |
|------------------------|-----------------------|-----------|--------------------|----------|----------|----------|--------------|
| Supportive Supervision | 2.29 | 1 | 2.29 | 1.20 | .28 | .01 | .05 |
| Task Interdependence | 0.05 | 1 | 0.05 | 0.06 | .81 | .00 | .01 |
| Perceived Org. Support | 1.63 | 1 | 1.63 | 1.08 | .30 | .01 | .05 |
| Goal Commitment | 1.56 | 1 | 1.56 | 1.91 | .17 | .01 | .09 |
| Social Cohesion | 2.29 | 1 | 2.29 | 1.66 | .20 | .01 | .08 |
| Group Performance | 0.57 | 1 | 0.57 | 0.49 | .48 | .00 | .02 |

Note: * indicates statistical significance ($p < .0083$). Alpha level adjusted at .05/6.

Ethnic Differences. An ANOVA was performed to determine if there were any differences between Hispanics and Whites on the six constructs. Other ethnic groups were excluded from the analysis due to low subsample sizes. As shown in Table 20, the differences between the means of Whites and Hispanics who responded to the survey were not significant for any of the six constructs.

Table 20
Summary ANOVA Between Ethnicity for the Six DVs

| Construct | <i>Sum of Squares</i> | <i>df</i> | <i>Mean Square</i> | <i>F</i> | <i>p</i> | η^2 | <i>Power</i> |
|------------------------|-----------------------|-----------|--------------------|----------|----------|----------|--------------|
| Supportive Supervision | 0.46 | 1 | 0.46 | 0.24 | .62 | .00 | .01 |
| Task Interdependence | 5.63 | 1 | 5.63 | 7.25 | .01 | .04 | .49 |
| Perceived Org. Support | 0.15 | 1 | 0.15 | 0.10 | .75 | .00 | .01 |
| Goal Commitment | 0.31 | 1 | 0.31 | 0.38 | .54 | .00 | .02 |
| Social Cohesion | 0.06 | 1 | 0.06 | 0.05 | .83 | .00 | .01 |
| Group Performance | 1.44 | 1 | 1.44 | 1.33 | .25 | .01 | .06 |

Note: * indicates statistical significance ($p < .0083$). Alpha level adjusted at .05/6.

Education Level Differences. An ANOVA was also conducted to determine if there was a difference in responses to the six constructs with regard to participant education level. Due to small subsample sizes, the categories less than High School

education” and “4 year college degree” were excluded from the analysis. As presented in Table 21, the differences between the means of level of education were not significant for any of the six factors, meaning that level of education did not make a difference in participant perceptions of supportive supervision, task interdependence, perceived organizational support, social cohesion, goal commitment, and group performance at their respective practices.

Table 21
Summary ANOVA Between Education Level Groups for the Six DVs

| Construct | <i>Sum of Squares</i> | <i>df</i> | <i>Mean Square</i> | <i>F</i> | <i>p</i> | η^2 | <i>Power</i> |
|------------------------|-----------------------|-----------|--------------------|----------|----------|----------|--------------|
| Supportive Supervision | 5.46 | 5 | 1.09 | 0.56 | .73 | .02 | .06 |
| Task Interdependence | 5.72 | 5 | 1.15 | 1.48 | .20 | .04 | .24 |
| Perceived Org. Support | 7.60 | 5 | 1.52 | 1.02 | .41 | .03 | .13 |
| Goal Commitment | 2.79 | 5 | 0.56 | 0.69 | .64 | .02 | .07 |
| Social Cohesion | 5.75 | 5 | 1.15 | 0.83 | .53 | .02 | .10 |
| Group Performance | 5.05 | 5 | 1.01 | 0.86 | .51 | .02 | .10 |

Note: * indicates statistical significance ($p < .0083$). Alpha level adjusted at .05/6.

Practice Type Differences. An analysis of variance was conducted between the three primary practice types (Pediatric, Family, and Specialty practices) to determine if there were differences among respondents based on the type of practice represented in the study. A summary of the results of the ANOVA are presented in Table 22.

Table 22
Summary ANOVA Between Practice Type Groups for the Six DVs

| Construct | <i>Sum of Squares</i> | <i>df</i> | <i>Mean Square</i> | <i>F</i> | <i>p</i> | η^2 | <i>Power</i> |
|------------------------|-----------------------|-----------|--------------------|----------|----------|----------|--------------|
| Supportive Supervision | 25.52 | 3 | 8.51 | 4.68 | *.00 | .07 | .69 |
| Task Interdependence | 6.27 | 3 | 2.09 | 2.69 | .05 | .04 | .36 |
| Perceived Org. Support | 25.10 | 3 | 8.37 | 6.00 | *.00 | .09 | .83 |
| Goal Commitment | 24.16 | 3 | 8.05 | 11.30 | *.00 | .15 | .99 |
| Social Cohesion | 14.54 | 3 | 4.85 | 3.62 | *.00 | .05 | .53 |

Table 22
Continued

| Construct | <i>Sum of Squares</i> | <i>df</i> | <i>Mean Square</i> | <i>F</i> | <i>p</i> | η^2 | <i>Power</i> |
|-------------------|-----------------------|-----------|--------------------|----------|----------|----------|--------------|
| Group Performance | 7.13 | 3 | 2.38 | 2.01 | .11 | .03 | .24 |

Note: * indicates statistical significance ($p < .0083$). Alpha level adjusted at .05/6.

Mean differences were significant among type of practices for four of the latent constructs, including supportive supervision, perceived organizational support, goal commitment, and social cohesion. Thus, participant perceptions of each of these constructs varied with regard to practice type. However, effect sizes (eta squared) were small for all constructs and power estimates were also low with the exception of perceived organizational support and goal commitment. This meant that although there were statistically significant differences among the types of practices and the four constructs (supportive supervision, perceived organizational support, goal commitment, and social cohesion), these differences were not of practical significance. Post hoc analyses using the Bonferroni procedure revealed statistically significant mean differences between Pediatric practices and Family care practices as well as Pediatric and Specialty practices for supportive supervision. With regard to POS, the mean differences between Pediatric and Family care practices was also statistically significant. For goal commitment, post hoc analyses revealed statistically significant mean differences between Pediatric practices and Family practices as well as Pediatric practices and Specialty practices. Further, the mean differences between Family and Specialty care practices was also statistically significant for social cohesion.

However, as mentioned previously, effect sizes (eta squared) were small for all constructs and power estimates were mostly low.

Practice Tenure Differences. Further, an ANOVA was performed to determine if there were any differences among groups based on tenure or experience at the practice and participant perceptions of supportive supervision, task interdependence, perceived organizational support, social cohesion, goal commitment, and group performance at their respective practices. The respondents were categorized into four groups, 0-5 years, 6-10 years, 11-15 years, and 16 years and over. A summary ANOVA is presented in Table 23.

Table 23
Summary ANOVA Between Years at the Practice Groups for the Six DVs

| Construct | <i>Sum of Squares</i> | <i>df</i> | <i>Mean Square</i> | <i>F</i> | <i>p</i> | η^2 | <i>Power</i> |
|------------------------|-----------------------|-----------|--------------------|----------|----------|----------|--------------|
| Supportive Supervision | 6.15 | 3 | 2.05 | 1.07 | .36 | .02 | .10 |
| Task Interdependence | 0.06 | 3 | 0.02 | 0.03 | .99 | .00 | .01 |
| Perceived Org. Support | 4.00 | 3 | 1.33 | 0.89 | .45 | .02 | .07 |
| Goal Commitment | 1.59 | 3 | 0.53 | 0.64 | .59 | .01 | .05 |
| Social Cohesion | 1.74 | 3 | 0.58 | 0.42 | .74 | .00 | .03 |
| Group Performance | 2.76 | 3 | 0.92 | 0.85 | .47 | .01 | .07 |

Note: * indicates statistical significance ($p < .0083$). Alpha level adjusted at .05/6.

As presented in Table 23, none of the F values was significant at the .0083 level for any of the six factors, indicating that the means among the different tenured groups did not vary significantly. This meant that tenure differences were not significant for each of the six constructs.

Summary

The Exploratory Factor Analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM) results provided useful insights regarding the associations between the variables involved in the study. Analysis of variance (ANOVA) results of pre- and post-incentive survey participants with regard to differences on

perceptions of supportive supervision, task interdependence, perceived organizational support, social cohesion, goal commitment, and group performance also provided useful insight. A more descriptive discussion of the study results, implications for HRD research and practice, and recommendations for future research are presented in *Chapter V*.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This chapter includes four major sections. The research hypotheses and findings are provided in the first section. The conclusions and recommendations of the study are included in the second section. The current study implications for HRD research and practice are discussed in the third section. In the fourth and final section, recommendations and directions for future research are presented.

Discussion

The main premise of the first research question posed by the researcher was to understand the effects of communication/cooperation, quality decision making, perceived organizational support, supportive supervision and task interdependence on the relationship between group cohesion (including both task cohesion and social cohesion) and group performance in selected primary care settings. Thus, there were seven original research hypotheses that pertained to the first research question. As mentioned in *Chapter IV: Methods* section, the second research question surrounding the moderation effects of organizational status diversity and practice size on the cohesion-performance relationship was tested using regression analyses. The results indicated that both practice size and organizational status diversity did not serve as moderators of the group cohesion-performance relationship. Results concerning the research hypotheses pertaining to the first research question are discussed below.

There were a total of three SEM models tested in this study. The hypothesized model included the following 9 constructs: communication/ cooperation quality decision

making, supportive supervision, perceived organizational support, task interdependence, goal commitment, social cohesion, task cohesion and group performance. The second model included 7 constructs and excluded communication/cooperation and task cohesion. The third and final model included 6 constructs and excluded quality decision making, communication/cooperation and task cohesion. It is important to recall that the first SEM model was primarily based on research and theory whereas the second and third models were mostly data driven.

Hypothesis 1.1. According to Hypothesis 1.1, Task Cohesion will fully mediate the relationship between the exogenous latent variables (Communication, Quality Decision Making, Supportive Supervision, and Perceived Organizational Support) and Group Performance. This hypothesis was not supported by the first model (SEM Model 1) given that the model was mis-specified, i.e., there was an extreme relationship between task cohesion and communication/ cooperation, which indicated that the latent variables communication/cooperation and task cohesion were close to being identical. Recall that task cohesion was removed and not included in SEM Models 2 and 3 given that both task cohesion and group performance items were similarly worded and loaded on the same construct during EFA analysis.

Hypothesis 1.2. According to Hypothesis 1.2, Social Cohesion will fully mediate the relationship between Perceived Organizational Support (POS) and Group Performance. This hypothesis was tested with SEM Models 2 and 3 and was not supported by either one. In SEM Model 2, there was a negative relationship between POS and social cohesion and although the relationship between social cohesion and

group performance was positive, it was not a strong relationship and was non-significant. However, perceived organizational support (POS) had a strong and significant relationship with goal commitment in both SEM Models 2 and 3 and a moderate yet significant relationship with social cohesion in SEM Model 3. This makes sense given that previous researchers have provided evidence that POS is related to social influence within organizations (Vardaman et al., 2009; Zagencyk et al., 2010) and that there is a positive and significant relationship between POS and goal commitment (Hutchinson & Gartska, 1996; Eisenberger et al., 1986) .

Hypothesis 1.3. According to Hypothesis 1.3, Social Cohesion will partially mediate the relationship between Task Cohesion and Group Performance. This hypothesis was tested with SEM Model 1, and was not supported. Although task cohesion was a strong predictor of social cohesion, there was an inverse relationship between social cohesion and group performance. Thus, unlike previous researchers that have demonstrated a positive and significant relationship between social cohesion and group performance (Zaccaro & McCoy, 1988), there was a negative relationship between these two latent variables in the present study. However, these results should be interpreted with extreme caution given that SEM Model 1 was more than likely not specified correctly, i.e., there were several multicollinearity concerns among several latent variables.

Hypothesis 1.4. According to Hypothesis 1.4, the relationship between Perceived Organizational Support (POS) and Social Cohesion will be partially mediated by Task Cohesion. This hypothesis was tested with SEM Model 1 and not supported.

Specifically, POS and social cohesion were inversely related. Again, interpretation of these results is limited due to model mis-specification. However, it should be noted that at the individual level, researchers have found that social influence processes such as generating shared perceptions of support within workgroups may increase an individual's POS (Vardaman et al., 2009).

Hypothesis 1.5. According to Hypothesis 1.5, Task/Job Interdependence will serve as a predictor of Group Performance. This hypothesis was tested with SEM Models 1, 2, and 3 and was supported by all three models. Thus, the current study findings reinforce what many previous researchers have maintained, i.e., that task interdependence is positively and significantly related to group performance (Allen, Sargent, & Bradley, 2003; Campion, Papper, & Medsker, 1996; Saavedra, Earley, & Van Dyne, 1993; Shea & Guzzo, 1987; Wagemen, 1995).

Hypothesis 1.6. According to Hypothesis 1.6, Goal Commitment will partially mediate the relationship between Task Cohesion and Group Performance.

This hypothesis was tested with SEM Model 1 and not supported. Unlike researchers who demonstrated that group cohesion and *goal commitment* were positively related (Whiteoak, 2007), and also provided evidence that *goal commitment* mediated the relationship between *group cohesion* and *performance* (Klein & Mulvey, 1995), there was a negative relationship between goal commitment and group performance in the current study. However, these results are not well-founded given the misspecification of SEM Model 1.

Hypothesis 1.7. According to Hypothesis 1.7, Goal Commitment will fully mediate the relationship between Perceived Organizational Support (POS) and Group Performance. This hypothesis was tested with SEM Models 1, 2, and 3 and was not supported. Although there was a strong and significant direct relationship between POS and Goal Commitment in all the SEM models tested, there was not a strong relationship between Goal Commitment and Group Performance in the present study. Although researchers have shown a positive relationship between goal commitment and performance (Hollenbeck & Klein, 1987), this has been demonstrated at the individual level, not the group level. Again, SEM Model 1 results should be interpreted with extreme caution given that this model was likely not specified correctly.

Models of the Study

The researcher of this study tested three SEM models (SEM Model 1, SEM Model 2 & SEM Model 3). While many of the specific paths in each of these models such as the ones between Task Cohesion and Group Performance (Knouse, 2006; Beal et al., 2003; Mullen & Copper, 1994; Zaccaro, 1991; Zaccaro & McCoy, 1988) and Task Interdependence and Group Performance (Allen, Sargent, & Bradley, 2003; Campion, Papper, & Medsker, 1996; Saavedra, Earley, & Van Dyne, 1993; Shea & Guzzo, 1987; Wagemen, 1995) were based on theory and prior empirical research results, there were some paths that were not. For example, there were no specific theories or empirical research that supported the hypothesized relationships between supportive supervision and task cohesion as well as between quality decision making and task cohesion. Also, since SEM Model 1 was not specified correctly, two new paths were drawn from task

interdependence to goal commitment and from quality decision making to social cohesion in SEM Model 2. Thus, SEM Model 2 results provided support that task interdependence was a strong predictor of goal commitment and group performance and that quality decision making was a strong predictor of social cohesion. However, within SEM Model 2, there was not strong support for the mediation effects of goal commitment and social cohesion on the relationship between POS and group performance. The role of mediating latent variables are described in more detail below.

Mediation Effects

One major emphasis of this study was to assess the role of intervening or mediating variables. Mediators are not restricted to individualistic methods and group-level constructs such as group cohesion have been tested for mediation effects. According to Baron and Kenny (1986), “Despite the range of application of the mediator concept, it is in principle capable of rigorous tests at the group level” (p. 1178).

The following mediation effects resulted from SEM Model 2 of the current study: The intervening latent variable goal commitment did not fully mediate the relationship between the exogenous latent variable perceived organizational support (POS) and the dependent latent variable group performance when controlling for other latent variables in the model. In addition, the intervening latent variable social cohesion did not fully mediate the relationship between the exogenous latent variable POS and the dependent latent variable group performance nor did it mediate the relationship between the exogenous latent variable quality decision making and group performance when introducing other latent variables in the model. The mediation effects of SEM Model 3

were similar to those in SEM Model 2. Specifically, neither social cohesion nor goal commitment mediated the relationship between the two exogenous latent variables (i.e., POS & task interdependence) and group performance when controlling for other latent variables in the model.

SEM Results

The results of the SEM analysis showed that SEM Model 2 and SEM Model 3 were both good fitting models. SEM Model 3 is of particular interest and will be discussed in detail in this section because it was the final model selected based on both parsimony and model fit.

SEM Model 3 included the following six latent variables: task interdependence, supportive supervision, perceived organizational support, goal commitment, and group performance. This model was similar to SEM Model 2 with the exception of the exclusion of the latent variable quality decision making, which was removed for the reason that it was not a good predictor of group performance and it also posed multicollinearity concerns. Thus, SEM Model 3 was a more practical and better fitting model given the model fit statistics, elimination of multicollinearity issues among the exogenous latent variables, and large standardized factor loadings and structural coefficients.

Specifically, perceived organizational support (POS) was a strong and significant predictor of both goal commitment and social cohesion. This makes sense given that researchers have shown that employee perceived organizational support is a strong predictor of goal setting as well as organizational commitment (Hutchinson & Garstka,

1996); and that social influence processes within workgroups are related to POS (Vardaman et al., 2009; Zagencyk et al., 2010).

Task interdependence was also a strong and significant predictor of goal commitment, perhaps for the reason that high interdependence fosters increased collaboration and commitment to group goals. After all, researchers have provided evidence that task interdependence in groups is positively related to helping behavior, job satisfaction, and group process quality among members (Allen, Sargent, & Bradley, 2003). However, neither goal commitment nor social cohesion were strong predictors of group performance. Rather, task interdependence and supportive supervision were the best direct predictors of group performance in SEM Model 3. These results support the findings from previous research studies.

Conclusions and Limitations

The researcher of this study attempted to investigate the relationship between the antecedents and consequences of group cohesion from a two dimensional perspective that included both social cohesion and task cohesion. Specifically, the relationships between group cohesion and communication/cooperation, quality decision making, supportive supervision, perceived organizational support, task interdependence, goal commitment, and group performance were tested using the researcher's hypothesized model. However, due to multicollinearity concerns and factor loading concerns, the direct and indirect relationships between the latent variables used in the study were examined and a few latent variables were reevaluated and some were removed in subsequent analyses to improve the accuracy of the results.

Overall, task interdependence was the largest and most significant predictor of group performance although supportive supervision was also a strong predictor of group performance. This makes sense given that task interdependence is associated with team effectiveness and efficiency (Wageman, 1995; Campion et al., 1996). Also, researchers have provided evidence in previous studies of the direct association between supportive supervision and group performance (Bass et al., 2003; DeGroot et al., 2000).

The researcher did not find a strong and significant relationship between social cohesion and group performance. Thus, the findings of the current study to some extent support those from previous researchers who have suggested that task cohesion is a much stronger predictor of group performance than social cohesion (Zaccaro, 1991; Mullen & Copper, 1994). However, results from a recent qualitative study conducted in primary health care practices demonstrated the importance and necessity of both social cohesion and task cohesion. Specifically, Lanham and colleagues (2009) reported that a mixture of both task cohesion and social cohesion are needed for primary care practice successful relationships as well as for promoting high quality care. Overall, the current study's findings suggest that in order for the group to perform well, maintaining bonds within primary health care groups or teams are not as vital as working closely, coordinating, and consulting with other co-workers and receiving supervisory support

This study included several limitations. First and foremost, the theoretical model that was tested by the researcher resulted in numerous measurement concerns and multicollinearity issues among certain factors. Therefore, subsequent analyses were more exploratory. Second, there were problems with the work environment instrument given

that task cohesion and group performance loaded on the same factor. Thus, task cohesion, one of the primary factors in this study, was removed from SEM Models 2 and 3 due to scale items being similarly matched with items in the group performance scale. The findings of this study were limited to include only the social aspect of group cohesion. With the removal of task cohesion, the second hypothesis, i.e., *Organizational status diversity and practice size will serve as moderators of the Group Cohesion-Performance relationship*, could not be tested from a task cohesion perspective.

Third, the researcher used a self-reported instrument, which was subject to respondent biases such as the inability to give accurate responses due to insufficient recall or memory as well as the possibility of providing dishonest answers.

Fourth, social cohesion was measured at the individual level, not the group level. Several researchers have argued for measuring cohesion at the group level and not the individual level since it is a group level construct (Chiocchio & Essiembre, 2009; Dion, 2004; Carless & De Paola, 2000; Klein et al., 1994). However, other researches have maintained that there is no level that is more advantageous than the other (Cota et al., 1995). The individual unit of analysis was used in the current study due to logistical reasons, i.e., it would be difficult to organize a group response in primary care settings.

A fifth limitation of the current study was sample size. The actual sample size was much smaller than the targeted sample size, especially in relation to the number of survey items and the complex structure of the first two models tested. Therefore, a larger sample size would be needed to determine if the models tested can be supported across different job titles and disciplines. In addition, it was difficult to determine how well the

sample represented the population given that the survey was voluntary and not administered at random.

Further, an analysis of variance (ANOVA) revealed that there were statistically significant differences in responses between pre-incentive versus post-incentive participants. Specifically, post-incentive survey respondents reported higher levels of *goal commitment*, and *group performance* compared to pre-incentive respondents. However, effect sizes (eta squared) were small for all constructs and power estimates were also small for all constructs with the exception of group performance. This meant that although statistically significant, these differences were not of practical significance. Further, an ANOVA that was performed between the three primary practice types (Pediatric, Family, and Specialty practices) revealed statistically significant differences among practice types for perceived organizational support, supportive supervision, goal commitment, and social cohesion. However, effect sizes were low for all constructs and power estimates were also small with the exception of goal commitment (Brown, 2008). Thus, although respondent perceptions of each of these constructs differed with regard to type of practice, these differences were not practically significant.

Implications for HRD Research and Practice

There are many implications of the current study findings to HRD research and practice. Generally, the researcher empirically tested three models, based on a theoretical framework, in organizational work group settings. Specifically, this study added to current knowledge in the group cohesion literature by examining key constructs related to social cohesion, group performance, and the social cohesion-performance relationship in

primary care practice settings. It is well known that identifying work group characteristics that contribute to group performance are essential in assessing the effectiveness of work teams (Goodman et al., 1987; Campion et al., 1993; Cohen & Bailey, 1997) and that effective teamwork in healthcare organizations has been directly linked with both group cohesion and performance (Stevenson et al., 2001; Campbell et al., 2009; Goni, 1999). Organizational researchers have also identified quality decision making (Strickland et al., 2007) and supportive supervision (Weed et al., 1976; Bass et al., 2003; DeGroot et al., 2000) as key workgroup factors related to performance. The study highlights the important difference between social cohesion and task cohesion and the intervening effects of goal commitment and social cohesion on the relationship between task interdependence and group performance and on the relationship between perceived organizational support and group performance. In particular, the researcher of this study revealed that task interdependence and supportive supervision are important predictors of group performance. Thus, the results of this study provide information to HRD researchers on the key characteristics of group performance as well as the processes, causes, and effects of the social aspects of cohesion. The research of this study also utilized a unique population, i.e., primary care group staff members that consisted of schedulers, medical assistants, office managers, nurses, and physicians. The findings of the current study provide insights into perceptions of task interdependence, perceived organizational support, supportive supervision, goal commitment, social cohesion and group performance in healthcare organizations.

From an HRD practitioner standpoint, this study also provides useful insights on how certain key characteristics may impact group performance within primary care practices. For instance, the current study findings suggest that task interdependence and supportive supervision were strong predictors of group performance but that goal commitment and social cohesion were not. Perhaps it may be more useful to focus on the task aspects of the group, which can lead to productivity and effectiveness, rather than the social aspects that can lead to social problems and subgroup identities. However, HRD practitioners should carefully consider the context and type of cohesion to target when attempting to improve group performance. –For example, if the aim is to reduce turnover rate in the group, then interventions specifically aimed at improving a group’s social cohesion should be implemented. On the other hand, if the goal is to improve a group’s task effectiveness, then task cohesion should be targeted” (Chang & Bordia, 2011, p. 403).

Recommendations and Directions for Future Research

The group cohesion-performance association is one of the most complex and widely studied associations in group research. However, most of the research on the group cohesion-performance relationship has been in the form of meta-analyses that have included different operationalized definitions as well as divergent types of groups, which may be the reason for inconsistent findings. The type of groups in the group cohesion literature is also mostly represented by student and sport groups. Thus, future research which examines consistent types of work groups and also includes consistent operational definitions of group cohesion is needed.

Although some of the relationships such as the ones between group cohesion and group performance and task interdependence and group performance have been researched extensively, other relationships, such as the antecedents of task cohesion (e.g., quality decision making and supportive supervision) have not. For instance, task cohesion as a predictor of quality decision making has been examined in the past (Mullen et al., 1994; Callaway, 1984) but quality decision making as a predictor of task cohesion has not been examined at all. Thus, future researchers should also revisit both the direct and indirect impact of both social cohesion and task cohesion on work related factors such as quality decision making and supportive supervision.

In this study, all constructs were measured at a single point in time and therefore, the temporal effects of the group cohesion-performance relationship were not examined. Future researchers should measure group cohesion and group performance at different intervals in time to determine the directionality and change in the group cohesion-performance relationship. As Campbell and Martens (2009) suggested, “By measuring cohesion and performance at multiple times (more than three points in time for both constructs), a researcher would be able to determine whether the changes in cohesion are related to changes in performance” (p. 241).

Future researchers should also examine group efficacy with group cohesion and group performance and among different types of service groups within organizations. Few researchers have studied group effectiveness, group cohesion and performance and there are no studies that have tested the potential role of efficacy on the relationship between group cohesion and performance (Campbells & Martin, 2009). Further, despite

the large amount of literature in health care teams or groups, researchers have not compared the effectiveness of organizational teams in health care settings with other type of service organizations.

Summary

The group cohesion-performance relationship, as well as antecedents, and consequences of group cohesion and group performance are key concepts for gaining insight into organizational group success. However, measuring group cohesion is more complex than measuring other constructs given its two-dimensional structure. In this study, the researcher investigated the correlational effects of several important constructs, including communication/cooperation, quality decision making, perceived organizational support, supportive supervision, task interdependence, group cohesion, and group performance, in selected healthcare organizations. Specifically, data was collected from 207 primary health care staff utilizing a 45-item survey. A series of analyses including confirmatory factor analysis (CFA), exploratory factor analysis (EFA), and structural equation modeling (SEM) were performed to examine the hypotheses of the study and determine the most appropriate model that fit the data. Additional ANOVAs were performed to examine group differences on the final set model's mean scale scores.

The results from the analyses of the current study are suggestive that quality decision making was a significant predictor of social cohesion and that perceived organizational support (POS) was a strong predictor of both goal commitment and social cohesion. Task Interdependence was also a large and significant predictor of goal commitment. However, neither goal commitment nor social cohesion mediated the

relationship between POS and group performance nor did goal commitment mediate the relationship between task interdependence and performance. Goal commitment was an unexpectedly weak predictor of group performance. As expected, social cohesion was not a strong predictor of group performance. Rather, the best predictors of perceived group performance were task interdependence and supportive supervision. The implications for HRD practice and research of the current study were presented. Further, recommendations and directions for future research were discussed.

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APPENDIX A

ORIGINAL CONSENT FORM AND QUESTIONS

Work Environment Survey

Dear Prospective Participant: Responding to this survey may benefit primary health care practices by demonstrating attributes positively correlated with group cohesion and performance. It is important to examine cohesion in primary health care groups because groups with high levels of teamwork are associated with high levels of cohesion.

The purpose of this survey is to gather data related to cohesion and diversity that impact group dynamics in work groups within certain situations. Your honest input is important and will contribute to understanding various characteristics that contribute to group cohesion and performance in primary care practices.

Please remember that your individual responses will not be traced back to you. Rather, all data will be reported anonymously at an aggregated level.

To participate in the study, you are being asked to respond to the questions contained in this survey. Your participation is entirely voluntary and you may withdraw from the survey at any time without repercussions. It will take approximately 15-20 minutes of your time to complete. You can begin taking the survey by clicking on the double arrow tab located on the bottom right hand corner of this page.

If you have any questions about this study or are interested in obtaining survey results after the study is completed, please contact Monica Trevino at trevinom17@tamu.edu.

Thank you for your time and participation,

Monica Trevino, M.A.,
Ph.D. Candidate, Educational Administration and Human Resource Development
Texas A&M University

The following questions are being asked to gather demographic information information about respondents. The information you provide cannot be traced back to you and will only be used to compare subgroups to see how opinions vary between these groups.

Q1 What is your age?

Q2 What is your gender?

- Male
- Female

Q3 What is your ethnicity?

- African American
- Asian
- Hispanic
- Native American
- White
- Other _____

Q4 What is your job title?

- Administrative Assistant
- Medical Assistant
- Nurse Practitioner (LVN)
- Nurse Practitioner (RN)
- Office Manager/Supervisor
- Physician
- Physician's Assistant
- Other _____

Q5 What is the highest level of education that you have completed?

- Less than High School
- High School/GED
- Some College
- 2 year College Degree
- 4 year College Degree
- Master's Degree
- Doctoral Degree
- Professional Degree (MD)

Q6 What type of practice do you work at?

- Pediatric Practice
- Family Practice
- Specialty Practice
- Internal Medicine
- Community Based Practice/FQHC
- Other _____

Q7 How long have you been employed at this practice? .

Q8 How would you describe your practice?

- Urban
- Academic
- Rural
- Other _____

Q9 If patient satisfaction is measured at your practice, what average overall rating did your practice receive during your most recent evaluation?

- Not applicable
- Very Satisfied
- Satisfied
- Neither Satisfied or Dissatisfied
- Dissatisfied
- Very Dissatisfied

Q10 Approximately how many staff (including schedulers, medical assistants, nurse practitioners, physicians and physicians assistants) work at your practice?

Please indicate on the scales below how much you agree or disagree with each statement below.

Q11 When there is a conflict in this practice, the people involved usually talk it out and resolve the problem successfully

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

Q12 Our staff has constructive work relationships

- Strongly Agree
- Agree
- neither agree or disagree
- Disagree
- Strongly Disagree

Q13 There is often tension between people in this practice

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

Q14 The staff and clinicians in this practice operate as a real team

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

Q16 The practice encourages nursing and clinical staff input for making changes and improvements

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

Q17 All the staff participates in important decisions about the clinical operation

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

Q18 Practice leadership discourages nursing staff from taking initiative

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

Q19 This is a very hierarchical organization; decisions are made at the top with little input from those doing the work

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

Q20 The leadership in this practice is available for consultation on problems

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

Q21 The practice defines success as teamwork and concern for people

- Strongly Disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly Agree

Q22 Staff are involved in developing plans for improving quality

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q23 Our practice team is united in trying to reach its goals for performance

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q24 I'm unhappy with my practice team's level of commitment to the task

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q25 Our practice team members have conflicting aspirations for the team's performance

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q26 This practice team does not give me enough opportunities to improve my personal performance

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q27 Our practice team would like to spend time together outside work hours

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q28 Members of our team do not stick together outside of work time

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q29 Our practice team members rarely party together

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q30 Team members of our practice would rather go out on their own than get together as a team

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q31 I work closely with others in doing my work

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q32 I frequently must coordinate my efforts with others

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q33 My own performance is dependent on receiving accurate information from others

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q34 The way I perform my job has a significant impact on others

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q35 My work requires me to consult with others fairly frequently

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q36 This practice team is very competent

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q37 This practice team gets its work done effectively

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q38 This practice team has performed its job well

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q39 My supervisor/ leader helps me solve work related problems

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree
- Not Applicable

Q40 My supervisor/ leader encourages me to develop new skills

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree
- Not Applicable

Q41 My supervisor/ leader keeps informed about how employees think and feel about things

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree or Disagree
- Somewhat Agree
- Agree
- Strongly Agree
- Not Applicable

Q42 My supervisor/ leader encourages employees to participate in important decisions

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree of Disagree
- Somewhat Agree
- Agree
- Strongly Agree
- Not Applicable

Q43 My supervisor/ leader praises good work

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree
- Not Applicable

Q44 I am strongly committed to pursuing the goal(s) of this practice

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q45 Quite frankly, I don't care if I achieve the goal(s) of this practice

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q46 It wouldn't take much for me to abandon the goal(s) of this practice

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q47 It's unrealistic for me to expect to reach the goal(s) of this practice

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q48 I think the practice's goal(s) is/are good goal(s) to shoot for

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q49 The practice strongly considers my goals and values

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q50 The practice really cares about my well-being

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q51 Even if I did the best job possible, the practice would fail to notice

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q52 The practice cares about my general satisfaction at work

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q53 The practice shows very little concern for me

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q54 The practice cares about my opinions

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q55 The practice takes pride in my accomplishments at work

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

Q56 To better understand the opinions of various practices, what is the name of the practice you work at? (This question is only being asked to determine practice response rates and your answers cannot be traced back to you)

APPENDIX B

REVISED CONSENT FORM WTH PARTICIPANT INCENTIVE

Dear Prospective Participant: Responding to this survey may benefit primary health care practices by demonstrating attributes positively correlated with group cohesion and performance. It is important to examine cohesion in primary health care groups because groups with high levels of teamwork are associated with high levels of cohesion.

The purpose of this survey is to gather data related to cohesion and diversity that impact group dynamics in work groups within certain situations. Your honest input is important and will contribute to understanding various characteristics that contribute to group cohesion and performance in primary care practices.

Please remember that your individual responses will not be traced back to you. Rather, all data will be reported anonymously at an aggregated level. To participate in the study, you are being asked to respond to the questions contained in this survey. Your participation is entirely voluntary and you may withdraw from the survey at any time without repercussions. It will take approximately 15-20 minutes of your time to complete.

If you decide to participate, you will have the option to click on a link at the end of the survey that will take you to a registration form for you to complete to enter a drawing for a \$200 Visa gift card. The drawing will take place on August 31, 2012 and the winner will be notified on the same day. Again, registration for the drawing is entirely voluntary and your name and contact information cannot be traced to answers on your survey.

You can begin taking the survey by clicking on the double arrow tab located on the bottom right hand corner of this page. If you have any questions about this study or are interested in obtaining survey results after the study is completed, please contact Monica Trevino at trevinom17@tamu.edu. If you have any questions about your rights as a research subject, please contact the Texas A&M University's Institutional Review Board (IRB) office at 979-458-1467 or irb@tamu.edu.

Monica Trevino, M.A., Ph.D. Candidate
Educational Administration and Human Resource Development
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DRAWING ENTRY FORM

\$200 Visa Gift Card Drawing

A drawing for a \$200 Visa gift card will be held on August 31st 2012. The winner will be notified by either telephone or e-mail. If you would like to participate in the drawing, please provide the following information.

Please enter your name below

Please provide your phone number or e-mail address

Thank you and good luck!

APPENDIX C

MODEL FIT STATISTICS TABLE

Table A-1

Model Fit Statistics Table

| | | χ^2 | df | CFI | TLI | RMSEA | SRMR |
|----------------|--|----------------|------------|------------|------------|------------|------------|
| Step 1 | Theoretical Model | | | | | | |
| | CFA Model 1 | 1659.40 | 908 | .94 | .94 | .06 | |
| | SEM Model 1 | 1752.96 | 921 | .94 | .93 | .07 | |
| Step 2A | EFA Model 1 | | | | | | |
| | 7 Factor EFA | 1570.18 | 554 | .99 | .98 | .09 | .04 |
| | 8 Factor EFA | 1274.86 | 520 | .99 | .98 | .08 | .03 |
| | 9 Factor EFA | 1308.11 | 621 | .99 | .99 | .07 | .03 |
| Step 2B | EFA Model 2 | | | | | | |
| | 6 Factor EFA | 697.19 | 270 | .96 | .93 | .09 | .04 |
| | 7 Factor EFA | 492.83 | 246 | .98 | .96 | .09 | .03 |
| | 8 Factor EFA | 422.13 | 223 | .98 | .96 | .09 | .03 |
| Step 3 | CFA Model 2 | | | | | | |
| | SEM Model 2 | 797.37 | 389 | .96 | .95 | .07 | |
| | <i>Difference between CFA and SEM Models</i> | 62.08 | 8 | | | | |
| Step 4A | EFA Model 3 | | | | | | |
| | 5 Factor EFA | 562.62 | 166 | .95 | .92 | .11 | .05 |
| | 6 Factor EFA | 357.25 | 147 | .97 | .95 | .08 | .03 |
| | 7 Factor EFA | 271.45 | 129 | .98 | .96 | .07 | .03 |
| Step 4B | CFA Model 3 | | | | | | |
| | SEM Model 3 | 555.96 | 241 | .96 | .96 | .08 | |
| | <i>Difference between CFA and SEM Models</i> | 15.64 | 5 | | | | |

* Note: All Chi squares and Δ in Chi squares were statistically significant.