# Effects of Conflict Types and Power Style Use Among Health Professionals In Interdisciplinary Team Collaboration

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# ABSTRACT

PERCEPTIONS OF CONFLICT AND POWER USE AMONG HEALTH PROFESSIONALS IN INTERDISCIPLINARY TEAM COLLABORATION

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This research examined the effects of perceived conflict and power style use on interdisciplinary collaboration outcomes in an academic health sciences education project. Fifty-one nurse practitioner students, physician assistant students and first and second year medical students and 16 faculty who participated in the education program, Interdisciplinary Student Community Patient Education Service (ISCOPES) were studied. A comparison group of 50 (non-ISCOPES) students from the same disciplines were recruited ($\underline{N}$ =117). It was hypothesized that task conflict would positively influence interdisciplinary team collaboration. Additionally, informal power styles were predicted to mediate the effects of task conflict on interdisciplinary team collaboration. Using path analysis to test a collaboration model and using qualitative content analysis from two focus groups, the following results were produced: (1) the ISCOPES experimental student and faculty groups had significantly higher scores in

interdisciplinary team collaboration compared to the non-ISCOPES comparison group, (2) there was no significant difference in perceptions of interdisciplinary team collaboration based on discipline, (3) emotional conflict is a stronger negative predictor of lower interdisciplinary team collaboration than task conflict, (4) high levels of task conflict negatively predict interdisciplinary team collaboration, (5) the informal power of goodwill mediates the relationship between task conflict and interdisciplinary team collaboration, (6) the combined power styles of goodwill, authority and discipline positively effect interdisciplinary team collaboration but do not mediate conflict, and, (7) health professional faculty shape student perceptions of collaborative leadership behaviors.

# Chapter 1

## Introduction

Rapid social, economic, and technical changes globally are shifting the US health care paradigm. As market forces are shaping the growth of managed care, there is an increased emphasis on cost reduction and the roles that healthcare practitioners play in the cost, quality, and accessibility of health care. Consequently, the distribution and education of health care professionals has received increased attention. These dynamic changes have influenced a trend toward primary care, prevention, population-based practice, and interdisciplinary teamwork.

This current health care shift has led health care organizations and academic health science centers to a resurgence of interest in promoting collaboration among health care professionals and evaluating its impact in terms of cost savings and health care outcomes. The effectiveness of these changes will only be realized if the central role of all health professionals in delivery of health care is transformed as well as the educational programs that produce and support them (Pew Health Professions Commission, 1995).

Health care delivery is being reorganized from the primary dyadic relationship of care provider and patient to multidisciplinary clinical teams in integrated systems of care extending from hospital to community-based sites. Concurrently, as the power and authority of health care professionals has become vulnerable with the dominance of

market-driven managed care, the opportunity for interdisciplinary collaboration has never been greater (Baldwin, 1995; Kronenfeld, 1993).

Outcomes are an important reason for the "why" of collaboration. Interdisciplinary team collaboration is a process that impacts patient care outcomes. Bennett, C.L., Garfinkle, J.B., Greenfield, S., Draper, D. Rogers, W., Mathews, C. and Kanourse, D.E., (1989) studied fifteen hospitals and found that the degree of nurse-physician collaboration was associated with decreased mortality of AIDS patients. Knaus, Draper, Wagner, & Zimmerman (1986), in a study involving the treatment and outcome of over 5,000 patients, established that positive nurse-physician relationships were associated with significantly decreased patient mortality in intensive care units. Communication between staff and coordination of care were found to be excellent in those hospitals in which a significant decrease in patient mortality was reported.

Statement of the Problem

Despite the emphasis placed on the role of the interdisciplinary team in health care delivery, students currently enrolled in medicine, nursing, and other health professions' schools have little interdisciplinary exposure to one another in the process of their education (AAMC, 1992; Fagin, 1992). Most educational experiences are offered to students from a single professional discipline. Students have few if any planned collaborative learning experiences in their curriculum which are designed to promote such relations. Paradoxically, upon graduation, health professionals are expected to work effectively in interdisciplinary teams and among special interest groups in the community.

The reality that only a small number of collaborative efforts are reported at the practice level between organizations and among health professions has created a critical knowledge gap. Impediments that accompany the development and evaluation of learning strategies to promote interdisciplinary collaboration reside at both the theoretical and practice levels. At a theoretical level, there is not a shared conceptual understanding of collaboration. Henneman (1995) proposed that the logical positivism paradigm has influenced an obsessive search for the unique contributions of health professions to patient care, which has hindered the understanding of professional interdependence and the need for collaboration.

Collaboration has been understood as a process in health care related to improved patient care outcomes. Unfortunately, many of these studies did not specifically define collaboration and often considered the term synonymous with other modes of interaction such as cooperation, coordination, and compromise. The confusion over the meaning of collaboration has hindered its usefulness as a variable in studies that attempt to evaluate its effectiveness. This ambiguity may also account for the lack of consistency reported by health care practitioners about the amount of collaboration occurring in the clinical setting as well as failure of some investigators to find a positive correlation between collaboration and patient outcomes (Baggs, 1990; Zimmerman et al., 1993). The need to further develop this concept from a research perspective will be especially important to nursing and its multi-level practice as full utilization of all nursing competencies including collaboration can create efficient and expanded use of nursing resources.

Conceptually, few definitions of collaboration are comprehensive and most narrowly define a certain type of practice rather than the concepts that underlie all practices. Thus, we are unclear about the components neccessary to achieve it. What has been well documented are the barriers and the benefits of collaboration when it does occur.

There are both qualitative and quantitative studies that have investigated interdisciplinary collaboration from a dyadic perspective (Bates, 1966; Prescott & Bowen, 1985; Weiss, 1983; Baggs, 1990; Stein, Watts & Howell, 1990; and Abramson & Mizrahi, 1996). Additionally, there is some research on collaboration between advanced practice nurses and physicians (Campbell, Mauksch, Neikirk, & Hosokawa, 1990; Mc Clain, 1988). However, the examination of shared collaborative experiences as an educational experience in interdisciplinary teams of three or more disciplines is quite limited (Siegler & Whitney, 1994).

From an educational perspective, Mariano (19898) argues that no matter how competent health care professionals are they cannot collaborate without training. She identifies underlying stereotypes and ignorance about other disciplines as the impediments to productive collaboration. Proponents of collaborative training advocate that health professional students learn collaborative skills while in school, where role socialization begins (Giardino, Giardino, & Siegler, 1994). The Pew Commission's report (1995) addressed the need to increase the amount of interdisciplinary training as interdisciplinary strategies were the most viable pathway to address complex health care problems and increase effective sharing of resources.

Yet collaboration training may not be as effective as educators claim (Siegler & Whitney, 1994). Some have also questioned the readiness of students to learn collaborative skills while acquiring role-specific skills (Turnbull, 1982). In the clinical arena, students must have role-models who demonstrate collaborative behaviors and faculty as preceptors must create a context for collaboration to occur. Strumpf & Whitney (1994) note that collaboration can be taught in the didactic portions of a program but that nurse practitioners learn the nuances of collaboration primarily at the clinical site. In essence, the clinical preceptorship is a collaborative practice experience.

Historically, the value for collaboration has not been shared or seen as essential across disciplines (Fagin, 1992). Team collaboration as a unit involving three or more disciplines within a larger structure or occurring between organizations needs further exploration. Refinement of instruments which evaluate the effectiveness and efficiency of collaboration processes upon cost-effective and quality healthcare outcomes is also critical.

This "gap" in the conceptual, operational, and contextual development of such a critical and dynamic construct like collaboration, hinders the ability of educators to develop and evaluate learning strategies which promote interdisciplinary team collaboration (Siegler &Whitney, 1994). Systematic inquiry into collaboration, therefore, remains essential for clarification and application to produce the collaborative workforce required for the 21st century.

Purpose of the Study

As part of a larger educational program evaluation, there were three purposes in this study: 1) to compare perceptions of nurse practitioner students, physician assistant students, and first and second year medical students based on an educational interdisciplinary team collaboration experience; 2) to examine the relationships between types of conflict and styles of power use on perceptions of interdisciplinary team collaboration; and, 3) to explore students' perceptions of their roles and the roles of faculty in facilitating interdisciplinary team collaboration.

Interdisciplinary Collaboration: Current Structures, Patterns & Outcomes

Collaboration: improved patient outcomes. Collaboration has been understood as a process in health care related to improved patient care outcomes. In specialty areas like geriatrics, research on collaborative team delivery of chronic and long-term care has reported improved patient outcomes as measured by lower mortality, fewer hospitalizations, reduced admissions to nursing homes and reductions in length of stay, more discharges to home, and fewer drug prescriptions (Rubenstein, Josephson, & Wieland, 1984; Zimmer, Groth, & McCusker, 1985). Greater satisfaction on the part of patients and caretakers, improved morale and functional status of patients, and lower direct costs are identified outcomes (Barker, Williams, & Zimmer, 1985).

Much of the importance of collaboration in health care has focused on the nurse-physician partnership as a process that impacts patient care outcomes. Bennett et al., (1989) studied fifteen hospitals and found that the degree of nurse-physician collaboration was associated with decreased mortality of AIDS patients. Knaus, Draper, Wagner, and

Zimmerman (1986) examined the treatment and outcomes of over 5,000 patients and established that positive nurse-physician relationships were associated with decreased patient mortality in intensive care units. Communication between staff and coordination of care were found to be excellent in those hospitals where a significant decrease in patient mortality was reported. Mechanic and Aiken (1982) observed decreased inappropriate use of emergency departments and increased problem identification after the establishment of nurse-physician consulting teams. In all of these studies, other care variables were involved and collaboration was widely defined.

The American Association of Critical-Care Nurses Demonstration Project identified nurse-physician collaboration as a variable in care that improved patient outcomes. Mitchell, Armstrong, Simpson, and Lentz (1989) used the Charns Organizational Diagnosis Survey (CODS) survey to evaluate clinical process workflow and information sharing between health care professionals and patients. Clinical outcomes of low mortality, fewer complications, and high patient satisfaction existed in units with high levels of perceived nurse-physician collaboration. However, collaboration was not operationally defined in this study.

The research by Baggs and Ryan (1990, 1992) analyzed collaboration with the decision to transfer patients out of the ICU. Collaboration was identified with a specific practice action that allowed investigation of the links between the process of collaborative decision making and outcomes for the same patient. In this study reports from both nurses and physicians demonstrated a significant positive correlation between collaboration and satisfaction with decision making. Reports by nurses of collaborative

decision making were positively associated with patient outcomes (controlling for complexity). However, physician reports of collaborative decision making were not significantly associated with patient outcomes. Nurses' satisfaction with decision-making predicted retention in the ICU one year later but was not significantly associated with overall job satisfaction. Additionally, as years of experience for physicians increased, there was an increased positive association with the valuing of collaborative practice.

Benefits for health care professionals. One reciprocal result of improved patient care outcomes is the further promotion of teamwork. The more successful the team perceives the outcomes to be in collaboration, the more reinforcing the process of teamwork and general job satisfaction is for individual team members. Research linking goal significance and attainment as critical variables to successful, sustained teamwork and collaborative efforts is increasingly reported (Mizrahi & Rosenthal, 1996; Rahim, 1994; Vinokur-Kaplan, 1995). Collaborative models of care are being advocated by professional nursing organizations and accreditation agencies (Henneman, Lee & Cohen, 1995). Collaboration has also been proposed as crucial for increasing nursing staff satisfaction and retention (Mitchell et al., 1989; Baggs & Ryan, 1990).

Nursing education and practice structures. While most educators would agree that the instruction and role models provided in educational programs set the stage for the socialization of students, little research exists on how professional socialization occurs (Zungolo, 1994). A period of socialization into the professional role and a chance to grow in reasoning ability are essential for the new nursing graduate, argues Frisch (1987). The student fails to accept diversity and looks to authority for direction if opportunities are not

presented that represent complex decision making. Interdisciplinary collaboration experiences in education can offer such a context. The need for students to understand that there is more than one way to accomplish a task and think about a problem is a part of progressive critical thinking (Frisch, 1987).

However, it has been noted that upon leaving the educational setting many nurses feel ill prepared for the practice environment that is found to be competition-based. To overcome the potential for "practice shock," students must have opportunities to work with persons from other disciplines and learn how to effectively "fit" into the larger health care delivery picture (Beatty, 1987).

As nursing expands clinical practice roles, the favorable impact of nurse practitioners on patient outcomes has been well documented (Jacox, 1987; Lewis & Resnick, 1967; Mc Grath, 1990; Safreit, 1992). Nevertheless a climate of competition permeates the health care delivery system. As nurses assume increasing responsibility, too many physicians fight to retain their "territory" and their patients (Mc Lain, 1988). Empirical studies have supported the link between strong collaboration, higher nursing satisfaction, and lower job turnover (Baggs, 1990; Weiss, 1983).

Interdisciplinary education. While each profession addresses its own educational reform, there remains relatively little discussion of shared educational issues (Giardino, Giardino, & Siegler, 1994). Health care is evolving toward coordinated service delivery systems with multiprofessional involvement. Therefore, educators need to prepare students for interdisciplinary practice through educational restructuring and process improvement.

A few interdisciplinary learning models are being developed but evaluation of these potential models is embryonic (Headrick et al.,1995). Therefore, exploration of the variables perceived to develop successful interdisciplinary collaboration is critical. The need for empirical understanding of the issues and processes involved in successful and unsuccessful collaboration is critically needed (Schmitt, 1994).

In a Louis Harris poll of health professionals conducted for the Pew Commission (Shugars, O'Neil, & Bader, 1991b), 65% of respondents stated that it was "very important" for professional schools to provide training on how to work effectively in teams with other health professionals. Sixty-one per cent of the same sample said that their school's training for effective teamwork was "good' to "excellent." Yet training may not be as effective as educators claim.

The Association of American Medical Schools (AAMC, 1992) surveyed 136 US and Canadian medical schools regarding curricular content. A strong majority of schools offered electives conducive to collaborative teaching in such areas as health care delivery systems, health promotion, and ethics courses. In 1992, only two medical schools listed explicit instructional innovations that included health care teams, and only three colleges in the survey reported coursework that was interdisciplinary in nature.

Although the medical profession has advocated collaborative practice initiatives less consistently than the nursing profession, The American Medical Association (AMA) advocated some forms of learning in collaborative practice for medical students by 1990. These forms included collaborative case management with nurses, especially in caring for

chronically ill and long-term care patients, and in academic settings (Giardino, Giardino, & Seigler, 1994).

Support for Interdisciplinary Collaboration. The Pew Health Professions Commission's (1995) report identifies team training and cross-professional education as essential. The commission perceived no justification for the artificial separation of professionals in training. Sharing of clinical training resources, exploration of various roles, cross-teaching by professional faculties, and the active modeling of effective interdisciplinary teams in the delivery of efficient, high quality care is the challenge facing all health care professionals in education.

Gray (1989) asserts that, from a systems perspective, organizations are so interdependent that as each one changes it creates the need for change in the other. Hence, in response to a health care system in profound dynamic change, the need for continual readjustment and mutual learning among health care professionals must occur. Proactive changes in the education of health professionals through interdisciplinary educational strategies can influence the development of a flexible and socially responsive health care system. This system can be created and characterized by health care professionals who understand and appreciate what it is they contribute to the "whole," and the process of collaboration will be seen as essential to ongoing action learning. Central to the action learning process is the reframing of the problem domain through the integration of multiple perspectives, which is collaboration.

According to Baldwin (1994) the practice of interdisciplinary teams began in the 1940's and has evolved during periods of high social need and scarce resources. Models

for education were developed during these periods but, in the absence of federal funding, few programs were sustainable. Baldwin describes interdisciplinary curriculum efforts as somewhat of a cyclical pattern: when economic forces reduce resources in health care, interdisciplinary collaboration in theory and practice increases. When resources are plentiful, educational collaboration is not focused upon.

Recent collaborative education models. In 1989, the University of Pennsylvania schools of nursing and medicine sponsored a 3-year interdisciplinary program to teach students collaborative skills and foster collaborative behavior between medical and nursing faculty. The goals of the project were to give students an understanding of the roles of other professionals and of the importance of collaborative practice in meeting the needs of the chronically ill. The first year the course was a one semester non-credit course with 22 first-year medical students and 11 fourth-year nursing students. During the second year credit was awarded for the course and 42 students enrolled. The third-year enrollment reached larger numbers of students: 34 medical students and 39 nursing students.

Faculty from the both schools taught the classes. The collaborative curriculum comprised both clinical and classroom components. Nursing and medical students followed a patient with chronic illness through the health care system including the clinic, hospital, and home care. The students worked collaboratively to determine the goals of care for the patient and coordinated joint responsibilities. The joint experience served as a basis for class discussions.

Standardized inventories, verbal feedback, and course evaluations suggested both positive and negative effects on the participants. Positively, there was an increased

appreciation of each role. Negatively, senior nursing students resented being paired with inexperienced medical students in clinical situations. Difficulty scheduling classroom and clinical times was another problem (Giardino et al., 1994).

In 1992 the National League for Nursing (NLN) and the National Fund for Medical Education (NFME) launched a partnership with Metropolitan Life Insurance project that sought to foster collaborative practice initiatives between medical and nursing schools. The funded schools were New York University (NYU) and Oregon Health Sciences Center. NYU organizers integrated collaborative concepts into two preexisting course experiences. Humanistic Medicine Groups was a seminar series that discussed student and faculty experiences in caring for patients. The other course was the Summer Urban Health Care Program. This work-study opportunity was team based in the community and provided a broad exposure to primary health care. Both faculty and students evaluated this experience quite positively in relation to improved physician-nurse communication, clearer understanding of roles and values, and collaboration focused on development and implementation of community education activities (Giardino et al., 1994).

Private sources of support for interdisciplinary education and training have included: The Robert Wood Johnson, W.K. Kellogg Foundations, and Pew Charitable Trusts. The W.K. Kellogg Community Partnership Initiative in Boston linked private and public health care institutions into a new educational partnership. Zungolo (1994) reported lessons learned from the experience. She described the traditional "dominance" of medicine as a major barrier to interdisciplinary efforts. Specifically, Zungolo argues

that professional socialization toward a "physician-centered" health care system begins long before students arrive on campus. Commercials and over-the-counter products offer testimony of physician endorsement. Hence, students enter professional education programs viewing the health care system as oriented to the curative elements of medical intervention and treatment.

Summary. The inability of the health care professions to sustain the commitment to interdisciplinary collaboration in practice and education has been explained from many different perspectives. One of the most consistent barriers is the extant process of professional socialization. The structures of universities create separate socialized paths to professional competencies whereby identification with one's discipline becomes primary and patterns of competition rather than cooperation develop between professionals (Pew Health Professions Commission, 1995).

In contrast, health care delivery systems reflect complex problems and recognition of the interdependence of these professionals to achieve critical goals. Team structures have been the primary units of health care delivery for some time. With emphasis on cost containment, limited resources, and increasingly complex care taking place in community clinics and homes, the need to understand, practice, and measure collaboration has never been greater. Optimal use of teams for the delivery of health care is impeded as the current socialization of health care professionals to their roles continues in isolation.

Teaching collaboration skills effectively requires commitment, expertise, modeling, research, and institutional support. All elements have yet to be institutionalized in the corporate culture of education. To convince institutions of the importance of these

courses, researchers must demonstrate that educational preparation induces change in professional behavior, such as greater interests in primary care, better collaborative skills, greater empathy toward patients, and/or more effective outcomes of care with decreased costs.

In summary, the current context of health care reform provides a "potential" opportunity to increase interdisciplinary collaboration for improved health outcomes through interdisciplinary education programs. Growing recognition of the value and utility of collaboration demands that nurses develop a clearer understanding of the complexities, risks, and benefits involved in undertaking such a process. The assumption that a collaborative process can be taught in such a complex academic environment requires systematic research to understand the nuances of professional socialization, modes of interaction of conflict styles, power use, and behavioral shaping techniques. A multi-dimensional strategy for investigation is essential to a definitive knowledge base of collaboration.

## Theoretical Framework

### The concept of collaboration

Perhaps the most well known conceptual model of collaboration is that of Thomas (1976), who defines collaboration as an equal concern for both the interest of others and the interest for self. To extend the concept of collaboration from the interpersonal structure to a team or group structure, collaboration is conceptualized by integrating Follett (Metcalf & Urwick, 1940) and Gray's (1989) perspectives in this study.

Collaboration is a process in which parties who have a shared interest or conflict that cannot be addressed by any one party alone creatively synthesize their different perspectives to better understand complex problems and develop integrative solutions that go beyond their own individual limited vision of what is possible. Each party, directly influenced by others actions to solve a problem, is considered a stakeholder critical to involve in the collaborative process

Hardy's model of role strain. This study used the integrated conceptual definition of collaboration just defined and Hardy's (1988) model of Role Strain as the conceptual framework for exploring interdisciplinary team collaboration within professional role socialization. Hardy's model on role strain integrates the perspectives of structural role theory (structures that influence role purpose/goals), symbolic interaction theory (a social interaction process for role learning), and social exchange theory (power as the mediator of role negotiation). Role theory has focused upon the phenomenon of role socialization as a continuous and cumulative learning process by which persons acquire the knowledge, skills, and dispositions that make them more or less able members of their society (Brim, 1966). From a role perspective the content of what is learned in the process of socialization includes both knowledge and understanding of the structure and values of the society as well as the role prescriptions and role behaviors attached to status.

Structural role theory. The concepts of structural role theory provide a means of describing a social system in terms of a system of roles. The structural perspective (Merton, 1976) focuses on society, social systems, and the patterned behaviors that develop over time. Social structures are seen to shape and to a large extent determine

individual behavior. When a social structure creates difficult or conflicting demands for occupants of positions within it, this condition is known as role stress. Merton used a sociologic theory of ambivalence to describe role stress. Merton's theory explains the processes through which social structures, like our current education for health care professionals, generate the circumstances in which role ambivalence (incompatible normative expectations) is embedded and role stress is created. The health professional's education system currently structured to center almost exclusively on a single discipline-medicine-helps to explain values and behaviors that ambiguously serve to block collaborative efforts.

As the structure of health care becomes more complex with new constraints, this traditional educational approach is a structure that is dysfunctional for all. From Merton's theoretical perspective, teams are viewed as ambiguous structures in which conflict will naturally occur. Comprehensive health care today requires a broad spectrum of knowledge that no one practitioner can provide, which creates role strain. Collaboration is a process that educational and clinical teams can use to leverage the ambiguity or diversity reflected in the health care system to generate new health care strategies that redefine and maximize the use of all health professional roles.

Role ambiguity and role stress are characteristic of all positions occupied by health care professionals (Hardy, 1988). Although structural theory perceived conflict as normal and potentially useful, extreme or chronically high levels of conflict can create role strain. Currently, the educational focus on role development in isolation of other health professional roles directly affects role performance in this highly interdependent practice

setting. Role stress for one individual can result in discordant conditions for interdependent role partners. Role stress may generate role strain (subjective feelings of frustration or anxiety). The most common forms of role strain have been identified as internal conflicts which emerge as "burn-out" in the clinical setting and "reality shock" where expectations of one's role are perceived to be quite different in the practice structure from the role expectations in the academic structure.

Merton argues that extreme levels of role strain can result in disruption of social interactions and prevent goal attainment. Fragmented health care is a common outcome when collaboration does not occur among health care providers. However, collaboration can reframe role strain by creating a value for different perspectives and viewing conflict as a source of inquiry rather than a limitation to cooperation. Role strain or role problems that occur are analyzed in terms of conflict for this study

Symbolic interaction theory. Symbolic interaction, as developed by George Herbert Mead (1934) complements the structural perspective for understanding role learning and collaborative growth through a primary focus on social interaction in which persons cooperate to achieve a goal or outcome. Such cooperative behavior requires reasonable consensus among persons on the nature of the situation. Only as "shared" agreement develops regarding the social context is it possible to then coordinate activities to obtain a shared goal. Symbolic interaction focuses on the reciprocal social interaction of individuals who actively construct and create their environment through a process of interaction where self and meaning emerge through role taking and reflexive action. Reflexive action is when the individual can perceive other's perspective as well as one's

own. An example of reflexive action is learning about another's education and role competencies. Reflexive action involves inquiry and listening. Reflexive action is the ability to allow uncertainty and explore context. Reflexive action in collaboration would be the integration of different perspectives to develop a broader understanding of a problem domain and joint planning for effectively intervening. Thus, reflexive action is critical to the success of collaboration. In the collaborative team context, such processes as mutual planning, shared decision making, and collaborative conflict resolution would only be obtained through reflexive action where commonality of greater purpose and individual contributions are achieved.

Conflict in role theory. A fundamental assumption of symbolic interaction related to role is that persons seek out problematic situations on which to use their skills and knowledge. Another assumption is that conflict is necessary for progress and consensus (Mead, 1967). The inevitability of conflict is a theme in symbolic interaction as well as structural role theory. It is inherent in social relations and can contribute to "unity." Conflict is one of the principal processes operating to preserve the social whole and its subparts. Conflict or problematic situations can facilitate the breadth of an individual's perspective. Diversity in social and professional relations would increase the social and intellectual perspective of persons.

From Mead's perspective (1967) roles emerge and are modified as interaction unfolds. Socialization is the learning of roles or role making as a two-way process in which the socializee and socializer are active participants in an interactional process in which they are mutually influenced by the players and the process. This framework

explains how variation in role implementation exists as different role occupants negotiate their role in unique ways. Exposure to different socializers such as mentors and peers is likely to create different role demands. Mutual influence in role learning affords diverse, often conflicting, perspectives which can provide the potential synergistic outcome of collaboration (Gray, 1989). Sharing differences creates a perspective that is more complete than any one role or single professional's view. Conflict and collaborative efforts in teams are created through mutual influence stimulating role tensions that must be successfully negotiated in order to achieve interdependent goals. The empirical perspective that task conflict can promote collaboration while emotional conflict decrease collaboration complements this theoretical proposition.

Role making takes place within a larger social structure where status of role and behaviors related to status are learned. This integrative idea led Hardy to bridge the concepts of symbolic interaction with structural role theory.

Social exchange theory. The need for role negotiation led Hardy (1988) to see an overlap between symbolic interaction and social exchange theory. Emerson's social exchange theory (Cook, 1989) describes roles as relationships in which actors provide each other with needed resources which are exchanged through negotiation. Role negotiation is based on the notion that dependence is a central concept in understanding power in bargaining relationships. Some degree of dependence is necessary for negotiation to occur. Role negotiation can imply a conflict among interests but also implies investment in goals that no party can achieve without taking the other's interest into account (Bacharach & Lawler, 1981). Thus collaboration in teams is realized when

the degree of dependence for each party is perceived as critical to goal attainment. When team members perceive their situation to be more interdependent, the power that would be exchanged to negotiate mutually reciprocal roles is strengthened resulting in greater collaborative action.

Power in role negotiation. Power is a mediating variable in the ability to negotiate role and leads to role making (Cook, 1989). Role making and role taking are two techniques described in symbolic interactions that may be used in the process of role negotiation. Role making describes the process that takes place when role modification is consciously entered. Role making is the interpretation of one's own role prescriptions and the process of creating and modifying one's own role. Role taking is the capacity to understand the role of the other and of imputing purpose or motive to another. It is the ability to be empathic and includes anticipating another's reactions to actions the self might take (Mead, 1967).

In reciprocal or negotiated exchanges the power of one role occupant resides in the dependency of another. If two persons are unequally dependent on one another for valued outcomes, the less dependent person will have a power advantage. Power imbalance is predicted to lead to an imbalance in exchange. The determinants of power are structural characteristics of the relations between persons rather than individual characteristics. The status of a role often connotes a formal level of power. Power is a function of a structural position that gives the person control over another's outcomes, whereas, power use refers to the ability to influence another's behavior. The mediation

between structural power and power use is done through different types of influence strategies.

Complementing social exchange theory is the work of French and Raven (1959) who posited six bases of power style use: reward, discipline, legitimate (authority), expert, referent (goodwill), and informational. French and Raven identified a typology of personal resources used to influence change. Social dependence was identified as a critical dimension to compliance behavior and power style use. Reward, discipline, and authority are considered formal power styles that can be exercised to influence compliance. Expert, goodwill, and informational power were seen as informal power styles that could be used to produce change that was socially independent. Thus, a change that was socially independent was one chosen and implemented through commitment rather than compliance. Even though a change was initiated by communication from a formal agent that change would become accepted based on informal power influence and the formal agent would be inconsequential. This assumes that change accepted through commitment would increase productivity (Raven, 1993). This model has been applied to many settings including health care and will be used to explore power use in a collaborative context for this study.

Current Context. The current education of health professionals takes place in a context of hierarchical structure with educational socialization processes focused on knowledge within role and little focus on role relationships. Hardy's (1988) integrated role strain model offers one approach to understanding why there are so few collaborative practice efforts. Structural theory would explain how the education of health

professionals is structured as an isolating experience in which very little interaction occurs with role partners from other disciplines until after graduation. The current educational structure creates an emphasis on role content and delineation with little focus on interpersonal competence and professional interdependence.

The status of role groups is an invisible structure that creates power imbalance and can lead to role strain and conflicts resolved by dominance of the most powerful. Social exchange theory explains that in negotiated exchanges the power of one role occupant resides in the dependency of another. If two persons are unequally dependent on one another for valued outcomes, the less dependent person will have a power advantage. The result of such conflicts can lead to chronic role strain and jeopardize the outcomes of the product and role relationships. Thus, a chronic inability to understand interdependence for goal accomplishment and power imbalance can undermine collaboration efforts in teams.

Symbolic Interaction theory (Mead, 1967) also offers ideas about how collaboration could occur. The interactional process of mutual influence lends understanding to the variability of role performance. Role occupants recognize or share a perception of goal interdependence, perceive conflicts, and differences as normal, and power use strategies are exchanged to negotiate for successful outcomes. The concepts of role making and role taking for the discovery of mutually beneficial accommodation are the role process in team collaboration that facilitates a fluid use of power strategies to achieve mutuality.

Theoretical Collaboration Model

By selecting overarching concepts from Hardy's (1988) integrated role theory model and current descriptions of collaboration, new perspectives are offered and new questions emerge. In Hardy's model three processes linked to professional role socialization are examined: team as a structure for learning reflexive action (collaboration), conflict as a part of collaboration, and power use in role negotiation. Although there are other process variables, these are clearly very crucial to collaboration.

Linking Hardy's theoretical model and the integrated conceptual definition of collaboration with current empirical research provides guidance in development of a model to examine the relationships between the variables of collaboration in the team context, conflict, and power use (See Figure 1.1).

In this model interdisciplinary team collaboration is the dependent variable that is influenced by both conflict and power. Emotional and task conflict are identified as independent variables that naturally occur in role socialization and as part of a team structure. They are reciprocal (note the arrow between the two conflict labels) which means they influence each other. Task conflict is presented as positively influencing interdisciplinary team collaboration, and emotional conflict is presented as negatively influencing interdisciplinary team collaboration (Jehn., 1994; Amason, 1996). Emotional conflict is proposed to be a stronger negative influence. Task conflict would be seen as a potentially positive influence on collaboration if informal power styles were used to resolve the conflict differences. However, if high levels of task conflict are present and

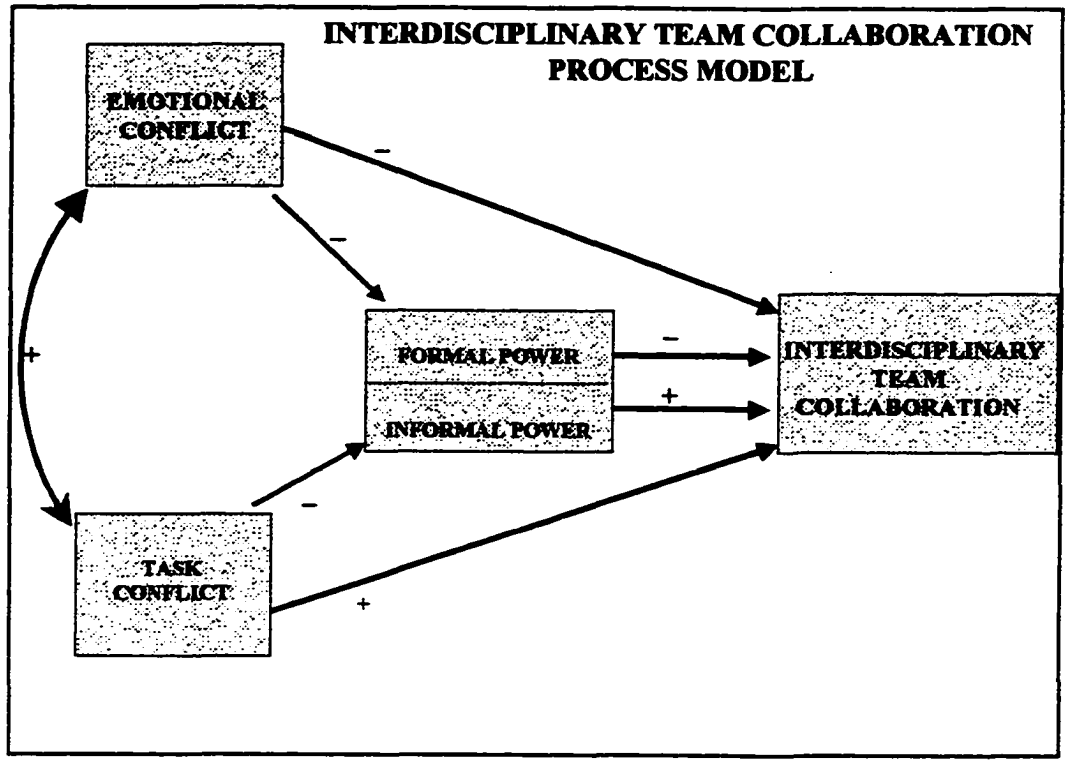


Figure 1.1. Theoretical Model of Collaboration based on Hardy's (1988) model of role strain, including the predicted influence of conflict types and power style on interdisciplinary team collaboration.

formal power is primarily used to resolve conflicts and proposed to have a negative impact on collaboration (Carson, Carson & Roe, 1993; Jehn, 1995).

Emotional and task conflict are also perceived to influence power style use. Power is identified as an independent variable that can positively influence interdisciplinary team collaboration through informal power and as a negative influence through the exclusive use of formal power. Power is also theorized as a mediating variable which means that it can increase or decrease the impact of conflict on interdisciplinary team collaboration indirectly. In the proposed model, formal power use would increase the negative effects of conflict on interdisciplinary team collaboration and informal power use would decrease the negative effects of conflict on interdisciplinary team collaboration (Raven and Kruglanski, 1970).

Research Purpose

Interdisciplinary collaboration within dyads has been the unit of primary focus in health care research. The purpose of this research was to expand the understanding of interdisciplinary collaboration at the team level, defined as having at least three health care disciplines represented. Theoretically, conflict and conflict resolution are an intrinsic part of the collaboration process (Gray, 1989). Although perceptions of conflict resolution have been explored (Prescott & Bowen, 1985), the impact of conflict types on perceptions of overall team collaboration has not been investigated. Earlier discussions indicated that the relationship between collaboration and conflict depends on the use of power strategies that can promote the sharing of diversity while building a common ground to resolve complex interdependent problems. Conceptually, collaboration operates on a model of

shared power. Practically, the nature and impact of shared power within the context of team collaboration have not been explored to understand how different power bases are used in teams to create countervailing power.

This study questions how types of conflict and different power styles affect the outcome of perceived interdisciplinary team collaboration. It attempts to elucidate how students perceived an interdisciplinary team collaboration experience in relation to increasing their role competence. Therefore, the following research questions and hypotheses address the variables of team conflict, types of power style use, and interdisciplinary team collaboration.

Questions and Hypotheses

Research questions. The present research was conducted to address the following questions:

(a) What is the relationship between the experimental and comparison groups and/or discipline in determining perceptions of interdisciplinary team collaboration?

(b) What is the influence of different types of conflict on interdisciplinary team collaboration?

(c) What is the influence of different styles of power on interdisciplinary team collaboration?

(d) Does a mediator causal model significantly describe the relationship between conflict types, power styles, and interdisciplinary team collaboration?

(e) How do health professional students perceive their role and the roles of faculty in facilitating interdisciplinary team collaboration?

Research Hypotheses. The following research hypotheses sought to address the research questions presented:

Hypothesis (1) Perceptions of interdisciplinary team collaboration will be higher in the student and faculty experimental group than the comparison student group.

Hypothesis (2) Perceptions of interdisciplinary team collaboration will be different between health care disciplines.

Hypothesis (3) The interaction of collaborative group membership and discipline will not significantly affect perceptions of interdisciplinary team collaboration.

Hypothesis (4) Perceptions of emotional conflict will negatively influence interdisciplinary team collaboration.

Hypothesis (5) Perceptions of task conflict will positively influence interdisciplinary team collaboration

Hypothesis (6) Informal power styles (information, expert, & goodwill) will positively influence interdisciplinary team collaboration.

Hypothesis (7) Formal power styles (authority, reward, & discipline) will negatively influence interdisciplinary team collaboration.

Hypothesis (8) Task conflict and emotional conflict are direct predictors of power style use.

Hypothesis (9) Emotional conflict, task conflict, and power styles are direct predictors of interdisciplinary team collaboration.

In addition to the quantitative measures of power, conflict, and interdisciplinary team collaboration, a qualitative inquiry using focus groups examined in more depth these

same variables and served to confirm or challenge the quantitative findings related to the hypothesized collaboration model. As role theory was applied to the hypothesized collaboration model, students' perceptions of their roles and the roles of faculty in facilitating collaboration were explored in the focus groups.

Concepts Defined and Operationalized

Dependent variable: interdisciplinary team collaboration. A conceptual definition that integrates both Gray's (1989)and Follett's (1940) definition of collaboration will be used for this study.

> Collaboration is a process in which parties who have a shared interest or conflict that cannot be addressed by any one party alone, creatively synthesize their different perspectives in order to better understand complex problems and develop integrative solutions that go beyond their own individual limited vision of what is possible. Each party directly influenced by others actions to solve a problem domain is considered a stakeholder critical to involve in the collaborative process.

Interdisciplinary team collaboration is operationalized using the Interdisciplinary Collaboration Scale (ICS) developed by Rendell (1988) based on Luszki's (1958) factors of interdisciplinary team collaboration. Dimensions of interdisciplinary team collaboration are operationalized as subscales: equality of influence (shared power); problem-centered action, sharing of suggestions, joint planning and decision making, reciprocal learning, acceptance of leadership, and, flexibility of role. These dimensions of interdisciplinary team collaboration have been empirically supported (Armer and Thomas, 1978; Rendell, 1988; and Vinokur-Kaplan, 1995). Additionally, a three item subscale "goal similarity" to

measure shared goals was incorporated (Jehn, 1995). Goal similarity was included to reflect Gray's additional dimension of a shared vision or shared goals which is the reason for health care interdisciplinary team collaboration. In this study nurse practitioner students, physician assistant students, and first and second year medical students led by an interdisciplinary faculty member are identified as the interdisciplinary teams.

Independent variable: conflict. Conflict is conceptually defined as an awareness by the role partners involved that there are discrepancies or incompatible wishes or desires present (Boulding, 1963). Two types of conflict are proposed. Emotional conflict contains personal and relationship components characterized by friction, frustration, and personality clashes within the team. Task conflict pertains to conflict of ideas in the group and disagreements about the content and issues of the task (Jehn, 1994).

Jehn (1994) operationalized the two dimensional concepts of conflict in the development of the Intragroup Conflict Scale. A 5-point Likert-type scale with 8 items regarding the presence of emotional conflict (4 items) and task conflict (4 items) based on Rahim's (1983) well established intragroup conflict subscale. The Likert scale is anchored by 1 equals "none" and 5 equals "a lot." This tool is used to operationalize types of conflict as emotional or task.

Independent variable: power. Social exchange theory (Cook, 1989) explains that in reciprocal or negotiated exchanges the power of one role occupant resides in his or her dependency on another. If two persons are unequally dependent on one another for valued outcomes, the less dependent person will have a power advantage. Power imbalance is predicted to lead to an imbalance in exchange. The determinants of power

are structural characteristics of the relations between persons. Formal power is a function of a structural position that gives the person control over another's outcomes, whereas informal power use refers to the ability to influence another's behavior through interaction.

The Power Base Inventory (PBI) developed by Thomas and Thomas (1985) is used to operationalize the measure of power styles used by students and faculty to influence each other in their respective teams. Six styles of power are identified as resources that have different effects. Formal power is comprised of three power base styles: authority, reward, and discipline. Authority is based on formal position and reflects the right of a team member to direct other team members. Reward is based on the influence of getting something of value such as a high grade. Discipline is coercive in nature and is an influence of punishment such as a low grade. These power bases are hypothesized to promote dependence and compliance rather than commitment to the task.

In contrast, informal power styles are identified as information, expertise, and goodwill. The informal power bases are predicted to produce increased commitment to the task or goal. Information is an influential power style that deals with clear logic, argument and regular communication of facts. Expertise is the influence of being perceived to know a great deal about a particular topic and to demonstrate ability. Goodwill is influential based on feelings of support and respect that team members have for each other. Goodwill may involve rapport, cooperative working relationships, and mutual friendship.

Summary. As the 21st century dawns, society and the health care system are at a critical juncture. The pace at which new problems are generated is rapid and their complexity is increasing. Organizations must make effective and timely responses. Trist (1983) identifies this condition as turbulence in the environment. Under turbulent conditions organizations become highly interdependent with others in indirect but consequential ways (Gray, 1989). Compared with past collaborative efforts, this increased interdependent context creates a most powerful force, supporting a renewed focus on interdisciplinary and inter-agency collaboration as teams become the primary unit of health care delivery.

The need to clarify collaboration, to develop operational processes for implementation, and to evaluate effectiveness is critical to the enduring nature of collaboration. The thinking of Mary Parker Follett (1940), a pioneer in collaborative research, remains especially insightful today. She postulated that conflicts are best resolved not by one side dominating the other or by compromise, but by a creative integration among the needs of the different parties. She explains that collaboration is important if used to integrate and synthesize new ideas rather than forcing compromise or domination. Thus, collaboration is a method of resolution that, while initially time-consuming, saves time in the long run by allowing people to use their different perspectives to create a new synthesis for understanding complex problems.

Gray (1989) extends the concept of collaboration beyond conflict resolution to include using the process to induce a collective vision to advance a collective good. Collaborative practice and its impact on quality patient care is such an example. She

argues however, that even when parties share a vision, conflict will occur. Dealing constructively with those differences is essential. Exploring the relationships among variables proposed to influence interdisciplinary collaboration as revealed by prior research establishes the grounding for this study.

## Chapter 2

## Literature Review

The review of the literature is organized into three specific topics critical to understanding collaboration in interdisciplinary teams and provides the context within which this research was conceptualized. The research on interdisciplinary collaboration practice and education is reviewed. A second area of review related to interdisciplinary team collaboration is that of the nature of conflict. The third area for review focuses on research in the area of power as related to conflict and collaboration.

### Conceptualization of Interdisciplinary Collaboration

In health care research, the term "collaboration" has been used in a variety of ways and confusion over the meaning has hindered its usefulness as a variable in studies which attempt to evaluate its effectiveness (Baggs, 1994; Henneman et al., 1995). In a concept analysis by Henneman et al., the attributes identified for collaboration are: joint venture, cooperative endeavor, willing participation, shared planning and decision making, team approach, contribution of expertise, shared responsibility, non-hierarchical relationships, and shared power based on knowledge and expertise.

Conceptually, teamwork and collaboration have been seen as roughly equivalent. Experts like Baldwin (1994) define teamwork as a special form of interactional interdependence between health care providers who merge different but complementary skills or viewpoints in the service of a patient or in developing solutions to health. Baggs

and Schmitt (1988) have challenged this equivalence stating that collaboration is assumed to represent the most important aspect of team care, but arguing the need for clear identification and delineation of the collaborative efforts from the other factors entering into the team care equation.

Another related concept that is often used synonymously with collaboration is interdisciplinary teams. It has been suggested by numerous authors in health care that interdisciplinary teams are those teams in which collaborative interactions occur (Rendell,1988; Siegler and Whitney, 1994). One of the earliest definitions of interdisciplinary healthcare teams was advanced by Luszki (1958).

> An interdisciplinary team is a group of persons who are trained in the use of different tools and concepts, among whom there is an organized division of labor around common problems, with each member using his own tools, with continuous intercommunication and reexamination of postulates in terms of the limitations provided by the work of other members, and often with group responsibilities for the final problem (p.16).

In addition to the conceptual definition of collaboration, there are ten factors or dimensions that promote interdisciplinary team collaborative practice identified by Luszki (1958): (1) equality of influence exerted by the representatives of one discipline on another; (2) acceptance of leadership; (3) flexibility of role; (4) free interchange of information; (5) sharing of suggestions; (6) participation of all team members in joint planning; (7) reciprocal teaching and learning among team members; (8) problem centered rather than discipline or individual centered; (9) free communication among all members;

(10) willingness of disciplines to subordinate own methods and interests to achieve aims. The multiple descriptors and dimensions of interdisciplinary team collaboration reflect complex dynamics which are interdependent factors that must be present for collaboration to occur.

Collaboration models described by Siegler & Whitney (1994) provide a larger conceptualization as the elements of collaboration were defined in terms of structure, process and outcomes. Empirical research by Cary & Androwich (1989) reported on the nature and development of collaboration as an outcome resulting from developmental staging of activities, group processes and conflict management. The study of 27 organizational units was comprised of both home health care agencies and nursing education institutions at the collegiate level. The convenience sample was taken from those attending a national conference session on the issues in research among institutions in the field of home health care. Program directors responded to a survey describing the types of research activities undertaken conjointly, areas of concern in collaboration research; financial apportionment strategies; major points of negotiation in collaboration experiences; and, rankings of factors which influenced collaboration outcomes.

Based on the quantitative analysis, the authors constructed a model of collaboration (Androwich & Cary, 1989, 1990; Cary, 1996). This collaboration model suggests that due to the dynamic nature of activities interacting to achieve collaboration, a point in time evaluation of collaboration can demonstrate a diversity in performance variables. The findings of Cary and Androwich (1989) may explain the inconsistent

collaboration research results among comparable studies due to the developmental staging variation and the timing of data collection.

Dimensions of Successful Interdisciplinary Collaboration

Most of the research on collaboration has been dyadic in nature and focused on nurse-physician interactions. Perhaps the best known research on interdisciplinary collaboration was conducted by Weiss and Davis (1984), authors of the Collaborative Practice Scales (CPS). They attempted to explore how collaboration was practiced between doctors and nurses. Their research addressed the difference in formal role power between physicians and nurses as use of the power strategies of assertiveness for nurses and inclusion by physicians would affect collaborative practice. Nurses were rated more collaborative if they exhibited assertiveness and were able to communicate expertise or competence. Physicians were rated collaborative if they integrated the nurses' contributions into the planning of patient care. Open discussion of differences was measured for both disciplines. The research found that although physicians were willing to achieve consensus about patient care goals and care responsibilities, the related idea that nurses should have greater responsibility for the outcomes of care were quite separate and not positively correlated.

Three qualitative studies used critical incidents in which collaboration was perceived to have been facilitated or blocked. Bates (1966), Prescott and Bowen (1985) looked at nurse/physician collaborative interactions, Abramson and Mizrahi (1996) looked at social work/physician collaborative interactions. The results are strikingly similar despite differences in discipline target groups, research methods, and a thirty year interval

of time. Abramson and Mizrahi (1996) asked social workers and physicians to identify a shared case in which both perceived collaboration occurred. Bates (1966) and Prescott and Bowen (1985) asked physicians and nurses to think of critical incidents in which they identified behaviors that positively or negatively impacted their relationships. There was a strong general agreement across disciplines that respect for their colleagues, shared perceptions-agreement, and quality communication were three very important areas that promoted collaboration.

However, social workers (Abramson & Mizrahi, 1996) and nurses (Bates, 1966; Prescott & Bowen, 1985) focused on different priorities in the collaborative relationship than did physicians when prioritizing the elements. While social workers and nurses focused on respect and trust as the first priority, physicians most often identified competency. Competency was described in the studies as "able to make good judgements," "skillful," or "capable." Additionally, Bates (1970) qualitatively identified the broader goal of giving the best patient care as common ground for increasing shared decision making and thus, collaboration among health professionals.

Areas where disagreement occurred, or collaboration was blocked, were similarly identified by nurses and social workers. Plan of care, patient disposition, and disrespectful approach were identified as areas that blocked collaboration. Physicians in all three studies identified presentation style of disagreements and different perspectives on planning patient care as primary barriers to collaboration. Disagreements were described differently by each discipline, but they appeared to be both sides of the same coin: different perceptions concerning the patient and different expectations on how to disagree. These

areas of disagreement reflect conflict in overlapping tasks and interpersonal/emotional processes.

Of the three qualitative studies only Prescott and Bowen (1985) using the Conflict Mode Instrument inquired into how disagreements were handled. In their study when conflicts occurred, the primary approach most frequently used by both physicians (65%)and nurses (53%)were assertive and uncooperative styles. The combination of assertive and uncooperative styles has been identified as competitive using the Kilmann and Thomas model (1977) of conflict mode styles. The second conflict mode most frequently identified was accommodation which was used by 32% of the nurses and about 16% of the physicians. Collaboration was identified by physicians (14%) and nurses (7%) as the third mode. Compromise and avoidance modes were rare but did occur. Interestingly, Prescott and Bowen identified disagreement as important to good patient care and therefore desirable for reaching that goal.

These findings suggest that nurses, social workers and physicians share similar ideas on the nature of collaboration but their differences in handling conflict often block effective collaborative practice. Additionally, it has been suggested by Prescott and Bowen that conflict between nurses and physicians is useful in providing better patient care. Conflict may be an inherent and potentially healthy part of the collaboration process.

Successful Interdisciplinary Team Collaboration

This section reviews the elements of successful interdisciplinary teamwork at the group level of collaboration. In a cross-sectional survey of 111 geriatric interdisciplinary teams Schmitt, Heinemann and Farrell (1994) examined the differences in attitudes toward

interdisciplinary teams and perceptions of teamwork. A total of 313 nurses, 119 physicians, 130 social workers, and 83 dietitians participated in the study. With regard to attitudes toward interdisciplinary team delivery of care, all disciplines reported high positive attitudes toward the quality of care and benefits of interdisciplinary teamwork. However, the disciplines reported less positive attitudes toward the actual teamwork process when clarity of goals, roles and norms for interacting together were not clear.

Differences between disciplines were examined on attitude, teamwork perceptions, and stress variables. Teamwork process, leader support, communication quality, and team effectiveness were significantly different by profession ($p =< .001$). Thus it was concluded that discipline significantly influenced perceptions of teamwork. Physicians were most positive about the teamwork experience and highly endorsed the physician role as the central one in interdisciplinary health care teams. Nurses were also quite satisfied with teamwork. Social workers and dieticians were the least satisfied members in the teamwork process.

The authors theorize that role span differences may account for the variance in member satisfaction. In other words, the broader "shared" scope of the roles that nurses and physicians occupy may increase teamwork satisfaction whereas the social work roles more narrow in focus, may decrease teamwork satisfaction for social workers. Another plausible explanation is that social workers by their education are likely to be more knowledgeable about group processes and therefore more sensitive observers with higher expectations than the other two disciplines (Schmitt, Heinemann & Farrell, 1994).

A study of 15 rehabilitation teams (N = 113) examined the perceptions of interdisciplinary team care (Strasser, Falconer, & Saltzmann, 1994). This study measured the hospital environment, the team environment, and interprofessional relations. The hospital and team environment results identified a relatively strong emphasis on order, strong organizational and team leader control, and a relatively low emphasis on innovations. On the dimension of interprofessional role sharing, the study revealed that although the staff generally endorsed a team approach, approximately one half of the sample perceived that other team members encroached on their professional territory while their own capacities were not fully used by other team members. Again the process of teamwork was perceived differently by different disciplines. This study raises the challenge of how to identify successful interdisciplinary teamwork given different perceptions of the process.

Both studies (Schmitt, Heinemann & Farrell, 1994; Strasser, Falconer, & Saltzmann, 1994) conclude that although a general value and positive attitude toward interdisciplinary teams across health care disciplines exists, there are significant differences in perceptions of satisfaction with the process of interdisciplinary teamwork by discipline. Additionally there is not an optimal use of team members and innovation suffers. In the current health care context the need for collaborative teams to maximize the use of all resources to develop innovative processes for quality patient care has never been greater. However, the need may not be met if healthcare professionals do not develop teamwork skills and knowledge of other professional roles early in their professional education.

From a nursing perspective, Alt-White, Charns, and Strayer (1983) studied personal, managerial, and organizational variables in an acute care setting to examine the factors contributing to collaboration. A total of 446 nurses and 46 patient care units were surveyed. Collaboration was conceptually defined as the process whereby nurses and physicians work together in the delivery of quality patient care, jointly contributing in a balanced relationship of trust. The scoring measure on the Charns et.al., (1981) operational measure of collaboration was not presented. Statistically significant positive correlations were found between nurse-physician collaboration and the use of primary nursing, communication and coordination processes on the units, hospital climate, and overall job satisfaction. From an educational perspective, orientation and inservice education were stronger positive correlates to collaboration than formal nursing education. These findings raise additional collaboration research questions concerning the impact of formal educational preparation of health care professionals to successfully collaborate in teams. Additionally, the statistical analysis of correlational relationships between collaboration and other factors does not actually test the predictors of collaboration. Inquiry into these relationships is required.

These research studies identify the value for collaboration and interdisciplinary teams, however, dissimilar priorities and perspectives on the processes of collaboration and teamwork based on discipline block the successful implementation of this value. The need to develop shared goals and knowledge of different health professional roles to improve interdisciplinary team effectiveness leads to a natural focus on role socialization

during formal education as one avenue to address and test as an intervention to increase collaboration skills.

Barriers to Interdisciplinary Collaboration: Status and Communication Interactions

Interprofessional conflict between nurses and physicians has been a part of nursing history since Florence Nightingale (Kalish & Kalish, 1978). Perhaps the most famous article on collaboration to date is Stein's view of the "doctor-nurse game" (1967). As a result of the hierarchical structure of health care professionals, communication between nurses and doctors in which the nurse must make recommendations while appearing passive has been one of the rules of the "game" observed by Stein. The author also notes that the "game" arose from attitudes shaped by doctors' and nurses' education and training processes. Kalish (1977) labeled the physician dominance/nurse deference pattern described in Stein's game as a structure that decreases reciprocal communication . Sheard (1980) identified the differences in ways the two professions structure their work as leading to misunderstandings. Tellis-Nayak and Tellis-Nayak (1984) studied the social psychology of physician-nurse interaction and found similar hierarchical communication patterns noted by Stein. Based on an elaborate social ritual effective communication can take place without changing the status and authority issues between the two professions. The ritual serves to retain the differences in status and authority between the two professions, not to change them, while promoting clear communication toward a common goal.

However, there is disagreement among investigators concerning whether collaborative practices and hierarchies are mutually exclusive. Baggs and Schmitt (1988)

identify the ICU as an example of physician expertise and the power to write orders as a fixed hierarchical relationship between doctors and nurses, yet collaboration is perceived to be practiced in negotiation, feedback, and complementary roles.

Mc Lain (1988) investigated the failure of nurses and physicians to collaborate and the underlying meaning of the failure. Using critical theory as the framework, Mc Clain explored how effectively the nurse practitioners had been able to collaborate with physicians based on their ability to create a "shared power" structure for developing mutual understanding. Collaboration was defined as nurses and physicians collaborating as colleagues to provide patient care. Eighteen family nurse practitioners and physicians in joint practice composed the sample for this qualitative study. The primary reason for initiating interaction between nurse practitioners and physicians was basic information exchange. Although both nurse practitioners and physicians spoke of the common values of mutual understanding and communicative competence, their practice comments revealed an interactive structure that was not free from constraint. Genuine agreement was not viewed as possible. She concluded that joint practice occurred but collaboration as defined by genuine agreement was hindered. In addition, the nurses continued to support the authoritarian and dominant position of the physicians with whom they practiced.

One qualitative study investigating the roles of physicians and nurses identified collaborative barriers that nurses participate in creating. Weiss and Remen (1983) used focus groups and identified representative groups of physicians, nurses and consumers to examine perceived understanding of the role of nursing in health care delivery that is unique and overlapping with physicians. The authors found that the public perceived

nurses as physician extenders; that all participants acknowledged nurses as having a role in health care delivery; and, the physician was seen as having the greater responsibilities.

Three patterns that prevented collaborative relationships by nurses were identified: 1) nurses' lack identification with their profession; 2) nursing expertise was perceived to be based more on "intuition" than analytical knowledge and therefore less valued by the nurses themselves and other professionals; and, 3) nurses reported discomfort with responsibility. Although nurses indicated a desire for more power and respect, they did not want the inherent responsibilities.

The research of Benner (1984, 1987) has served to reframe and increase the value of "intuition" as a form of knowing that can be based on a high level of expertise in professional practitioners. This research has gained wide respect across disciplines. Additionally, her methodological use of qualitative research to develop a deeper understanding of such a complex phenomena like "domains and levels of clinical competence" has reframed how the expertise of collaboration can be identified through a situation based interpretive approach.

Katzman and Roberts (1988) in a qualitative study used participant observation and informal interviews of nurse practitioners to examine how social roles relate to professional roles. Several themes emerged. The first major theme concerned the subordination of the nurse's professional judgment about patient care to the decision-making power of the physician. The second theme concerned role definition by nurse practitioners. The authors observed both seasoned and neophyte practitioners exhibit stereotypical gender role behaviors when implementing their professional roles. Lack of

interaction between the team members was noted and when it did occur, deference and demeanor to physicians by the nurses was commonly observed. The authors concluded that despite expanded nursing roles among women, male physicians dominate the subservient role behavior of the female nurse.

Stein revisited the doctor-nurse game (Stein, Watts & Howell, 1990) and found changes in the physician/nurse hierarchical patterns of communication. Stein and his colleagues describe nurses as having greater confidence and less willing to play "the game." The relationship between physicians and nurses is dynamic which means a change in nursing creates a change in the physician. Stein et. al. (1990) perceived that conflict was more overt between the two health professions and that negotiation of goals was increasingly demonstrated. The change in women's status, the nursing professions' interest in greater autonomy and the recognition of physician fallibility were factors identified as changing the dynamic working relationship between the two health professions.

Gender differences between nurses and doctors that existed until recent years needs to be considered as a barrier to collaboration. As the number of women entering the field of medicine has increased, there has been speculation that relationships between the two disciplines will become more positive. However, a survey of 1,000 nurses found that 55% perceived their working relationship with female physicians to be no better than those with men physicians (Nursing 91, 1991).

Although there may be new emerging patterns of communication and power use between nurses and physicians as suggested by Stein et al. (1990) the theme of hierarchy

or power differences between the professional roles nurses and physicians occupy is identified as a fundamental explanation for the lack of collaboration. The higher status of the physician and disparate disciplinary perspectives leads to dominance by the physician and accomodation by the nurse. These patterns are also observed at the team level.

Interdisciplinary Teams: Status and Communication Patterns

Investigators who have studied participation patterns in interdisciplinary meetings of health care professional have shown that higher status individuals receive more communication, exhibit higher levels of participation and satisfaction, are better liked and give less irrelevant communication to other members than disciplines of lower status in the team (Abramson, 1989; Bailey, Thiele, Ware, & Helsel-DeWert, 1985; Feiger & Schmitt, 1979). Teams which include physicians often confront the continuing dominance of physicians in team decision making. Physician team interaction, problem identification and options for intervention disproportionately influence team actions due to their higher status (Campbell-Heider & Pollack, 1987; Toseland & Rivas, 1986).

Lamb and Napadano (1984) taped interactions between physician and primary care teams. Collaboration was defined as face-to-face interchange, participation from each person to problem-solve, integration of ideas and formulation of new plans. Only 6.7% of patient contacts prompted interactions between providers and only once did the physician initiate a discussion. Only 5 of the 22 interactions were rated as collaborative by the observers. The participants perceived there was more collaboration than the researcher. The definition used by the authors for collaboration-direct face-to face

communication-may be questionable criteria. Additionally over time less direct contact in collaborative teams may be a natural outcome (Schmitt, Farrell, & Heinemann, 1988).

Temkin-Greener (1983) interviewed administrators in medicine and nursing about team care. Although there was agreement on the definition of a team, there was conflict about leadership and authority in decision-making, concern about territory, and no evaluation of members based on team functioning.

Research at both the dyadic and group levels reveals consistent themes: 1) the structure of hierarchy between health professional roles defines patterns of interactions between role occupants, 2) gender roles continue to influence the nature of collaboration, and, 3) hierarchy or power differences between the roles professional nurses and physicians occupy is a fundamental explanation for the lack of collaboration.

Interdisciplinary Stereotyping

Collaboration emanates from an understanding and appreciation of the roles and contributions that each discipline brings to the care delivery experience. As noted earlier, the lack of exposure and education to the roles of other health care professionals blocks collaborative efforts. Stereotyping is often a symptom of ignorance concerning another's role and skill. Koeske, Koeske, and Mallinger (1993) explored perceptions of professional competence among psychologists, social workers, nurses and psychiatrists ($N = 101$). Additionally, vignettes were used to reveal how those perceptions influenced choosing resources for client care. Each professional group rated itself more competent than professionals with health care roles different than their own. A hierarchy concerning who

was most competent was clearly perceived but varied across disciplines. Psychologist and psychiatrists rated themselves as having the highest levels of expertise. No professional group was perceived to have low levels of competence. Social workers were perceived as highest in warmth ratings.

Furnham, Pendleton, and Manicom (1981) found very different patterns of perception of accessibility and status between health care disciplines (N = 125). General practitioners, nurses, health visitors, occupational therapists, and social workers evaluated themselves and each other on the attributes of skill, power, status, sympathetic posture, accessibility, and training. They perceived each other negatively if role overlap existed. In every case except for general practitioners, each discipline tended to perceive themselves more positively on each dimension than did any other discipline.

Another study identified stereotyping more positively. Folkins, Wieselberg, and Spensley (1981) asked mental health interdisciplinary team members to identify typical descriptions of different disciplines (N = 41). The results indicated significant agreement among the three disciplines on perceptions of five mental health disciplines. Considerable stereotyping was present for all of the disciplines on the teams. In this study, the stereotyping was favorable. Other disciplines were perceived as competent, skillful, dependable, and holding similar values. However, physicians received more power-oriented adjectives as well as more unfavorable adjectives than the other disciplines.

In synthesizing this dimension of collaboration research, the idea is supported that the lack of role knowledge outside a discipline is a primary barrier to successful collaboration. Additionally the social status differences between health care professional

roles serve as a structure that encourages the physician perspective to dominate. The results of these two conditions: role knowledge deficits and lack of shared power, lead to conflict and differences being treated hierarchically. In the hierarchy different perspectives concerning overlapping areas of interest are not integrated but valued based on role status where conflict becomes win/lose and unique skills may not be used. Paradoxically, role competence is both a facilitator and a barrier to the collaboration process, depending on the ability of health professionals to identify and value the roles of others.

Developing Role Competence

The call for a different approach to the socialization of health care professionals which can increase their interest, knowledge and value for interdisciplinary collaboration as a critical set of competencies has been noted by many leaders in medicine and nursing. Most educators would agree that the instruction and role models provided in educational programs set the stage for the socialization of health care professionals into their roles. However, there is little investigation into how professional socialization occurs and no studies concerning the impact of team experience on role socialization.

A study by Wilson and Startup (1991) found that nursing students frequently had to find their own view amid conflicting values of faculty and clinical staff. They studied three cohorts of first year nursing students ($n = 43$), teaching staff ($n = 28$) and clinical staff ($n = 35$). Conducting semi-structured interviews initially and at the end of the year as well as observing the students educational experience, they found dramatic changes in the students values as the year progressed. For example, initially over 67% of the students expected the school to provide adequate preparation for their clinical experience. By the

end of the year, less than 12% felt the school had provided it. Although the teaching staff were perceived to be more intelligent than the clinical staff, they perceived the clinical staff to have more power and to identify the actual practice priorities and procedures. The conflicts between school and work values were identified as quite stressful. The teaching faculty acknowledged that their infrequent visits hindered stronger socialization and support for the students. Clinical faculty identified "limited time" as a primary barrier to supervising student to learn higher practice standards.

Other studies have found mixed results on the impact of specific strategies to enhance professional socialization such as clinical preceptorships (Goldenberg & Iwasiw, 1993). The study purpose was to examine the effect of a senior clinical preceptorship experience on the professional socialization of nursing students from three different educational programs. A three-group, pre-and post-test design was used (N=62). Using professional role attitude, role conception scales, and demographic variables the results indicated that the preceptorship experience had a strong socializing effect on the community college and baccalaureate students, with a lesser effect on the RN-BSN students. The RN-BSN continued to experience the greatest role conflict after the preceptorship experience. This study supports the value of preceptorship experiences as bridging university and clinical learning. The findings also imply that timing may be a critical variable in the socialization process concerning role conflict which is an essential dimension and part of collaboration skill development.

As the current health care paradigm shifts impacting all health care professional roles (Pew Health Professions Commission, 1995), the impact of changing role definitions on professional socialization has received little study (Hardy, 1988).

The classic studies of Becker, Geer,and Strauss (1961) and Merton, Reader, and Kindall (1957) concerned the socialization of medical students and identified one of the most powerful mechanisms of professional socialization to be interaction with fellow students. Each study described a strikingly different context of student socialization. Similarly, Oleson and Whittaker (1968) observed the existence of a student culture among undergraduate nursing students with established "norms" regarding scholastic achievement.

It has been noted that the greater the congruence of the norms, values, and behavioral expectations between educational preparation of the profession and realities of the work setting, the smoother the transition will be from the neophyte to full-fledged professional. Kramer (1974) proposed the concept of "reality shock" to highlight the role conflicts between the norms, values, and behavioral expectations existing in the educational setting of nursing and those of the work situation . Kramer suggested an anticipatory socialization process as a means of transmitting role-specific behaviors intended to meet the exigencies of the work world and to acquaint nursing students with the reality of health care delivery without losing their vision.

Student perceptions of interdisciplinary education. Inability to understand different roles and competencies required for practice in various health professions disciplines has been cited as a major barrier to collaboration (Prescott & Bowen, 1985; Weiss, 1983; Mc

Cahan 1986). Most recently, Laschinger and Weston (1995) investigated the perceptions of nursing and medical students in understanding of their own and others role in collaborative decision making. First and fourth year nursing and medical students differed markedly in their perceptions of competencies important for nursing. Both groups agreed that people skills were important nursing competencies, however medical students considered abstract skills such as theory testing, analyzing quantitative data and leadership less important for nursing than did nursing students. The study suggested that by the end of their educational program, nursing students seemed to be more accurate in their perceptions of the medical role than the medical students had of the nursing role. This study suggests that as role socialization in formal education progresses in isolation from other health care roles, knowledge of others roles decreases and the value for one's own role increases. This educational isolation by physicians and nurses can lead to difficulty in collaboration.

Laschinger and Weston (1995) operationally measured collaboration using six statements reflecting physician/nurse collaboration identified by Devereux (1981) although these elements are not empirically based. Both student groups were moderately positive toward the notion of physician/nurse collaboration in patient care decision-making. However, nursing students were significantly more positive toward collaborative decision making than medical students. This finding suggests that nurses need to collaborate in order to develop the full potential of their role. The examination of the relationship between perceptions of role congruence and attitudes toward collaboration, demonstrates

a significant and positive correlation. This finding suggests that as different roles are better understood attitudes toward collaborative decision-making increase.

Webster (1985) studied medical students and found that their opinions about the composition of the health care team changed during 4 years of medical school. After the 4-year educational process students usually described health care team members as concerned about patients from a bio-medical care perspective. Webster also found that as medical students' perceptions of their own role became clearer, they became less clear about a nurse's role. Fewer than 20% of the third and fourth year medical students were aware that the nurse had legitimate roles independent of physician orders and expectations.

Snyder (1981) and Beatty (1987) investigated nursing school curricula, faculty attitudes and students' attitudes toward health care teams. Snyder (1981) researched the extent to which different entry level schools of nursing prepared nursing students to function as members of the health team. Using a multimethod research approach, the curricula of three schools that offered an associate degree, a baccalaureate degree, and a diploma school of nursing (N = 207) was evaluated.

Although students and faculty strongly supported the concept of health care teams and courses were identified with content on health care teams, only 42%-66% of the students believed they had received adequate preparation for work in health care teams. Earlier work by Snyder (1981) also found that actual interdisciplinary interaction was minimal. Fifty per cent of associate degree student nurses, 33% diploma student nurses,

and 16% of the students in the baccalaureate program had not had an actual experience with a health care team.

Beatty (1989) also studied the attitudes, preparation, and curricular content of 50 associate and baccalaureate nursing programs related to interdisciplinary health care teams. She found that baccalaureate students had separate courses of study on health care teams. Surprisingly 79% of the total sample responded that they had never had an entire course on health care teams. However, actual clinical team experience had increased with 85% of the baccalaureate degree students and 91% of the associate degree students having health care team experience in medical and community care settings. Although both curriculums provided initial interdisciplinary team experiences, baccalaureate students received more didactic and repetitive health care team experiences and reported greater readiness to be members of a health care team.

Students in this study, identified course content on group dynamics as the most helpful preparation for health care teams. However, there were areas within group dynamics that were problematic (i.e. decision making, authority, and role conflicts). The study showed no positive relationship between the amount of course content on health care teams and students' attitudes toward health care teams. Further analysis of respondents rating of the health care team curricula found that both associate and baccalaureate students frequently rated their programs as 'fair' on health care team content which suggested a need for expansion. Beatty (1989) recommended ways to enhance effective teamwork for nursing students: formal preparation in collaborative and

conflict management skills and principles; working in teams; and, inclusion of assertiveness skills in the curriculum.

These studies of nursing students, faculty, and curriculum suggest that the formal education of health professionals creates role knowledge deficits of health professionals outside the nursing discipline. Additionally when interdisciplinary exposure is provided the skills to develop collaboration are not directly offered to students as part of their developing role competency.

Teaching collaboration: faculty perceptions. Much of the research on teaching interdisciplinary team collaboration has focused on curriculum models and explored different approaches to role socialization for health care professionals. The amount of collaboration and the value of this practice within the faculty is not clear.

Past experience with interdisciplinary education and practice has created an awareness that the task of teaching collaboration in health care is most challenging. Interdisciplinary concepts are not easy to understand and even more difficult to achieve in practice. Information on interdisciplinary education shows that support for this endeavor has been primarily from outside the university setting with funding from private or government sources (Baldwin, 1994).

Faculty beliefs about collaboration in health care teams affect student acceptance of the concept in practice. In earlier research studies by Jones and Jones (1977) and Oleson and Whittaker (1968) students identified the instructor as being the person most influential in helping them define their nursing role. Wilson and Startup (1991) found that nursing students were often confused as to what constituted professional nursing given the

conflicting values of clinical and university faculty. Unlike nursing, medical education delivers the student to the clinical arena where the clinicians take over. As more learning experiences take place within the community clinic context the evaluation of the relationship between university and clinical faculty will be critical to all health professional student socialization. The relationship between community and university faculty is critical as they role model to students how different areas and levels of expertise are valued and merged in practice.

Based on a health care team questionnaire, Snyder (1981) compared faculty and student scores on their value of health care teams ($\underline{n}$ = 169 students, $\underline{n}$ = 38 faculty). In the associate degree school, the faculty mean was lower than the students' mean and the mean for the associate degree faculty was lowest of the other two nursing school faculty groups. The number of schools identified for this research is too small to generalize, however it does raise the critical question of how faculty values as well as behaviors influence student values concerning interdisciplinary collaboration.

The Paradox of Conflict

There is conflicting data concerning the impact of role conflict on team productivity. The degree to which conflict is energizing or impeding is unclear. In a meta-analysis of 43 studies, role conflict was negatively related to commitment, involvement, satisfaction with role, co-workers, and supervisors (Gitelson, 1983). However, the existence of incompatible expectations (role conflict) is not necessarily negative. Some researchers have demonstrated that role conflict can have a positive impact on role occupants. Jones (1993) using an ethnographic research model studied 42

social service administrators over a year. Interviews were conducted on 20 of the administrators who were identified by their peers as most effective. She found that daily confrontation with conflicting roles forced individuals to be open to different points of view, to be more flexible and to expand their sources of information. The participants described "needing to network" to understand the frustrations and goals of others. The need to build coalitions to complete the complexity of their work was strongly identified as essential to their success. These 20 participants identified needing to develop the trust of others and then to make decisions and plans for handling the problems together. Theoretically, the idea of conflict enhancing role learning/negotiation is congruent with the concept of conflict as a normal part of a collaborative experience (Thompson, 1967).

Conflict can enhance decision making. Researchers have held for some time that a team's cognitive capability is related to its cognitive diversity. Diversity provides capabilities upon which a team can draw when making complex decisions. Without conflict among diverse perspectives no synthesis occurs and decision quality suffers (Amason, 1996; Murray, 1989). Bantel and Jackson (1989) observed that when solving complex non-routine problems top management groups were more effective when composed of individuals having a variety of skills, knowledge, abilities, and perspectives.

Additionally, the interactional processes a team uses to produce their decisions are of equal importance (Hare, 1992; Steiner, 1972). Effectively using a team's capabilities involves identifying and synthesizing those skills and perspectives most appropriate for each decision (Schweiger Sandberg, & Ragan, 1989). Business research has demonstrated that dialectically styled interactions in strategic planning teams promotes rigorous debate

of different and opposing positions to produce a synthesis of conflicting alternatives toward a decision that is superior to any of the initial single perspectives (Schwenk, 1989). Amason (1996) notes that conflict, consensus and positive affective relationships are equally important to effective decision making. However these three attributes are not completely complementary. Although conflict is acknowledged as critical to high-quality decisions, it also well established that conflict can be an impediment and hinder the development of consensus and positive affect.

Recent empirical research identifies conflict as a multidimensional concept (Jehn, 1994; Rahim, 1983; Wall and Nolan, 1987). Wall and Nolan found that perceived inequity was positively related to the amount of perceived conflict within a group and conflict around people rather than the task. Exploration of the dimensions of conflict that are productive or enhance decision quality as well as those dimensions that are less beneficial also received research attention (Amason, 1996; Jehn, 1992).

Jehn (1994) explains the inconsistencies of conflict outcomes by the examination of two types of conflict with differing effects on performance. She defines task and emotional conflict in the following ways. When conflict is functional, it is generally task oriented and focused on judgmental differences about how to achieve common objectives. This type of conflict is called task conflict. Task conflict does not adversely affect consensus and affective acceptance but can enhance commitment by contributing to understanding through the cognitive debate which develops a "shared understanding" that is richer than one single perspective. When conflict is dysfunctional it is emotional and focused on personal incompatibilities or disputes. This type of conflict is called emotional

conflict. Task conflict can escalate into emotional conflict if left unaddressed or avoided by teams.

Jehn examined the relations among group values, conflict, individual satisfaction, and group performance using a quasi-experimental field design. A sample of 440 full time employees of various business organizations participated. Interval scales were used to measure organizational culture, conflict types, performance outcomes, and individual satisfaction. A Q-sort technique was used to measure group values. Using regression analyses, Jehn found that as group value consensus increased emotional conflict and task conflict decreased. Emotional conflict was found to be negatively related to group performance and member satisfaction. Task conflicts was positively related to group performance but not significantly related to satisfaction.

Additionally emotional and task conflict were found to mediate the effects of shared values on group performance and individual satisfaction. Using the three regression analyses suggested by Baron and Kenny (1986), mediation of task and emotional conflict was tested. Both emotional conflict and task conflict were found to be strong mediators of the effects of group value consensus and group value fit on group performance and individual satisfaction. This indicates that the presence of both task and emotional conflict can strongly decrease teamwork intentions and outcomes.

Using a multi-method approach incorporating both survey and qualitative methods to examine the structure of 105 work groups and management teams, Jehn (1995) found that task conflict in groups engaged in nonroutine tasks had a positive effect on production but task conflict was negatively related to routine task performance. A work

team was defined as having at least two members with intact boundaries, members recognize themselves as a group, and operated within an organization. An international business organization was the source of the research sample (N =589). A survey of 85 self report, Likert-style questions provided the quantitative measures. Task conflict was measured using Jehn's Intragroup Conflict Scale (1994).

Testing a model of intragroup conflict, task conflict was explored in relation to individual satisfaction, group performance, group interdependence, routine versus non-routine tasks and group conflict norms. The author hypothesized a curvilinear linear relationship between task conflict and group performance. Performing hierarchical regressions a curvilinear model was significant for predicting task conflict as a positive influence on individual performance appraisals but was short of significance (F change = 2.31, $p < .10$) for positively influencing group performance. Thus, Jehn (1995) concluded that task conflict is positively related to individual and nonroutine-group performance up to a certain point ($x = 5.25$), representing a high amount of task conflict. Beyond the identified level, task conflict becomes a negative influence and performance declines.

Hurst, Rush, and White (1989) found that teams must maintain affective relationships that allow them to work together effectively. Team members with strong negative sentiments toward one another or toward the team in general are less likely to participate fully in the decision-making process and in the long run undermine the decision making process. In emotional conflict members focus on differences in personality or the behavior of other members or completely suspend evaluation of ideas (Amason & Schweiger, 1994; Jehn, 1994). Groupthink (Janis, 1982) is more likely to occur when

critical evaluation is not displayed. Groupthink is the collective striving for unanimous actions that can override group members' motivation to realistically appraise alternative courses of action with subsequent detrimental impact.

Amason (1996) developed and empirically tested a conflict and decision making model based on cognitive and affective conflict. Two samples were taken from management teams across the U.S. The first sample was 48 teams from small and mid-size companies used for survey and statistical data analysis, and the second sample was 5 different teams from other firms that were surveyed and interviewed. The average size team was 4 managers, ranging from 2 to 7 team members. Jehn's (1994) intragroup conflict tool of Likert-type scales measuring commitment and affective acceptance were used in this study. Multiple regression analysis demonstrated that task conflict positively and significantly impacted decision quality ($b=.336$, $p=.027$), while emotional conflict significantly and negatively impacted decision quality ($b= -.246$, $p=.031$).

Thus what appears at first to be paradoxical that task conflict and affective acceptance are necessary for good decision making are reframed by a better understanding of the concept of conflict types. Constructive conflict and trusting interpersonal relationships are seen as interdependent or complementary to decision-making quality. These findings would support and explain the paradox of conflict. Although task conflict can potentially enhance decision making, the mediation of emotional conflict on team outcomes can produce barriers to collaboration efforts. As shared decision-making and conflict are critical aspects of interdisciplinary collaboration, understanding how these

variables affect collaboration is of critical importance. This phenomena warrants further investigation.

Constructive conflict resolution. As stated earlier conflict is a critical and ambiguous dynamic in team decision making. The use of conflict to enhance decision making and still support the team to work together is the constant tension present in interdisciplinary team collaboration. As a result of this perception, over the past 20 years, both theorists and researchers have shifted from looking at "how to resolve" conflict to "how to productively use it." (Cosier & Rose, 1977; Deutch, 1969; Rahim & Bonoma, 1979; Thomas, 1976). Theoretically conflict is inherent in collaboration so that as different perspectives become integrated a new solution can develop (Mintzberg, 1996).

Prescott and Bowen (1985) conducted one of the few studies that explored how conflict was approached in health care interdisciplinary practice. They operationalized collaboration using the Kilmann and Thomas (1977) tool to investigate how disagreements were handled between physicians and nurses. Few examples of collaboration were identified. Most resolutions were reached competitively or through accommodation. These forms of problem solving were perceived to increase inefficiency and ineffectiveness. The authors recommended practicing collaborative conflict resolution as an optimal course of action for professionals to resolve problems in the long run.

In the past, many accounts of nurses' management of conflict have been anecdotal or narrative (Cavanagh, 1991). Recently five studies used the Thomas Kilman Inventory (Thomas & Kilmann, 1974) to measure staff nurses' and nurse administrators' ways of managing conflict (Barker, 1984; Barton, 1991; Cavanagh, 1991; Hightower, 1986;

Woodtli, 1987). In a summary analysis by Valentine (1995), the studies indicated that compromising was the conflict management strategy of choice for nurse managers Staff nurses primarily used avoidance. Three of the studies used the strategy of competition. In congruence with the studies carried out on women, the nurses in these studies used the strategies of avoidance and compromise most frequently and competition least. The authors suggest that gender may be a social variable that influences conflict mode use.

Jehn (1995) included the evaluation of the relationship between group conflict norms and emotional and task conflict. Work and management teams (N = 589) in a large international organization were surveyed. The author hypothesized that the more accepting of conflict norms within a group, the smaller the negative effect of conflict and the greater the positive effect of conflict on individual satisfaction, individual performance, and group performance. Group norms promoting openness increased the positive effects of task conflict on individual and group performance. Groups with emotional conflict and norms promoting open discussion were less satisfied than groups with emotional conflict and conflict avoiding norms. These findings suggest that while conflict acceptance norms increase the beneficial aspects of task-related conflict on performance, they also increase the negative impact of relationship or emotional conflict rather than diminishing the effects.

Changing conflict styles. A large and influential body of work explicates the notion of predisposition for interpersonal conflict management style (Conrad, 1991; Sternberg & Dobson, 1987; Thomas & Kilman, 1974). Research identifies dominant orientations to conflict management which have been linked to a variety of outcomes. The

assumption that individuals adhere to one style of conflict management for the duration of a single conflict event has been challenged and research is accumulating (Nicotera, 1994; Putnam & Poole, 1987). The relationship between personality and modes of conflict resolution have been mixed (Jones and White, 1985). While it is true that self-report instruments do not assess actual behavior, they do assess general orientation or intent to act. Theoretically (Thomas, 1976) saw the use of styles as dependent on the context and amenable to change. Research has indicated that these styles differ in the degree to which they are perceived to be effective and constructive (Nicotera, 1994) and reinforce the contextual manner of style utility originally theorized by Thomas.

Power and Conflict

Rahim (1986) explored hierarchical relationships between superiors, subordinates, and peers and styles of handling interpersonal conflict based on his research integrating Blake and Mouton (1964) and Thomas (1976) conflict modes. Rahim measured interpersonal conflict with the Rahim Organizational Conflict Inventory (ROCI-II) which identifies five interpersonal conflict styles: integrating, obliging, dominating, avoiding, and compromising. This is one of the few studies that dealt with styles of handling interpersonal conflict acknowledging hierarchy. The results of 1,219 managers at top, middle, and lower organizational levels indicated that respondents were mainly obliging with superiors, integrating with subordinates, and compromising with peers. A second discriminate function indicated that to a lesser degree, managers were compromising with superiors, and dominating with subordinates. This research explores the idea that a variety

of styles might be used by the same person within a team setting. The impact of these styles on such outcomes as work productivity or job satisfaction was not explored.

Additionally there were only 50 females represented in this sample. A stepwise multiple discriminant analysis was performed with the five scales of conflict as the independent variable and gender as the dependent variable. The results indicate that the females were more integrating, avoiding, and compromising, and less obliging than males. The dominating scale could not discriminate between males and females. The findings from Rahim's study and the conflict strategies used by nurse managers (Cavanagh, 1991) suggests that gender may indeed be a factor in the use of different conflict resolution strategies. These findings would extend understanding of the earlier literature reported on collaboration between health care professionals as disagreements on how differences were to be presented (Bates, 1966, Prescott & Bowen, 1985; and Abramson & Mizrahi, 1996). Therefore the use of different styles of conflict resolution, " the how," could lead to misperceptions of intent and outcome in a collaborative process.

Theoretically from a social exchange perspective, structure or status determines opportunities for power use, but how power is actually implemented depends on its form of exchange or the strategy used. Molm (1981, 1987) found that power strategies or exchanges are used to compensate for the lack of structural power. Creating strong behavioral tendencies is one way that structurally weak actors make their less valuable resources more potent. Examples include: consistently offering help, withholding information, and being skilled in unique areas. Furthermore, Molm, Quist, & Wiseley

(1994) suggest that structure and strategy are only weakly related and therefore can be treated as relatively independent dimensions of power.

The perspective taken by Raven (1993), contrasts with Molm's conclusion that structure and strategy are weakly related. One of the social power bases Raven identified in his power model is informational power. Informational persuasion is based on the information or argument that is presented to a target in order to implement change. Indirect informational power is in the form of suggestions or hints versus directly telling someone. Raven interprets Stein's research on the doctor-nurse game (1971) as an example of someone (nurse) in a low power position attempting to influence someone(doctor) in a superior position though the use of indirect information power.

In order to understand power interaction, Raven and Kruglanski (1970) studied how two parties try to influence each other during conflict. Simultaneously or sequentially, each party would go through a process of reviewing available power strategies, attempt influence based on their assumptions of their own and their opponent's motivations, and reexamine their strategies. The authors speculated that when both parties used coercive power, greater distancing, greater distrust, and greater attribution of negative qualities to the other while holding oneself in higher esteem would occur. By contrast when both parties effectively used referent (goodwill) power which emphasized their communality, it resulted in less distancing, less distrust, greater cooperation, and de-escalation of conflict occurred.

One empirical example of this model has been the application of the bases of power analysis which examines the ways doctors and other health practitioners are

influenced to follow hospital policies. A sample of 437 hospitals which included 7,188 hospital nurses were surveyed on power style use. Raven, Freeman, & Haley (1982) found that informational and expert power were most frequently used by the infection control nurses and medical epidemiologists. Informational power is defined as the use of logic or argument to explain an idea. The expert power base is the use of knowledge in a specific area. Additionally, some infection control nurses in the sample who were more likely to use legitimate or coercive power bases were significantly lower in self-efficacy ratings. This finding integrates the assumption that how power is perceived influences behavior. Formal power (legitimate or coercive power) is an external focus and nurses may tend to overuse formal power if they do not perceive themselves to have other informal power sources within.

Power and Mentoring

Kram (1983) identified that during the initial phase of mentoring a protégé respects a mentor because of his or her competence or knowledge. With experience the protégé perceives the mentor as providing role-modeling, acceptance, trust, and friendship-all of which are aspects of informal power. Kram perceived that the mentored target may identify expert power before referent (informal power) emerges. The perception of expert power may lead to greater attraction toward the agent. Carson, Carson and Roe (1993) identified quantitative support for this relationship based on a revised model of social power developed by French and Raven.

The authors revised and tested competing models that depict interrelationships among the social power bases using a structural equations analysis (LISREL). The model

was based on a meta-analysis of recent empirical research using the five power bases developed by French and Raven (1959). In the seminal work of French and Raven five power bases were identified including legitimate power, the perception that the power holder has the authority to prescribe behavior; reward power, the powerholder can mediate rewards; coercive power, the perception that the powerholder can mediate punishment; referent power, the identification with the powerholder; and expert power, the perception that the powerholder has some special knowledge or expertise.

The model developed by Carson, Carson and Roe (1993) proposed that legitimate or formal authority has a direct influence on the preceptions of reward and coercive powers as well as the perception of referent (feelings of respect and support)and expert powers. Second a path was added connecting reward power to coercive power. Third, the perception of expert power is antecedent to perception of referent or informal power. This model was tested using LISREL for structural equations modeling and was found to be superior to the original model. The chi-squared value was not significant and criteria indicated good fit of the model to the data ($X^2$/df = 1.60; GFI = .994; GFI = .957; TLI = .865; NFI = .981).

Additionally correlations between three criterion variables of supervisor satisfaction, job satisfaction and performance on each of French and Raven's (1959) five power styles was done. The sample included nursing and social science faculty ($N$ = 2,666). All correlations reached significance ($p \leq .05$). The informal power styles of expert power ($r$ = .47) and referent power ($r$ = .39) were most strongly correlated with satisfaction with supervision. Coercive power was significantly and negatively related to

supervisor satisfaction ($r$ = -.30). The relationships between satisfaction with supervision and authority ($r$ = -.04) and reward ($r$ = .04) powers were notably weaker. Expert ($r$ = .21) and referent ($r$ = .11) powers were most strongly associated with job satisfaction. Coercive power also had a relatively strong negative relationship with this outcome ($r$ = -.17). There was no significant relationship between legitimate power/job satisfaction (r = .01) or between reward power/job satisfaction ($r$ = .04) Performance outcomes were assessed by supervisors based on quantity and quality of work. The strongest relationship was found between expert power and performance ($r$ = .28) followed by reward power and performance ($r$ = .17). Referent power ($r$ = .10) and legitimate power ($r$ = .09) were marginally related to performance, and coercive power was negatively related ($r$ =-.04) to performance.

Interpretation of these results indicates that expert and referent powers are strongly and positively related to satisfaction with supervision, implying that a leader may most effectively build subordinate loyalty and support through development of personal (informal) power bases. The same pattern is identified with informal power bases exerting the most positive influence on job satisfaction. Similarly the use of coercion is negatively related to job satisfaction.

A different pattern of power style use emerges when examining performance results. With performance, expert and reward powers seem most influential, followed by referent and legitimate powers. Expert power is more strongly related to performance than reward. These results indicate that authority has little influence on either satisfaction

or performance while personal power bases most strongly influence satisfaction. Expert power influences all outcomes.

The research and model identified by Carson, Carson and Roe (1993) demonstrates the importance of strategies of influence and establishes an intial understanding of the types of power strategies that may be effective or ineffective in a hierarchical context. If the informal power styles of expert and referent power are positively related to the outcomes of improved performance and greater job satisfaction, what is the impact of these power styles on collaboration? It is important to understand how power styles may promote and block collaboration efforts. As the authors established the flexible utility of power styles, the impact of shifting styles must be understood within the goal of mutually beneficial outcomes. Consequently the concept of "shared power" must be analyzed in order for practice implications to be understood. To date research in this area is embryonic.

Conclusion

The review of literature on collaboration reveals the many barriers to effective interdisciplinary collaboration, as well as the need for strengthening collaboration. Often the value for collaboration is more positively anticipated than the actual reports of satisfaction with this multi-dimensional dynamic process Barriers to collaboration include lack of role knowledge outside one's own discipline, hierarchy or unequal status relationships which lead to physician dominance of nurses, and inadequate conflict resolution styles.

The discovery of the components of emotional and task conflict promote an understanding of how conflict can both enhance and inhibit collaboration. Diverse perspectives (which can come from different disciplines) can create task conflict and improve decision making. This reframing of conflict infers that conflict is an inherent part of collaboration, not to be avoided but addressed.

The third concept addressed in the literature review is power. It is theorized that the relationship between collaboration and conflict depends on the use of power strategies which promote the sharing of diversity while building a common ground to resolve complex interdependent problems. Collaboration operates on a model of shared power, critical for both committed decision making and constructive conflict resolution. This does not mean that parties to collaboration are equal in power. It does mean that to achieve collaboration all parties must have some form of countervailing power and mutual exchange (Gray, 1989). Thus the parties engaged in collaboration must in some way be interdependent with each other and be able to influence each other.

The current structure of health care professional education and role socialization violates the central tenets of building team collaboration skills by interdisciplinary modeling, experiences, and reflective practice options. In fact traditional health professions education assures disciplinary specific roles, hierarchical controls in decision making and independence of function. Solutions concerning optimal content and educational strategies for effectively developing the shared values, knowledge and skills necessary for interdisciplinary collaboration are postulated and measured by the empirical methods implemented in this research study.

# Chapter 3

## Methodology

In order to examine the effects of an interdisciplinary training program, an exploratory ex post facto comparison group design was used (Pedhazur & Schmelkin, 1991). The quantitative standardized instruments employed to measure interdisciplinary team collaboration, conflict types and power styles were self reported questionnaires. The qualitative measures of the nature of the process and outcomes of interdisciplinary team collaboration, conflict types and power were illuminated through the use of focus groups.

There were three purposes in this study: 1) to compare the perceptions of nurse practitioner students, physician assistant students and first and second year medical students based on an educational interdisciplinary team collaboration experience; 2) to examine the relationships between types of conflict and styles of power use on perceptions of interdisciplinary team collaboration; and, 3) to explore students' perceptions of their roles and the roles of faculty in facilitating interdisciplinary team collaboration.

The complexity of social research with such concepts as interdisciplinary team collaboration, power and conflict is enriched through research methodologies which examine these concepts from different perspectives. A triangulated method design of quantitative data collection through self-reported rating scales and qualitative discovery through focus group dialogues, strengthened understanding of these concepts and enhanced the validity of the findings (Munhall & Boyd, 1993).

Pilot Test

The purpose of the pilot study was to allow the investigator to assess the feasibility of the methods to answer the research questions. The design was piloted with a university-based clinical practice team of interdisciplinary health professionals. The six subjects completed all instruments and provided feedback to the researcher on the questionnaire. The wording of demographic questions were revised based on suggestions from the pilot sample. In addition, the focus group questions were presented and revised based on the pilot feedback. The pilot study data was excluded from this study.

Data Collection Procedure For Quantitative Methods

Data collection took place from April 22 through August 11, 1997. The investigator informed faculty and students in ISCOPES meetings, in class announcements, and through ISCOPES email announcements about the nature of the study and its purpose. Community faculty and some students were approached individually to request their participation. Lunch was usually provided to participants.

All participants completed an informed consent (Appendix A), a questionnaire containing demographic information, and the paper and pencil instruments relating to their perceptions of interdisciplinary team collaboration, conflict types and personal power style use (Appendix B,C,& D). Students who were not able to attend a luncheon were given an envelope containing an informed consent form and the questionnaire after a verbal review of the study purpose and informed consent. To protect participant anonymity the subjects were asked to return the forms in the envelopes marked only with the researcher's name to the investigator's mailbox.

ISCOPES students willing to participate in a follow-up focus group in July were asked to place their names on a sign-up sheet at the time they were completing the questionnaires. Students were asked to identify themselves as having a positive or negative experience.

Sample

The purposeful sample of 117 included 67 students and faculty who participated in ISCOPES and 50 students who did not. Three discrete groups agreed to participate in this research project. The students and faculty are from two universities, one private and one state supported, that collaborate in the education of health care professionals. These nurse practitioner students, physician assistant students and first year medical students attend the same first year anatomy physiology, pharmacology, and physical assessment classes. The ISCOPES training program was one option for community service.

The first group, the experimental ISCOPES student group was comprised of students who self-selected to participate in ISCOPES training for one year. The students are from a master's program for nurse practitioners, a master's program for physician assistants, and first and second year medical students. When data collection began in May of 1997, 58 students were participating in ISCOPES. Fifty one of the 58 ISCOPES students (88%) agreed to participate in the study. Students who had dropped out of the project earlier in the year were excluded from the study. Although community service projects are mandatory educational experiences for nurse practitioner students and physician assistant students, they remain voluntary for medical students in this setting.

The second experimental group comprised university and community faculty who participated in the ISCOPES program. University faculty from both institutions support the nurse practitioner, physician assistant and medical student academic programs. The role of the university faculty preceptor is to offer technical advice and expertise to students, help them access resources and knowledge, and provide a forum for team reflection and discussion. The community faculty preceptors were clinicians from medicine, nursing, or public health backgrounds. The role of the community faculty preceptor is to introduce the students to the site, help them to understand the local community and its health needs, facilitate the student project on sites, and offer guidance as the project proceeds. The community faculty preceptor incentive to participate in this project was through the offering of faculty development programs, identification as an adjunct faculty by the university, and 3 free credit hours of academic study. Evenly divided, there were 10 community and 10 university faculty who were co-leaders of the student project teams. Of the 20 faculty participants in ISCOPES, 16 faculty (80%) agreed to participate in this study.

The third group, a non-ISCOPES comparison group of 50 students was recruited. Selection was based on discipline and university programs. Volunteers were recruited from the same nurse practitioner, physician assistant, and first and second year medical student classes. The intrinsic factors of gender and age as well as the external factor of previous interdisciplinary team experience were measured. These variables were used to enhance the identification of differences between the comparison and experimental student

groups which can threaten the internal validity of ex post facto studies such as this one (Polit & Hungler, 1995).

Comparison sample size was determined using Cohen's (1988) power analysis table of sample sizes necessary to achieve selected levels of power for the test of difference of two means. Selecting a power of 0.80, an $\alpha = .05$, and a medium effect size of .40, an estimated *n* of 99 was adequate. Thus a comparison group of 48 students was adequate. Analytical comparisons between the three disciplines were achieved with a sample size of approximately 30 students per group. Therefore, the power analysis applied to the discipline specific variable decreased the estimated power effect to .10.

Setting

This research was conducted in one of six sites. A program of the Pew Health Professions Commission and the National Fund for Medical Education, sponsored by the Pew Charitable Trusts, the Corporation for National Service and the Bureau of Health Professions entitled, Health Professions Schools in Service to the Nation (HPSISN), selected six sites and provided matching funds to universities for the development of stronger academic/community collaborative partnerships to improve the health of the communities, especially the needs of the under-served. The three year grant focused on interdisciplinary team learning and training in the context of community service (Seifer & Connors, 1997). The community sites serve various populations including senior citizens, immigrants, the uninsured and under-insured, pre-school and school-aged children.

The Washington Metropolitan Area was the setting for this research. Twelve clinics and community prevention programs provided sites for student team experiences.

Community and university faculty worked in partnership with interdisciplinary student teams to develop, implement, and evaluate service-learning projects over a period of one year. Collaboration between students, university faculty, community agencies and the citizens they serve was seen as a primary value; and, a team structure was used to achieve the goals of this project. The project for the Washington area site was named Interdisciplinary Student Community Patient Education Service (ISCOPES).

ISCOPES Training

The educational intervention ISCOPES was developed by local university faculty. A core curriculum was created to enhance group problem solving which exposed students to Community Oriented Primary Care (COPC) and Systemic Quality Improvement (SQI) as models for understanding community problems as well as the need for interdisciplinary team collaboration at a theoretical level. The assumption of this focus was that the identification of an integrated framework for complex problem solving would enhance communication, provide a structure for developing shared understanding of community problems and a common language. Collaboration and service-learning were the values identified to guide this project.

Collaboration was defined as a mutually beneficial and well-defined relationship entered into by two or more persons to achieve common goals (Mattessich & Monsey, 1992). The teams were perceived to be an operationalized collaborative structure with the potential to develop a process for identifying specific goals, sharing resources, sharing responsibilities, and creating mutual accountability for success.

Service learning, the second identified value, is a method of experiential learning through which participants are involved in a community service to meet community needs while developing their abilities for critical thinking and group problem solving (Liu, 1995). Formal class content was applied to the context of the community and team-based service learning projects. Students were required to spend two to four hours a week at their community sites. An interdisciplinary group of students supported by community and university faculty were assigned to a community site for at least one year. During this time the students designed and carried out a project to improve the health of the community.

The topics and methods used for the curriculum were based on summary recommendations for interdisciplinary education (Baldwin, 1994; Grant, Finnocchio,& the California Primary Care Consortium, 1995) and evaluation feedback from students and faculty after the first year of the project. Didactic and experiential exercises were used as teaching methods to develop knowledge and skills in both collaboration and service learning. Initially a two day retreat (12 hours) was held to provide information concerning the goals of the project, benefits for the participants, experiential learning in the areas of collaborative team building, and to introduce a framework for assessment of community projects. An historical overview of the Washington D.C. area was provided to develop a basic knowledge of the community context. Community agency representatives and university faculty presented and participated as team members with the students in this retreat. Formal two hour classes held monthly from September through April, and the retreat, totaled 28 hours of classroom instruction. Topics included Community Oriented

Primary Care (COPC), quality improvement such as running effective team meetings , continuous quality tools, conflict resolution, and cultural sensitivity. A poster session was presented by each team to report on the development and progress of each community project. A course syllabus was developed containing reference articles and continuous quality improvement tools to use in team meetings and to design community projects.

The ISCOPES project is an interdisciplinary structure governed by the Service-Learning Advisory Committee comprised of two project coordinators, students, university and community faculty. The interdisciplinary team structure consisted of nurse practitioner students, physician assistant students, first and second year medical students, and one university and one community faculty. Interdisciplinary team experience was a primary goal. Therefore, site selection was based on ensuring that each discipline was represented in each team. Students were placed in teams based on preference for site, interdisciplinary mix and transportation ability. Three community sites prioritized by the students allowed faculty and student representatives to attempt to match learning context preferences. The frequency of team meetings held by the student teams with faculty leaders were based on mutual agreement and project need. In the second year of the project 12 community sites were used and 13 teams developed community projects. Initially, there was a team at each site and one team was assigned to a community service van which provided health care across the city of Washington D.C.

Human Subjects Review Process

Approval for the research was obtained from the primary investigators of the ISCOPES project. Although anonymity could not be assured, confidentiality of each

participant was maintained through a numeric coding system eliminating all personal references. All data related to personal references were kept in a secure place. Each person's participation in this study was voluntary through written and verbal informed consent (See Appendix A –Consent Forms). The proposal was reviewed and approved by the internal research review board of each participating university. This study met the criteria for exempt status and expedited review in both settings.

Members of both experimental and comparison groups were recruited through class announcements requesting volunteers and subjects were compensated with lunch. Informed consent forms included requests for student volunteers from the ISCOPES project to participate in focus groups at a separate session and time from the questionnaire information.

Instruments

At the conclusion of the ISCOPES experience, the concepts of interdisciplinary team collaboration, conflict types, and power styles were measured by 3 standardized instruments. The instruments included: Interdisciplinary Collaboration Scales (ICS), Intragroup Conflict Scale, and The Power Base Inventory (PBI).

Interdisciplinary Collaboration Scale. The tool selected to operationally measure interdisciplinary team collaboration was the Interdisciplinary Collaboration Scale (ICS). The ICS was initially developed by Armer and Thomas (1978) and further refined by Rendell (1988). Collaboration is constructed as a unidimensional trait in this tool. The ICS consist of seven subscales: Equality of Influence, Flexibility of Role, Sharing of Suggestions, Joint Planning and Decision Making, Reciprocal Learning and Teaching,

Problem Centered, and Acceptance of Leadership (See Appendix B). These subscales are summated to describe the concept of collaboration as postulated by Luszki (1958) and further operationalized by Rendell (1988).

Originally, the subscale of leadership was deleted by Rendell after his pilot because the subscale negatively correlated with all other subscales. Rendell attributed this finding to contextual (management) issues. However, the subscale of leadership was included as part of this study in order to evaluate how leadership was perceived given the role of faculty as leaders of the student teams.

The ICS as developed by Rendell (1988) has 28 items presented in a Likert format with seven possible responses for each item – strongly agree, agree, slightly agree, neither agree nor disagree, slightly disagree, disagree, strongly disagree. Scoring for this measure is strongly agree = 7...to strongly disagree = 1. Approximately half the questions from each subscale are worded positively and half negatively, with reverse scoring of the negative items. For this self-report inventory, the score is the sum of all items to which the participant responds in each subscale.

In addition to the 28 items of Rendell's scale, for this study, a three item measure of goal similarity was added to the ICS measure of collaboration (see Appendix B). A Cronbach $\alpha$ of .83 was reported by Jehn (1995) for the goal similarity subscale. This variable has been identified as a key dimension of collaboration although not explicitly operationalized in the ICS tool (Gray, 1989; Henneman, et al., 1995; Jehn, 1995; Mattessich & Monsey, 1992). Thus a total of 31 items were used to measure interdisciplinary team collaboration in the revised ICS instrument.

A summative score from the ICS was applied in the research. The summative measure of the ICS reflects the degree to which a team exhibited collaboration. The more collaborative the self-report responses, the higher the overall score. The ICS appears to be the best measures of the construct currently available for use at the team level. Additionally the theoretical model of role development guiding this study supports the descriptive dimensions of this tool.

ICS Reliability & Validity. Rendell reported strong internal consistency with $\alpha$ = .87 for the total ICS measure, which was very close to the figure he obtained one year earlier of $\alpha$ = .84. Test-retest reliablity was examined comparing the Pearson's correlations between the scores of the same respondents who completed the tool one year earlier. The reliability coefficients for each subscale ranged from r = .66 for the role flexibility subscale to r = .85 for reciprocal learning and teaching. Criterion validity of the ICS was evaluated by correlation with a group conflict scale developed by Haas (1964). The correlation between the ICS score and the conflict score was r =.5112, $p < .01$ (N=129).

The tool as originally developed by Armer and Thomas (1978) revealed an internal consistency alpha of = .81. Apart from the authors' efforts to build face validity into the instrument, two criterion measures were used: (a) meeting patterns with education personnel teams, and (b) judges' ratings of collaboration. The validity of the ICS was supported by a high degree of correlation with both judges' ratings and the existence of regular planning meetings. The ICS has also been adapted and used by Vinokur-Kaplan (1995) with a sample of 15 interdisciplinary mental health teams (N = 98) to evaluate the

effectiveness of teams. The adapted tool was modified to 10 items from the original 28 items of Rendell's scale and an alpha of .82 was obtained for this modified version.

Revised ICS Factor Analysis. Given the limited use of this tool and the addition of the goal similarity subscale an exploratory factor analysis was completed on the ICS measure. The factor analysis evaluated construct validity of the team collaboration measure to further assess the theoretical dimensions of the factors (Munro and Page, 1993). The exploratory factor analysis in the current study was conducted in two steps. The first step was the extraction of factors using principal components analysis which identified 10 factors with a minimum eigenvalue (1.0) in the data from the tool (See Table 3.1). Examination of the correlation matrix revealed the Bartlett's test of sphericity was significant at the .0000 level. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .75. Since the KMO was close to .80 it was appropriate to proceed with a factor analysis (Pedhazur & Schmelkin, 1991). The rotation of factors was accomplished in the second step of the analysis using orthogonal (varimax) rotation which minimizes collinearity and is useful for the identification of the unique contribution of each factor (See Appendix C). Factor loadings exceeding .40 were identified as meaningfully correlated (Pedhazur & Schmelkin, 1991). Again, 10 factors were identified with eigenvalues above 1.0.

However, this number of factors could not be meaningfully examined. The identification of one variable for each of the last three factors was considered unreliable (Tabachnick & Fidell, 1996). Six items that loaded on more than one factor were dropped

Table 3.1
Factor Analysis of Interdisciplinary Collaboration Scale (ICS)

| ITC | (N = 117) | | Varimax Rotation 6 Factor Solution |
|---|---|---|---|
| Factor | Eigenvalue | Pct of Variance | Cumulative Pct |
| 1 | 6.25 | 25.0 | 25.0 |
| 2 | 3.06 | 12.3 | 37.3 |
| 3 | 1.74 | 6.9 | 44.2 |
| 4 | 1.57 | 6.3 | 50.5 |
| 5 | 1.41 | 5.7 | 56.2 |
| 6 | 1.25 | 5.0 | 61.2 |

and a second factor analysis was completed. A 6 factor solution with a total of 25 items was identified which reflected stronger internal consistency and well defined dimensions (See Table 3.2).

The revised ICS factors support the conceptual factors identified by Luszki (1958) of interdisciplinary team collaboration; however, a slightly different distribution of items on the original ICS subscales led to renaming them based on item clustering (See Table 3.2). Joint planning and decision making, clearly the strongest factor, accounted for 25% of the variance with an eigenvalue of 6.25. This factor supported the original subscale developed by Rendell but added other items from the "sharing of suggestions" subscale. The key dimension added to this factor was "shared responsibility for participation."

Goal-focused role learning is the second factor and accounts for 12.3% of the variance. Two of the three items from goal similarity loaded into this strong, 6 item factor. Role learning and shared goals clustering into one factor supports the conceptualization of disciplinary role flexibility being based on shared goals in collaboration. The items from the subscales of "reciprocal teaching and learning," "role flexibility" and "shared goals" redefined this factor. After careful examination of these items, it was concluded that this factor was measuring attitudes toward role learning provided by teams and was renamed "goal focused role learning." Factors 3 and 4 support the existing "equality of influence" and "problem centered" subscales. Factor 5, with three items, appears to reflect reciprocal trust and respect for roles. Factor 6 focuses on leadership. Although factor 6 had only two items for the subscale, they were strongly uncorrelated with other variables and each loaded above .75 on this respective factor

Table 3.2
Comparison of Cronbach Alphas On ICS With Exploratory Factor Analysis

| Interdisciplinary Collaborative Scales 25 Items (N = 109) | | Interdisciplinary Collaborative Scales 28 Items (N = 129) | |
|---|---|---|---|
| Varimax Rotation Factors | α | Rendell's Subscales Factors | α |
| Factor 1: Items: 18,19,21,22,24,23,28 Joint Planning & Decision Making | .84 | Factor 1: Items 21,22,23,24 Joint Planning & Decision Making | .79 |
| | | Factor 2: Items 17,18,19,20 Sharing of Suggestions | .64 |
| Factor 2: Items: 13,25,26,27,37,38 Goal-Focused Role Learning | .80 | Factor 3: Items 25,26,27,28, Reciprocal Teaching & Learning | .72 |
| Factor 3: Items:9,10,11,12 Equality of Influence | .78 | Factor 4: Items 9,10,11,12 Equality of Influence | .77 |
| Factor 4: Items 29,30,31 Problem Centered | .65 | Factor 5: Items 29,30,31,32 Problem Centered | .67 |
| Factor 5: Items 16,20,35 Reciprocal Respect & Trust | .53 | Factor 6: Items 13,14,15,16 Flexibility of Roles | .40 |
| Factor 6: Items 33,34 Shared Leadership | .56 | Factor 7: Items 33,34,35,36 Acceptance of Leadership | .21 deleted |
| Total Alpha | 0.84 | Total Alpha | 0.84 |

(Tabachnick & Fiddell, 1996). The total proportion of variance explained by this 6 factor model is 61.2 %. Further analysis of this tool was beyond the scope of this study. Although previous factor analysis comparison results are absent, the findings in this study strengthen the construct validity of the tool and provide data for future research on the ICS tool.

Finally in this study, the reliability of the total ICS ($\alpha = .84$) and the subscales were strong with improved $\alpha$'s for the subscales (See Table 3.2). "Joint planning and decision making" with 7 items had a higher alpha of .84. Factor 2 (6 items) "goal-focused role learning" had an improved alpha of .80. The reliability was strongly improved for the "problem centered" subscale changing the $\alpha$ from .40 to .65. Factor 6 (2 items) "leadership" has an acceptable alpha of .56 which allows for measurement of this critical dimension rather than deletion as Rendell (1988) had been forced to do.

The Intragroup Conflict Scale. The Intragroup Conflict Scale (Jehn, 1994) was selected because it effectively measures both emotional and task conflicts which are perceived to be a critical dimension of team collaboration. Measurement of this variable is based on the theoretical perspective that conflict is a natural and essential aspect of role development in teams. Roles are created and modified as reciprocal interaction unfolds through ambiguous negotiation, structure, and dependence. It is in conflict interactions that different role perspectives are shared and thus role reflexive action can develop. Reflexive action is the ability to perceive other's perspective as well as one's own (Hardy, 1988). This is the essence of collaboration.

The Intragroup Conflict Scale is a self-report tool that is easily administered. Jehn developed a 5-point Likert-type scale with 8 items regarding the presence of emotional and task conflict based on Rahim's (1983) well established intragroup conflict subscale. The Likert scale is anchored by 1 = "none" and 5 = "a lot." There are two subscale scores, which measure emotional and task conflict respectively. Construct validity has been established through exploratory (Jehn, 1994) and confirmatory factor analysis (Amason, 1996) . Jehn (1994) completed a principal components analysis and oblique rotation of responses from 440 participants comprising employees of different organizations as well as part-time students in business. A two-factor solution with eigenvalues above 1.0 was identified. The first factor represents emotional conflict and the second factor represents conflict of task issues. In this study, the two factors accounted for 71% of the variance. Analyses indicated that regression results were not significantly influenced by multicollinearity.

Jehn (1994) further tested the validity of this conflict scale. Group members from various organizations and part-time business students ($\underline{N}$ = 440) wrote descriptions of actual conflicts that occurred within their temporarily formed groups. These descriptions were used to validate the type and level of conflict within the group. Raters blind to the results of the questionnaire rated the level of emotional and task conflict within each group. These ratings correlated, on average, .75 with the self-report measures of conflict (Jehn, 1994).

Amason (1996) studied top management business teams for the purpose of understanding the effect of conflict on strategic decision making. Amason supported the

construct validity of the Intragroup Conflict Scale with identification of two factors on oblique rotation. Subjected to confirmatory factor analysis, using LISREL 8, the two dimensional model of conflict produced a chi-square of 57.63 as well as a goodness of fit index of .91 and root mean square residual of .06. This indicated an acceptable degree of fit between the data and two distinct dimensions of conflict.

Jehn (1994) reported Chronbach αs for the subscales of emotional conflict and task conflict as .83 and .79 respectively which are consistent with past studies using this measure (Jehn, 1992, Shah & Jehn, 1993). Amason (1996) loaded 7 of the 8 items on a two factor solution and produced emotional conflict $\alpha = .86$ and task conflict $\alpha = .79$.

The Chronbach alphas for the current study were .84 for emotional conflict and .89 for task conflict (See Table 3.3). The exploratory factor analysis supported a two factor solution with 72.2% of the variance accounted for. These findings confirm the earlier findings of internal consistency and validity.

The Power Base Inventory (See Appendix D). The Power Base Inventory (PBI) developed by Thomas and Thomas (1991) was selected to operationally measure styles of power used by students and faculty to influence others in their respective teams. The PBI contains 30 force choice items and is based upon French and Raven's (1959) six power bases: information, expert, referent/goodwill, legitimate/authority, reward, and discipline. The position power bases (authority, reward, discipline) are associated with the formal power a member can use to influence team members. The informal power bases (information, expertise, goodwill) must be personally developed. Theoretically, informal power bases produce commitment to the task purpose.

Table 3.3
Reliability of Jehn's Intra-group Conflict Measure
(N = 117)

| Conflict : Subscales: | Chronbach Alpha |
|---|---|
| Emotional | .84 |
| Task | .89 |
| Total Scale | .90 |

Table 3.4
Reliability of Power Base Inventory by Thomas & Thomas
(N = 117)

| Subscales | Chronbach Alpha |
|---|---|
| Informal Power | |
| Information | .64 |
| Goodwill | .66 |
| Expert | .62 |
| Formal Power | |
| Discipline | .73 |
| Authority | .52 |
| Reward | .56 |

In contrast, the positional power bases produce compliance at best and resistance at worst. Authority and reward tend to result in compliance while discipline tends to produce resistance. In ideal situations, leaders would receive adequate position power bases from the organization and also develop high levels of personal power bases. In collaboration efforts the "sharing" of power within teams is not well understood. This tool was selected to explore how power style use impacts perceptions of team collaboration.

This well-established tool has been used with graduate students in business. The PBI yields six scores, one for each power base. Each possible score can be compared to the scores of 317 managers who have previously taken the tool. The high 25% and bottom 25% separate the middle 50% of the scores on each power base (Thomas & Thomas, 1991).

The reported Cronbach alpha average for the PBI is based on each subscale: $\alpha$ .65 with a range of .55 for the legitimate power base and a .77 for the discipline power base. In forced choice instruments the coefficient alpha is a misleading measure of reliability since each statement in an item pair can optimally explain only half of the variance in an item (Symonds, 1967). A five point Likert-format of the PBI was developed and coefficient alphas range from .72 to .88 exceeding the minimum level suggested by Nunnally (1978). Test-retest correlations are satisfactory and range from .63 to .80 for an average of .70. A multimethod approach was used to establish convergent validity. Intercorrelations between the PBI as a force choice tool and another power tool developed by Hersey and Natemeyer (1979) provided evidence of convergent validity (Thomas and Boone, 1985). Intercorrelations were high for referent/goodwill ($\underline{N} = 67$, r

= .74, p <.001); moderately high for coercive/discipline (r =.48, p=<.001); legitimate/authority (r =.47, p=<.001); and, modest for reward (r =..25, p=.02), expertise (r =.24, p=.02), and information (r = .18, p = .07). In addition, the PBI was examined for social desirability bias and no significant correlation was found (r =.27, p = .32 for N = 6 bases).

The reliability coefficients for the PBI subscales in this study were within an acceptable range compared with previous reliability reports (See Table 3.4). The average reliability $\alpha$ =.62 is also reflective of the lower coefficient alpha that is commonly obtained in force choice instruments (Thomas & Boone, 1985)

Analysis Procedure For Quantitative Research

Hypothesis 1. Perceptions of interdisciplinary team collaboration will be higher in the student and faculty ISCOPES experimental group than the non-ISCOPES comparison student group. This hypothesis was tested using a one way ANOVA with a one-tailed test of significance. Interdisciplinary team collaboration was the dependent variable and group membership was the independent variable.

Hypothesis 2. Perceptions of interdisciplinary team collaboration will be different between health care disciplines. This hypothesis was tested using a one way ANOVA with interdisciplinary team with a one-tailed test of significance. Collaboration was the dependent variable and discipline was the independent variable for this analysis.

Hypothesis 3. The interaction of group membership and discipline will not significantly affect perceptions of interdisciplinary team collaboration.

This hypothesis was tested using a two way ANOVA to reveal the interaction effects of group membership and discipline as independent variables and interdisciplinary team collaboration as the dependent variable.

Hypothesis 4. Perceptions of emotional conflict will negatively influence interdisciplinary team collaboration. This hypothesis was tested using a simple linear regression with a one-tailed test of significance. Emotional conflict was the independent variable and interdisciplinary team collaboration was the dependent variable.

Hypothesis 5. Perceptions of task conflict will positively influence interdisciplinary team collaboration. This hypothesis was tested using a simple linear regression with a one-tailed test of significance. Task conflict was the independent variable and interdisciplinary team collaboration was the dependent variable.

Hypothesis 6. Informal power styles (information, expertise, & goodwill) will positively influence interdisciplinary team collaboration. This hypothesis was tested using a stepwise multiple regression in order to identify the unique contribution of each independent variable (informal power styles) on the dependent variable of interdisciplinary team collaboration. A one-tailed test of significance was used.

Hypothesis 7. Formal power styles (authority, reward, & discipline) will negatively influence interdisciplinary team collaboration. This hypothesis was tested using a stepwise multiple regression in order to identify the unique contribution of each independent variable (formal power styles) on the dependent variable of interdisciplinary team collaboration. A one-tailed test of significance was used.

Question #4: Would a mediated path model significantly describe the relationship between conflict types, power styles and interdisciplinary team collaboration?

The following hypotheses are tested using multiple regression and path analysis to test a causal model for predictors of interdisciplinary team collaboration. Conceptually a variable is said to function as a mediator to the extent that it accounts for the relation between the predictor and the criterion. In the seminal work by Baron and Kenny (1986), three conditions must be met for a variable to function as a mediator.

First, variations in the levels of the independent variable significantly account for variations in the presumed mediator. Second, variations in the mediator significantly account for variations in the dependent variable. Third, when the path from the independent variable to the mediator and the path from the mediator to the dependent variable is controlled, a previously significant relation between the independent and the dependent variables is no longer significant. This finding is the strongest indicator of mediator effects. The last condition runs a continuum. In social science there are always multiple causes therefore, a decrease in the path between the independent and the dependent variable in the last step can be interpreted as indicative of a mediator effect. The greater the change in the independent variable's effect on the dependent variable the stronger the mediator effect. The conditions outlined by Baron and Kenny (1986) were used to develop the mediated model hypotheses.

Hypothesis 8. Task and emotional conflict are direct predictors of power style use.

Hypothesis 9. Task conflict, emotional conflict and power style are direct

predictors of interdisciplinary team collaboration.

Path Analysis Procedure

A path analysis, which is a regression-based method, was used to examine a model that hypothesized how the variables of conflict types and power styles affect interdisciplinary team collaboration. Path analysis is commonly used for studying patterns of causation among a set of variables in an ex post facto study such as this one (Tabachnick & Fidell, 1996). Specifically each endogenous variable is regressed on the variables said to affect it. Path analysis can specify direct and indirect effects among independent variables on a dependent variable and test the significance of path coefficients in proposed causal models. The b's (unstandardized coefficients) or β's (standardized coefficients) are path coefficients which indicate the effects of the variables with which they are associated. The significance test that relates to each regression weight indicates whether the path coefficient is statistically significant, different from zero (Pedhazur & Schmelkin, 1991).

Prior to conducting the analysis all correlations between the potential variables in the proposed models were entered into a series of simultaneous regressions to ascertain the significance of the proposed paths. All data met the assumptions for multiple regression. The explanatory models developed were based on the assumption that the model was intrinsically linear. An intrinsically linear model is one that is linear in its parameters but nonlinear in the variables. By appropriate transformation, a model that has nonlinear variables may be reduced to a linear model (Pedhazur, 1982).

Although β 's are scale free indices and useful in comparing the effects of different variables within a single population, the unstandardized coefficient *b* is presented for model discussion due to the stability of the term despite variances and covariances of variables across different settings or populations. Consequently, the b's in a given equation cannot be compared to evaluate the relative importance of the variables with which they are associated. Both β's and *b*'s will be reported in this study for completeness of presentation (Pedhazur & Schmelkin, 1991).

Based on theoretical assumptions mediation models were tested. The hypothesized model that is presented first identifies all possible paths drawn from the exogenous to the endogenous variables with path coefficients. This is called a just-identified model (See Appendix I). Models A & B represent trimmed models after path coefficients were dropped based on theoretical understanding and statistical analysis. Once paths were dropped the analyses were rerun with the retained variables and the overall models tested for goodness of fit (Grimm &Yarnold, 1995).

There is no single criterion available for determining how many and which predictors compose the "best" subset for an over-identified model. Additionally, it is important to remember in path analysis that overall model fit has nothing to do with the magnitude of coefficients or the amount of variance explained in the endogenous variables. However, model fit is important as it compares the proposed model with the data collected and is used to test the validity of the model. The reproduction of correlations through the direct and indirect paths between variables is one way that model validity was evaluated in this study. The total model was tested using a comparison of the composite

$R^2$ of the Models A & B to the hypothesized model. The larger the composite $R^2$ the stronger the model in identification of independent variables that account for variance in the dependent variables.

The incremental partitioning of variance or reproduction of correlations is not intended to provide information about the relative importance of variables but rather about how closely the path coefficients in the proposed model fit with the observed data (Grimm & Yarnold, 1995).

A combination of both substantive meaningfulness and statistical significance was used to evaluate these models. If the incremental change in $\underline{R}^2$ was statistically significant and theoretically the order of the variables could be meaningfully presented, then the model was not rejected. Although it is recommended that variables only be retained in the model if they have statistical significance ($\underline{p} < .05$) and b weights $< .05$, this statistical consideration was balanced with theoretical meaningfulness (Pedhazur, 1982)

Qualitative Methods

To further explore the concepts of interdisciplinary team collaboration, conflict types, and power style use and their inter-relatedness, questions were developed and presented to two ISCOPES student focus groups. The following questions were presented:

1. What would you identify as collaborative team behaviors? Please give examples.
2. Please specify the way in which faculty assisted you in collaboration.

3. Did any one person(s) have more influence than others on your team?
4. How did discipline influence teamwork?
5. Based on the ISCOPES experience, how would you describe your role and the role of others on the team?
6. What were some of the conflicts in your teams? How were conflicts handled? Was it ever beneficial?
7. What did you learn about interdisciplinary team collaboration from this experience?

Data Collection Procedure For Qualitative Data

Two focus groups with ISCOPES participants were held. Due to the end of semester finals and different schedules for students from each discipline, it was not possible to have the three disciplines represented in each of the focus groups. It was also not possible to separate the participants into two groups based on positive and negative experiences as was originally planned. Three physician assistant students and one medical student volunteered to participated in the first focus group. Six nurse practitioners constituted the second focus group. Each focus group was approximately 90 minutes in length and held on campus. The informed consent was reviewed at both focus group sessions and both sessions were audiotaped. Additionally, two medical students were interviewed by phone and asked the same focus group questions in order to obtain a representative medical student perspective. These two medical students were chosen based on their high level of participation. Therefore, the composite group was made up of 3 medical students, 3 physician assistant students, and 6 nurse practitioner students.

The purpose of the focus groups was to further explore how collaboration was experienced in practice, viewing the phenomena from more than a conceptual basis (Stewart and Shamdasani, 1990). Questions for the focus group amplified the concepts of interdisciplinary team collaboration, conflict and power measured by the standardized instruments. A total of 12 participants from ISCOPES generated self-reported nuances or connections they perceived from this interdisciplinary experience. Using focus groups to inform quantitative research creates a fuller, deeper understanding of the phenomena being studied (Kingry, Tiedje, & Friedman, 1990).

Qualitative Data Analysis

The transcripts were typed by this researcher. A qualitative content analysis was used to examine data contained in typed transcripts of the focus group interviews and the telephone interviews. Early data analysis involved several general overview readings. The purpose of the early readings was to facilitate holistic acquaintance with the data. After the overview readings key descriptive concepts were identified from the data. Categories were then developed and defined based on the operational categories used for the variables in the quantitative analysis (See Appendix G). Additional categories were developed for concepts that arose from the data perceived as different from the manifest categories. Categories were then clustered and interpreted into themes. Thus a combined latent and manifest content analysis was undertaken for inquiry into the validity of the quantitative findings as well as exploration of the qualitative data for additional understanding through inductive as well as deductive analysis.

Two types of reliability pertinent to content analysis, stability and reproducibility, were examined in order to support these findings. Stability or intra-rater reliability, which refers to the extent to which the results of content classification are invariant over time, was ascertained by the same content being coded twice by the same coder. Re-coding allowed for inconsistencies to be identified and reformulated for greater clarity. Reproducibility was examined by using another coder to establish inter-rater reliability (Weber, 1985). The outside coder experienced in qualitative analysis and interdisciplinary team collaboration was blind to the research hypotheses. This coder read all transcripts and identified concepts as well as parent codes for the data analysis. The outside rater was then asked to review the categories that were developed for interdisciplinary team collaboration and their definitions and to rate them for their relevance based on her own analysis of the data.

Additionally, themes identified by this researcher were also rated by the same outside coder. Using a 4 point rating scale, whereby 1 equals not relevant, 2 equals somewhat relevant, 3 equals quite relevant, and 4 equals very relevant, there was a 95% agreement between the co-raters (See Table 3.5). Two of the themes were modified based on consensual agreement between the co-raters since this was the unit of analysis of greatest importance.

Construct validity was evident as the comparison of the qualitative data descriptors from the focus group revealed a strong fit within the operational categories of the variables used in the quantitative analysis (See Appendix G). Additionally, the identified themes were viewed as strongly relevant by the outside rater. Latent content analysis may

Table 3.5

Ratings Of Categories & Themes In Content Analysis

| | Rater 1 | | | | Rater 2 | | | |
|---|---|---|---|---|---|---|---|---|
| Interdisciplinary Team Collaboration | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| **Categories*** | | | | | | | | |
| 1. Joint Planning & Decision Making | | | | X | | | | X |
| 2. Goal Focused Role Learning | | | | X | | | | X |
| 3. Problem Centered | | | | X | | | | X |
| 4. Reciprocal Trust & Respect | | | | X | | | X | |
| 5. Shared Leadership | | | | X | | X | | |
| 6. Equality of Influence | | | | X | | | | X |
| **Themes** | | | | | | | | |
| 7. Understanding and using the expertise of others | | | | X | | | | X |
| 8. Behaviors identified with interdisciplinary team collaboration related to the total process and outcomes of teamwork. | | | | X | | | | X |
| 9. Maturity is a greater influence on collaboration efforts than discipline. | | | | X | | | | X |
| 10. Faculty as role models for interdisciplinary team collaboration: mixed effectiveness | | | | X | | | | X |
| 11. Role negotiation as integral to maintaining collaboration | | | | X | | | | X |
| 12. Structure drives the process for developing interdisciplinary team collaboration | | | | X | | | X | |
| 13. Conflict as an inevitable part of collaboration. | | | | X | | | X | |
| 14. Both informal and formal power were used to influence the collaboration process. | | | | X | | | | X |

*Definitions for the categories were items from the Interdisciplinary Collaboration Scale (Appendix B) which literally matched many of the parent codes both raters identified in their early analyses.

**Items to Domain 1 = not relevant 2 = somewhat relevant 3 = quite relevant 4 = very relevant

be highly valid because the underlying meanings in the communication are considered. Glaser and Strauss point out that latent content analysis is not designed to ensure that different analysts working independently will achieve the same results. Rather the issue is whether different researchers would find evidence that data could not be coded as it was (Catanzaro & Olshansky, 1988).

# Chapter 4

## Results

The Statistical Package for the Social Sciences (SPSS-X Version 3.0, SPSS, Inc., 1988) was used to analyze the quantitative data. The chapter first presents a description of the sample and responses to the instruments used. This is followed by a discussion of the hypotheses and research questions. Quantitative data was analyzed at two levels: (a) the individual level which examined the entire sample; (b) the group level which compared experimental and control groups, disciplines, and teams. In addition, qualitative findings were identified using content analysis to address the 7 focus group questions from ISCOPES students.

### Sample

There was a total of 117 participants in this study. Experimental group membership comprised both students and faculty ($n = 67$). When data collection took place in May of 1997, 51 out of a total of 58 ISCOPES students (88%) agreed to participate in the study (See Table 4.1). Out of a total of 20 faculty, 16 agreed to participate (80%). Each discipline was represented in this interdisciplinary faculty. For the comparison group, 50 students were recruited based on matching discipline and university program. Each discipline represented approximately one third of the entire sample and within student groups. Medical students were the most strongly represented discipline in the experimental group and physician assistants were the largest numbers in

Table 4.1
Descriptive Characteristics of Sample
Discipline (N=117)

| | Experimental Group | | Comparison Group | | Faculty Group | | |
|---|---|---|---|---|---|---|---|
| Discipline | n = 51 | Percent | n =50 | Percent | n = 16 | Percent | Total % |
| Medical | 20 | 39% | 17 | 34% | 5 | 31% | 36% |
| NP | 18 | 35% | 15 | 30% | 6 | 38% | 33% |
| PA | 13 | 26% | 18 | 36% | 2 | 13% | 29% |
| Other | 0 | 0% | 0 | 0% | 3 | 19% | 02% |
| Total | 51 | 100% | 50 | 100% | 16 | 100% | 100% |

Gender (N=117)

| | Experimental Group | | Comparison Group | | Faculty Group | | |
|---|---|---|---|---|---|---|---|
| Sex | n = 51 | Percent | n = 50 | Percent | n = 16 | Percent | Total % |
| Female | 40 | 78.4% | 35 | 70.0% | 14 | 87.5% | 76.0% |
| Male | 11 | 21.6% | 15 | 30.0% | 2 | 2.0% | 23.9% |

Previous Interdisciplinary Team Collaboration Experience (N=117)

| | Experimental Group | | Comparison Group | | Faculty Group | | |
|---|---|---|---|---|---|---|---|
| Previous | n = 51 | Percent | n = 50 | Percent | n = 16 | Percent | Total % |
| No | 21 | 41.2 % | 8 | 16% | 0 | 0% | 24.7% |
| Yes | 30 | 58.8 % | 42 | 84% | 16 | 100% | 75.2% |

Enjoy Work In Teams (N=117)

| | Experimental Group | | Comparison Group | | Faculty Group | | |
|---|---|---|---|---|---|---|---|
| Enjoy | n = 51 | Percent | n = 50 | Percent | n = 16 | Percent | Total % |
| No | 3 | 5.9% | 6 | 12.0% | 0 | 0% | 7.6% |
| Yes | 48 | 94.1% | 44 | 88.0% | 16 | 100% | 92.4% |

Evaluation of Prior Team Experience (n=88)

| | Experimental Group | | Comparison Group | | Faculty Group | | |
|---|---|---|---|---|---|---|---|
| Evaluate | n = 30 | Percent | n = 42 | Percent | n = 16 | Percent | Total |
| Negative | 6 | 20.0% | 7 | 16.7% | 0 | 0% | 11.1% |
| Positive | 24 | 80.0% | 35 | 83.3% | 16 | 100% | 88.9% |

Age by Group (n=116)

| | Experimental Group | Comparison Group | Faculty Group |
|---|---|---|---|
| Mean ± SD | 30.4±7.9 | 31.8 ± 8.7 | 41.1 ± 6.8* |

* TukeyB test with significance level of .05

Ethnicity by Group (N=116)

| | Experimental Group | | Comparison Group | | Faculty Group | | |
|---|---|---|---|---|---|---|---|
| Race | n = 51 | Percent | n = 49 | Percent | n = 16 | Percent | Total % |
| African American | 2 | 3.9% | 4 | 8.2% | 2 | 12.5% | 6.9% |
| Asian Pacific | 5 | 9.8% | 6 | 12.0% | 0 | 0% | 9.5% |
| Caucasian | 39 | 76.5% | 38 | 77.6% | 11 | 68.8% | 75.9% |
| Hispanic | 5 | 9.8% | 0 | 0.0% | 2 | 12.5% | 6.0% |
| Other | 0 | 0.0% | 1 | 2.0% | 1 | 6.3% | 1.7% |

discipline in the experimental group and physician assistants were the largest numbers in the comparison group. Predominately caucasian and female (70-78%), a chi-square post hoc analysis of the two student groups found no significant difference between the groups regarding gender ($\chi 2$ (1, $\underline{n}$ = 101) = .93, $\underline{p}$ = .33) or evaluation of prior team experience ($\chi^2$(1, $\underline{n}$ = 101) = 3.13, $\underline{p}$ = .21). A one-way ANOVA revealed no significant age difference between the two student groups (experimental versus comparison) but as expected a significant age difference between the faculty and student groups (See Table 4.1). The average number of years of education after high school was 6.1 for the entire student sample.

In the experimental student group of 51, only 59% ($\underline{n}$ = 30) of the students reported prior interdisciplinary team experiences while over 85% ($\underline{n}$ = 42) of the comparison group reported prior interdisciplinary team experience. The actual amount of prior interdisciplinary experience was not obtained. A chi square analysis of the two student groups related to previous interdisciplinary team experience was significantly different between groups ($\chi^2$(1, $\underline{n}$ = 101) = 7.81, $\underline{p}$ < .01). From a discipline perspective, medical students most often reported no prior experience with interdisciplinary teams. Both the experimental and comparison student groups were similar in positively evaluating prior team experience (80% in the experimental and 83% in the comparison group). The question was asked concerning how many hours both students and faculty had participated in their respective teams of reference over the past two semesters. The question was not clearly interpreted and responses varied so broadly that the item was deleted.

Medical students represented 36% (n = 37) of the total student sample. Twenty-two participants were first year medical students and 15 were second year medical students. Thirty first-year nurse practitioners students and three second-year nurse practitioner students made up 33% of the student sample. Physician assistant students totaled 33% of the sample (29 being first year and 2 second year).

Data Screening

Prior to analysis, demographic data, self-report perceptions of interdisciplinary team collaboration, perceptions of team conflict and perceptions of power style use were examined through various SPSS programs for accuracy of data entry, missing values, and fit between their distributions and the assumptions of multivariate analysis (See Appendix F). Proofreading the original data against computerized listings was completed to ensure data accuracy. Frequencies were reviewed for outliers. Given the small sample size all cases were included.

Missing data was handled in several ways. Each single missing value on ethnicity and age was deleted. There were 37 missing values for the power style measurement and 7 cases with 8 random missing values for interdisciplinary team collaboration. Listwise deletion of cases for all analyses was used. There were nine item responses on the conflict tool (two cases) with fraction integers (for example; 3.5) which were rounded to the lower whole number.

In evaluating the ungrouped data for normality of distribution, several variables were negatively or positively skewed (See Appendix F). Negatively skewed mean scores were reflected. Moderately negative and positive skewed distributions were transformed

by using a square root and reflecting as needed to achieve normality. The use of transformation substantially improves analysis particularly when some variables are skewed and others are not (Tabachnick & Fidell, 1996). Transformation is undertaken because the distribution is skewed and the mean is not a good indicator of the central tendency of the scores in the distribution. Since rank order is not affected by transformation, the means can still be used to compare identified groups and are presented for ease of reader interpretation.

Descriptive Statistics on the Instruments

Interdisciplinary collaboration scale. A summary of the data on the interdisciplinary collaboration scale, ICS (revised), reported for the total sample appears in Table 4.2. The higher the score, the more collaboration in practice by participants was reported. The mean scores of the ICS are based on the final 25-item tool that resulted from the factor analysis. Scores of the total sample are presented with the subscale means and the summative mean. A mean summative score of 88.86 (SD = 20.2) for the entire sample was negatively skewed and after reflection, resulted in a mean score of 41.68 (See Appendix F). When a variable with negative skewness is converted to one with positive skewness through reflection, the direction of the interpretation of the variable must also be reversed (Tabachnick & Fidell, 1996). Therefore, the mean score is operationally interpreted as a positive and strongly moderate evaluation of overall interdisciplinary team collaboration for the entire sample.

Interestingly, the ICS was used as a summative scale by Rendell however, the total scores were not reported and therefore no comparison of the scores with other

Table 4.2

Interdisciplinary Team Collaboration Score by Factors & Summative Score (before transformations)

| Subscale (N=117) | Score Range | Mean | SD |
|---|---|---|---|
| Joint Planning & Decision Making (7 items) | 0-42 | 24.38 | 9.05 |
| Goal Focused Role Learning (6 items) | 0-36 | 26.96 | 7.79 |
| Equal Influence (4 items) | 0-24 | 11.60 | 6.74 |
| Problem Centered (3 items) | 0-18 | 9.60 | 3.76 |
| Reciprocal Trust & Respect (3 items) | 0-18 | 12.65 | 3.52 |
| Leadership (2 items) | 0-12 | 7.78 | 2.73 |
| Summative ICS | 0-150 | 88.86 | 20.25 |

Table 4.3

Summative ICS Scores by Group & Discipline (before transformations)

| Summative ICS | M | SD | Cases |
|---|---|---|---|
| Groups (N = 117) | | | |
| Experimental | 93.43 | 20.85 | 51 |
| Comparison | 80.48 | 16.69 | 50 |
| Faculty | 100.44 | 19.04 | 16 |
| Discipline (n = 101) | | | |
| Medical Students | 90.08 | 19.91 | 37 |
| Nurse Practitioner Students | 83.97 | 20.68 | 33 |
| Physician Assistant Students | 86.61 | 20.46 | 31 |

populations is possible. Although Rendell (1988) did report mean scores for subscales of the ICS, the revised scales prevent the results of this study from being compared to other studies. The sample means for the revised subscales based on this research sample are reported in Table 4.2. Analysis at the group level found the experimental ISCOPES group with the higher ICS score ($\underline{M}$ = 100.44; $\underline{SD}$ = 19.04) for faculty and ($\underline{M}$ = 93.43; $\underline{SD}$ = 20.85) for students compared to the non-ISCOPES comparison group (See Table 4.3). Discipline specific comparison revealed medical students with the highest ICS score ($\underline{M}$ = 90.08; $\underline{SD}$ = 19.91). The team level data is small ($\underline{n}$ = 67) and shows considerable range in team size and means. A post hoc ANOVA analysis of team means produced a statistically significant F ratio. However, the Sheffe test revealed no significant difference between teams (See Table 4.4).

Intragroup conflict scale. Jehn's (1994) Intragroup Conflict Scale measures emotional and task conflict. Higher scores indicate greater levels of conflict. Descriptive statistics for the scale are presented in Tables 4.4 and 4.5. Again, it is important to remember these data are skewed. At the ISCOPES team level low task and emotional conflict scores were noted with high interdisciplinary team collaboration scores (See Table 4.4). With the exception of site seven, the inverse relationship between conflict and collaboration was consistent across the teams. The comparison or non-ISCOPES student group reported higher levels of emotional and task conflict compared to the ISCOPES student and faculty groups (See Table 4.5). From the total sample, physician assistant students reported the highest mean levels of emotional conflict and task conflict. The total sample mean scores

Table 4.4

Means & Standard Deviations by Teams on Interdisciplinary Team Collaboration (ICS), Task (TC) & Emotional (EC) Conflict (n = 67)
(before transformations)

| Experimental Teams | Cases | ICS M | ICS SD | EC M | EC SD | TC M | TC SD |
|---|---|---|---|---|---|---|---|
| Site 1 | 4 | 106.00 | 21.83 | 2.00 | 2.16 | 3.75 | .96 |
| Site 2 | 4 | 102.75 | 5.32 | 3.50 | 4.36 | 4.00 | 3.37 |
| Site 3 | 12 | 105.25 | 14.52 | 3.33 | 1.85 | 3.88 | 2.75 |
| Site 4 | 6 | 94.00 | 15.59 | 3.17 | 2.56 | 6.17 | 2.40 |
| Site 5 | 4 | 71.25 | 7.89 | 4.75 | 2.50 | 7.25 | .96 |
| Site 6 | 6 | 109.33 | 17.95 | 2.00 | 1.41 | 2.67 | 1.63 |
| Site 7 | 9 | 79.00 | 16.18 | 2.11 | .93 | 3.44 | 2.19 |
| Site 8 | 7 | 71.00 | 25.50 | 7.57 | 3.21 | 10.86 | 3.58 |
| Site 9 | 1 | 116.00 | - | 6.00 | - | 5.00 | - |
| Site 10 | 4 | 111.50 | 7.42 | 2.75 | 1.26 | 6.50 | 3.00 |
| Site 11 | 10 | 102.00 | 10.88 | 3.50 | 2.17 | 3.80 | 1.55 |
| Total Sample | 67 | 95.10 | 16.36 | 3.45 | 2.71 | 4.97 | 3.26 |

Table 4.5

Intragroup Conflict Scores by Group & Discipline (before transformations)

| Conflict Factors | Emotional | | Task | | |
|---|---|---|---|---|---|
| Groups (N=117) | Mean | SD | Mean | SD | Cases |
| Experimental | 3.71 | 2.83 | 4.90 | 3.60 | 51 |
| Comparison | 5.52 | 3.16 | 6.28 | 2.97 | 50 |
| Faculty | 2.63 | 2.16 | 5.19 | 1.83 | 16 |
| Discipline (n=101) | | | | | |
| Medical Students | 4.30 | 3.13 | 4.86 | 2.84 | 37 |
| NP Students | 4.27 | 2.85 | 5.39 | 3.70 | 33 |
| PA Students | 5.32 | 3.35 | 6.65 | 3.40 | 31 |

of 4.37 (SD = 3.07) for emotional conflict and 5.57 (SD = 5.57) for task conflict in this study are higher than mean values found for organizational work teams ranging from 3.02 to 3.89 for emotional conflict and 2.14 to 2.48 for task conflict (Jehn, 1995; Amason, 1996). The means in this study do reflect a skewed distribution and both task and emotional conflict were transformed after descriptive analysis.

A post hoc analysis comparing the means of the two student groups found a statistically significant difference between the two groups. The comparison student group scored significantly higher on both conflict types than the ISCOPES or experimental student group. A two tailed t test found the emotional conflict level at $t(101) = -3.51$, $p < .001$ and the task conflict level at $t(101) = -2.66$, $p < .01$. The F value tests for homogeneity of variances was met. As expected, an inverse relationship between conflict and interdisciplinary team collaboration scores was observed in this data analysis as the higher the emotional conflict scores the lower the collaboration scores in comparing all three groups of ISCOPES students, faculty and non-ISCOPES students. However, the faculty group task conflict mean was higher than the ISCOPES student group task conflict mean, while the faculty reported the highest collaboration mean.

Power base inventory. The Power Base Inventory measures six social power styles. Formal or positional power is obtained by use of authority, reward or discipline style of influence. Expert, information and goodwill are personal or informal power styles that can influence others. A forced-choice instrument, a maximum score of 10 is possible on each power style. A summary of the data on the Power Base Inventory (PBI) appears in Table 4.6. The goodwill power style (M = 5.96) was found to be the highest power

goodwill power style (M = 5.96) was found to be the highest power style mean in the total sample (Appendix F) and highest in the faculty group (M = 6.38). The information power style was the second highest reported mean of all power styles from the total sample and the highest mean among medical students (M = 7.11; SD = 1.94). A post hoc ANOVA revealed medical students scored significantly higher on use of the information power style compared with nurse practitioner students and physician assistant students. ($F$ (2, 117) = 7.94, $p$ = .0008); with the application of the TukeyB range test of the differences statistically significant at the < .05 level.

Based on the total sample, reward was the formal power style with the highest mean of 5.71. The nurse practitioner students also reflected a high mean of 5.97 on the reward power style as well as the physician assistant students with a mean of 5.90. Thomas and Thomas (1991) reported low, middle and high ranges for each power style. On 5 of the 6 power styles, the total and group sample means of this study are equivalent to the middle to upper middle score ranges (50% to 60%) of the comparison population presented by the tool authors (before transformations). However, the formal power base authority was congruent with the low score ranges (10%-20%) with a total sample average of 3.68 (normal distribution).

HypothesisTesting

Hypothesis 1. Perceptions of interdisciplinary team collaboration will be higher in the faculty and student experimental groups than the comparison student group.

To evaluate the effect of providing an opportunity for interdisciplinary team collaboration for students from different disciplines, a comparison was made between

Table 4.6

Power Based Inventory Scores by Group & Discipline (before transformations)

| Power Styles | Information | | Goodwill | | Expertise | | Reward | | Discipline | | Authority | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Groups (N=117) | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Experimental | 6.12 | 2.23 | 6.31 | 2.15 | 3.98 | 2.27 | 5.61 | 2.36 | 3.82 | 2.31 | 3.06 | 1.90 |
| Comparison | 6.18 | 2.07 | 5.48 | 2.52 | 4.06 | 2.34 | 5.42 | 2.13 | 4.66 | 2.86 | 4.12 | 2.27 |
| Faculty | 4.25 | 3.03 | 6.38 | 2.58 | 4.88 | 2.41 | 4.75 | 2.15 | 4.88 | 2.53 | 4.25 | 2.05 |
| Discipline (n=101) | | | | | | | | | | | | |
| Med Student | 7.11 | 1.94 | 5.76 | 2.73 | 3.46+2.24 | | 4.78 | 2.65 | 3.89 | 2.72 | 3.54 | 2.41 |
| NP Students | 5.24 | 2.08 | 5.76 | 2.31 | 4.00+2.14 | | 5.97 | 1.91 | 5.03+2.63 | | 3.85 | 1.80 |
| PA Students | 5.96 | 2.02 | 6.22 | 1.96 | 4.71+2.40 | | 5.90 | 1.83 | 3.81+2.37 | | 3.35 | 2.20 |

faculty and students who had participated in the ISCOPES experience and non-ISCOPES students. This hypothesis was tested using a one way analysis of variance (ANOVA) and one-tailed test of significance with interdisciplinary team collaboration as the dependent variable and group membership as the independent variable. A statistically significant difference between the three groups was found (See Table 4.7). The ISCOPES faculty and student experimental group scores were significantly higher on perceived collaboration than the comparison group ($F$ (2, 116) = 9.38, $p$ = .0002, one-tailed test). The TukeyB test with a significance level of $p$ =< .05 supported both faculty and student ISCOPES groups being significantly different from the student comparison group means. Thus, the hypothesis was supported by the data.

There are several explanations for this finding. The Hawthorne effect introduced by the training, which is a kind of placebo effect, may have obscured perceptions on collaboration. Self presentation, which refers to the desire on the part of the respondent to present self to the researcher to make a particular impression may have influenced ISCOPES participants who were to receive grades (Pedhazur & Schmelkin, 1991).

As mentioned earlier, the finding on post hoc analysis that in the experimental student group, only 59% of the students reported prior interdisciplinary team experience while over 85% of the comparison group reported prior interdisciplinary team experience is one explanation for the difference in collaboration perceptions. Thus, students with little collaborative interdisciplinary team experience selected into this educational experience. In this ex post facto research study design there was no pre-test to evaluate

Table 4.7

Analysis of Variance: Interdisciplinary Team Collaboration By Groups (N = 117)

| Source of Variation | DF | Sum of Squares | Mean Squares | F Ratio | F Sig |
|---|---|---|---|---|---|
| Between Groups | 2 | 6721.60 | 3360.80 | 9.38 | .0002* |
| Within Groups | 114 | 40840.93 | 358.25 | | |
| Total | 116 | 47562.53 | | | |

*p = < .01, one-tailed test
** p = < .05 Tukey B test significance level

Table 4.8

Analysis of Variance: Interdisciplinary Team Collaboration By Discipline (n=101)

| Source of Variation | DF | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 658.88 | 329.44 | 0.83 |
| Within Groups | 98 | 38977.08 | 397.73 | |
| Total | 100 | 39635.96 | | |

group differences prior to the educational intervention. Thus when groups were assessed on the basis of their status related to a dependent variable, the possibility that people from different groups have been exposed to the same "intervention" could not be ruled out. Equally important to consider is the small sample of each student group (n=50) in which effect size is increased and meaningful differences between group means decrease (Pedhazur & Schmelkin, 1991). Finally, this finding could be true and focused educational efforts can indeed improve collaboration skills in health care professionals. However, conclusions drawn from this finding must be cautiously interpreted. It is important to remember that at the evaluation point, both groups were more appropriately included into a larger sample size, as the less experienced participants from ISCOPES had experienced a year of interdisciplinary team experience.

Hypothesis 2. Perceptions of interdisciplinary team collaboration will be significantly different between disciplines. Based on previous role experience in interdisciplinary teams, this hypothesis speculated that nurse practitioner students would perceive interdisciplinary team collaboration differently than students from other disciplines with less interdisciplinary team experience. To test this second hypothesis, a one way analysis of variance (ANOVA) with one-tailed test of significance was performed with interdisciplinary team collaboration as the dependent variable and discipline as the independent variable (Table 4.8). The effect of discipline on interdisciplinary team collaboration was not statistically significant ($F$ (2, 114) = .83). The sample size may have been too small to accurately evaluate this hypothesis. Complicating the evaluation of this

Table 4.9

2-Way ANOVA: Interdisciplinary Team Collaboration
By Discipline & Group (n = 101)

| Source Of Variation | DF | Sum of Squares | Mean Square | F Ratio |
|---|---|---|---|---|
| Main Effects | 3 | 4499.33 | 1499.78 | 4.22* |
| Discipline | 2 | 589.89 | 294.95 | .83 |
| Group | 1 | 3914.42 | 3914.42 | 11.02** |
| 2-Way Interaction | 2 | 978.03 | 489.02 | 1.38 |
| Explained | 5 | 5900.55 | 1180.11 | 3.23* |
| Residual | 95 | 33735.41 | 355.11 | |
| Total | 100 | 39635.96 | 396.36 | |

*p < .01
**p < .001

Table 4.10

Correlation Matrix: Interdisciplinary Team Collaboration (ITC),Power Styles & Conflict Types (N = 117)

| Measure | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. ITC | — | .10 | .19* | -.06 | .19* | .19* | -.05 | .24** | -.60*** | -.51*** |
| 2. Information | | — | -.01 | -.11 | .23* | .26** | .16 | .21* | -.06 | -.05 |
| 3. Goodwill | | | — | .05 | .48*** | .36*** | -.12 | .80*** | -.12 | -.19* |
| 4. Reward | | | | — | .07 | .23* | .20* | .14 | .06 | -.03 |
| 5. Discipline | | | | | — | .32*** | -.32*** | .80*** | -.04 | -.12 |
| 6. Authority | | | | | | — | -.12 | .70*** | -.11 | -.05 |
| 7. Expert | | | | | | | — | -.25* | -.00 | -.09 |
| 8. Power* | | | | | | | | — | -.12 | -.16 |
| 9. Emotional Conflict | | | | | | | | | — | .50*** |
| 10.Task Conflict | | | | | | | | | | — |

* p < .05; ** p < .01, ***p < .001

*Power = Authority/Goodwill/Discipline Interaction

hypothesis may have been the focus on "team" collaboration and not a direct focus on the ability of certain disciplines to collaborate.

Hypothesis 3. The interaction of group membership and discipline will not significantly affect perceptions of interdisciplinary team collaboration. This hypothesis was tested using a two-way ANOVA and revealed that the interaction effect between group membership and discipline with interdisciplinary team collaboration was not significant ($F$ (2, 101) = 1.38). Therefore, the null hypothesis was retained (See Table 4.9).

Hypothesis 4. Perceptions of emotional conflict will negatively influence interdisciplinary team collaboration. The Pearson Product Moment Correlation matrix (See Table 4.10) presents the correlations among these variables. As expected emotional conflict was negatively and moderately correlated with interdisciplinary team collaboration ($r = -.60$). The negative correlation between ICS and emotional conflict was somewhat higher in magnitude than the negative correlation of ICS and task conflict. To examine the relations among emotional conflict, task conflict and interdisciplinary team collaboration, regression analysis was used to test these hypotheses (See Table 4.11).

A simple linear regression revealed that emotional conflict is statistically significant ($R^2 = .359$, $p = < .001$) and negatively associated with interdisciplinary team collaboration ($b = -16.64$, $p = < .001$, one-tailed test). Thus, the initial hypothesis of the relationship of emotional conflict as a negative predictor of interdisciplinary team collaboration was supported by the findings of this study.

Table 4.11

Regression Analysis:
Using Task and Emotional Conflict to Predict Interdisciplinary Team Collaboration (N=117)

| Variables | b | β | t | $R^2$ | Change in $R^2$ | F |
|---|---|---|---|---|---|---|
| Single Regressions | | | | | | |
| Emotional Conflict | -16.64 | -.60 | -7.95*** | .359 | .359 | 63.25*** |
| Task Conflict | -14.00 | -.51 | -6.36*** | .260 | .254 | 40.50*** |
| Multiple Regression | | | | | | |
| Emotional Conflict | -12.51 | -.45 | -5.42 | .359 | .359 | 63.25*** |
| Task Conflict | -8.77 | -.30 | -3.55 | .414 | .064 | 41.19*** |

***p = < .001

Hypothesis 5. Perceptions of task conflict will positively influence interdisciplinary team collaboration. The relationship between task conflict and interdisciplinary team collaboration was also examined. Using a simple regression analysis, this hypothesis was significant ($R^2 = .260$, $p = < .001$). However, task conflict was a statistically significant negative predictor ($b = -14.00$, $p < .000$, 1 tailed test) of interdisciplinary team collaboration.

A post hoc analysis using a stepwise multiple regression (See Table 4.11) tested and compared the direct effects of both task and emotional conflict to see if emotional conflict to identify which independent variable was the stronger negative predictor. The effects of both emotional and task conflict on interdisciplinary team collaboration produced an $R^2$ of .414 ($p = < .001$). As expected, in comparing the magnitude of the standardized beta's, emotional conflict was larger in magnitude. Emotional conflict ($\beta = -.45$, $p = < .001$) accounts for over 35% of the variance in interdisciplinary team collaboration while task conflict ( $\beta = -.30$, $p = < .001$) increased the variance by approximately 6%. Therefore, emotional conflict demonstrates a stronger inverse relationship to interdisciplinary team collaboration than does task conflict.

In addition, a post hoc ANOVA of group differences within the sample revealed that the ISCOPES faculty and student groups, which reported the highest interdisciplinary team collaboration mean, also reported the lowest task and emotional conflict means. The faculty and student experimental groups were significantly lower in perceived levels of emotional conflict from the comparison group ($F$ (2, 117) = 10.51, $p = .0001$) with TukeyB significance of $p =< .05$. The comparison student group had a significantly higher

task conflict mean than the experimental student group mean ($F$ (2, 117) = 3.93, $p$ = .023) with TukeyB significance level of $p$ =<.05). It is interesting to note that within the ISCOPES group although the mean for task conflict was higher in the faculty group their interdisciplinary team collaboration mean was higher than the experimental student group.

The nature of independence between task and emotional conflict was examined. Theoretically, the level at which emotional conflict impacts cognitive conflict is not well understood. Statistically, task and emotional conflict were significantly correlated ($r$ = +.50, $p$ = .000). However the tolerance level in the regression analysis for both task and emotional conflict was above .74 which suggests the proportion of variance that is unique to each independent variables is strong (Pedhazur & Schmelkin, 1991). Thus, the regression results were not significantly influenced by multicollinearity.

Hypothesis 6. Perceptions of informal power style use (information, goodwill, expertise,) will positively influence interdisciplinary team collaboration. Hypotheses 5 and 6 examined the relationship between different power styles and interdisciplinary team collaboration. Hypothesis 5 and 6 were tested using stepwise multiple regression analyses.

A stepwise regression analysis (See Table 4.12) which entered the three styles of informal power identified goodwill as the only informal power style to be a positive predictor of interdisciplinary team collaboration (b = +1.62, p = .02, one-tailed test). The $R^2$ of .037 is statistically significant at the p = < .05 and identifies goodwill power as accountable for approximately 4% of the variance in interdisciplinary team collaboration. Information power was positively associated with interdisciplinary team collaboration but

was not statistically significant. Additionally expertise was negatively but not significantly associated with interdisciplinary team collaboration.

Hypothesis 7. Perceptions of formal power style use (authority, reward, discipline) will negatively influence interdisciplinary team collaboration. Predicting that all formal power styles would be negatively associated with interdisciplinary team collaboration was not supported (See Table 4.12). A stepwise multiple regression analysis ($R^2 = .037$, $p = < .05$) of formal power styles identified discipline as significant ($b = + 1.45$, $p = .042$) and positively related to interdisciplinary team collaboration. Authority was also positively related though not significantly with interdisciplinary team collaboration. Reward was negatively though not significantly related to interdisciplinary team collaboration.

The low statistical significance for the formal power style suggests multicollinearity among the different power styles. The correlation matrix revealed significant intercorrelations between the power styles of goodwill, authority, and discipline (See Table 4.12). The shared variance between these three power styles may reflect weaknesses in the validity of the PBI tool and also reflect the use of both informal and formal power styles used by this sample to influence team efforts in interdisciplinary team collaboration. Thus, in a post hoc regression analysis, the power styles of goodwill, authority and discipline were integrated. This analysis (See Table 4.13) revealed power (operational definition for the integration of authority, discipline, and goodwill) to be significantly ($R^2 = .059$, $p = <.01$) and positively related to interdisciplinary team collaboration ($b = +.898$, $p = .008$). This finding identifies the integration of formal and informal power styles as significant predictors of interdisciplinary team collaboration.

Table 4.12

Stepwise Multiple Regression
Using Power Styles to Predict Interdisciplinary Team Collaboration (N=117)

| Informal Power Variables | b | β | t | $R^2$ | F |
|---|---|---|---|---|---|
| Goodwill Power | +1.62 | +.19 | 2.09* | .037 | 4.38* |
| Variables Not In The Equation | | Beta In | | | |
| Information | | +.097 | | | |
| Expert | | -.069 | | | |

| Formal Power Variables | b | β | t | $R^2$ | F |
|---|---|---|---|---|---|
| Discipline | +1.45 | +.19 | 2.04* | .035 | 4.17* |
| Variables Not In The Equation | | Beta In | | | |
| Authority | | +.139 | | | |
| Reward | | -.076 | | | |

*p = < .025, one-tailed test

Table 4.13

Using Power (Discipline/Authority/Goodwill) to Predict Interdisciplinary Team Collaboration

| Variable | b | β | t | $R^2$ | F |
|---|---|---|---|---|---|
| Power (Goodwill/Discipline/Authority) | +.898 | + .24 | 2.70** | .059 | 7.27** |

**p = < .01

Hypothesized Model

Conceptually, conflict has often been described as negatively affecting collaboration efforts. However, the idea that different types of conflict would vary in effect on interdisciplinary team collaboration has not been tested. Additionally, collaboration operates on a model of "shared" power. In health care there has long been an established hierarchy. Therefore, in order to achieve collaboration all parties must have some form of countervailing power. Thus, the use of different power styles may serve to develop "shared" power and mediate conflict as well as broadly support collaboration. There is no empirical research on the relationship between power styles and types of conflict as predictors of interdisciplinary team collaboration. This hypothesized model explored how the independent variables of power styles and types of conflict influenced the dependent variable of interdisciplinary team collaboration.

This hypothesized model (See Appendix I) is defined as a non-recursive model. Non-recursive models describe some paths as reciprocal. Emotional conflict and task conflict are identified as reciprocal exogenous variables. Exogenous variables are those that act as a cause but have no causal antecedents. Therefore, the model does not attempt to explain the presence of both task and emotional conflict and statistically, their parameters cannot fully be estimated. The theoretical proposition that the presence of both types of conflict are quite powerful in their combined negative impact on interdisciplinary team collaboration is one of the path hypotheses. The model also proposes that power mediates the effects of conflict on interdisciplinary team collaboration.

Model Testing

In order to test the significance of this four variable model, two regression analyses were required. One regression analysis is needed for each endogenous variable in this path model. Power and interdisciplinary team collaboration are the endogenous variables and were the dependent variables in the two step regression analysis. Endogenous variables are the variables that are explained by other variables in the model. In the first regression analysis, the impact of both types of conflict on the power variable was tested. The power variable represents the integration of goodwill, discipline, and authority that were the power styles which positively and significantly correlated with interdisciplinary team collaboration in this study.

This regression analysis produced an $\underline{R}^2 = .009$, $\underline{p} = .219$ which is not statistically significant. The second regression step produced an adjusted $\underline{R}^2 = .43$, $\underline{p} = .000$. These results indicate that the independent variables of task conflict, emotional conflict, and power are significant predictors of the dependent variable, interdisciplinary team collaboration and account for 43% of the variance in interdisciplinary team collaboration. However, in the first regression there was no statistical support to show the direct effect of conflict on power style use.

One statistical test which examines the strength of the overall model is a composite $\underline{R}^2$ for models. This composite data is used to compare the just-identified model with the two overidentified models. The composite $\underline{R}^2$ for the hypothesized model was:

$$R^2_m = 1 - (1 - R^2_1)(1 - R^2_2 \ldots\ldots (1 - R^2_p).$$

Hypothesized Model: $R^2_m = 1 - (1 - .43) = .43$

There is no increase in the composite $\underline{R}^2$ since the first regression was not significant and only the second regression was significant. This composite $\underline{R}^2_m$ =.43 of the hypothesized model indicate that the just-identified model is an adequate model and would be compared to the two overidentified models that were developed (Schumaker & Lomax, 1996).

Multiple regression addressed the statistical significance of the effects of identified independent variables on dependent variables which is known as a direct effect. However, in path analysis the direct and indirect effects of variables can be specified to further explain the relationship between the model variables and is equally critical to assessment of the model. To test the hypothesized effects, the total, indirect and direct effects between the variables in the model were examined.

Path Significance

Hypothesis 8. Task and emotional conflict directly affect power style use.

As noted earlier, the regression of task and emotional conflict on power, produced an $\underline{R}^2$ = .009, $\underline{p}$ = .219 which is not statistically significant (See Table 4.14). This regression equation produced path coefficients which are used to measure the direct and unique impact of task and emotional conflict on power. In order to test if a path coefficient is significant, the t ratio must be significant at the $\underline{p}$ = <. 05. Regressing power on emotional conflict (b = .33, p = .33;) and task conflict (b = .98, p = .11) indicated the path hypothesis was not statistically significant. Table 4.15 presents the direct and indirect effects of these variables as they are identified in the mediated model.

Hypothesis 9. Emotional conflict, task conflict, and power are significant and direct predictors of interdisciplinary team collaboration. The second regression step which produced an adjusted $R^2 = .43$, $p = .000$ identified the direct effects of emotional conflict, task conflict and power on interdisciplinary team collaboration as statistically significant. The path coefficients for each of the independent variables, emotional conflict ($b = -11.47$, $p = .000$), task conflict ($b = -7.03$, $p = 000$), and power ($b = +.56$, $p = .02$) were all significant(See Table 4.14). This regression analysis supports the model paths related to the direct negative effects of task and emotional conflict on interdisciplinary team collaboration and the positive effects of combined power styles on a moderate level of interdisciplinary team collaboration (See Table 4.15).

Model Validity

One way the validity of proposed models is assessed is through reproduction or decomposition of the correlations among the identified variable pairs. This procedure was undertaken for this just-identified model and the two overidentified models that will be discussed. The total effect of an independent variable on a dependent variable is defined as the sum of its direct and indirect effect(s) (Pedhazur, 1982).

Direct Effect + Indirect Effect = Total Effect

Direct effects exist between two variables where there is no intervening variable. Indirect effects exist between two variables when there is indirect causality through at least one intervening variable. The total effect is the sum of the indirect and direct relationship. The total effect is interpreted as the magnitude of the effect on the dependent variable by the mediator from an initial unit of change in the independent variable. Since a mediating

Table 4.14

Hierarchical Regressions for Each Stage of the Proposed Causal Models ( N = 117)

| Hypothesized Model | | b | β | T Sig | $R^{2*}$ | F Sig |
|---|---|---|---|---|---|---|
| Dependent Variable | PredictorVariables | | | | | |
| Power | Emotional Conflict | -.33 | -.05 | .33 | .009 | .219 |
| | Task Conflict | -.98 | -.13 | .11 | | |
| ITC | Emotional Conflict | -11.47 | -.46 | .00 | .430 | .000 |
| | Task Conflict | -7.03 | -.26 | .00 | | |
| | Power | + .56 | +.15 | .02 | | |
| Trimmed Model A | | | | | | |
| Emotional Conflict | Task Conflict | + .55 | + .50 | .00 | .254 | .000 |
| Goodwill Power Style | Task Conflict | - .60 | -.19 | .05 | .034 | .05 |
| ITC | Task Conflict | -7.19 | -.26 | .00 | .410 | .000 |
| | Emotional Conflict | -11.56 | -.46 | .00 | | |
| | Goodwill Power | + .72 | +.09 | .12 | | |
| Trimmed Model B | | | | | | |
| Emotional Conflict | Task Conflict | +.55 | +.50 | .00 | .250 | .000 |
| Power | Task Conflict | -1.17 | -.16 | .09 | .025 | .091 |
| ITC | Task Conflict | -7.03 | -.25 | .00 | .429 | .000 |
| | Emotional Conflict | -11.47 | -.46 | .00 | | |
| | Power | +.56 | .15 | .02 | | |

ITC = Interdisciplinary Team Collaboration P = Power ( Discipline/Authority/Goodwill)
$R^2$ = After first step, adjusted $R^2$ is entered for overall model.
T significance = *p = < .05, one-tailed test

Table 4.15

Analysis of Effects For Hypothesized Paths Within Each Causal Model

| Hypothesized Model | Direct | Indirect | Total Effect |
|---|---|---|---|
| TC* & EC* | r = .50 | | .50 |
| EC→TC | -.05 | (u)* | -.05 |
| TC→P | -.13 | (u) | -.13 |
| EC→ITC* | -.46 | -.01 | -.47 |
| TC→ITC | -.26 | -.02 | -.28 |
| P*→ITC | .15 | (u) | +.15 |
| Model A | | | |
| TC →EC | +.50 | (u) | +.50 |
| TC→GP* | -.19 | (u) | -.19 |
| EC→GP | (u) | -.10 | -10 |
| TC→ITC | -.26 | -.04 | -.30 |
| EC→ITC | -.46 | -.13 | -.59 |
| GP→ITC | +.09 | (u) | +.09 |
| Model B | | | |
| TC →EC | +.50 | (u) | .50 |
| TC→P | -.16 | (u) | -.16 |
| EC→P | (u) | -.08 | -.08 |
| TC→ITC | -.25 | -.03 | -.28 |
| EC→ITC | -.46 | -.13 | -.60 |
| P→ITC | +.15 | (u) | +.15 |

TC* = Task Conflict EC* = Emotional Conflict
ITC* = Interdisciplinary Team Collaboration
P* = Power ( Discipline/Authority/Goodwill)
GP* = Goodwill Power Style
(u)* = Unanalyzed effects

variable reduces the effect of the independent variable on the outcome, the strength of the mediator is evaluated by the difference between the direct and total effect (Loehlin, 1992).

In order to analyze the effects between variables in the models the β's are used to calculate the effects. In a four variable model, the indirect effects can become difficult to calculate due to other effects such as spuriousness and error. The procedure described by Pedhazur (1982) for decomposing the effects was followed for the models in this study.

Unique to the hypothesized model is the correlated exogenous variables of task and emotional conflict. In a correlated model, the $r_{12}$ is treated as a given and therefore cannot be decomposed. Equivalently, the parts of other paths that are due to the correlation of these two variables are unanalyzed. In this mediating model it is the comparison of the direct effects to the total effects that are of the greatest interest. The analysis of the total effects (direct plus indirect effects) of task conflict on interdisciplinary team collaboration and emotional conflict on interdisciplinary team collaboration was calculated as

$$\beta_{TC,P} = -.26 + -.13\ (+.15) = -.28$$

$$\beta_{EC,P} = -.46 + -.05\ (+.15) = -.47$$

The direct effect from task conflict and emotional conflict to interdisciplinary team collaboration was smaller than the total effect, signifying a small though not statistically significant amount of mediation (See Table 4.15). The total effects reflect the proposed model in which all of the indirect paths of these two variables are not analyzed and identifies the presence of power.

Although not statistically significant, theoretically it is important to understand how countervailing power may diminish the effect of conflict or if the conflict is high, as reflected in this model, the power level and styles (formal and informal) used are inadequate for diminishing the effects of conflict on interdisciplinary team collaboration. Therefore, in this model although the overall parameter estimates of the model are strongly significant, the path coefficients are not statistically significant. Note that the standardized coefficient β is used to estimate the variable effects.

Trimmed Model A

Model A (See Appendix I) is termed an overidentified model as constraints are placed on the model. In this model the path between task and emotional conflict was given a directional relationship. Additionally, the single informal power style, goodwill was identified as the mediator. The path between emotional conflict and goodwill power was dropped due to the path not being statistically significant. A regression analysis was repeated after these changes were made.

Theoretically this model identifies task conflict as an exogenous variable which directly affects emotional conflict. Goodwill power is identified as the mediating power style to again examine the proposition that informal power will mediate task conflict. The path identifies goodwill power as directly affected by task conflict and proposes a mediator effect of task conflict on interdisciplinary team collaboration through goodwill power. Emotional conflict is identified as directly affecting interdisciplinary team collaboration and only indirectly affected by goodwill power. Consistently following the theoretical assumption of the direct effects of each of the independent variables on

collaboration, the model also identifies conflict and power as directly affecting interdisciplinary team collaboration. Again, the direct potential for informal power to support other aspects of collaboration and for emotional conflict to directly block collaboration is acknowledged in this model. These direct effects allow for the identification of the dynamic tension that is part of the interdisciplinary team collaboration process.

Regression Analyses. In order to test the significance of this overidentified model, three regression analyses were required. Again one regression analysis was needed for each endogenous variable. Emotional conflict, goodwill power and interdisciplinary team collaboration were the endogenous variables. Emotional conflict was regressed on task conflict. This first regression was a single regression that was statistically significant and produced $R^2 = .254$, $p = .000$. The second regression was also a single regression of goodwill power on task conflict which produced an $R^2 = .034$, $p = .000$. In the third regression which was a multiple regression, interdisciplinary team collaboration was regressed on emotional conflict, task conflict and goodwill power (adj $R^2 = .410$, $p = .000$). Thus, this larger mediating model demonstrates an incremental and adjusted $R^2$ that is statistically significant (See Table 4.14) and creates strong model parameters. The overall composite model fit for Model A is $R^2_m = 1 - (1 - .254)(1 - .034)(1 - .410) = .575$ which is stronger than the hypothesized model.

Path Significance. The first path predicted task conflict would directly affect emotional conflict. This path coefficient was statistically significant and supported by this model ($b = +.55$, $p = <.001$). The indirect effect of emotional conflict on task conflict in

this path analysis is unanalyzed. When a variable, in this case emotional conflict, is conceived to be dependent on a single cause or exogeneous variable the indirect effect is not analyzed (Pedhazur, 1982).

The second path identified the indirect path of task conflict on interdisciplinary team collaboration through the mediator of goodwill power. In order to test a mediator model, Baron and Kenny (1989) recommend that three conditions must hold. First, the independent variable must affect the mediator in the first equation. Second, the independent variable must be shown to affect the dependent variable in the second equation. Third and last, the mediator must affect the dependent variable in the third equation. If these conditions all hold in the predicted direction, then the effect of the independent variable on the dependent variable must be less in the third equation than in the second.

Three regression equations are suggested and were applied. First, goodwill power (mediator) was regressed on task conflict (independent variable) and found to be significant ($b = -.60$, $p < .05$). Second, task conflict is significantly related to the dependent variable, interdisciplinary team collaboration ($b = -14.00$, $p < .001$). And third, regressing the dependent variable on both the independent and the mediator variables, goodwill power fell short of statistical significance ($b = +.10$, $p = .11$). However, the effect of task conflict on interdisciplinary team collaboration was less when the goodwill variable was included in the third regression equation and the magnitude of task conflict was decreased ($b = -13.49$) which suggests some mediation. Although the effect change

in task conflict was small, the beta change in task conflict suggests that goodwill power is a weak but, partial mediator of task conflict in interdisciplinary team collaboration.

Further assessment of model A identified the direct effect of task conflict on interdisciplinary team collaboration ($\beta$= -.26, p <.01) as less than the total effects ($\beta$= -.30). Although there is only a small amount of difference between these two paths, mediation is proposed. The direct effect of emotional conflict on goodwill power was unanalyzed as the path was deleted based on prior statistical assessment of the path. The indirect effect however is a $\beta$= -.13, p = <.01.

In Model A, goodwill power was positively related but not statistically significant as a direct effect on interdisciplinary team collaboration when included into the multiple regression analysis (See Table 4.15). The direct effect of goodwill power is significantly reduced in the presence of task and emotional conflict +.09 which just falls short of significance p = .12. The indirect effect of goodwill power is not calculated in this model (Pedhazur, 1982).

In summary, the model parameters are strong, the model fit is improved from the hypothesized model, and the path coefficients are statistically significant between each of the variables except in the last path in which is the direct effect of goodwill power on interdisciplinary team collaboration is not significant (b = +.72, p = .12). Theoretically, the lack of statistical significance for this direct effect path may suggest that one single power style would not be an effective predictor of collaboration if high levels of task and conflict exits. However, goodwill power does appear to partially mediate the impact of task conflict on interdisciplinary team collaboration in this model.

Trimmed Model B

Model B is also an overidentified model that repeats the same variable paths with the exception of the mediating variable being power (the composite of discipline/ authority/ goodwill power styles). Theoretically, this model postulates that task conflict is mediated by informal power styles rather than formal power styles. Formal power styles, used at low levels, are critical to the support of interdisciplinary team collaboration but when task conflict develops it is the informal power style that mediates rather than the formal power styles.

Regression Analyses. In order to test the significance of this four variable model, three regression analyses were required. Again emotional conflict was regressed on task conflict and produced an $R^2$ of .254 (p = .000). The second regression of power on task conflict produced an $R^2$ of .025 (p = .091) which was not statistically significant at the p = .05. The third regression of interdisciplinary team collaboration on task conflict, emotional conflict and power was statistically strong (R2 = .429, p = .000). Two of the regressions were statistically significant and used to create the composite $R^2$ for Model B:

$$R^2_m = 1 - (1 - .25)\,(1 - .43) = .575$$

Path Significance. The first path predicted task conflict would directly affect emotional conflict. This path coefficient was statistically significant and supported by this model (b= +.55, p = <.001). The direct effect is the only analyzed effect in this model following the partitioning of variance procedure identified by Pedhazur (1982). The second regression analysis which produced path coefficients for the direct effect of task conflict on power was short of statistical significance (b = -1.17, = p = .09). The path

coefficients for the third regression were statistically significant for both task ( b = -7.03, p = < .001) and emotional conflict ( b = -11.47, p = < .001) as directly and negatively affecting interdisciplinary team collaboration. The indirect effect of task conflict on interdisciplinary team collaboration is $\beta_{TC, P} = -.16\ (.15) = -.03$ and the total effect is $\beta = -.25 + -.03 = .28$. The total effect is larger than the direct effect with the presence of the power variable. The total effect of emotional conflict in this model is $\beta = -.60$, p = <.01, which reflects the strength of this negative variable in the absence of any direct mediating variable. Power had a positive and significant effect on interdisciplinary team collaboration as the path coefficient was b = +.56, p = .04 (See Table 4.15). The indirect effect of power in this model is not analyzed according to Pedhazur (1982).

Summary of Models. It is important to note that two different overidentified causal models may be equally effective in reproducing correlations (Pedhazur, 1982). Theoretically and statistically, Model A is important for understanding the unique mediating influence of goodwill power on task conflict. Model B is important to understanding what combination of power styles can positively predict interdisciplinary team collaboration but may not significantly mediate conflict. The statistical differences are small and each model offers a slightly different theoretical understanding.

Qualitative Data Results

During the analysis of the transcripts of the two focus group interviews and two phone interviews, the following themes emerged: (1) Understanding and using the expertise of others; (2) behaviors identified with interdisciplinary team collaboration are related to the total process and outcome of teamwork; (3) personal maturity is a greater

influence on collaboration efforts than discipline; (4) faculty as role models for interdisciplinary team collaboration achieved mixed effectiveness; (5) role negotiate is integral to maintain collaboration; (6) structure drives the process for developing interdisciplinary team collaboration; (7) conflict is an inevitable part of collaboration, (8) both informal and formal power are used to achieve goals and influence the collaboration process. A discussion of these emergent themes are presented. Words included in quotation marks are those of the focus group participants.

Understanding and using the expertise of others. Understanding of and acknowledging the expertise of others by using their skills was the process described as critical to interdisciplinary team collaboration. There was general agreement among the participants that initially, they were focused on identification of skills they personally brought to the team, but quickly realized that identifying the strengths of other team members was equally critical in order to achieve the goals. This theme would be complementary to the concept of reflexive action where self and meaning emerge through role taking (Mead, 1967). Reflexive action is when the individual can perceive other's perspective as well as his own. One participant asserted:

> I think to share personal, educational and discipline perspectives was helpful. The different perspectives allowed me to recognize and acknowledge the expertise of individuals within the team and to capitalize on them. I was really humbled-you just never know how much others know...that they have these areas of expertise that surprise you.

Another participant stated: "Well, shared participation is really contributing your skills as well as your ideas, but so is listening...by listening, I mean that you give feedback, that you acknowledge the other person's ideas or skills and then the team uses the expertise of everybody."

Another participant described the struggle inherent in collaboration that can make the process slow at times and identfied the developmental nature of collaboration as a process and outcome.

> I think it took a long time for us to figure out what we really knew within ourselves and to actually know each other. There was such limited time, so you know, they would come in and say why are you doing it this way?...and kind of like wait, you don't know what your doing. When it comes to collaboration, you don't know what anybody's experience or expertise is. It's hard to come together, really work together. Ideas are great and sharing information is great but once you know it, it still takes a long time to really work it out together and I think collaboration really came in the end...when we all kind of solidified and could assume different roles.

Behavior identified with collaboration. Behaviors are related to the total process and outcomes of teamwork. The descriptors identified by the focus groups were placed in categories that were identified for the quantitative analysis of interdisciplinary team collaboration (See Appendix G). The description of collaboration as an outcome and the identification of a "critical" group of participants working together, did not fit into any former categories.

The behaviors identified with interdisciplinary team collaboration were numerous and related to the total process and outcome of teamwork. When asked to identify behaviors associated with interdisciplinary team collaboration, the descriptors were noted to impact every phase in teamwork. Such descriptors included: "shared planning," "shared goals had to be identified," "... everyone had a say when we finally made decisions," "tasks were coordinated," "..the workload had to be distributed and we tried to match people with their skills," "when we disagreed, often we found that to brainstorm and even to let some time pass we had different ideas emerge and we could reach an agreement through consensus."

Thus from initial goal setting through the phases of planning, implementation, and outcomes of teamwork a collaborative process was suggested. Additionally there were certain values concerning the social process of collaboration that were repeatedly identified by the participants. Shared "mutual respect" for each other and a value for "open communication" that included concerns and differences were often expressed.

Maturity as an influence on collaboration. Maturity is a greater influence on collaboration efforts than discipline. When participants were asked about the influence of different disciplines on team collaboration there was an immediate and general denial that a discipline perspective was a negative influence. Although the question was not asked in the negative, most participants responded to the question by immediate identification of barriers to collaboration. Maturity was frequently mentioned as a bond between members, as participants described identification of common ground within the teams as essential to their success. One participant stated: "Many of the students were so young-I sometimes

felt like a mother hen...we were just more responsible and committed to the idea of collaboration...because of our career and perhaps our maturity. I would end up taking them many different places."

Another participant from a different discipline and focus group added: "Yes, to me I met an NP my age and we immediately bonded. I think age and maturity created different expectations and ideas." The last excerpt is a participant from the third discipline and reflects a similar perspective.

> We had first year med students in their 20's and me, I am in my 40's and more serious. So, I think age may have been a conflict. Some of the younger students just wanted to get it done, and I was interested more in the experience and taking time to be more thorough.

Faculty as role models: mixed effectiveness. This theme contains the polarities of positive and negative dimensions of collaborative role modeling that were identified by the participants. The participants differentiated between "the strong faculty" and the "ineffective faculty." Some participants perceived they had worked with faculty that were ideal role models of collaboration (See Appendix H).

> Our community preceptor made a real effort to bring in other people from the organization to work with us so we weren't so isolated...she really motivated us...especially in the beginning with the first meeting. She gave us a tour....it was evident she had done so much for the site it was really inspiring. The way she talked with the agency people was really role-modeling how to effectively interact

at the community site. She made us feel like we were apart of something that was really important!

The sharing of "information" was the strongest positive collaborative behavior identified by all participants. The identification of resources for the team and orienting the participants to their assigned agencies was also identified as supportive behavior demonstrated by the "strong" community faculty. The other descriptors identified were congruently focused on "commitment" and team facilitation skills. Faculty that developed "agendas for meetings" with their teams and "clarified work responsibilities" were described as the "organized" leaders who "guided" but did not direct their teams. "Strong" faculty were described as showing "support" and being "accessible." Their communication with the team was "frequent and timely." Often described as "guides", they were able to tolerate conflict and ambiguity within the project and the team. Another participant described her faculty preceptor as the "glue" for the team.

> She would reach out and initiate contact with us-she was the center for information. She encouraged participation and meetings in a regular fashion. She would start meetings by clarifying what the outcomes were...what the purpose of the meetings were. She would clarify expectations, assist us with her follow-through. She would email asking where we were in a process and it was comfortable. We could admit mistakes to her...she was a caretaker in a way...it really helped our morale when school was so demanding. She was so organized and supportive...I knew I wasn't any busier than she was and if she could find time for this project so could we. It left quite an impression on me. Our faculty leader

was not a doctor but she offered a public health perspective that was so very useful to me as a med student.

The most common negative descriptions of "ineffective" faculty behaviors that blocked collaboration were "uncommitted," "disappeared in the middle of the year," and "unavailable." "Faculty would often delegate rather than let the team flail with it...meeting her expectations instead of the team's. Faculty seemed to avoid stepping on each other's toes, especially when there were competing goals."

Another participant related: "Our faculty did a sort of negative thing, she tried to set my role as the leader...she assigned the leader and it created inequality in the group...it made me feel uncomfortable."

Role negotiation is integral to maintaining collaboration. Participants found role negotiation very difficult during the interdisciplinary team experience. Ideally collaboration is a process in which the stakeholders wrestle with the question :how can I satisfy my interest in the context of what is in the collective good? This question leads to the challenge of role development and flexibility. One assumption underlying this question is that some degree of interdependence is present and acknowledged. Social exchange theory suggests that some degree of dependence is necessary for role negotiation to occur. There was a perception by many of the participants that once a member identified a role to take on the team, it was often difficult to get others to take or exchange roles. Two participants asserted:" Once I started doing the role..It felt like I was expected to keep doing it even though I didn't want to." Another added: "Well there were the leaders and the followers. Once you assumed a role you were in it...there was no role flexibility."

Other participants described roles of "overfunctioning" in order to try and collaborate within their teams. The focus on task as the priority is also clear in the following excerpts. "We were the ones that organized the meetings, called the people and met with them, we typed everything. We did it all and we were accountable...We pick up the pieces, it is always our role."

> We wanted to get things done right...some of them did not want to be there, they were not committed so we would just do it. We could avoid conflict by doing it this way...there was no overt conflict it was covert. They had a great deal of apathy and I felt frustrated so it was sort of passive aggressive. I would say they needed to do a little part or delegate something to them and then we did the rest. Our faculty member recommended we do it this way. I would have done it this way without her suggestion."

Another participant expressed: "I think in general, nursing is educated to be over-responsible to take over projects...and I think we fail in not letting people do what they are suppose to do...we take over and do things that others can do."

Reciprocal role relationships can emerge and the following excerpt is one example of how role differentiation can occur:

> At first we tried to do it together, but we didn't get anywhere. When I stepped forward others stepped back. One member stepped back after I took the organizer position and spent a lot of time doing an equally important role, doing background research for the team. We started to rely on him for that work.

Another participant described a similar pattern: "In our group we had to have someone step forward and say, okay I'll do that administrative work. In fact the rest of the group was very involved in the actual task but somebody has to be directing it. Keeping an eye on it." The discovery of a mutually beneficial accommodation in roles was described by another team participant:

> We all made an attempt to share the work. We had no leader per se. One person made the phone calls, somebody did something else, we shared it. People volunteered to share the work. No one did the same thing.

What leads to role flexibility? One participant stated: "The more I became active in my role rather than passive I really became committed to the goals of the project. I then found myself doing whatever it took to reach the goals, so my role changed throughout the year."

Structure drives the process. Throughout the focus group discussions perhaps the consistent thread that was woven into all of the themes was equality. The expectation that the project was to be an interdisciplinary team collaboration process was heard by most of the students as a project of "shared responsibility." Participants were able to articulate clearly how the basic curriculum structure created problems for developing a collaborative process. The following quotes represent every discipline in the project. "I didn't see a difference in teamwork definitions by discipline. The "volunteer" versus "required" issue was the bigger problem."

> I think we had the problem of equal responsibility...you know because some were getting a grade and some were not, ...that influenced our accountability,

productivity, and commitment. I think it has happened in the past....to truly collaborate you need to feel and really be equally responsible.

Sometimes people would miss meetings. Since ISCOPES was required for some disciplines and voluntary for others, it led to different expectations and levels of commitment. It really needs to be addressed. I am not sure if it should become mandatory...it could create resistance to this wonderful idea and become a negative experience.

Another observation:"Our team we had a strong bond, we were all required to be there, we had similar backgrounds....in that we had similar work experiences and were interested in community health."

Conflict is an inevitable part of collaboration. Participants explained that limited time and demanding class schedules were the basic drivers for many of the conflicts they experienced during the project. There were two phases in the team's work that were identified as "high" in conflict. This conflict was described as being overt and discussed openly in meetings. First, in the initial phase, when teams were trying to identify a community project and second, in the implementation phase when the actual work was being distributed and follow through was critical. Emotional conflict was acknowledged in different forms. "Guilt" was one response to internal conflict experienced by a participant who was in conflict over meeting other academic demands and meeting her commitment to the project. Another participant stated that she had a great deal of internal conflict over her role in the team but perceived the constraints of her peers to be greater than her own so she continued in the role.

When asked what impact these conflicts had upon the teamwork and the project, there was a strong shared perception that although the conflict was uncomfortable it was essential for clarification and joint action toward meeting project goals. One participant stated: "Many people who could not handle conflict left the project, but those who stayed realized that the conflict actually improved our understanding of what we would do because different opinions made the product better" Another participant added "it really wasn't bad...but useful...when we resolved the conflict positively, the teamwork was better." One participant described a positive resolution to conflict: "when we disagreed we brainstormed and rehashed things...it seemed like if we had different ideas and we waited a while, like by the next meeting we could find agreement."

Power use in collaboration. Both informal and formal power were used to achieve goals and influence the collaboration process. Continuing with the thread of equality participants described the importance of relating to their fellow team participants as "equals" and they explored the ways in which they tried to influence others and how others influenced them. In contrast to the quantitative findings on the formal power hypothesis 3b, the participants reported informal power as the consistent choice of influence style used by students in the project teams. The following quotes support this description: "I don't think people used formal power in our team. For us it was knowledge, information related to work that had the greatest influence." Another participant stated: "Yes, like clinical experience or expertise. Like we looked at blood glucose and had students who knew more about it than most of us so they were very influential and knowledge made the argument." Still another participants agreed: "We

had three RN's and the group relied on their clinical experience. We would often ask them what they thought. They never forced their opinions on us and would not present their knowledge until we asked they what they thought."

There were some descriptions that depicted a more complex picture of informal power use being integrated with formal power use.

> As a scheduler I had informal power. The faculty and community preceptor used formal power to set direction and limits at times. Yes I think we saw ourselves as equals in working together and learning how to work in the community. I don't think discipline was a source of power used by the students.
>
> I think we went between being equal to being in a hierarchy. I mean I had to organize things and that was when it was hierarchical. We made decisions about the work as an equal group

One person stated: "I thought if I worked hard and was enthusiastic I guess I thought it would influence others ...it would rub off...that others would follow...When that didn't seem to work I started delegating. I was so frustrated."

There was also a general perception by some of the participants that formal power was used most often by the faculty but it was seldom directly exhibited. Faculty were also described as using informal power such as "sharing information or expertise." and "guiding" the team process through suggestions or clarification using questions. "Faculty used formal power. Initially our faculty assigned tasks for the project and at the end they assigned tasks to get the paper done."

Some participants perceived that grades given by the faculty was a constant "invisible" formal power that inhibited participants in some teams from expressing different views. "They really seemed worried about their grades. They were really deferential to their faculty leaders. I was glad that I didn't feel that type of pressure."

General Impressions. In summary, the following impressions were inductively developed from the focus group interviews. Effective interdisciplinary team collaboration requires the members to interact on an equal level, regardless of discipline. Members must be committed to making the group function effectively. Commitment includes some choice in tasks, role flexiblity, motivation, involvement, follow-through, and willingness to seek mutual accommodation. Communication, including listening, compromising, keeping an open mind, and contributing information is vital. Team members value respect, support, acknowledgement of expertise and inspiration to each other. Team members also valued expertise of others in the subject area and must have goal sharing. Team members are fair with each other and behave responsibly. Older, more mature members tend to be more collaborative and responsible. The group must have a leader who offers guidance and treats the members fairly. The leader should not do the bulk of the work but should delegate, share information and support members.

The quantitative and qualitative findings focused on the identified hypotheses have been presented and represent initial understanding of the relationships between interdisciplinary team collaboration, types of conflict, and power style use. Additionally insights from participants describing their role experiences as well as perceptions of faculty

behaviors that influenced interdisciplinary team collaboration offer guidance for future interdisciplinary education strategies.

# Chapter 5

## Discussion

The purpose of this research was three fold: 1) to compare the perceptions of nurse practitioner students, physician assistant students and first and second year medical students based on an educational interdisciplinary team collaboration experience; 2) to examine the relationships between types of conflict and styles of power use on perceptions of interdisciplinary team collaboration; and, 3) to explore students' perceptions of their roles and the roles of faculty in facilitating interdisciplinary team collaboration.

The results presented in Chapter 4 revealed the complex nature of the variables that were examined. This chapter constitutes a discussion of those results. The initial discussion is in two parts. Part one is a presentation of the significant findings obtained from the study. In part two, the results are discussed with respect to their relationship to the research and theory previously reviewed in the field. Following this, the limitations of the study are presented. Finally, the implications of these results are discussed and future avenues of research proposed to expand empirical knowledge concerning collaboration.

### Findings

In this study hypothesis 1, that the perceptions of interdisciplinary team collaboration will be significantly higher in the faculty and student experimental groups than the comparison group was significant. There was a significant difference in perceptions regarding interdisciplinary team collaboration. The student and faculty

ISCOPES groups scored higher than the non-ISCOPES student group on the ICS. The perception of significantly higher interdisciplinary team collaboration in the ISCOPES group compared with the non-ISCOPES group is a finding that must be viewed cautiously and may have several explanations. The research design for this study was one typical of field research and therefore low on control by exclusion. The lack of controlling for prior collaboration experience may actually afford wider generalizability of the findings (Pedhazur & Schmelkin, 1991). Significantly higher levels of previous interdisciplinary team collaboration by the non-ISCOPES comparison group may not be directly interpretable; but higher levels of experience may have created a more generic and less idealistic focus than a specific team experience. Statistically, both student groups reported an overall positive value for teamwork . The relationship of interdisciplinary team collaboration with the other variables of power style and conflict types identified similar patterns for both groups. There are no current empirical studies on collaboration to use for contrasting or comparing these results.

Hypothesis 2, perceptions of interdisciplinary team collaboration will be significantly different between disciplines was not supported. The quantitative finding that there was no statistically significant difference in perceptions of interdisciplinary team collaboration based on discipline was also validated in the focus groups. This finding is in contrast to research by Laschinger and Weston (1995) who found that first year medical students and first year nursing students rated the value for collaboration very differently with nursing students generated significantly higher scores than medical students. Weiss and Davis (1985) reported differences in perceptions between physicians and nurses

concerning shared decision-making. Baggs (1990) also identified significantly different perceptions about the amount of collaboration that was perceived to be occurring between ICU nurses and physicians. She concluded that perhaps the concept was understood differently. Farrell, Heinemann, & Schmitt (1992) also found statistically different perceptions of teamwork based on discipline. However, Rendell (1988) found no difference in the evaluation of attitudes toward teamwork based on discipline.

The findings from both hypothesis 1 and 2 may suggest that indeed during the professional socialization of students a discipline bias has not yet formed which underscores the need to expose health professional students to early interdisciplinary experiences. An alternative explanation would be that graduate nursing students and graduate medical students have greater maturity than younger, less experienced students and therefore were able to identify more common ground for collaboration. These findings may also indicate that the skills needed for effective collaboration and teamwork transcend discipline; rather, the skills are psycho-social and necessary for understanding interpersonal, group, and organizational dynamics.

In the focus groups, the identification of maturity as a stronger influence on collaboration is complementary with Frisch's (1987) findings related to nursing students' assessments in complex situations and may warrant further investigation into research based on Perry's theory (1970) of adult cognitive development. This theory describes cognitive development as a spectrum of critical thinking that starts with basic dualistic thinking, in which the world is viewed in polar terms with "right" answers. Evolving into the acceptance of diversity as legitimate and learning as contextual connotates increasing

intellectual maturity. At the higher levels of cognitive maturity individuals are more committed and can handle high levels of ambiguity.

Maturity was a variable that Baggs and Ryan (1990, 1992) identified. They found an increased positive association between the number of years of experience for physicians with higher levels of value for collaborative practice.

The null hypothesis 3, that the interaction of group membership and discipline will not significantly affect perceptions of interdisciplinary team collaboration failed to produce a significant effect on perceptions of interdisciplinary team collaboration. The null hypothesis was retained. Had the results of this hypothesis been significant, new avenues of inquiry related to common areas of overlap between team and discipline would have been explored.

Interdisciplinary Team Collaboration Behaviors. A major theme that evolved from focus group discussions concerned behaviors identified with interdisciplinary team collaboration and were related to the total process and outcome of teamwork. This finding reflects the descriptive literature on collaboration. In a concept analysis by Henneman et al. (1995), the attributes currently identified in the literature for collaboration are joint venture, cooperative endeavor, willing participation, shared planning and decision making, team approach, contribution of expertise, shared responsibility, non-hierarchical relationships, and shared power based on knowledge and expertise. The focus group participants identified many of these same descriptors (see Appendix G). The descriptors also served to further validate the dimensions identified in the revised interdisciplinary collaboration scale.

Baggs and Schmitt (1988) have challenged the multidimensional definitions of collaboration, stating that collaboration is assumed to represent the most important aspect for team care. They specify the need for clear identification and further separation of the collaborative effort from the other factors entering into team care. However, Gray (1989) insists that collaboration is a process. The findings in this study would suggest that perhaps collaboration is a value that when applied to teamwork creates a different teamwork process. Additionally the focus group participants described collaboration as an outcome as well as a process which is supported by the collaboration research of Cary & Androwich (1989).

Interaction of collaboration and conflict. Hypothesis 4, that the perceptions of emotional conflict will negatively influence interdisciplinary team collaboration, was supported. Hypothesis 5: perceptions of task conflict will positively influence interdisciplinary team collaboration, was not significant. The post hoc analysis revealed emotional conflict as a stronger negative predictor of interdisciplinary team collaboration than task conflict. Task conflict was found to be less negative in magnitude on interdisciplinary team collaboration than emotional conflict. Additionally higher team collaboration levels were associated with lower task and emotional conflict scores.

This data pattern is congruent with Jehn's findings (1994) that task and emotional conflict decreased as the group's value for consensus increased. The negative strength of emotional conflict was noted as the comparison student group reported the highest levels of emotional conflict and also rated interdisciplinary team collaboration lowest. The same pattern was seen at the team level with higher conflict scores resulting in lower ICS

scores. However, faculty reported fairly high levels of task conflict ($x = 5.19$) as well as perceived the highest collaboration of the three groups.

The findings on task conflict raise the question of how conflict was resolved and how collaboration was defined by the participants in this study. Jehn (1994, 1995) found emotional conflict to be negatively related to group performance and member satisfaction and task conflict to be positively related to group performance but not to individual satisfaction. Additionally Amason (1996) found that task conflict was significantly and positively related to the affective acceptance of team decisions and understanding of group decisions.

Thus, the idea that task conflict positively impacts group performance but not satisfaction leads to the question of how interdisciplinary team collaboration is conceptually understood. In this study, interdisciplinary team collaboration may have been conceptualized by some participants to be related more to satisfaction in team performance while others may have perceived it to be related more to actual team outcomes.

The findings from this study also suggest that emotional conflict strongly decreases performance. Yet based on the qualitative reports, task conflict can increase performance. Therefore, in order for the positive aspects of task conflict to outweigh the negative impact, a collaborative process must first be in place. Jehn (1994) stated that in order to stimulate task conflict team leaders must create environments in which members can openly voice different opinions. The collaborative environment can foster such potential. Additionally, it will be important for practitioners and leaders to be able to distinguish

between these two types of conflict in order to resolve emotional conflicts as well as promote productive task conflicts. However, the dynamic nature of conflict raises a concern about the escalation of task conflict into emotional conflict and leads to the understanding of power as a mediator in the support of collaboration as well as the escalation or de-escalation of conflict.

Theoretical and qualitative explanations. Unfortunately, the positive aspects of task conflict were not quantitatively captured in this analysis. However, the focus group data confirmed the positive benefits of task conflict. Participants reported that although conflict occurred, there was a shared perception that differences in perceptions improved the team process and performance. The conflicts resolved were those which were task focused and which the teams perceived they had direct control over. For example one participant stated: "Many people who could not handle conflict left the project, but those who stayed realized that the conflict actually improved our understanding of what we would do because different opinions made the product better." Another participant added, "...it really wasn't bad...but useful...when we resolved the conflict positively, the teamwork was better." One participant described a positive resolution to conflict: "when we disagreed, we brainstormed and rehashed things...it seemed like if we had different ideas and we waited a while, like by the next meeting we could find agreement."

The focus group themes of "structure influencing behavior" and "role negotiation" during this collaboration experience expand the understanding of conflict experiences and collaboration efforts in this study. These themes can be explained by Hardy's integrated role theory model (1988). Merton (1976) asserts that social structures like the current

curriculum of health professions schools, create conflicting demands or role strain that can prevent goal attainment. The focus group descriptions of conflict and how it was handled suggest that conflicts which the students could not immediately influence, such as the structural conflict issues of different school schedules based on different disciplines and grade expectations for the project being different among disciplines, directly influenced interpersonal and intrapersonal behavior.

Often what appeared as a result of this structure were chronic patterns of intra and interpersonal conflicts over priorities between classes and the project meetings and the inability to negotiate roles within the teams. For example, role negotiation as integral to maintaining collaboration was another theme that was identified in the focus groups and may actually be explained as part of the larger structural issues. This finding reflects Merton's structural perspective (1976) of ambivalence and role stress that is created when the individual role occupant perceives conflicting discipline expectations, team expectations, and his or her own personal expectations.

The fact that some students received grades and other did not suggests an inequality of accountability to the project at a structural level. Additionally, Social Exchange Theory (Cook, 1989) explains that in reciprocal or negotiated exchanges, the power of one role occupant resides in the dependency on another. If two members are unequally dependent on one another for valued outcomes, the less dependent person has the power advantage. The structural difference of grades thus created an unequal dependency issue at the team level between students for role negotiation and between

faculty and students in terms of the formal power of faculty influencing students rewarded by grades.

Competing expectations often blocked role negotiation for those who perceived themselves as more dependent than others for the project to be successful. Additionally the focus groups revealed that those who felt the greatest dependency frequently experienced internal role conflict and often did not overtly express the conflict. Thus, the lack of feedback led to the reciprocal response of team members to continue in the same roles since they did not have any direct information that the role occupant was in distress.

A positive scenario was also presented to this same ambivalent structure by several participants. One participant reported that, as time progressed and her commitment to the goals of the project increased, she found herself experiencing greater role flexibility and collaboration within her team. She reported being willing to do many different tasks to accomplish the goals and to ask others for help. She saw this same behavior in others on her team.

These findings may suggest that role conflict is inevitable as Merton (1967) has postulated; however, when committed to a valued goal role conflict may have a different impact on the role occupant. Additionally, the incredible power of mutual influence on role functions in groups or the dimension of reciprocal role relationships based on perceived power supports Hardy's (1988) model which integrates symbolic interaction theory with structural theory and social exchange theory into a synthesized understanding of how invisible intrapersonal and organizational structures affect the dynamics of interpersonal role negotiation behaviors. It was clear that the ISCOPES participants

understood many of the conflicts to be symptoms of underlying dynamic tensions related to the course, university structures, and intrapersonal demands.

Power and Collaboration Interactions. Hypothesis 6, that perceptions of informal power styles (information, goodwill, and expertise) will positively influence interdisciplinary team collaboration, revealed goodwill as the only informal power style to be a positive predictor of interdisciplinary team collaboration. Information power style use was positive but not statistically significant. Expertise was negatively but not significantly associated with interdisciplinary team collaboration.

Hypothesis 7, that perceptions of formal power styles (discipline, authority, and reward) will be negatively associated with interdisciplinary team collaboration, was not supported. Discipline was statistically significant and positively related to interdisciplinary team collaboration. Authority was also positively related though not statistically significant to interdisciplinary team collaboration. Reward was negatively though not significantly related to interdisciplinary team collaboration.

Theoretically the use of informal power bases must be personally developed or earned and are thought to increase commitment within teams. The high use of formal power bases are thought to negatively influence teamwork. Compliance or resistance can be expected by others in a team if positional power is the primary type of influence used by team members (Thomas & Thomas, 1991).

Power results of this study were discovered in the formal power styles of discipline and authority and the informal power style of goodwill. These integrated power styles were identified as positively affecting interdisciplinary team collaboration. The findings of

informal and formal power use in this research are complementary with the findings of Carson, Carson and Roe (1993) who also used Raven's power style model. Expert and referent (which was defined as goodwill in this study) are the most positively correlated power styles with regard to satisfaction with supervision. Expert power and reward powers were the strongest power bases for positively influencing performance results.

Previous research that is complementary to the findings in this study was done by Raven (1983). He found that informational power and expert power were most frequently used by the infection control nurses and medical empidemiologists to positively influence other professional staff to comply with policy outcomes in hospitals.

However, Carson et al. (1993) also found authority power and coercive power to be negatively correlated with performance results. Expert power was the only power style found to positively and strongly affect satisfaction with supervision and performance outcomes. The labeling of the power styles was somewhat different between Carson et al. (1993) and this research. Definitions were compared for congruence. The similarity in Carson's et al. (1993) seminal work and this research is the identification of formal power as influencing outcomes.

The surprising finding that authority and discipline were positive and significant predictors of interdisciplinary team collaboration reflects reported low level use of these two power bases. The finding may also reflect context. The fact that the faculty are perceived to have formal authority and that the grades may have been perceived as both a punishment (discipline) and a reward may explain the context. The reality is that a formal position cannot be denied by faculty and that students openly accepted faculty as being in

authority positions. However, the facilitation of commitment within the teams by the faculty leaders was described by student participants in terms of informal power base use. The low levels of authority and discipline power use within the teams by students also suggests that students' sense of power in this context revealed they had no real formal power.

The integration of power styles as positively influencing interdisciplinary team collaboration is supported by Gray's (1989) description of power use. She states that in order to achieve collaboration all parties must have some form of countervailing power.

Understanding and using the expertise of others. This theme from the qualitative content analysis of "understanding and using the expertise of others" is strongly congruent with the literature findings just identified on the effectiveness of "expertise" power on performance and satisfaction. This theme is also complementary to the concept of reflexive action where self and meaning emerge through role taking (Mead, 1967). Reflexive action is when the individual can perceive the other's perspective as well as his or her own. This finding also reflects some of Luzki's (1958) collaboration factors: free interchange of information, reciprocal teaching and learning, and a problem-centered rather than discipline-centered focus.

In the quantitative findings of this study, the fact that "expertise" was not statistically significant as positively influencing interdisciplinary team collaboration may be explained as students do not yet see themselves as "experts" even though they perceived they could identify exptertise in others. The focus group participants clearly identified expert power in faculty and each other as critical to promoting interdisciplinary team

collaboration. The focus group findings suggest that the use of expertise power and goodwill power will most strongly influence satisfaction and performance in interdisciplinary team collaboration.

Faculty As Role-Models. The theme from the focus groups was that some faculty were better role models than others. Although not generalizable, the qualitative findings on faculty behaviors that were seen to facilitate or block interdisciplinary team collaboration offer initial data for further research on the competencies effective collaborative leaders need to develop (See Appendix H). The "sharing of information," "sharing of expertise," and "supportive" labels were the strongest positive collaborative behaviors of faculty identified by the participants. These descriptions complement the three informal power bases identified by the Power Base Inventory of information, expertise, and goodwill. Goodwill power was the only informal power style to be statistically significant and positively related to interdisciplinary team collaboration in this study. However, the information style power base was the highest reported mean of all the power styles for the entire sample in this study. The information power style was found to be significantly highest among the faculty and lowest among the medical students. The failure of the ICS tool and the Power Base Tool to partially correlate with this variable may be related to construct validity differences in these measures.

The informal power bases of expert and goodwill power have been strongly correlated with satisfaction of supervision (Carson, Carson & Roe, 1993). The finding of "information" and "expertise" as positive collaborative attributes is congruent with Kram's (1983) research on role-modeling. He identified that in the initial phase of a mentoring

relationship, a protégé respects a mentor for his or her competence or knowledge. With experience the protégé perceives the mentor as providing role-modeling, acceptance, and friendship--all of which are aspects of informal power.

Other descriptors of effective collaborative behaviors by faculty, termed as ability to "organize," "accessible," and "guiding" may suggest that a leader can most effectively build commitment through an integration of expertise with the other personal power bases of goodwill and information to develop a negotiated structure in new task situations. This interpretation would support Gray's (1989) description of collaborative leadership through negotiated order.

Reward power was the formal power with the highest student mean as well as a high mean by faculty. Reward power (formal power) such as grades might be expected to be a source of power for faculty and motivation for students striving to receive them. These results are consistent with the findings of Carson, Carson & Roe, (1993) who found that expert and reward power have been significantly and positively correlated to performance outcomes. The focus group reflected that participants who were to receive grades were more concerned with the team performance and often described participants as "over-functioning" or feeling unable to negotiate their roles for fear of not reaching the goals.

The surprising finding that authority and discipline were positive and significant predictors of interdisciplinary team collaboration reflects that these two power bases were reported to be at low levels. The reality is that a formal position cannot be denied by faculty and students openly accepted faculty as being in authority positions. However, the

facilitation of commitment within the teams by the faculty leaders was described by student participants in terms of informal power base use. The low levels of authority and discipline use scores on the PBI by students also suggest that their sense of formal status in this context was that they had no real formal power.

Interdisciplinary Team Collaboration Causal Models

Hypothesized Model. The hypothesized model explored how the independent variables of power styles and types of conflict influenced the dependent variable of interdisciplinary team collaboration. In this model, power (which was the integration of discipline, authority, and goodwill) could not mediate the effects of task or emotional conflict on interdisciplinary team collaboration. Statistically, the sample size may have been too small to adequately reflect a relationship. Theoretically, this finding may suggest the limitations of the identified power style levels to effectively mediate both task and emotional conflict which is consistent with the Raven and Kruglanski (1970). They studied how two parties try to influence each other during conflict. The authors speculated that when both parties used coercive power, greater distancing, greater distrust, and greater attribution of negative qualities were imputed to the other while holding oneself in higher esteem. By contrast when both parties effectively used referent power emphasizing their commonality, less distancing, less distrust, greater cooperation, and de-escalation of conflict occurred. Empirically this is supported by the findings on power use noted by Carson, Carson & Roe (1993) in which formal power styles were negatively correlated with performance outcomes and satisfaction with supervision.

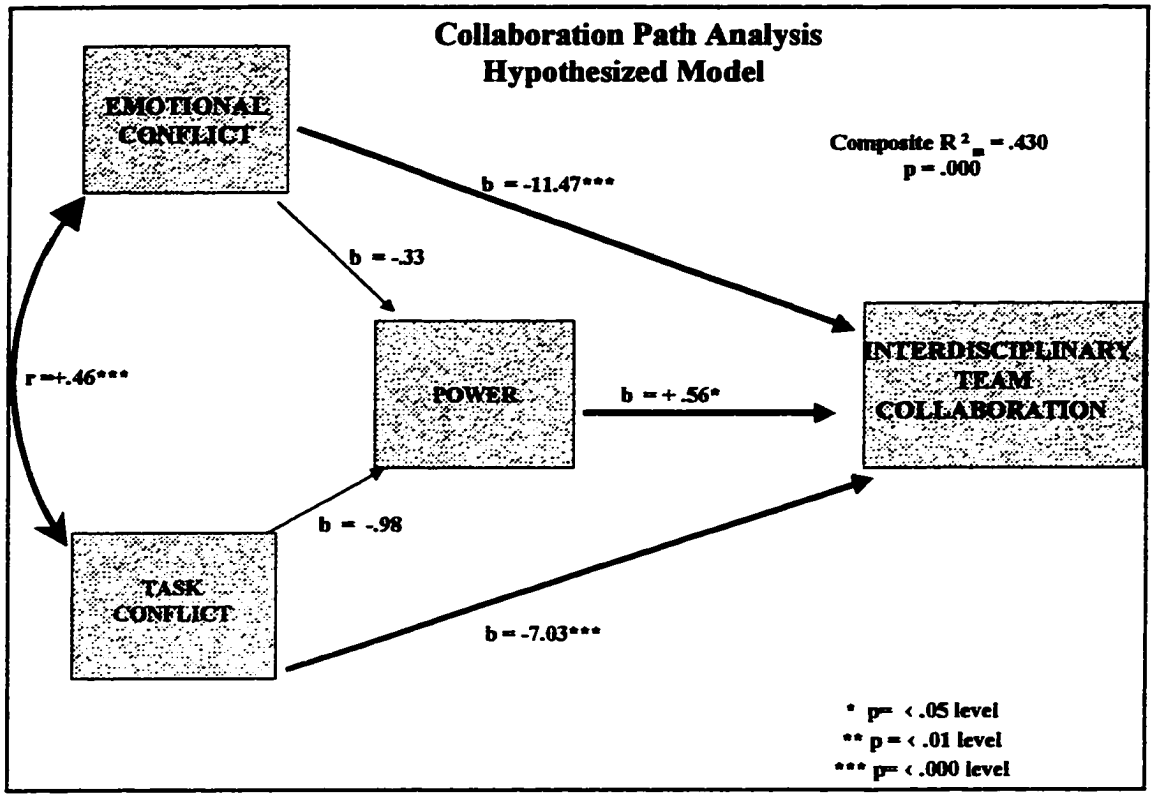


Figure 5.1. Hypothesized Model with path coefficients representing relationships and effects between conflict types and power style use on interdisciplinary team collaboration.

Theoretically, the lack of power to mediate conflict might suggest that the one informal power style would not be an effective mediator for both types of conflict given the added effects of emotional conflict with task conflict. The finding may also suggests that goodwill was not reciprocally practiced or at high enough levels to mediate the negative effects of the combined conflict types.

Trimmed Model A. Theoretically and statistically, Model A is important for understanding the unique mediating influence of goodwill power on task conflict. The first path of the model identifies the positive and strong influence of task conflict affecting emotional conflict. This finding is supported by Jehn (1994) and Amason (1996). Both authors found that task conflict can quickly escalate into emotional conflict if left unresolved and negatively impact team performance and decision making.

The second path revealed that part of the effect of task conflict on interdisciplinary team collaboration is mediated by goodwill power. Although the direct path from goodwill power to interdisciplinary team collaboration fell short of statistical significance, this sub-model is congruent with the previously identified studies concerning the positive effects that task conflict can have on team performance in an open, trusting environment (Jehn, 1994; 1996). Additionally the finding that goodwill power can mediate task conflict is congruent with the findings by Carson et al. (1993) that informal power positively influences performance. Finally, this finding is supportive of Raven & Kruglanski's model (1970) predicting mutual use of informal power style as de-escalating conflict. Both task and emotional conflict were identified as directly and negatively affecting interdisciplinary

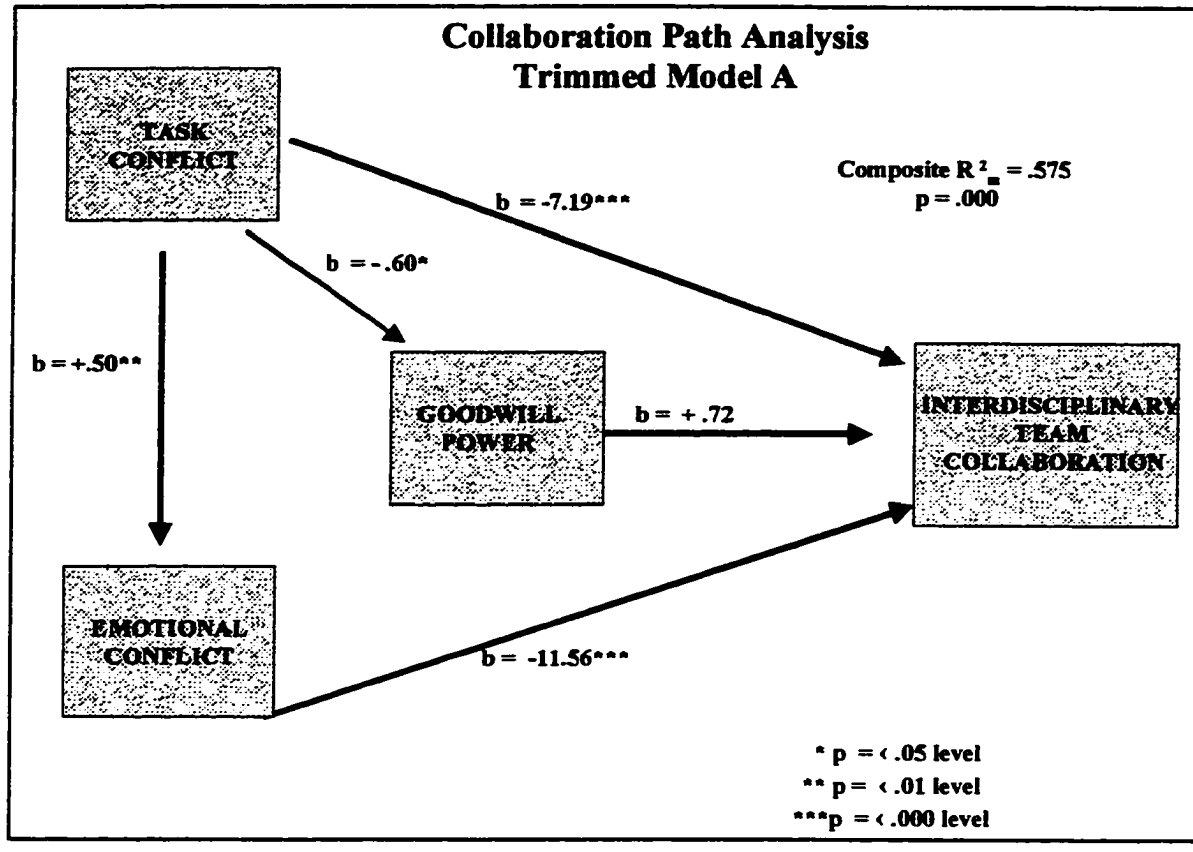


Figure 5.2. Trimmed model A with path coefficients representing the effects of types of conflict and goodwill power on interdisciplinary team collaboration. (Power = Discipline/Authority/Goodwill)

team collaboration and task conflict was indirectly mediated by goodwill power. Goodwill power was not found to be a significant predictor of interdisciplinary team collaboration with the presence of emotional conflict in the model. This would be congruent with the earlier findings (See hypothesis 3) in this study which identified the inverse relationship of conflict to collaboration. Therefore this model suggests that as levels of task conflict increase and emotional conflict is also present, goodwill power at the level it was used could not mediate the negative influence of conflict on collaboration.

Trimmed Model B. Model B is important to understanding what combination of power styles can positively predict interdisciplinary team collaboration but may not significantly mediate conflict. The only difference between model A and model B is the testing of different power variables. Model B identified the inability of the combined power variable to mediate task conflict. However, the power variable remained a significant and positive direct predictor of interdisciplinary team collaboration, which was a different outcome from Model A. The inabilty for the power combinations to mediate task conflict is an important dimension to test. The finding in Model B is again congruent with the empirical research on task conflict (Jehn, 1994, 1996) and the power model identified by Raven & Kruglanski's model (1970). The inability for the power combination to mediate task conflict suggests that the use of formal power in task conflict will not mediate or decrease the effects of task conflict on collaboration. This need for promotion of open disagreement and consensus resolution is the premise upon which collaboration is upheld and model B is consistent with that premise. Open conflict can be

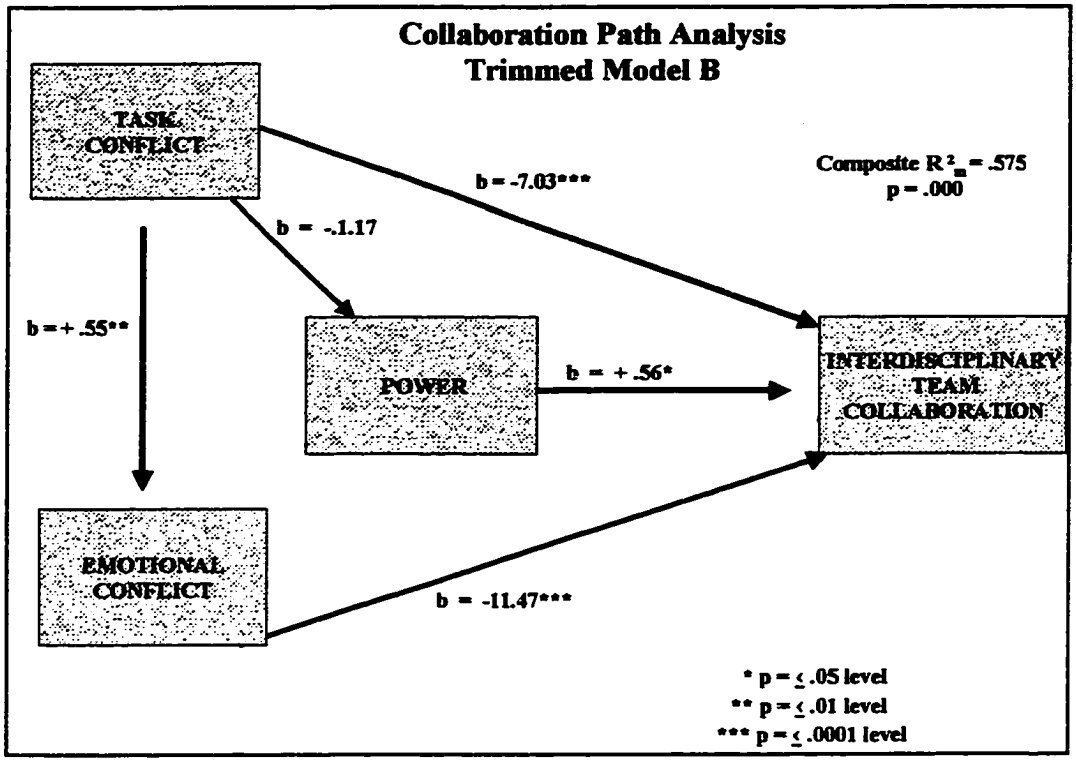


Figure 5.3. Trimmed model B with path coefficients representing the effects of types of conflict and power (discipline/authority/goodwill) on interdisciplinary team collaboration.

safer if approached through informal power use and handled with those attributes, not through the use of formal power use. This finding further suggests that effective collaborative leaders would need to become comfortable in identifying different perspectives and allowing team members and themselves to be uncomfortable at times. Leader expertise in allowing such tensions is contrary to the natural tendencies to avoid such open task conflicts (Jehn, 1996).

Finally, the propositions concluded from the focus groups validate the three models presented concerning the impact of power on collaboration. Participants strongly perceived the positive use of both informal & formal power to achieve goals and influence the collaboration process. Faculty were perceived to exercise some formal power. However, there were also perceived negative effects to the use of formal power by faculty. Informal power was perceived to positively affect interdisciplinary team collaboration among all team members.

In summary, the three causal models reviewed are theoretically meaningful and offer a springboard for further identification and testing of predictors for interdisciplinary team collaboration. Together, Models A, B, and C are complementary and propose a larger view of the complex and dynamic relationships between conflict types, power styles, and interdisciplinary team collaboration. Conflict has long been identified as a paradoxical variable that serves to block and facilitate collaboration. Shared power as critical to successful collaboration has not been empirically developed in relation to the context of interdisciplinary team collaboration. These three causal models provide an initial understanding of these three very important variables.

Limitations

Although the significant findings in this study are theoretically and empirically supported, some limitations of this study should be considered. The non-equivalent control group posttest research design is weak in its ability to reveal causal relationships. With little control over the independent variable, random assignments to groups, and the one time testing of the variables of concern the interpretation of results may be tentative. Thus the results of such a study must be reviewed with caution (Polit & Hungler, 1995).

It is well known that convenience sampling is the weakest form of sampling and the most commonly used (Polit and Hungler1995). In ex post facto studies, such as this one, the assumption that the groups being compared were similar before the occurrence of the independent variable cannot be made. Preexisting differences may be a plausible alternative explanation for any observed differences in the dependent variable. However, in cases in which the phenomena under investigation are fairly homogeneous within the population, the risks of bias may be minimal (Pedhazur & Schmelkin, 1991). The study of interdisciplinary team collaboration is a phenomena that is found across the health care professional population, thus there is less risk of bias sampling. However, the identification of a comparison group and the use of both quantitative and qualitative methods strengthens the study design given the realities of social science research. This research design is strong in realism and therefore has intrinsic appeal for the exploration of such complex phenomena.

Additionally, path analysis is an appropriate and recommended method for analysis of data from an ex post facto research design with a nonequivalent control group

(Pedhazur &Schmelkin, 1991). Path analysis is a strong and rigorous statistical method for capturing the dynamic relationships between the complex variables in this study. However, the data obtained in this study was a one time outcome evaluation. Therefore, the results represent a static perception. Ideally, data collected several times both during and after the education experience would reveal the evolving and enduring nature of the relationships.

There are limitations to path analysis. Path analysis is based on the assumptions that there are no specification errors and no measurement error. Specification error refers to inaccuracy in specifying the regression model. The two most critical specification problems are (a) that a variable is included in the model that does not belong in the model and (b) that a variable that belongs in the model has been omitted. The second category has to do with the causal ordering of the variables within the model. Measurement error refers to inaccuracy in measurement of the observed variables. Multiple regression and therefore path analysis assumes that all the variables are accurately measured. This suggests that running this path model on a program such as LISREL would be critical to consider as measurement error can be estimated (Grimm & Yarnold, 1995).

Qualitative content analysis has been identified as an appropriate method for analysis of data from printed documents such as transcripts from focus group interviews (Stewart & Shamdasani, 1990). However, analysis of data using this method has certain limitations. Inability to conduct follow-up interviews with participants can impede clarification and description of identified themes or categories. To compensate for the inability to carry out follow-up sessions, an outside rater with experience in qualitative

content analysis and interdisciplinary health care teams was identified and served to increase the reliability of the data interpretation using categories and themes.

Ideally, qualitative data collection from focus groups would include several sessions, with earlier group meetings having a broad focus and subsequent group interviews targeted toward clarification of concepts (Morse, 1994). In this study, however, data collection was limited to two focus group interviews with 10 participants and 2 telephone interviews. These 12 participants represented a mix of both positive and negative interdisciplinary team collaboration experiences based on the overall educational experiences within the ISCOPES project. Therefore, the qualitative data from this study are not generalizeable to advanced practice health professionals in general and provide only partial representation of the individual perspectives of one group of student participants.

The choice of measures for the variables included in the model is an important aspect of providing an adequate test of theory. Measurement errors in the independent variables can lead to severe bias in parameter estimation. Instrumentation reliability should be sufficiently high (Ferketich & Verran, 1990). Jehn's Intragroup Conflict Tool demonstrated high reliabilty (See Table 3.3). The Interdisciplinary Collaboration Scales (ICS) tool was revised after an exploratory factor analysis and had high reliability as applied in this study. However, this tool is new and needs further development with larger sample sizes (See Table 3.2). The Power Based Inventory Tool (PBI) had lower reliabilities (See Table 3.4), but this is not unusual with force-choiced instruments (Thomas & Boone, 1985). However, PBI and ICS were not strongly compatable.

Theoretically and empirically, there is supporting evidence that expert and informational (informal) power bases would correlate positively with interdisciplinary team collaboration. Participant score averages for both of these power bases were high and their use was reported in focus groups This raises questions of whether the PBI tool really measures the power bases as well as it is purported.

Future Research Recommendations

The repeated testing of any causal model with other populations and larger populations would be a critical next step for increasing validity for the proposed variables and interrelationships identified in the interdisciplinary team collaboration causal model. This model is also preliminary and additional identification of antecedent variables that positively predict interdisciplinary team collaboration are important to consider and test.

Shared goals was an aspect of collaboration that was integrated into the Interdisciplinary Team Collaboration scale. Based on these findings shared goals would be positioned as an antecedent and tested in a model and goal attainment would be the outcome measure for team collaboration. Future studies to include such variables as task complexity, team size, group interdependence, and gender need to be tested as antecedent variables.

This study used theoretical, investigator and method triangulation. The use of triangulated qualitative and quantitive methods to develop increased understanding of complex phenomena like interdisciplinary team collaboration is highly recommended. The integration of qualitative and quantitative methods allowed for a greater synthesis of meaning (Munhall & Boyd, 1993). As variables were amplified by each methodological

process separately, they were re-evaluated across context and within context. The study of collaboration is still in its infancy and many aspects remain to be described (Henneman, 1995). Therefore, the energies of investigators to examine this phenomena from multiple perspectives are critical to the discovery of optimal understanding of such a critical phenomena.

Outcomes were not examined to identify the impact of interdisciplinary team collaboration on project effectiveness and quality. For education and practice contexts developing a causal model which addresses competencies related to team skill development as well as clinical performance would serve to amplify the value of this process. Future studies measuring interdisciplinary team collaboration in relation to certain mixes of disciplines and levels of expertise for assuring quality care outcomes and keeping costs economically efficient need to continue. Studies measuring interdisciplinary team collaboration with specific patient populations and health outcomes over time are critical. Finally, the financial costs of collaboration need to be studied over time. Consideration should be given to costs and savings involved in improved patient outcomes and retention of professional and non-professional staff.

Goodwill power, which is an informal power style, was found to weakly but positively mediate task conflict and to be positively associated with interdisciplinary team collaboration. A larger sample size to test this hypothesis again is a critical next research step. Further exploration into the use of social power bases during different collaboration phases will potentially offer new insights on the impact of such power use. Observation as well as self-report methodologies will be useful for exploring within team patterns of

power use. The findings of this study suggest that different types of power styles can positively support different aspects of the collaboration process as well as influence constructive conflict resolution. How those patterns change over time and in context warrants further research.

Implications

As the nation's health care delivery and financing structures continue to undergo fundamental transformations, increased emphasis on interdisciplinary teamwork for the delivery of quality and cost effective primary care through population based practice cannot effectively occur without a collaborative paradigm in which innovations in education and health care delivery are developed. From a policy perspective, the ignorance among the health professions as to nonphysician providers' experience, level of training and education, and role competency is a major professional barrier to maximizing the optimal use of health professional resources. Sources of fears and objections to increasing role expansion must be resolved. This is a time when role flexibility could increase support and provide quality health care to greater numbers of citizens (Safriet, 1994).

Current health care professional teams must create new visions and implement them with nonphysician health professionals and laymen members to create optimal outcomes. The federal government as a major financier and provider of care is both a direct and indirect regulator of practitioners and their production. Funding for collaborative efforts in redesigning health care to optimally use interdisciplinary teams must be grounded in new paradigms for interdisciplinary education, as well as outcomes

research to evaluate these efforts. Early dissemination of these innovations to the policy makers, professionals and the public is critical.

From an educational perspective, the findings of this study support the belief that discipline does not have to limit collaboration and that it is important to offer students theoretical and practical "collaborative learning" experiences during their formal role socialization process in academic education to promote the development of collaborative skills. Additionally, collaborative experiences developed by educators need to identify a context and tasks of sufficient complexity and magnitude in order for true interdependence to be experienced.

The Interdisciplinary Collaboration Scale was tested again and revised to continue refinement of this much needed measure. The exploratory factor analysis provided construct validity for the ICS and added the shared goal dimension. The use of informal power as an intervening variable to promote productive use of task conflict extends the current understanding of the dynamic and paradoxical role of conflict in the collaborative process from a theoretical and practice perspective.

Empirically, types of conflict were identified as having different levels of impact on interdisciplinary team collaboration. From a practice perspective, health care professionals as team members and leaders need to understand the impact of both emotional and task conflict and be able to distinguish between the two types in order to attempt to resolve emotional conflict and at the same time promote productive task conflict. Understanding that when negative emotions are ignored, we realize that interdisciplinary team

collaboration can be severely undermined and results in poorer decision quality, fragmented efforts, job dissatisfaction and the ineffective use of resources.

Task conflict was described as devoid of interpersonal attributions and was focused on different approaches to a task and ideas related to that task. This is not to say that task conflict cannot easily escalate into emotional conflict (Jehn, 1995). Emotional conflict can also reflect high task conflict but the affective dimensions of emotional conflict such as friction, frustration , tension and dislike among members reframes the intentions of participants creating distrust; thus, collaboration is undermined. Leaders in the clinical arenas and faculty in educational settings must create environments that can foster trust for openly voiced opinions, especially dissenting ones. The skills to manage emotional attributions so that tasks are positively coordinated are germaine to collaborative leadership effectiveness.

Complementary to this value for dialogic discussion or promotion of task conflict is the need for advanced health care practitioners to develop and use more informal styles of influence with each other as well as with the patients they care for. Goodwill power, which is an informal power style, was found to weakly but positively mediate task conflict and to be positively associated with interdisciplinary team collaboration. The use of goodwill is related to trust of others, attributing respect and looking for the best in others. This posture, coupled with the continued development and sharing of clinical expertise, can create a sensitive and collaborative health care professional.

In summary, it is essential to educate health professionals from the perspective of a modern existence of fundamental interdependence. This compels educators to reexamine

how we organize professionals to solve health care problems, locally as well as nationally. Educating health professionals who are skilled in collaboration across disciplines is a process valued more than understood. By providing interdisciplinary educational experiences early in professional socialization, we can understand the value for collaboration from both an ethical as well a scientific perspective.

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# APPENDIX A

## Consent Forms

**THE GEORGE WASHINGTON UNIVERSITY MEDICAL CENTER**
**Washington, D.C. 20037**

**Informed Consent to Participate in a Research Study**

*Research Study:* ***Perceptions of Conflict and Power Use in Interdisciplinary Team Collaboration,*** **IRB #049710ER**

*Conducted by:* **Deborah B. Gardner, RN, MSN**
**Doctoral Student, George Mason University**
[redacted]

**Ann Cary, PhD**
**Faculty Advisor, George Mason University**
[redacted]

INTRODUCTION: You are invited to take part in a research study. Your decision to take part in the study is voluntary, and you are free to choose whether or not you will participate. This consent form provides information about the research study. Ms. Gardner will be available to answer questions about the study, questionnaires and focus groups. If you agree to take part in this research study, you will be asked to sign this consent form. This process is known as informed consent. If you have questions about the informed consent process or your rights as a research participant, please contact the Director, Office of Human Research at The George Washington University Medical Center [GWUMC] at [redacted]. This research project has been approved by the Committee on Human Research of the GWUMC.

STUDY DESCRIPTION: This study will evaluate the impact of interdisciplinary team experiences on perceptions of conflict, power use, and collaboration in teams by nurse practitioner students, physician assistant students, and first and second year medical students. If you agree to participate, you will be asked to complete a questionnaire about a recent experience in an interdisciplinary health care team. Some persons will be invited to participate in a focus groups discussion. If you wish, you may see copies of the questionnaires before you decide to participate. The questionnaires will take about 25-30 minutes to complete. Participation in the focus groups will take approximately 90 minutes. The focus group will be audio-taped, and the tapes will be transcribed without person-identifiable information. The audiotapes will be kept secure and accessible only to the researcher and advisor. Tapes will be destroyed after transcription. Your name will not appear on the questionnaire or in any reports of the research. The information you provide may be used for additional research, but because your name is not recorded, your identity is protected.

POSSIBLE RISKS AND BENEFITS: There are no foreseeable risks due to your participation in this study. All data collected in this study will be kept confidential and all person-identifiable data will be coded so that you cannot be identified. Reports or publications of the results of this research study will not identify you. You may not benefit personally from

participating in this study, but information gained may enhance interdisciplinary team collaboration and improve health care delivery to patients in the future.

COSTS AND COMPENSATION: Study participation will not result in any additional costs to you other than your time. No financial compensation or payment is available for participants in this study. Focus group participants will be provided with lunch.

RIGHT TO WITHDRAW FROM THE STUDY: Your participation in this research study is voluntary. You may decide not to begin or to stop at any time. You are not obligated to complete the questionnaires or focus group discussions. Your care and relations with health care providers and faculty members at GWUMC will not be affected regardless of study participation.

CONFIDENTIALITY: The results of this research study will be presented as fulfillment of doctoral degree requirements at the George Mason University. Results of the study will also be presented to the ISCOPES project directors. Research records may also be provided, upon request, to the U.S. Department of Health and Human Services and the Committee on Human Research of GWUMC. Except for these entities, research study records will be kept confidential unless you authorize their release or the study records are required by law (i.e., court subpoena). You will not be identified (e.g., name or social security number) in any reports, presentations or publications of this study.

PARTICIPANT'S STATEMENT: By signing this consent form, you affirm that you have read this informed consent for, the study has been explained to you, your questions have been answered, and you agree to take part in this study. You do not give up any of your legal rights by signing this informed consent form. You will receive a copy of this consent form.

| Participant (Print Name) | Signature | Date Signed |
|---|---|---|

INVESTIGATOR'S STATEMENT: I certify that the research study has been explained to the above individual by me, including the description of the study and the possible risks and benefits. Any questions raised have been answered to the individual's satisfaction.

| Deborah B. Gardner, RN, MSN<br>Investigator and<br>Person Obtaining Consent | Signature | Date Signed |
|---|---|---|

IRB# 04971ER
Consent Approval RSJ 4/18/97
Void After 3/31/98

Perceptions of Conflict and Power Use in Interdisciplinary Team Collaboration

Consent Form
Principal Investigator: Deborah B. Gardner, RN, MS
Doctoral Student
George Mason University

This study is being conducted to evaluate the impact of interdisciplinary team experiences on nurse practitioner students, physician assistant students, and first and second year medical students perceptions of conflict, power use, and collaboration in teams. If you agree to participate you will be asked to complete a questionnaire about a recent experience in an interdisciplinary health care team and some of you will be asked to participate in a focus group. If you wish, you may see copies of the questionnaires before you decide to participate. The questionnaires will take about 25 to 30 minutes to complete. Participation in the focus group will take approximately 90 minutes.

There are no anticipated risks due to your participation in this study. Your name will not appear on the questionnaire or in any reports of the research. The information you provide may be used for additional research, but because your name is not used, your identity is protected. Your participation is voluntary, and you may withdraw from the study at any time and for any reason. There is no penalty for not participating or withdrawing. The personal benefits for participation in this study are indirect as you may assist more health care professionals of the future to increase their collaboration skills and practice.

The are no foreseeable risks due to your participation in this study. However, all data collected in this study will be kept confidential; all person-identifiable data will be coded so that you cannot be identified. The focus group will be audio-taped and the tapes transcribed without person identifiable information. The audiotapes will be kept secure and accessible only to me. They will be destroyed after transcription. There are no costs to you or any other party.

This study is being conducted by Deborah B. Gardner RN, MSN, doctoral student at Geoge Mason University and should be contacted at [redacted] or Ann Cary Ph.D., advisor, can also be contacted at [redacted] if you have questions or comments. You may also contact the George Mason University Office of Sponsored Programs at [redacted] if you have any questions or comments regarding your rights as a participant in this research.

This project has been reviewed according to George Mason University procedures governing your participation in this research.

I have read this form and agree to participate in the study.

Signature: _____ Date: _____

# APPENDIX B

## Interdisciplinary Collaboration Scale

This set of questions has to do with collaboration in a health care team you are presently working in. Based on your experience with the team, place the number corresponding to your perception of the team's ability to collaborate in the space provided.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| **Strongly Disagree** | **Slightly Disagree** | **Disagree** | **Neither Agree Nor Disagree** | **Slightly Agree** | **Agree** | **Strongly Agree** |

_____ 09. Each member of the team has as much power as any other member.

_____ 10. The suggestions of some team members are considered more important than those of others.

_____ 11. Team decisions are controlled by one or two individuals.

_____ 12. The contribution of all professional disciplines on the team carry equal weight.

_____ 13. Exposure to the role of other disciplines has increased my awareness of their contribution to the treatment process.

_____ 14. Members of the team function pretty much the way they functioned before they were assigned to this team.

_____ 15. From the way a member of the team functions or from the types of tasks they deal with, it would be fairly easy to tell what their professional discipline is.

_____ 16. What a member does depends more on their particular skills than on their professional discipline.

_____ 17. Each member has a clear idea of the specific tasks of each discipline in the treatment process.

_____ 18. There is a low degree of participation on the part of some members of the team.

_____ 19. Everyone is actively encouraged to have their say before decisions are made.

_____ 20. Members do not discuss some of the important problems they are confronted with because the other professional discipline would not fully understand the problems.

_____ 21. Before undertaking a course of action, team members rarely ask for help and suggestions from others.

_____ 22. The activities undertaken by the team are jointly determined by all team members.

_____ 23. Members of the team work together as a team.

_____ 24. Although we are known as a team, most members end up "doing their own thing" with little input from others.

_____ 25. Working with other professional disciplines has not modified the way some of the team members view problems.

_____ 26. Suggestions from other team members have improved my effectiveness in working the this setting.

_____ 27. Working closely with other team members has helped in developing skills I might not have learned working with people in my own professional discipline.

_____ 28. Some team members think they have nothing to learn from other members.

_____ 29. Team meetings are usually focused on clearly defined issues.

_____ 30. In our team meetings we often get sidetracked into discussing peripheral issues.

_____ 31. After an issue is raised, we quickly reach a decision as to what to do about it.

# APPENDIX B

## Interdisciplinary Collaboration Scale

_____ 32. This team spends the majority of time discussing personal observations and reaction to the issue under consideration.

_____ 33. Teams function best when there is a designated leader.

_____ 34. The most efficient teams operate under the democratic principle of group consensus, with no need for a team leader.

_____ 35. Because of their administrative responsibility, the physician should be the team leader.

_____ 36. The team leader should be the most insightful and experienced member of the team regardless of discipline.

**Goal Similarity**

_____ 37. As a work unit (team), we have similar goals.

_____ 38. The main goals of this team are the same for all members of this team.

_____ 39. We (the team) all agree on what is important to our group.

# APPENDIX C

## Rotated Factor Matrix of ICS

| ROTATED FACTOR MATRIX OF ICS | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Factor 6 |
|---|---|---|---|---|---|---|
| 22 Activities by team jointly determined | 0.76 | | | | | |
| 24 Most members do their "own thing" | 0.75 | | | | | |
| 23 Members work together as a team | 0.71 | | | | | |
| 19 All encouraged to participate in decisions | 0.69 | | | | | |
| 18 Low participation by some members | 0.60 | | | | | |
| 28 Some have nothing to learn from other members | 0.58 | | | | | |
| 21 Team members rarely ask for help or suggestions from others | 0.57 | | | | | |
| 27 Develop new skills working outside my own profession | | 0.80 | | | | |
| 13 Exposure to other disciplines increased awareness of their contributions | | 0.76 | | | | |
| 26 Goals of team are same for all members | | 0.69 | | | | |
| 38 Suggestions from others improve my effectiveness | | 0.61 | | | | |
| 37 As a work unit, we have similar goals | | 0.60 | | | | |
| 25 Working with other disciplines has not modified how some members view problems | | 0.60 | | | | |
| 9 Each member has a much power as any other member | | | 0.84 | | | |
| 10 Suggestions of some members considered more important | | | 0.79 | | | |
| 11 Team decisions controlled by one or two individuals | | | 0.78 | | | |
| 12 Contributions of all disciplines carry equal weight | | | 0.54 | | | |
| 29 Team meetings are usually on clearly defined issues | | | | 0.77 | | |
| 30 In meetings we get sidetracked into peripheral issues | | | | 0.74 | | |
| 31 Once issue raised, we quickly reach a decision | | | | 0.61 | | |
| 16 What a member does depends more on skills than discipline | | | | | | |
| 20 Some problems not discussed, other disciplines would not understand | | | | | 0.75 | |
| 35 Due to administrative responsibility, physician should be leader | | | | | 0.52 | |
| 34 Most efficient teams operate under democratic principle of consensus, with no need for a team leader | | | | | 0.49 | 0.82 |
| 33 Teams function best when there is a designated leader | | | | | | 0.75 |

# APPENDIX D

## Intragroup Conflict Scales

Most interdisciplinary health care teams have conflict. Conflict can be defined as an awareness by parties involved that there are different perspectives or different goals. This set of questions asks about your observations concerning the type and degree of conflicts that are present in a health care team in which you currently participate. Place the number that best describes your experience in front of the question.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| None | | | | A Lot |

_____ 01. How often do people in your work group disagree about the work being done ?

_____ 02. To what extent are personality clashes present in your work group?

_____ 03. How often do people in your work group disagree about ideas regarding the task?

_____ 04. How much emotional conflict is there in your work group?

_____ 05. To what extent are there differences of opinions regarding the task in your work group?

_____ 06. How much friction is present in your work group?

_____ 07. How frequently are there disagreements about the task you are working on in your work group?

_____ 08. How much anger is present in your work group?

# APPENDIX E

## Power Base Inventory

# INTRODUCTION

The *Power Base Inventory* assesses the techniques you use to influence others. Influence is the ability to get others to do what you want them to do by altering their beliefs or behavior.

Although we think of power and influence as the domain of the *formal* leader (manager of a work team, committee chairperson, corporate president, parent) *any* member of the group can exert leadership and influence on other members. For this reason, the *Power Base Inventory* has applicability in a wide variety of settings. Throughout the *Power Base Inventory* we have used the generic scenario of a team leader influencing team members. You should however keep in mind your specific situation when you are answering the questions and interpreting your results.

# DIRECTIONS

On the following pages are several statements describing reasons why team members might be influenced by you. For each pair, please circle the "A" or "B" statement that is more characteristic of their reasons.

In many cases, neither the "A" nor the "B" statement may be typical of their reasons; but please select the reason that is most likely to occur.

1. A. They think I am much smarter about these things.
   B. They have to agree with the facts that I use for support.

2. A. They accept my formal right to decide matters.
   B. They have a general sense of goodwill towards me.

3. A. They believe that I may do something for them in return for their assistance.
   B. They realize that, beyond a certain point, noncompliance might not be tolerated.

4. A. They enjoy doing what they can for me.
   B. They are impressed with my greater competence.

5. A. They believe that my official status allows me to settle these issues.
   B. They know that I will try to make their cooperation worthwhile for them.

6. A. If we disagree, I demonstrate to them how they are wrong.
   B. If things got out of hand, they know I would have to be firm with them for the good of the organization.

7. A. They are impressed with my greater competence.
   B. They feel formally responsible for following my instructions.

8. A. They comply because they care about me and like to make me happy.
   B. They perceive that I will reward them for helping me out.

9. A. They know they would have to be punished if they violated important directives.
   B. They put less stock in their own powers of judgment than in mine.

10. A. They understand my reasoning and are persuaded by it.
    B. I have some rapport with them.

11. A. They believe that I could be hard on them if they deserved it.
    B. They believe that it is their duty to obey me.

12. A. They see that I provide positive incentives for their contributions.
    B. I show them how to properly interpret and deal with the situation, so that we agree.

13. A. They comply because they care about me and like to make me happy.
    B. They are aware that if they persisted in defying me, I might have to take corrective action for everyone's sake.

14. A. They believe that my official status allows me to settle these issues.
    B. They have to agree with the facts that I use for support.

15. A. They trust my skills and abilities much more than their own.
    B. They realize that conscientious cooperation will merit some form of compensation.

16. A. If we disagree, I demonstrate to them how they are wrong.
    B. They think I am much smarter about these things.

17. A. They enjoy doing what they can for me.
    B. They realize that I have been delegated the power to make these judgments.

18. A. If things got out of hand, they know I would have to be firm with them for the good of the organization.
    B. They perceive that I will reward them for helping me out.

19. A. I have established a reputation with them for making good decisions.
    B. I have developed a good working relationship with them.

20. A. They know I will try to repay them for their good work.
    B. They believe that my official status allows me to settle these issues.

21. A. If things got out of hand, they know I would have to be firm with them for the good of the organization.
    B. They have to agree with the facts that I use for support.

22. A. They respect the fact that the organization has empowered me to determine such matters.
    B. They believe that I am considerably more qualified to make good decisions.

23. A. They see that I provide positive incentives for their contributions.
    B. They enjoy doing what they can for me.

24. A. They think I am much smarter about these things.
    B. If things got out of hand, they know I would have to be firm with them for the good of the organization.

25. A. They follow my example because they feel positive about me.
    B. I am able to get them to see why I am right.

26. A. They do my bidding because of my superior rank.
    B. They think that I could be tough with them if I had to.

27. A. They have to agree with the facts that I use for support.
    B. They know I will try to repay them for their good work.

28. A. They believe that I could be hard on them if they deserved it.
    B. They go along with me because they have some affection for me.

29. A. They are forced to go along with the overwhelming evidence which I marshal for support.
    B. They believe in my official right to tell them what to do.

30. A. They perceive that I will reward them for helping me out.
    B. They think I am much smarter about these things.

# APPENDIX F

## Data Clean-Up and Transformation

DATA ANALYSIS-CLEAN UP

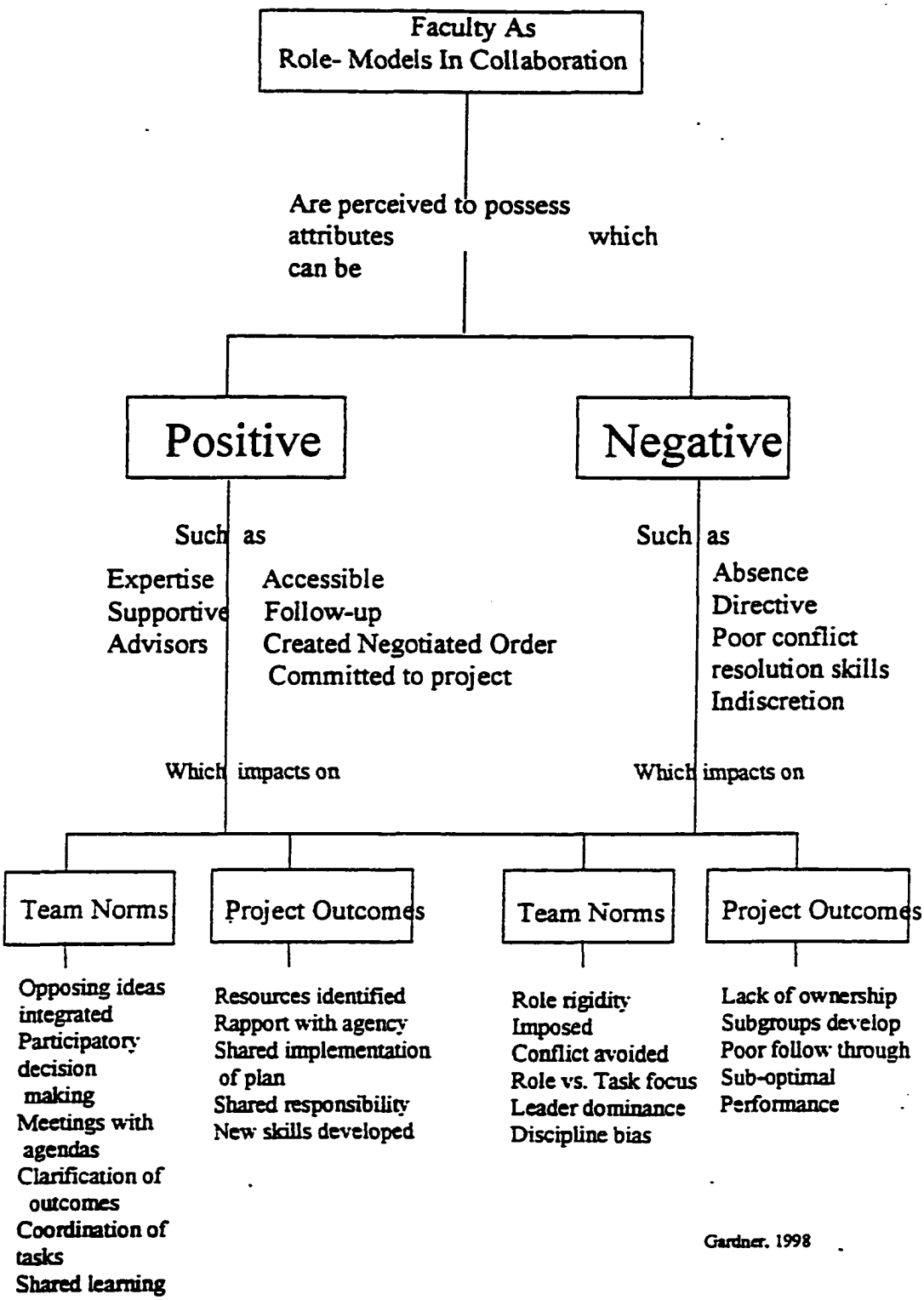
| Variables | Subscales | Missing Value Codes | Valid Cases | Original Coding | Recoding | Level of Measure | # of Items | Means | SD | Z Score | Reflected Z Score | Square Root & Reflected Z Score | Reflected M & SD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflict | Subscales | | | | | | | | | | | | | |
| | Emotional | | 117 | 1 thru 5 | 0 thru 4 | Interval | 4 | 4.37 | 3.07 | 5.06 | | 1.13 | 3.08 | .81 |
| | Task | | 117 | 1 thru 5 | 0 thru 4 | Interval | 4 | 5.57 | 3.21 | 3.80 | | 2.06 | 2.77 | .74 |
| ICS | Total | 8 Missing Values | 117 | 1 thru 7 | 0 thru 6 | Interval | 25 | 88.32 | 20.25 | -1.05 | 1.05 | | 41.15 | 20.25 |
| Power | Subscales | 37 Missing Values | | | | | | | | | | | | |
| | INFORMAL | | | | | | | | | | | | | |
| | Information | | 117 | A or B | 0 to 1 | Interval | 10 | 5.94 | 2.35 | -1.60 | 1.60 | | 5.11 | 2.35 |
| | Expert | | 117 | A or B | 0 to 1 | Interval | 10 | 4.14 | 2.32 | 1.11 | | | | |
| | Good | | 117 | A or B | 0 to 1 | Interval | 10 | 5.96 | 2.39 | -1.25 | 1.25 | | 5.03 | 2.39 |
| | FORMAL | | | | | | | | | | | | | |
| | Authority | | 117 | A or B | 0 to 1 | Interval | 10 | 3.68 | 2.14 | 1.23 | | | | |
| | Reward | | 117 | A or B | 0 to 1 | Interval | 10 | 5.71 | 2.23 | -1.62 | 1.62 | | 5.58 | 2.23 |
| | Discipline | | 117 | A or B | 0 to 1 | Interval | 10 | 4.32 | 2.61 | 0.58 | | | | |

# APPENDIX G

## Qualitative Analysis: Collaboration Behaviors Identified

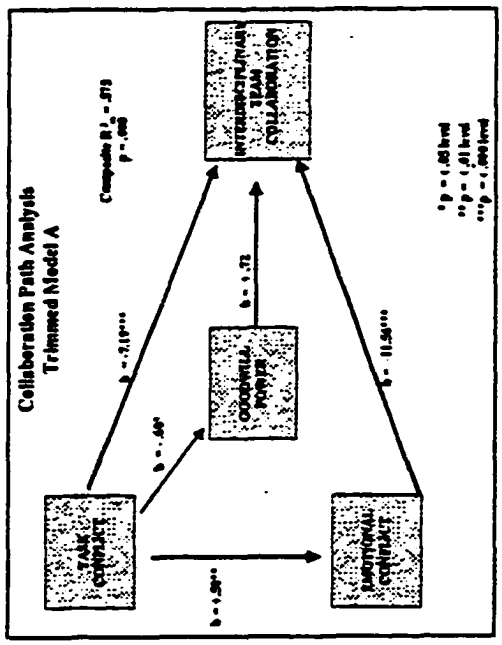
| Categories (based on operational definitions) | Initial Words or Phrases from Focus Groups |
|---|---|
| **Interdisciplinary Team Collaboration Dimensions** | |
| **1) Joint Planning and Decision Making** | |
| **Activities were jointly determined-coordinated** | Share ideas |
| **Share ideas** | Shared decision-making-using consensus |
| **Shared participation** | We were all involved in planning |
| | Shared responsibility/accountability /Compromising |
| | Everyone has a say before decisions were made |
| | Tasks were coordinated |
| **All accountable for the outcomes** | Carry out tasks-follow through |
| | Defined roles for all members |
| | Shared workload |
| **2) Goal Focused Role Learning** | |
| **Shared goals** | Role flexibilty- |
| **Role developed based on needs to reach goals** | Exposure to expertise of others in different disciplines |
| **Learn from other disciplines** | Learned about different roles |
| | Learning from each other |
| | Shared goals |
| | Share knowledge and experience |
| **3) Problem Centered** | |
| **Focus of discussions were on the task and project** | How to share the workload was a real problem |
| | Logistics for meetings-when and where to have meetings |
| **4) Reciprocal Trust and Respect** | Shared information and expertise during the meetings |
| **Suggestions/ideas from other disciplines improve** | Open communication |
| **my own learning** | Listening validated by the feedback and questions |
| | Express concerns and doubts openly |
| | Shared workload |
| | Respect for each other |
| **5) Leadership Shared** | |
| **Leadership can change in the team** | She really made us feel like we were part of something |
| **based on expertise needed to accomplish** | really important |
| **a particular task** | Guides |
| | Helped to create a structure that included everyone |
| | Different members sort of "lead" at different times |
| **6) Equality of Influence** | |
| **Equal influence of all disciplines** | People contributed in different but useful ways |
| | We really treated each other as peers |
| | Members suggestions were valued |
| **7)Other Dimensions Described** | |
| | Collaboration came at the end |
| | "critical" mass of people working together, |
| | not everyone, did their fair share |
| **8)Blocks to collaboration** | |
| | Stereotyping comments concerning discipline |
| | Faculty perceived to be uncommitted |
| | Failure to carry out tasks-follow through |
| | Lack of shared decision making |
| | Conflict over different expectation |

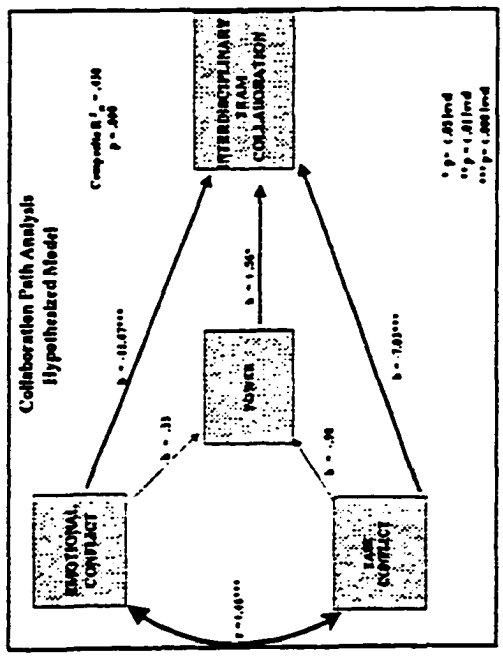
Appendix H

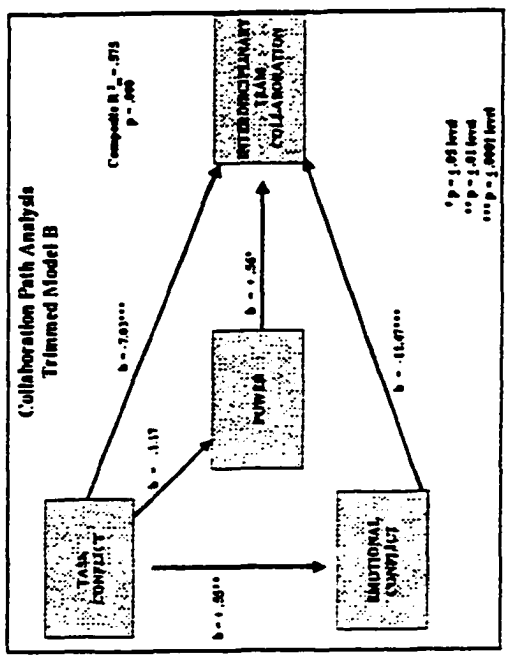



Gardner, 1998

# APPENDIX I
## Path Analysis Models



# CURRICULUM VITAE

Deborah B. Gardner was born on May 13, 19[redacted] in Walnut Ridge, Arkansas, and is an American Citizen. She hold's a bachelor's in science nursing degree from Oklahoma Baptist University (1973) and a master's degree in psychiatric mental health nursing from the University of Hawaii (1979). She began her nursing career in the U.S. Navy working in both surgical and cardiac intensive care. After graduate school and postgraduate work in family systems theory at Georgetown University, she worked for Kaiser Permanente in Honolulu Hawaii for six years as a clinical nurse specialist and hospital liaison in mental health. From 1987 to 1994, she worked as a clinical nurse specialist and administrator at the National Institutes of Health in mental health research. A member of Sigma Theta Tau, SERPN, and ANA, she has published several articles on interdisciplinary collaboration. As a doctoral student at George Mason University she has been an adjunct faculty member and part time consultant.