DECISION MAKING OF A HOSPITAL BASED
HOME CARE TEAM DURING CASE
MANAGEMENT MEETINGS

by

Lynda S. Baum

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SUPERVISORY COMMITTEE APPROVAL

of a thesis submitted by

Lynda S. Baum

This thesis has been read by each member of the following supervisory committee and by majority vote has been found to be satisfactory.

[Signatures]

Dale A. Lund

[Date of Approval]
To the Graduate Council of The University of Utah:

I have read the thesis of Lynda S. Baum in its final form and have found that (1) its format, citations, and bibliographic style are consistent and acceptable; (2) its illustrative materials including figures, tables, and charts are in place; and (3) the final manuscript is satisfactory to the Supervisory Committee and is ready for submission to the Graduate School.

[Signature]
Member, Supervisory

Approved for the Graduate Council

[Signature]
ABSTRACT

The group decision-making process and resultant decision outcomes of an interdisciplinary hospital-based home care team were described using an interaction process analysis method and an audit of client treatment plans. The team demonstrated many characteristics of a collaboration stage of group development. Positive, nontask behavior was high and there was little evidence of preplanning or standardization of problems, objectives or treatment. All decision procedures associated with production of high quality decisions were used but some may not have been used enough. Approximately 90% of the team's decisions were written in the client treatment plans but evaluation of the decisions was difficult. Almost 40% of the objectives were unmeasureable and 30% of the problems were insurmountable. This study suggests that the decision work accomplished by an interdisciplinary health team during case management meetings may be partly a function of how that work is planned, organized, directed and controlled.
To Kerry, Kerry, Jr., Tatia, Christian, Buffy, Patrick,

Britta, and Natalie for their loving support.
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CHAPTER 1

INTRODUCTION

One of the ways in which the role of nursing is changing is in the area of management. In the past, nurses were brought from a clinical setting directly into positions which required them to manage and supervise other nurses. But with new approaches to health care delivery and the accompanying changes in organizational design, nurses are also being given the opportunity to manage groups made up of individuals from a variety of other disciplines. One such group is the interdisciplinary health team.

The idea of teams has been dominant in health care for at least thirty years (Brown, 1982), and the terminology connected with it has been used for so many different purposes that it is necessary to explicitly define the word "team" as it will be used in this thesis. An interdisciplinary health care team is a group of professionals with representatives from both technical and social disciplines who meet together to communicate, collaborate and consolidate information for the common purpose of planning health care delivery.

"Collaboration" is the ultimate stage of group development that is characterized by supportive, open relationships, free participation, individual commitment to group goals, good listening and sharing of information, resolution of conflict and disagreements as they occur, collective decision making when all resources are
needed and individual decision making when an expert is required; evaluation of performance that is growth producing, appropriate differentiation and integration of labor, shared leadership, and suitable attention to group process (Cohen, Fink, Gadon, & Willits, 1980).

This idea of collaboration or collegiality is evaluated (Feiger & Schmitt, 1979), taught (Croen, Hamerman & Goetzel, 1984; Milne, 1981) and facilitated (Gaston, 1980) as the normative expectation for health care teams, but there is a growing awareness that a gap exists between the rhetoric of teams and what actually exists (Banta & Fox, 1972; Given & Simmons, 1977; Wise, Rubin & Beckhard, 1974).

Investigators from the behavioral sciences are finding that groups neither necessarily produce the best decisions of which members are capable (Maier & Solem, 1952; Thomas & Fink, 1961) nor are members always highly motivated to carry out the group's decisions (Hoffman & Maier, 1961; Maier & Hoffman, 1964).

From the health sciences, authors report a general absence of collaborative behavior (Feiger & Schmitt, 1979; Temkin-Greener, 1983), and in the few rigorous studies on team development interventions, there is a lack of evidence that productivity can be increased (Kaplan, 1979; Woodman & Sherwood, 1980).

There seems to be a general consensus from across several disciplines that bringing a group of people together for the purpose of solving complex problems will not necessarily produce appropriate sharing of leadership or effective flow of information, let alone successful problem solving and goal attainment. In fact, even though groups are relatively simple to organize, science has found them to be
so complex that even the basic paradigms are undergoing revision (Mills, 1979).

Although effective groupwork is not easily achieved, a group approach to decision making is the method of choice if (a) there is a quality requirement such that one solution is likely to be more rational than another, (b) no one person has enough information to make a high quality decision, (c) the problem is complex, and (d) acceptance of the decision by subordinates is critical to effective implementation (Vroom & Yetton, 1973).

Research supporting this contention includes that of Heise and Miller (1951) who found that the greater the task complexity or diversity, the more appropriate to utilize the resources of a number of people, and Steers (1977) who concluded that the greater the need for individual team members to make adjustments and to be committed to a plan of action, the greater the need for them to share in the original planning and decision making.

The problem, then, is not whether group decision making is ever appropriate, but whether the obstacles to productive group decision making can be clearly identified and realistically overcome. In view of the fact that some interventions are not working and theorists are reexamining their assumptions, it seems that more information is needed about how teams make decisions and whether or not the decisions are a result of known quality producing procedures and principles. As suggested by the literature, an interdisciplinary team presents an immediate management problem to a nurse with the responsibility of planning, organizing, implementing and evaluating team performance.

Management work is to increase the degree to which selected
actions contribute to the performance of an organization and a management problem is a discrepancy between what is desired and what actually exists (Charns & Schaefer, 1983). There are two prerequisites to defining a problem: It is necessary to understand (a) what goal is to be achieved, and (b) how present outcomes differ from the desired goal.

In attempting to establish what kind of performance outcome is desirable for an interdisciplinary team, another clarification is necessary. In the past, the outcome of an interdisciplinary health team has been measured by the quality of care clients receive. Certainly, that is an ultimate measure of team effectiveness, but it does not measure the quality of the team's decisions. The development of and choice among alternatives is a different kind of work than the effective implementation of a group decision (Charns & Schaefer, 1983). To further illustrate, decision making results in a client treatment plan which then becomes the input for direct care of the patient (see Figure 1).

Client satisfaction and well-being is an outcome of direct patient care and is contingent upon the behavior of individual professionals who may or may not be carrying out group plans. It is important, therefore, to differentiate between the outputs of group collaboration efforts and the results of direct work so as to clearly identify where problems occur. This study will focus on team decision making rather than direct patient care.

As was stated earlier, in order to define a team decision-making problem, it is necessary to know what standard of decision outcome is desired and where the team stands in relation to that standard. No
Figure 1. Separation of decision making from direct work.

attempt will be made to define a quality decision beyond what the research suggests, or even to evaluate a team against those parameters. The purpose of this study is to describe both the throughput and output of a decision-making interdisciplinary team in an attempt to obtain more information about the problem.

Problem Statement

The purpose of this study is to describe (a) the group decision making process, and (b) the resultant decision outcomes of an interdisciplinary hospital based home care team by documenting interaction during case management meetings and auditing client treatment plans.
Definitions

Group Decision Making Process

There are two aspects to group throughput, or interpersonal activity, that produces a plan of action: (a) how a team functions to produce a decision, namely, to what extent two or more individuals, regarded as a unit, interact to either maintain the group's cohesion or accomplish group work, and (b) what a team discusses before making a decision, which in this study focuses on the extent to which individuals examine problems, objectives, alternative interventions, contingencies, implementation and evaluation of results.

Decision Outcomes

Decision outcomes are the actual output of the group decision-making process which includes problem definitions, objectives, interventions, and plans for implementation that are not verbally discarded by the team during case management meetings and which may or may not be written down.

Interdisciplinary Hospital Based Home Care Team

An interdisciplinary hospital based home care team is a group of health care professionals, from various disciplines, that meets for the purpose of planning primary care and promoting overall health goals of housebound clients who do not require institutional care (nursing home, hospital) but whose health needs require close family support and professional supervision.

Case Management Meeting

A case management meeting is a regular time period set aside for
team members to come together and discuss the treatment plans of eligible clients with complex, multidimensional health problems.

**Client Treatment Plan**

Client treatment plans are official documents listing the client's health problems along with the goals, objectives and interventions designed to improve the client's quality of life. These plans are a direct result of case management meetings and list those who are specifically assigned to carry out interventions. They are to be signed by the client or client's caregiver and all members of the team involved in the client's primary care.
Notes

1See Arndt and Huckabay (1980) for a thorough discussion of systems theory as it applies to nursing administration.
CHAPTER 2

LITERATURE REVIEW

Research concerning both the process and outcome of group
decision making is reviewed, proceeding from a discussion of groups in
general to specific literature on interdisciplinary health teams.

**Group Decision-Making Process**

Most of the research on group decision making comes from the
behavioral sciences. Formidable collections of information about
small groups have been collected (Hare, 1978; Berkowitz; 1978) but
there is no integrated theory of group decision making.

Models range from the normative in which decision-makers are
completely rational with knowledge of every alternative and subsequent
consequence (Duncan, 1973) to descriptive designs that recognize the
prevalence of human subjectivity, scarce time and resources, and
cognitive limitations (Simon, 1976). Other models focus on the
variables that affect decision making such as the input, output and
feedback of an entire system (Bailey & Claus, 1975) or the influence
of conflict and uncertainty (Shukla & Breindel, 1983) on decision-
making efforts.

Modeling of human interaction has focused on small groups in
tightly controlled situations (Clarkson, 1968; Swinth & Tuggle, 1971)
resulting in major factors that limit the applicability of results
from laboratory to practice. Also, some process models tend to be
abstractly mathematical and difficult to tie to observable behavior (Davis, 1973; Shiflett, 1979; Steiner, 1966).

The model of interest for this study was proposed by Hoffman (1979) and is intended to describe the functioning of major variables that are known to make up or impact the group process (see Figure 2).

Briefly, what can be understood from the model is that a group is an open system in which two main functions of interaction (task and maintenance) are thought to be simultaneously activated when a group attempts to solve a problem, and are carried out either implicitly or explicitly within the context of group norms and other related influences (Hoffman, 1979).

"Task" activities, such as problem definition or solution generation, evaluation and adoption, are concerned with selecting and carrying out group work or purposes. "Maintenance," or social-emotional functions, address the general ability of members to

interact effectively with each other through such activities as relief of tension, mediation, and encouragement.

Problem solving groups in organizations rarely discuss their social-emotional issues explicitly and almost universally follow a norm that they not be discussed. Yet difficulty at the social-emotional level can affect decision making at any phase (Hoffman, 1979).

Hare (1978) summarizes six major factors affecting the interaction process: personality, social characteristics, group size, task, communication network, and leadership. Other variables include architectural and geographical meeting space (Rubin & Beckhard, 1972). Components of group process that have greatest relevance for organizational decision making are (a) personality characteristics of group members, particularly an individual's capacity for abstraction, assimilation and projection of information, (b) group dynamics or degree of homogeneity, cohesion and cooperation, and (c) communication structure (Ebert & Mitchell, 1975).

Besides all the individual and situational factors that impact on a group's effectiveness, groups are known to go through developmental stages (Cohen, et al., 1980; Lowe & Herranen, 1981). Because progress through these phases is not inevitable, few groups actually reach the ultimate and last stage of "collaboration," "team maintenance," or "growth" which may explain the general absence of teamwork in actual practice. Successful interventions to facilitate movement through stages have been reported (Dalkey, 1969; Delbecq, Van de Ven, & Gustafson, 1975; Osborn, 1957). One interesting study showed pre-meeting meditation and relaxation to have a positive effect on a
group's ability to collaborate (Kindler, 1979). This finding is not surprising since others have found that stress, particularly from time pressure, causes decision makers to revert to one of several decision making pathologies (Janis & Mann, 1977).

Different problem characteristics require different combinations of abilities and information (Hackman & Morris, 1975; Hoffman, Friend & Bond, 1979). There has been some disagreement about which communication structure is more conducive to maximum group performance. Studies by Lawson (1964) and Shaw (1954) indicate that decentralized (circle) networks are more efficient for complex tasks. Mulder (1960) argued that even though circles have superior performance in the beginning, the difference tends to decrease over time and a centralized decision structure becomes more efficient.

Several studies demonstrate that the nature of the task, rather than an imposed communication network, dominates the behavior of the group and that decentralization does not necessarily mean an effective group (Davis, 1973; Faucheux & MacKenzie, 1966; Hackman, 1975; Hackman & Morris, 1978; Steiner, 1972). Current thinking is that if the task calls for differentiated levels of expertise in a group, then the effectiveness of that group's process will depend upon the degree to which it gives influence to appropriate members and if the task calls for evenly distributed resources among the members of a group, then the effectiveness of the group's process will depend upon the degree to which influence is equally shared among the members (Cohen, Fink, Gadon, & Willits, 1980).

Heterogeneous groups have been shown to be more creative and innovative than groups with more similar member characteristics.
(Ghiselli & Lodahl, 1958; Hoffman, Harburg, & Maier, 1962; Pelz, 1956) and therefore lend themselves better to the task of an interdisciplinary team. Duncan (1976) goes further to suggest that a project group of diverse membership be used for decision making and a more homogeneous functional work group be used for implementation.

Most of the systematic study of ongoing problem solving groups has been limited to the study of participation (Fisek & Ofshe, 1970) or "process loss" (Shiflett, 1979; Steiner, 1966). It has been found that behaviors expressing aggression, power, status or insecurity can impede attempts at problem solving (Mann, Gibbard & Hartman, 1967). Positive feelings among members promote security and decrease the risk of suggesting unusual solutions, as in successful brainstorming sessions (Berkowitz & Levy, 1956). However, initial unanimity about a solution can also create such euphoria that the group fails to recognize when the solution is wrong (Davis, 1973; Maier & Solem, 1952).

Some investigators began to probe deeper into the content of what was being said. It was found that members' acceptance of a group's decision shows little or no correlation with the objective quality of a solution (Hoffman & Maier, 1961). Participation rates and consistent support of particular solutions are definite factors in biasing the outcome of problem solving processes (Blake & Mouton, 1961; Hoffman & Clark, 1979). These findings seem to suggest that it is more than just how individuals interact that determines the quality of a decision.

Janis and Mann (1977) have extracted from the extensive literature on effective decision making, seven major criteria or
procedures that result in high quality decisions. This normative model includes (a) generation of a wide range of alternatives, (b) discussion of objectives and the values implicated by them, (c) discussion of positive and negative consequences of each alternative, (d) intense search for new information relevant to further evaluation of alternatives, (e) correct assimilation of new information or expert judgment even though it does not support the preferable choice of action, (f) reexamination of positive and negative consequences of every alternative, including those previously rejected, and (g) detailed provision for executing a course of action with attention to contingency planning in case of major interference. Two procedures not included in this model but which are considered by many authors to be vital to effective decision making are (a) adequate definition of the problem and (b) evaluation of the effect of solution implementation on the problem.

Maier (1970) used research results to propose several decision-making principles but his ideas were never organized into a theory. Some of his advice to discussion leaders was to (a) direct efforts toward overcoming surmountable, rather than insurmountable, obstacles, (b) use available facts even when they are inadequate, (c) generate solutions from the problem to the goal rather than vice versa, (d) spend more time focusing on the problem and less time on reaching a solution, (e) use disagreement constructively to produce more alternatives and reduce the undesirable aspects of conformity, (f) separate idea generation activity from idea evaluation, (g) avoid imposing predetermined solutions on the group.
Team Decision Making

Bales (1951) developed a diagnostic tool for analyzing both the task and social-emotional aspects of group process and it has been used by behavioral scientists in at least twenty-one different studies (Bales & Hare, 1965). Hoffman (1979) also devised a method for examining the way in which participation either for or against a particular solution affects the actual adoption of one, but there is no indication that either of these instruments has ever been used to describe an interdisciplinary health care team.

Feiger and Schmitt (1979) videotaped and coded the interaction of four interdisciplinary health teams in order to describe the amount of "collegiality" that existed but the method produced only a total number of acts initiated and received and did not describe any other facet of group process.

Other studies of teams reported by the health and allied health professions are primarily descriptive and have to do with the effects of organizational climate (Gaston, 1980) and education (Mazur, Beeston, & Yerxa, 1979; McPherson & Sachs, 1982; Stein & Garcia-Shelton, 1981) on team functioning.

Much is said about what characterizes teamwork (Lee, 1980; Norville, 1983), but the product or service that a team is to provide has not been clearly established (Spitzer & Roberts, 1980; Temkin-Greener, 1983). Studies specifically addressing health team productivity either measure the effects of direct work (Feiger & Schmitt, 1979; Shultz, McGlone, Kinderknecht, & Morton, 1977) or demonstrate the problem of differing expectations of quality care (Hinshaw and Oakes, 1977).
One of the conclusions of a recent historical study on interdisciplinary teams (Brown, 1982) is that teams have probably never been fully planned, implemented and evaluated. The Veteran's Administration has organized numerous hospital based home care teams throughout the United States in an effort to provide comprehensive health care within the homes of eligible veterans but no studies have been reported in the literature on the effectiveness of hospital based home care team decision making.

A few researchers began to address the issue of interdisciplinary groups' decision making either from a broad organizational systems perspective (Chase, Wright & Ragade, 1981) or within the bounds of a clinical setting (Mira, 1969). Mira's (1969) approach is practical but analyzes only the decision outcomes written in official meeting reports. A followup study of Brick and Swinth (1980) demonstrated that a computer language model could be developed that would match routine clinical group decision making to a statistically significant level.

The principle justification for this study is that no one has examined an interdisciplinary health team's decision-making process and outcome in its entirety.
CHAPTER 3

METHOD

Since there is such a complex array of variables affecting group decision making and such difficulty in measuring them, it is more appropriate at this point to describe the extent to which selected variables exist than to infer cause and effect. Even if the problem were already adequately identified, such designs as a double blind experiment are not feasible due to the difficulty in disguising interventions. Furthermore, it is difficult to randomly assign participants or establish a meaningful control group without introducing artificiality. The opportunity to make statistical inferences is sacrificed to retain the natural characteristics of the decision-making process and outcomes of the team being studied.

Measurement of Decision-Making Process

There are two aspects of a team's decision-making process that require attention. First, the rate and manner of individual participation within general interaction categories will reveal how teammembers work together. Second, a closer examination of what is being said will help determine whether the team is being utilized for the purpose it was intended, namely, to consolidate specialized information for the common purpose of planning primary health care and promoting overall health goals of housebound clients.
**Interaction Categories**

Individual and group interaction was documented using Bales' (1970) well-formulated technique for classifying and analyzing selected facets of group interaction (see Figure 3).

This technique is supported by years of research and is based on the assumption that there is an empirical nature to human interaction, namely, that certain actions tend to have related effects on subsequent action. For example, questions usually stimulate answers and questions and answers can result in either positive or negative reactions. A and D are primarily the social-emotional areas of interaction and B and C are the task areas.

Even though a few changes in the naming and content of categories has been made by Bales since he first published his procedure, the nature of the unit and the scoring conventions are identical with the

|-------------------------------|------------------|--------------|----------|

**Figure 3.** Interaction process categories from *Personality and interpersonal behavior* (p. 92) by R. F. Bales, 1970, New York: Holt, Rinehart & Winston. Copyright 1970 by Holt, Rinehart & Winston. Reprinted by permission.
original. Abbreviated definitions of the most recent categories are:¹

**Seems friendly.** Raises other's status, gives help, reward, supportive agreement, obeys, chuckles or smiles for good will.

**Dramatizes.** Shows tension release, jokes, shows satisfaction, tells stories, fantasizes, exaggerates, symbolizes.

**Agrees.** Shows neutral acceptance, understands, concurs, complies, nods.

**Gives suggestion.** Tries to assume leadership on the task, asks questions for that purpose, decides, orients others.

**Gives opinion.** Evaluates, analyzes, expresses a feeling or wish, reflects, diagnoses.

**Gives information.** Gives neutral feedback that is factual or testable.

**Asks for information.** Requests facts or experience.

**Asks for opinion.** Requests information that requires speculation or evaluation.

**Asks for suggestion.** Proposes a submissive or tentative opinion, expresses confusion in a neutral, task-oriented way.

**Disagrees.** Rejects, reacts with unbelief or surprise, withholds help.

**Shows tension.** Evades due to conflict, acts anxious or embarrassed, laughs.

**Seems unfriendly.** Argues in support of a disagreement, shows antagonism, deflates other's status, defends or asserts self, shows irritation or inconsideration, attempts to dominate, leaves or otherwise acts inattentive.

Coding into the twelve, individual, interaction categories was
unnecessary for the purposes of this study but an explanation of them was given to provide a greater understanding of the more general categories of positive (P), negative (N), and task oriented behavior (A & Q).

Since only one investigator gathered the data for this study no interrater reliability scores were possible. Bales (1951) reported a score of .97 on his original method but other investigators found that act-by-act reliability could not be obtained above .61 (Waxler & Mishler, 1966).

**Decision-Making Procedures**

The content of Bales' categories was primarily designed to make inferences about personality and does not address the decision-making process itself. Hoffman and Maier's (1979) model focused on decision making but only the solution adoption aspect of it, so it was decided to adapt Bales' (1970) instrument.

Space was added at the top of Bales' (1970) Interaction Code Sheet for writing a shorthand of what was said and the subject category to which it belonged (see Figure 4). It was then possible to document the extent to which teammembers used various decision-making procedures before coming to a decision.

In assigning subject categories, an attempt was made to incorporate Janis and Mann's (1977) model for effective decision making as well as differentiate activity centering on problem identification and evaluation of goal achievement. General definitions of the subject categories are:

**Problems.** Any response attempting to introduce, clarify, analyze
Client: Date: 
Presenter of case: Absent: 
Treatment plan recorder: 
Board recorder: 

<table>
<thead>
<tr>
<th>Subject Category:</th>
<th>Description:</th>
</tr>
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<tbody>
<tr>
<td>1. seems friendly</td>
<td>2. dramatizes</td>
</tr>
<tr>
<td>3. agrees</td>
<td></td>
</tr>
<tr>
<td>4. gives suggestion</td>
<td>5. gives opinion</td>
</tr>
<tr>
<td>6. gives information</td>
<td></td>
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<tr>
<td>7. asks for information</td>
<td>8. asks for opinion</td>
</tr>
<tr>
<td>9. asks for suggestion</td>
<td></td>
</tr>
<tr>
<td>10. disagrees</td>
<td>11. shows tension</td>
</tr>
<tr>
<td>12. seems unfriendly</td>
<td></td>
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</tbody>
</table>

**Figure 4.** Interaction code sheet. P = positive & mixed interaction; A = answers; Q = questions; N = negative & mixed interaction. Adapted from Bales (1970).

or define an obstacle to the achievement of team goals; includes a discussion of any effects a problem has on any individual involved, whether it be client, family member, or health professional. Problems were differentiated according to areas of expertise. Medical (MP), social (SP), occupational (OP), and administrative (AP) problems are specifically defined in Appendix A.

**Objectives** (OB). Interaction addressing or defining ends and the time they are to be achieved; includes values implicated by ends.

**Interventions.** Discussion of methods for achieving ends or
solving problems. Interventions were differentiated according to area of expertise. Medical (MI), social (SI), occupational (OI), and administrative (AI) interventions are defined in Appendix A.

Positive/negative consequences (+/-). Any interaction discussing the advantages or disadvantages of pursuing a particular means to an end; the pros and cons of adopting a particular alternative.

Implementation (IM). Any discussion or decision involving when, where, how, or by whom an intervention is to be carried out; includes Contingency Planning (C) which is defined in Appendix A.

Evaluation (E). Review of the success or failure of interventions or assessment of progress toward objectives.

Measurement of Decision Outcomes

Decision outcomes were examined by auditing the client treatment plans for the answers to selected research questions. Since no known auditing tools were available for this kind of investigation, a Client Treatment Plan Analysis Form (see Figure 5) was devised by the investigator to more easily compile data. It provided a simple record of differences between what was decided in case management meetings and what was recorded in the treatment plan.

Sample

The selected sample is one of 49 Hospital Based Home Care (HBHC) teams instituted on an experimental basis within Veteran's Administration facilities throughout the United States. The HBHC program uses an interdisciplinary team approach in an effort to provide eligible veterans with individual medical, nursing, social, dietetic and rehabilitative services within the milieu of the
<table>
<thead>
<tr>
<th></th>
<th>Discussed but not written</th>
<th>Written but not discussed</th>
<th>Both written and discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Problems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Objectives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Interventions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Implementations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 5. Client treatment plan analysis form.

individual's home and family (Veteran's Administration [VA], 1981).

The program is essentially an outpatient program providing authorized services to individuals who require professional care and for whom return to an outpatient clinic on a frequently recurring basis is not feasible. The objective is "to obtain optimum patient health through development of a suitable home environment and to establish a proper climate in the home for continued and preventive care" (VA, 1981, chap. 30, p.6).

The team is responsible for writing and implementing the patient care plan, as well as optimizing program operations, utilization and evaluation. One team member is assigned as coordinator with the responsibility of planning, directing, monitoring and evaluating HBHC program operations. The physician assigned to the team is to supervise direct patient care and guide the team toward the achievement of treatment objectives.
The HBHC team featured in this study was chosen because it has a nurse coordinator, it was accessible, the team was willing to be studied, and because the Veteran's Administration was interested in the resulting information.

The team is composed of four nurse practitioners (two male and two female with one of the females acting as coordinator), one social worker (male), one occupational therapist (female), one medical doctor (male), and one secretary (female). The team is also authorized a dietician but one was not available during the time this study was conducted.

A case management meeting is held on a new patient after the social worker and assigned nurse practitioner have made a home visit. The occupational therapist is also requested to make a premeeting if warranted by the patient's condition. Each professional writes his or her own assessment and the nurse practitioner leads the case discussion. Other team members (excluding the physician) take turns writing on the board or the client treatment plan during the meeting. Client treatment plans are reviewed every 60 days as long as the client is in the HBHC program and the dietician and physician may make home visits when necessary.

The investigator's contact with the team was limited primarily to these biweekly case management meetings which were always held in the morning in the HBHC conference room of the VA hospital. Permission to conduct the study was granted by both the VA Research and Development Committee and the Review Committee for Research with Human Subjects Institutional Review Board at the University of Utah.
Materials

A videocamera mounted on a tripod and connected to a deck type video recorder was used to videotape case management meetings. The tapes were later replayed on a TV screen for the purpose of coding interaction and procedures. The data from the coding sheets was entered into a computer. Copy machines were used to duplicate client treatment plans before and after the meetings.

Procedure

Data for this descriptive study was gathered by only one investigator who videotaped the biweekly case management meetings for a 3 month period and documented resultant changes in the client treatment plan.

Since seating arrangement has been demonstrated to have an effect on interaction, team members were instructed to sit in the same place each time the meeting was filmed while the investigator acted as a nonparticipating observer. Notes of the meeting were written by the investigator at the top of the Interaction Code Sheet (see Figure 4) and subsequent changes in the treatment plans were marked in yellow.

After the researcher had become thoroughly familiar with the kind of behaviors that characterize each of Bales’ interaction categories, the videotapes were played in a stop-and-go fashion and all the verbal and nonverbal interaction was categorized, beginning when the client was introduced by name and ending when the group indicated the case discussion was closed. In other words, the social-emotional activity that often precedes and follows the actual case presentation was deleted from this study. Symbols were used to identify each person (in
this case, "Y" for the secretary; "1" for the team coordinator; "2", "3", and "4" for the other nurse practitioners; "S" for the social worker; "M" for the physician; and "O" for the occupational therapist).

Acts were scored by writing down, in the appropriate category on the Interaction Code Sheet, the symbol for the person sending and receiving the message, i.e., the social worker speaking to nurse practitioner 1 would be entered as S1, the physician speaking to the secretary would be entered as MY, etc. Messages sent to or from the entire group were designated by a "G" and then later, each team member involved was counted as having received or sent a message.

Individuals were counted as sending a group message if, while talking, they did not look at anyone in particular, or their eyes went from person to person as they talked. Acts initiated by the group usually had to do with laughing or listening behaviors.

Leaving temporarily to take care of other business was categorized under "not listening" because it interfered with the progress of the meeting even though it was not meant to be unfriendly. For purposes of evaluation, it was identified separately on the code sheets by circling the symbols of who was not listening to whom. The content of what was said (written at the top of the Interaction Code Sheet) was then labeled (MP, MI, OI, C, etc.) according to the part of the decision-making process into which it fit.

Finally, an audit of client treatment plans (VA Form 507 & 10-0043 which was an updated version) was conducted to document how much of the plan was actually written and reviewed, as well as the number of unsolvable problems, unmeasureable objectives, and recurrent
problems with the same objectives and interventions.

An item of discussion was counted as being written regardless of when it was actually recorded on the plan because items were frequently written in one meeting and then discussed during several subsequent meetings. An additional score was given under "number of objectives" if an expected date of completion was mentioned or written.

Because writing on the treatment plan is a major portion of meeting activity, changes made in the plan were coded as either "positive" if it was supportive, an "answer" if it was a suggestion, and "negative" if it was decided upon in the meeting but not written down. These changes were written on the Interaction Code Sheet in red to distinguish them from other acts.

The physician also took notes during the meetings and approximately 2 weeks after the filming began, he changed one of the recording procedures. The official client treatment plan had a sheet for everyone's signature as well as a space for summarizing the 60 day review on each client. Originally, the summary was written by the secretary, but the physician began writing his own version of the treatment plan on Form 507 (a progress note) and that is what everyone then signed. To the extent that it was in agreement with the proceedings of the meeting, the physician was coded as giving help (P). Otherwise, it was coded as a suggestion (A) or as negative behavior (N) if it was in obvious disagreement with what the team seemed to have decided. Due to the tedious and time consuming nature of this project, a random sample of 20 discussions (constituting 33% of the total clients discussed during the 3 month period) was selected.
from the available tapes. A computer program was also written (see Appendix B) to accurately organize all the data into manageable matrices. Descriptive statistics were then used to answer the following research questions which were designed to reveal certain aspects of general interaction, decision making and decision outcome.

**Research Questions on Team Decision-Making Process**

**General Interaction**

1. What proportion of the total interaction do individual team members send and receive?

There was a total of 8 team members, 20 clients discussed, and 50,371 verbal and nonverbal acts recorded in the sample. For purposes of comparison with other studies, however, group size was controlled by including only those discussions that had all 8 team members present. These data included 9 discussions (45% of the total) and a total of 27,118 recorded acts. Total acts both sent and received by each team member were then divided by the total team acts in the controlled sample to obtain a percentage.

2. Does individual participation vary with the kind of problem or intervention discussed? The total task activity sent (questions + answers) by each team member in each subcategory of problems and interventions (MP, SP, MI, SI, etc.) was divided by the total team task activity in that category. Even though there is some task activity mixed in with positive and negative interaction, it was found that separating the task activity out was more differentiating in answering this question.

3. Does the proportion of social-emotional activity to task
activity change over time?

Group size was controlled in this comparison since it is a major factor affecting interaction (Hare, 1978). A group size of 8 was selected because that size group discussed 3 clients in each of three, fairly evenly spaced periods (see Table 1). The percentage of total group acts spent on social-emotional activities (positive + negative) and task activities (question + answers) was then calculated for each of the 9 client discussions. It was also calculated for the rest of the 20 client discussions to see if group size had any apparent effect on the proportion of social-emotional activity to task activity.

4. To what extent does the team, as a group, engage in each of the interaction categories (positive, questions, answers and negative)?

The team's total activity in each interaction category was divided by the total acts overall to obtain a percentage (interaction sent is equal to that received for the team as a whole). The percentage of "not listening" as a subcategory of negative interaction

Table 1

<table>
<thead>
<tr>
<th>Period</th>
<th>Date</th>
<th>No. Clients Discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/1/85</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>8/22/85</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>8/24/85</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>10/17/85</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>10/19/85</td>
<td>2</td>
</tr>
</tbody>
</table>
and "writing on the treatment plan" as a subcategory of positive interaction were also calculated.

5. To what extent do individuals initiate and receive acts in each of the interaction categories?

An individual's total activity in each interaction category was divided by the total team acts in that category to obtain a percentage. "Not listening" was not included in the negative category this time because the majority of it was due to being summoned out of the meeting temporarily by someone else and was therefore not initiated by the team member.

Decision-making procedures

1. What proportion of the total task-related interaction is spent on problems, objectives, interventions, positive and negative consequences, implementation, contingency planning, and evaluation?

The total task-related interaction (questions + answers) for all 20 clients by the entire team on each of the decision-making procedures was divided by the total task-related interaction overall to obtain a percentage.

2. Does the proportion of positive and negative interaction sent vary with the discussion of each decision-making procedure?

This question was answered by calculating a percentage of total negative and positive interaction sent for each of the decision making categories. "Not listening" was excluded from the negative acts for reasons stated earlier and contingency planning was included with implementation.

3. Does individual participation vary with the discussion of
objectives, positive and negative consequences, implementation and contingency planning?

The total task activity (question + answers) sent by each team member in each of the decision-making categories of interest was divided by the total team task activity for that category to obtain a percentage.

**Research Questions on Decision Outcomes**

1. Of the total plan discussed, what percent was not written?
   
The number of plans apparently decided on but not written were divided by the sum total of plans decided upon.

2. Of the total plan written, what percent was not discussed?
   
   Certain aspects of implementation, such as those responsible for carrying out an intervention, were not discussed directly but could be inferred because the responsible person reported and it was obviously understood that they were responsible. In these cases, they were counted as having been discussed. However, if someone was written down as the person accountable for the carrying out of a plan and they were either no longer a part of the team or had rearranged their responsibilities, it was counted as written but not discussed. The percentage was derived by dividing that part of the plan that was written but not discussed by the sum total of the plan that was written.

3. What is the proportion of medical, social, occupational, and administrative problems identified in the client treatment plan and how does that compare with the participation associated with each?
   
   This proportion was measured by counting the total number of each
kind of problem recorded in the treatment plan and dividing by the total number of problems in all. Participation was figured by taking the total task-related interaction for all 20 clients by the entire team on each of the different types of problems (MP, SP, OP, and AP) and then dividing by the total task-related interaction for all problems to obtain a percentage.

4. Of the total problems, what percentage was insurmountable, as written?

A problem was considered insurmountable, as written, if it could not be alleviated, either because the patient was too high risk or there was no curative treatment. Amputation, cancer and organic heart disease are examples. A problem was counted every time it was written, whether it was listed on a previous patient or not. Problems that had been resolved but were still on the client treatment plan were also counted in the total problems.

5. What percentage of the total objectives written were not measurable?

"To walk 40 feet to the bathroom three times a day by 9/26/85" is an example of an objective stated in measureable terms. "To minimize stress" or "to maximize independence" are examples of unmeasureable objectives. Both long term and short term objectives were counted even though they were often quite similar. Whether or not the objective was realistic was not considered, but only whether a specific change could be determined. For example, to "prevent falls" may have been out of the exclusive control of the team but it was possible to document whether falls occurred.

6. How many problems occurred in more than one patient, and of
the objectives and interventions written for those problems, what percentage were repeated?

If 3 patients had the same problem listed, they would most often have a different number of objectives and interventions written (to fit the needs of the particular patient). The interest here was only those objectives and interventions that seemed to be routine.
Notes

1See Bales (1970) for a more complete set of coding instruction.
CHAPTER 4

RESULTS

One investigator compiled these data from a random sample of 20 client case discussions of a hospital based home care team. Research questions were organized within the general subjects of (a) team decision-making process, and (b) team decision outcomes.

Team Decision-Making Process

Research questions were separated according to whether they addressed general interaction or decision-making procedures.

General Interaction

1. What proportion of the total interaction do individual team members send and receive?

   No one participated more than 24% or less than 6% of the time and the number of acts received were very close to the number initiated for each individual (See Table 2). This indication of collaboration was unexpected in view of the complaints voiced toward teams in the literature.

2. Does individual participation vary with the kind of problem or intervention discussed?

   For the most part, individual participation varied according to responsibility and expertise. Almost one third of the interaction on medical problems and interventions was contributed by nurse
Table 2

Interaction Matrix in Percentages for Group Size Eight

<table>
<thead>
<tr>
<th></th>
<th>4</th>
<th>S</th>
<th>M</th>
<th>2</th>
<th>3</th>
<th>1</th>
<th>0</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acts initiated</td>
<td>24.1</td>
<td>16.0</td>
<td>14.2</td>
<td>13.2</td>
<td>9.7</td>
<td>9.0</td>
<td>7.4</td>
<td>6.4</td>
</tr>
<tr>
<td>Acts received</td>
<td>27.2</td>
<td>11.2</td>
<td>14.4</td>
<td>13.9</td>
<td>10.8</td>
<td>8.1</td>
<td>8.0</td>
<td>6.3</td>
</tr>
</tbody>
</table>

Note. Numbers 4, 2 & 3 = nurse practitioners; S = social worker; M = physician; 1 = nurse coordinator; 0 = occupational therapist; Y = secretary.

practitioners 2, 3 and 4 (See Table 3). Another 10% per medical category was contributed by the physician.

The greatest amount of participation on social problems and interventions was that of the social worker (S), followed by nurses 2, 3, and 4. Note that the proportion of participation in the area of expertise was considerably greater for the social worker than for anyone else.

Occupational problems were discussed almost equally by the physician and nurses 2, 3 and 4 and about half that much by the occupational therapist. In the area of occupational interventions, the participation rate of the occupational therapist exceeded others by an average of 35-23% which might be expected with her role definition.

Administrative problems were discussed primarily by the secretary, the physician, and nurses 2, 3, and 4. It was not surprising, however, that most of the administrative interventions were addressed by the team coordinator (nurse 1).

3. Does the proportion of social-emotional activity to task
Table 3

Individual Participation Percentages on Problems and Interventions

<table>
<thead>
<tr>
<th></th>
<th>% MP</th>
<th>% MI</th>
<th>% SP</th>
<th>% SI</th>
<th>% OP</th>
<th>% OI</th>
<th>% AP</th>
<th>% AI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>0.3</td>
<td>0.2</td>
<td>0.4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.5</td>
<td>20.0</td>
<td>2.0</td>
</tr>
<tr>
<td>1</td>
<td>0.9</td>
<td>2.3</td>
<td>0.7</td>
<td>2.7</td>
<td>1.6</td>
<td>4.8</td>
<td>6.7</td>
<td>40.3</td>
</tr>
<tr>
<td>2</td>
<td>26.1</td>
<td>28.4</td>
<td>27.9</td>
<td>16.5</td>
<td>22.1</td>
<td>13.8</td>
<td>20.9</td>
<td>12.9</td>
</tr>
<tr>
<td>3</td>
<td>25.2</td>
<td>15.9</td>
<td>11.0</td>
<td>9.2</td>
<td>11.2</td>
<td>20.3</td>
<td>11.5</td>
<td>5.0</td>
</tr>
<tr>
<td>4</td>
<td>32.0</td>
<td>38.7</td>
<td>19.2</td>
<td>3.9</td>
<td>22.3</td>
<td>12.4</td>
<td>15.4</td>
<td>7.8</td>
</tr>
<tr>
<td>S</td>
<td>3.5</td>
<td>2.0</td>
<td>35.1</td>
<td>60.5</td>
<td>3.4</td>
<td>7.1</td>
<td>4.5</td>
<td>7.6</td>
</tr>
<tr>
<td>M</td>
<td>10.4</td>
<td>11.1</td>
<td>3.7</td>
<td>4.2</td>
<td>26.9</td>
<td>2.1</td>
<td>18.5</td>
<td>20.9</td>
</tr>
<tr>
<td>0</td>
<td>1.6</td>
<td>1.4</td>
<td>2.0</td>
<td>3.0</td>
<td>12.5</td>
<td>39.0</td>
<td>2.5</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Note. MP = medical problem; MI = medical intervention; SP = social problem; SI = social intervention; OP = occupational problem; OI = occupational intervention; AP = administrative problem; AI = administrative intervention; Y = secretary; 1 = nurse coordinator; 2, 3, & 4 = nurse practitioners; S = social worker; M = physician; 0 = occupational therapist.

activity change over time?

The amount of social-emotional activity to task activity was quite erratic over the 3 month period. Social-emotional activity was an average of 12.6% greater than task activity in Period 1, 24.5% greater in Period 2, and 3.9% greater in Period 3 with task activity exceeding maintenance activity by 3% one time during the last period. The only other times that task activity exceeded maintenance activity was once by 22% when 3 nurse practitioners were absent and another time by 7% when 1 nurse practitioner was absent.

4. To what extent does the team, as a group, engage in each of the interaction categories (positive, questions, answers and negative)?

Overall, this team engaged in 14.6% more social-emotional
activity (positive + negative) than task behavior (questions + attempted answers) and the positive behavior exceeded negative behavior by almost three and one half times (see Table 4).

"Not listening" was 10.2% of the total interaction sent and "writing on the treatment plan" was 3.3%. The ratio of questions to answers was approximately 1:10.

5. To what extent do individuals initiate and receive acts in each of the interaction categories?

The amount of positive interaction sent was quite evenly dispersed among individual team members (see Table 5). However, almost 50% of the total negative interaction was sent by the physician and one nurse practitioner. The physician asked the most questions, and the social worker and nurses 2, 3, and 4 answered the most.

Positive, as well as negative, acts were primarily aimed at the social worker, the physician, and nurses 2, 3, and 4 (see Table 6). The secretary (Y), coordinator (1), and occupational therapist (O) received the fewest number of questions but answers were most generally directed to the group as a whole.

Table 4
Percentage of Team Activity Sent in Interaction Categories

<table>
<thead>
<tr>
<th>Interaction Category</th>
<th>% Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive (and Mixed)</td>
<td>44.8</td>
</tr>
<tr>
<td>Attempted Answers</td>
<td>39.0</td>
</tr>
<tr>
<td>Questions</td>
<td>3.7</td>
</tr>
<tr>
<td>Negative (and Mixed)</td>
<td>12.5</td>
</tr>
</tbody>
</table>
### Table 5

**Percentage of Individual Activity Sent in Interaction Categories**

<table>
<thead>
<tr>
<th>Interaction Categories</th>
<th>% Positive</th>
<th>% Answers</th>
<th>% Questions</th>
<th>% Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>13.9</td>
<td>0.9</td>
<td>1.0</td>
<td>7.3</td>
</tr>
<tr>
<td>1</td>
<td>9.6</td>
<td>3.0</td>
<td>7.6</td>
<td>6.9</td>
</tr>
<tr>
<td>2</td>
<td>13.0</td>
<td>25.3</td>
<td>17.4</td>
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<tr>
<td>3</td>
<td>9.2</td>
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<td>10.7</td>
<td>4.9</td>
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<tr>
<td>4</td>
<td>12.5</td>
<td>28.3</td>
<td>19.4</td>
<td>12.6</td>
</tr>
<tr>
<td>S</td>
<td>12.3</td>
<td>12.0</td>
<td>12.0</td>
<td>11.6</td>
</tr>
<tr>
<td>M</td>
<td>17.1</td>
<td>10.1</td>
<td>24.7</td>
<td>28.4</td>
</tr>
<tr>
<td>O</td>
<td>12.4</td>
<td>3.3</td>
<td>7.2</td>
<td>8.0</td>
</tr>
</tbody>
</table>

*Note. Y = secretary; 1 = nurse coordinator; 2, 3, & 4 = nurse practitioners; S = social worker; M = physician; O = occupational therapist.*

### Table 6

**Percentage of Individual Activity Received in Interaction Categories**

<table>
<thead>
<tr>
<th>Interaction Categories</th>
<th>% Positive</th>
<th>% Answers</th>
<th>% Questions</th>
<th>% Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>2.1</td>
<td>12.5</td>
<td>6.1</td>
<td>3.3</td>
</tr>
<tr>
<td>1</td>
<td>3.6</td>
<td>9.8</td>
<td>6.3</td>
<td>6.9</td>
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<td>11.1</td>
<td>16.0</td>
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<td>9.9</td>
<td>12.1</td>
<td>14.2</td>
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<td>28.2</td>
<td>12.1</td>
<td>19.9</td>
<td>21.7</td>
</tr>
<tr>
<td>S</td>
<td>10.4</td>
<td>12.8</td>
<td>11.8</td>
<td>10.3</td>
</tr>
<tr>
<td>M</td>
<td>8.7</td>
<td>19.2</td>
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<tr>
<td>O</td>
<td>4.5</td>
<td>12.6</td>
<td>8.5</td>
<td>6.7</td>
</tr>
</tbody>
</table>
Decision-Making Procedures

1. What proportion of the total task related interaction is spent on problems, objectives, interventions, positive and negative consequences, implementation, contingency planning, and evaluation?

Approximately 68% of the task time was divided fairly evenly between discussion of problems and discussion of interventions and another 25% was divided quite evenly between discussion of positive/negative consequences and evaluation (see Table 7). Contingency planning received the least attention from the group.

2. Does the proportion of positive and negative interaction sent vary with discussion of each decision-making procedure?

For the most part, the proportion of positive and negative interaction sent varies with discussion of decision-making procedures in about the same way that task behaviors vary (compare Tables 8 & 7). Discussion of positive and negative consequences is the only decision procedure that seems to have a disproportionate amount of negative interaction associated with it as compared with the proportion of positive activity on that subject.

3. Does individual participation vary with the discussion of objectives, positive and negative consequences, implementation, contingency planning, and evaluation?

Everyone participated within a range of 12-24% on the subject of objectives with the exception of the secretary and occupational therapist (see Table 9). Likewise, the discussion of implementation was quite evenly distributed among those who were responsible for most of the direct work.

The physician exceeded everyone in the discussion of
### Table 7

**Percent Team Interaction Sent on Decision-Making Procedures**

<table>
<thead>
<tr>
<th>Decision-Making Procedure</th>
<th>% Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Problems</td>
<td>37.1</td>
</tr>
<tr>
<td>2. Objectives</td>
<td>3.7</td>
</tr>
<tr>
<td>3. Interventions</td>
<td>30.3</td>
</tr>
<tr>
<td>4. Positive/negative consequences</td>
<td>11.0</td>
</tr>
<tr>
<td>5. Implementation</td>
<td>3.5</td>
</tr>
<tr>
<td>6. Contingency planning</td>
<td>0.5</td>
</tr>
<tr>
<td>7. Evaluation</td>
<td>13.9</td>
</tr>
</tbody>
</table>

### Table 8

**Percent Team Social-emotional Interaction Sent on Decision-Making Procedures**

<table>
<thead>
<tr>
<th>Decision-Making Procedure</th>
<th>Social-emotional Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Positive</td>
</tr>
<tr>
<td>Problems</td>
<td>43.3</td>
</tr>
<tr>
<td>Objectives</td>
<td>3.6</td>
</tr>
<tr>
<td>Interventions</td>
<td>25.8</td>
</tr>
<tr>
<td>Positive/Negative Consequences</td>
<td>9.8</td>
</tr>
<tr>
<td>Implementation</td>
<td>3.7</td>
</tr>
<tr>
<td>Evaluation</td>
<td>13.8</td>
</tr>
</tbody>
</table>
Table 9

Individual Percentages on Selected Decision-Making Procedures

<table>
<thead>
<tr>
<th></th>
<th>OB</th>
<th>PN</th>
<th>IM</th>
<th>C</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>0.8</td>
<td>2.2</td>
<td>1.7</td>
<td>0.0</td>
<td>0.3</td>
</tr>
<tr>
<td>1</td>
<td>12.3</td>
<td>6.3</td>
<td>3.1</td>
<td>1.0</td>
<td>0.8</td>
</tr>
<tr>
<td>2</td>
<td>24.2</td>
<td>17.7</td>
<td>15.7</td>
<td>3.1</td>
<td>28.2</td>
</tr>
<tr>
<td>3</td>
<td>17.8</td>
<td>7.9</td>
<td>14.7</td>
<td>2.0</td>
<td>17.3</td>
</tr>
<tr>
<td>4</td>
<td>16.8</td>
<td>16.0</td>
<td>26.6</td>
<td>50.0</td>
<td>30.2</td>
</tr>
<tr>
<td>S</td>
<td>13.6</td>
<td>19.2</td>
<td>19.0</td>
<td>6.1</td>
<td>14.9</td>
</tr>
<tr>
<td>M</td>
<td>12.4</td>
<td>23.6</td>
<td>16.2</td>
<td>36.7</td>
<td>4.4</td>
</tr>
<tr>
<td>0</td>
<td>2.2</td>
<td>7.0</td>
<td>2.9</td>
<td>1.0</td>
<td>3.9</td>
</tr>
</tbody>
</table>

Note. OB = objectives, PN = positive or negative consequences, IM = implementations, C = contingency planning, E = evaluation.

positive/negative consequences by at least 5% and he and 1 nurse practitioner contributed 87% of the participation on contingency planning. Evaluation was done primarily by those who had the most direct contact with clients.

**Team Decision Outcomes**

1. Of the total plan discussed, what percent was not written?

Ten per cent of the total client treatment plans that were apparently decided upon by the team did not get written down.

2. Of the total plan written, what percent was not discussed?

Eighteen per cent of the treatment plans were written but not discussed. In other words, that much of the treatment plans were not reviewed by the team.

3. What is the proportion of medical, social, occupational, and administrative problems identified in the client treatment plan and how does that compare with the participation associated with each?
The majority of problems identified and discussed were medical. It appears that the discussion associated with social and occupational problems is out of proportion to the actual number of each kind of problem identified in the treatment plan (see Table 10). Even though four percent of the discussion of problems had to do with obstacles to the organization, direction or control of client interventions, no such problems were identified in the plan.

4. Of the total problems, what percentage were insurmountable, as written?

Thirty per cent of the problems discussed by the team were nontreatable. The objectives indicated that the group was usually working on some maintenance or palliative strategy but the problem they addressed was not stated.

5. What percentage of the total objectives written were not measureable?

Thirty-seven per cent of the total objectives written were not stated in measureable terms. Progress was not consistently or systematically documented other than with an occasional note or a line

Table 10
Problems Written Compared With Problems Discussed For Each Discipline

<table>
<thead>
<tr>
<th></th>
<th>MP</th>
<th>SP</th>
<th>OP</th>
<th>AP</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Problems Written</td>
<td>74.5</td>
<td>12.2</td>
<td>13.3</td>
<td>0.0</td>
</tr>
<tr>
<td>% Problems Discussed</td>
<td>68.9</td>
<td>21.9</td>
<td>4.8</td>
<td>4.4</td>
</tr>
</tbody>
</table>

Note. MP = medical problems, SP = social problems, OP = occupational problems, AP = administrative problems.
crossing something out. It was seldom clear whether the line meant that something was resolved or abandoned.

6. How many problems occurred in more than one patient, and of the objectives and interventions written for those problems, what percentage were repeated?

Of the 14 problems occurring in more than 1 patient, 6 occurred 5 or more times. Out of the 79 total objectives written for these goals, 27% of them were repeated once and 15% were repeated 2 to 6 times. Of the 185 interventions, 20% were repeated once and 16% were repeated 3 to 5 times. In other words, approximately 40% of the objectives and interventions chosen by the group for recurring problems seem to follow a predictable pattern.
CHAPTER 5

DISCUSSION

The group decision-making process and resultant decision outcomes of an interdisciplinary hospital based home care team were described using an interaction analysis method coupled with an audit of client treatment plans. It was found that the problem with this team was not in their inability to collaborate but in the management of the decision process itself. Results of this study will be discussed in connection with proposed conclusions, followed by suggested implications for theory, practice and future research.

Conclusions

1. The interdisciplinary team in this study demonstrated many characteristics identified in the literature as a collaboration stage of group development except that (a) some group norms seemed to discourage the discussion of certain pertinent issues, (b) division of labor was not always clear, and (c) feelings of conflict and disagreement were not always dealt with directly, leaving some issues unresolved.

One of the advantages of using a long-standing interaction analysis technique is that the results of many studies reported over the years can be combined to arrive at averages and norms. For example, the proportion of total interaction that individual team members sent and received during this study can be compared to the
average interaction matrices reported by Bales (1970) for a group size of eight (see Table 11).

It appears from the dispersion of acts sent and received, that this particular interdisciplinary group shares leadership and utilizes resources more than other reported groups. According to Bales (1951), if a person receives significantly more acts than he initiates in comparison with other group members, it may be an indirect indication of high status for the receiving individual. Based on that assumption, this group also appeared not to have an obvious status hierarchy. Absence of such a hierarchy suggests that no one or more individuals are seen by the group as possessing the greatest amount of information.

Table 11
Comparison of Team Interaction with Bales' Interaction Averages

<table>
<thead>
<tr>
<th>Rank order of individuals in group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group interaction</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8</td>
</tr>
<tr>
<td>Team interactiona</td>
</tr>
<tr>
<td>Acts initiated</td>
</tr>
<tr>
<td>24.1 16.0 14.2 13.2 9.7 9.0 7.4 6.4</td>
</tr>
<tr>
<td>Acts received</td>
</tr>
<tr>
<td>27.2 11.2 14.4 13.9 10.8 8.1 8.0 6.3</td>
</tr>
<tr>
<td>Bales' interaction averagesb</td>
</tr>
<tr>
<td>Acts initiated</td>
</tr>
<tr>
<td>39.8 16.6 12.7 9.8 8.6 5.5 4.3 2.7</td>
</tr>
<tr>
<td>Acts received</td>
</tr>
<tr>
<td>25.6 7.1 7.0 4.9 4.1 2.9 1.8 1.2</td>
</tr>
</tbody>
</table>

Note. aResults of the present team under study for group size 8 (see Table 2); total acts in sample = 27,118. bBales' (1970) averages for 10 groups of size 8; total acts in sample = 12,830.
The rate of participation was found to be dependent on a number of factors. For example, when an individual presented a case, his or her participation was greater. The only ones presenting cases in this sample were nurse practitioners 4, 2, and 3, so the differences in their rates of participation (see Table 2) may be partly explained by the fact that they presented 67%, 22%, and 11% of the time, respectively.

In the past, physicians have been found to dominate health teams through hierarchical differentiation of status and authority (Caudill, 1958; Wessen, 1966; Wise, 1974). It is notable that the participation of the physician on this team was almost the same as that of the social worker (see Table 2). Perhaps one of the reasons the team was able to participate more equitably was because the physician was not playing an overly dominant role. In fact, one of the team members said, "It is so wonderful to have a doctor that believes paramedicals have something to offer." It is also worth mentioning that the nurse coordinator of the group whose formal responsibility is "planning, directing, monitoring, and evaluating HBHC program operations" was also nondominating in her interaction.

Albeit, there did appear to be some norms that discouraged participation of some team members. For example, on several occasions, one individual offered some intervention ideas that were medically nontraditional. The suggestions were met with laughter, teasing and a lot of negative overtones. In one instance, as the supportive behavior began to relieve the tension, the team members (including the physician) started discussing all the scientific rationale for why the person might be right. In the end, however, the
team decided to continue the traditional treatment anyway even though the nurse practitioner had reported it as not working.

The majority of discussion for individual team members correlated with their own areas of responsibility and expertise (see Table 3). The higher participation rate of the social worker in his field may indicate that the "overlap" or common knowledge base among team members is less in the area of social work than for medicine or occupational therapy. Probably the reason the nurse coordinator of the group did not participate as much in the area of administrative problems is because those discussed in case management meetings had primarily to do with the clients. Other administrative issues would usually be reserved for a different kind of meeting. Individual participation on objectives, implementation and evaluation (see Table 9) indicates that leadership was given to those who most needed to discuss that part of the plan.

Even though the number of client treatment plans audited was a very small sample, there was evidence that the occupational therapist had as much contribution to make as the social worker in terms of the number of problems they were addressing (see Table 10) and yet her participation was consistently lower than his in most areas (see Tables 3 and 9). Again, this difference may be due to the fact that his role is more differentiated than hers. In other words, her profession may be considered less of a "specialty" by the rest of the group. Considering the overall group participation on social and occupational problems indicated in Table 10, it may also mean that social problems receive higher priority from the group.

The fact that social-emotional activity doubled during the second
period and then dropped back to one third of what it was in the beginning seems to indicate that the group was going through stages. This process is understandable considering that the physician and one nurse practitioner were new in the beginning of the first period. According to the common characteristics of group developmental stages, participation in the membership phase is superficial and polite, becomes heated during the confrontation stage and then settles down in the differentiation stage to individuals contributing according to their expertise (Cohen et al., 1980). The fact that the defensive, aggressive, antagonistic, argumentative, tense behavior of the newcomers was twice to three times as high as anyone else's (see Table 5) is supportive of this "stage" concept.

The methodology of this study did not differentiate negative interaction, but sometimes negative behavior centered around issues that were never identified directly and therefore never resolved. For example, one teammate came in late and said, "I'll bet no one missed me anyway." The immediate reply was, "We were doing just fine." Another time, a member of the team with authority made a suggestion that was apparently accepted by the team and even written in the treatment plan. The idea was discarded, however, during a meeting when that teammate was absent.

2. Deviations within the interaction categories (positive, negative, questions, answers) suggest that (a) a high value was placed by the team on positive, nontask behavior, and (b) there was little evidence of preplanning or standardization of problems, objectives or treatment.

Before discussing participation in the interaction categories, it
may be helpful to establish where this team stands in relation to other groups. Bales (1970) compiled estimated norms for different kinds of groups in various situations which can be compared to the activities of the interdisciplinary team under study (see Table 12).

The positive activity of this group is 9% to 19% higher than Bales' reported medium range for either sending or receiving. Writing on the treatment plan (which probably did not occur in the groups used to calculate the norms) only accounts for 3.3% of the positive activity. Since negative interaction is not high, and there is such an even distribution of individual interaction in the positive area (see Table 5), it may indicate a general team acceptance of certain nontask values, such as free expression, festivity and entertainment, egalitarianism, altruism, sociability, and conservation of the best in group beliefs and precedents. It may also be that the values of society in general have changed since Bales proposed his range

Table 12
Comparison of Percent Team Activity with Bales' Norms in Interaction Categories

<table>
<thead>
<tr>
<th>Interaction category</th>
<th>% Acts initiated&lt;sup&gt;a&lt;/sup&gt; Medium range&lt;sup&gt;b&lt;/sup&gt;</th>
<th>% Team acts Sent &amp; Received&lt;sup&gt;c&lt;/sup&gt;</th>
<th>% Acts received&lt;sup&gt;a&lt;/sup&gt; Medium range&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>16.0 - 25.8</td>
<td>44.7</td>
<td>22.8 - 36.4</td>
</tr>
<tr>
<td>Answers</td>
<td>38.7 - 60.9</td>
<td>39.0</td>
<td>32.9 - 50.7</td>
</tr>
<tr>
<td>Questions</td>
<td>6.6 - 12.5</td>
<td>3.7</td>
<td>5.9 - 11.2</td>
</tr>
<tr>
<td>Negative</td>
<td>8.9 - 15.7</td>
<td>12.5</td>
<td>10.4 - 18.2</td>
</tr>
</tbody>
</table>

Note. <sup>a</sup>See Bales (1970) for a description of the process used to arrive at these norms. <sup>b</sup>Range (including boundary numbers) of the middle 7 of 21 cases (Bales, 1970). <sup>c</sup>Results of the present team under study (see Table 4).
estimations in 1970.

This group was generally quite fun-loving and apologies would sometimes be made if things got too "boring." The physician was influential in limiting extraneous anecdotes during case presentations but the joking simply transferred from the client plan to the time limits and protocol of the presentation. Fisher (1974) noted that the social aspect of group decision making, which is not necessary when only one person makes a decision, may explain why group decision making takes longer. In this group, an average of 58% of their time was spent on social-emotional activities.

There may be some connection between the amount of social emotional behavior and the size of the group. The only times the team task activity exceeded social-emotional activity was once by 22% when five people were present, once by 7% when seven people were present and once by 3% when eight people were present. Larger group size has definitely been associated with lower job satisfaction (Porter, Lawler & Hackman, 1975) which may, in turn, increase the need for more social-emotional activity. If it is desirable to increase task activity, it may be worth asking how many people are actually needed for the various phases of group decision making.

The amount of interaction in the category of "Answers" was on the low side and even though the ratio of questions to answers indicated a general sharing of resources, the percentage of questions asked were 3% below norm (see Table 12). This may be due to the considerable amount of time spent on social-emotional issues and could indicate that if anything is to suffer, it is the "vigilance" or painstaking search for relevant information described by Janis and Mann (1977).
Furthermore, the social worker and nurses 2, 3, and 4 (who are more heavily involved in direct case work) did more reporting and answering than the physician who needed to ask them a fair number of questions in order to make medical decisions (see Tables 5 & 6). This raises the question of why health professionals meet as a group. Is it primarily for the purpose of reporting to the doctor? Could the physician be briefed prior to the meeting so as to give the group more time for generating and evaluating alternatives?

Other evidence of the need for preplanning was found in the amount of team discussion used for making what appeared to be routine decisions. Approximately 40% of both the objectives and interventions were repeated for problems that occurred in more than one patient. It has already been demonstrated by Brick and Swinth (1983) that some kinds of clinical group decision making can be duplicated using a computer process model.

3. This team used all of the decision procedures that current research deems necessary to produce high quality decisions, but there is a question whether some procedures (such a problem identification and generation of alternatives) were used enough.

One of the criticisms of American culture is that not enough time is spent defining the problem (Drucker, 1973) or the cause of the problem (Kepner & Tregoe, 1976). It seemed surprising that this group spent a greater portion of their discussion time on problems (37%) than on solutions (30%). That is not to say that no more time need be spent on problem definition, especially since discussion of problems was accompanied by 42% of the disagreement, tension, and antagonism of the group (see Tables 7 & 8). Unresolved disagreement over
definitions of the problem could certainly impede the generation, choice, and implementation of appropriate interventions.

The fact that the physician was so much more verbal than the others on the subjects of positive/negative consequences and contingency planning may indicate that he has more knowledge in those areas (see Table 9). It is not known why one nurse practitioner was so active in the area of contingency planning except that he may have had clients who, through his experience with them, required the planning of alternate courses.

The decision procedure of thoroughly examining the positive and negative consequences of pursuing a particular solution could be a fairly objective process, but the amount of negative behavior associated with it (22%) is out of proportion to the amount of positive interaction (9.8%) or even total discussion (11%) it received (see Tables 8 & 7). This phenomenon possibly occurs because people tend to emotionally defend their own ideas and interpret differences of opinion as lack of support which then serves to create even more defensive behavior. The negative behavior surrounding discussion of positive and negative consequences illustrates Hoffman's (1979) contention that one of the major obstacles to the effective utilization of resources is the intrusion of social-emotional issues on task functions.

Another problem that may be associated with the suppression of productive idea generation is the lack of structure in the discussion of alternatives or solutions to problems. This team's process evolved similarly to what White, Dittrich, and Lang (1980) described as the "interactive group process" in which single alternative
solutions are openly suggested, evaluated and even decided upon before all ideas are generated. Separating the functions of solution generation from solution evaluation has been found to promote the generation of a greater number of alternatives not only by providing for the constructive use of disagreement, but by delaying premature dismissal of an idea (Maier, 1970).

4. The Client Treatment Plan was a reliable record of team decision making but its format did not always lend itself well to a multidimensional approach.

The VA has a saying, "If it's not written down, it's not done." It simply means that in the health care industry, there are legal and administrative reasons that make it vitally necessary to document any care given. One thing this team did that contributed to thorough record keeping was that when a new patient was admitted to their program, one team member wrote on a board for everyone to see while, at the same time, the secretary wrote on the official client treatment plan so that two records of the meeting were being kept simultaneously. This practice was particularly helpful since not everyone was always familiar with the various professional terminologies.

Nonetheless, it appears that 10% of what this team planned to do did not get written down in the client treatment plans. One of the problems was that there was more than one place to record things. For example, medication changes were sometimes written in the treatment plan and sometimes on the medication sheet. There was little motivation to leave something out because of disagreement since the primary nurse usually presented the case while other members of the
team took turns updating the treatment plan. It was interesting that the percentage of acts coded by this researcher as "not listening" was also 10%. In other words, there may be a correlation between what is heard and what gets recorded.

Administrative problems primarily included obstacles to the efficient implementation of client interventions (such as not being able to obtain medications or get clients into other VA clinics without an unusually long wait). Even though these issues constituted only 4% of the discussion of problems and no part of the client treatment plan (see Table 10), coordination of services is a specified goal, by the VA, for HBHC teams.

One of the real advantages of teamwork is the opportunity it affords to coordinate services which probably could not be accomplished as well if individuals were making decisions without team input. In one instance, the occupational therapist had the idea of teaming up a man who needed physical therapy (but who did not want to drive alone) with a man who also needed therapy but was in a wheelchair and needed transportation. If the therapist had not been participating in the meeting, she would probably never have known of the need.

There were several cases where one professional would have a perception of a situation and another person would have had a different experience. Team discussion, unlike individual decision making, seemed to make it possible to define a problem from several different perspectives. The physician also played an important coordinating role as a result of being in attendance at team meetings. Being in a position of influence, he did much to reduce duplication of
services with other clinics.

The question that arises is whether written coordination goals and activities should be included somewhere as bona fide team activity, particularly, when teamwork seems to offer a real advantage over individual decision making in that area.

Another observation was that the plans primarily followed a medical model (see Table 10). Even though this is a hospital based home care team and clients are only eligible for the team's services if their medical problems are sufficient to require a primary caregiver, social and functional problems did not always fit under a single medical category or even under a medical category at all.

5. Clear, factual evaluation of both team decision making and direct work was difficult because (a) there was no definition of how the decision-making group differed from the direct work group in its responsibilities, goals or accomplishments, and (b) progress toward goals was not always documented in measurable terms.

Most of the discussion categorized as "evaluation" in this study had to do with whether or not clients were progressing toward greater independence and health. The time spent on evaluation (14%) may be partially due to the fact that 80% of the sample cases were 60 day reviews. Individual participation on objectives, implementation and evaluation (see Table 9) indicates that leadership was given to those who most needed to discuss that part of the plan.

One measure of the effectiveness of team decision making could be the number of problems correctly identified. Unfortunately, when a problem was no longer being addressed by the team, a yellow mark was put through it and it was impossible to tell whether the problem was
resolved or merely abandoned and whether or not it resolved spontaneously or as a result of intervention. There was also no record of the number or type of interventions suggested but untried.

One of the problems with the Client Treatment Plan seemed to be with followup since 18% of the treatment plans were written but not reviewed by the team. Some team members were more attentive to updating than others but it also may have been a function of time. Several authors (Hoffman, 1979; White, et al., 1980) maintained that minimizing the time spent in the decision-making process was a major deterrent to high quality task activity. It may be that full review of the treatment plan (which invariably takes more time) was one place the problem of time pressure surfaced in a measurable way.

From a management perspective, it is important to have some way of measuring whether or not goals and objectives are being reached. Team members demonstrated that they knew how to write measurable goals at least 67% of the time but there were some problems. For example, how does one measure whether a client has resolved feelings of self-harm, or a family member has improved his or her self image, or client and family have realistic expectations of treatment?

Although the team seldom actually worked on problems that could not be changed, the difficulty with working on something unstated is that it is nearly impossible to assess whether or not the goal is being reached. Furthermore, clear goal definitions guard against objectives that seem doomed to failure such as to "prevent undiagnosed recurrence" of a lung lesion or "ensure patient safety." Nonetheless, the team does write goals that provide hope of success at least 70% of the time!
Another consideration is that goal acceptance and goal achievement could be more easily correlated if goal achievement were measureable. There seemed to be some confusion about how goal acceptance was indicated. One team member viewed the professional signatures as indicating presence at the case management meetings whereas another team member considered them as a sign that the plan was accepted.

Theoretical Implications

One of the contributions of this study is the quantitative documentation that collaboration is possible within an interdisciplinary health care team. Even though this team may be atypical in that regard, several lessons may be learned from it. It is important not to make assumptions about a team's ability to make effective decisions, and it may be that lack of collaboration is a symptom rather than a cause of problems.

Hoffman (1979) did not pretend to include all the factors that can affect group decision making in his model but one variable that seems to be important as a result of this study is the clarity with which the goal of a group is identified.

The idea of forward movement toward a goal has stimulated an entire philosophy based on the contention that a person's human body or "servo-mechanism" will automatically pursue any goal with which it is thoroughly "programmed" (Maltz, 1969). Rogers (1980) even incorporated into a major nursing theory the idea that man is continually moving and changing along an axis of space and time. If these ideas are accurate, then it stands to reason that bringing
individuals together could also bring the dimension of movement toward a goal into the group system (see Figure 6).

The management challenge is whether or not an organizational goal can ever supersede the individual goals already inherent in the group. Current thought is that it can only be done effectively if the organizational goal supports or supplements individual goals (Heneman, Schwab, Forsum, & Dyer, 1983).

**Implications for Practice and Future Research**

Dickoff, James, and Wiedenbach (1968) maintain that the purpose of research is to serve theory and the purpose of theory is to serve practice. It would seem, then, that the significance of any research should only be measured by the extent to which it can be applied to practice. Of particular interest, here, is nursing management practice. How can a nurse apply the findings of research to the management of an interdisciplinary hospital based home care team?

If research or theory is to aid practice, it must be read and

![Figure 6. Goal-direction in group decision making. Adapted from Hoffman's (1979) model.](image)
applied. Many problems with teams could probably be avoided by simply applying the research findings of others. For example, writing measureable goals and objectives may have positive effects other than merely providing for management control. If any team members are motivated by high achievement, they would gain increased satisfaction from receiving immediate feedback on how they are were doing.1 If team members received more satisfaction from the process of team decision making, perhaps it would, in this case, reduce the need for so much social-emotional activity.

If change is warranted, one of the cardinal rules for success is for management to include the people being affected in the change process (Bennis, Benne, & Chinn, 1969). The entire group could be involved using the decision-making process itself as a workable framework: agree on a definition of the problem, agree on priorities, investigate and brainstorm alternatives, evaluate alternatives (as a separate activity from solution generation), give the group time to propose even more advantages and disadvantages to the favored solution, make a choice, decide how to measure progress, implement it, evaluate it, and report it in the professional literature.

An excellent framework for identifying and solving management problems is published by the United States Department of Health and Human Services, Public Health Service. It defines management as "the process for constructing, implementing and evaluating organized responses." An "organized response" is dependent on the establishment of three prerequisites: (a) a carefully designed problem statement, (b) the existence, acceptance and availability of effective technology, (c) and the effective and efficient organization of
technology and resources. The implications of this study suggest research which addresses the effects of all three prerequisites on team process and outcome. Some specific research questions might be:

1. To what extent do measureable goals and objectives affect the proportion of social-emotional behavior to task activity during case management meetings?

2. To what extent do individual team members attempt to implement those things in the client treatment plan for which they have been given responsibility?

3. To what extent are team goals and objectives achieved?

4. To what extent does problem-oriented data recording (also known as SOAP charting) have on the decision-making process and decision output of an interdisciplinary health team?

5. Can a computer model be devised to produce the more routine aspects of a client treatment plan and if so, how would that affect the number of nonpredictable alternatives generated by an interdisciplinary team?

6. Does separating solution generation from solution evaluation effect the number of alternatives generated?

7. During discussion of solution evaluation and adoption, does limiting the group size to only those responsible for implementation of group plans significantly increase the proportion of task activity to social emotional interaction?

A closing remark on the methodology of this study might also aid other investigators. Bales' (1970) instrument is really quite adaptable to describing the affect of interaction on a number of variables. More specific subject categories might be added to better
differentiate decision-making activity, such as subdividing the negative interaction category into what the negative behavior was about.

Once the problems of a group are identified, taping and coding could be concentrated on specific areas of interest which would reduce the tediousness of the method. For example, if just the extent of task activity is known, then the social-emotional activity can be inferred. This study also supported Mira's (1969) conclusion that the direct record of a group provides a measure that is sensitive to the decision-making behavior of the group.
Notes

1 See Bales (1970) for a more detailed explanation of how interaction analysis can be used to infer individual values.

2 See McClelland (1976) for a discussion of the motivation needs of high achievers.
APPENDIX A

CODING INSTRUCTIONS

Medical problem (MP). An obstacle to physical or mental well-being.

Social problem (SP). An obstacle to positive interpersonal relationships or survival in a particular social structure (such as the need for financial aide); demographics of an individual which may or may not contribute to various problems.

Occupational problem (OP). An obstacle to the recovery or rehabilitation of a client's physical activity.

Administrative problem (AP). An obstacle to the organization, direction and control of a group plan.

Medical interventions (MI). Medicinal, surgical or psychiatric treatments used to overcome medical problems.

Social interventions (SI). Individual or group activities designed to overcome social problems.

Occupational interventions (OI). Exercises or mechanical aides designed to overcome or compensate for a client's problems in moving his body from place to place.

Administrative interventions (AI). Plans for coordinating or improving the functions of intra- or intergroup activities.

Contingency planning (C). Provision for executing a course of action in case of major interference to a plan; discussion of what may
happen and how to deal with it rather than what has already happened; includes planning alternate courses of action depending upon the results of tests, etc.
APPENDIX B

COMPUTER PROGRAM

Program VA;

Label
   ChangePatient, StopPrint;

Type
   Shortlist = String[3];
   List = Array[1..16] of Shortlist;
   RepRS = (Sec, NP1, NP2, NP3, NP4, Soc, MD, OT, None);
   RepMan = (Posi, Answ, Ques, Nsub, NLsub, NoMAN);
   RepSub = (MP, SP, OP, AP, OB, MI, SI, SI, AI, PN, IM, CC, EE, NoSUB);
   RepRSlst = Array[1..8] of RepRS;
   SheetRS = (Receive, Send);
   SheetDta = Array[Sec..OT, SheetRS, MP..EE, Posi..NLsub] of Integer;
   Pat = Record
      Who, TypeP, Present, Plan, Board : Shortlist;
      Date, Absent : String[6];
   End;

Var
   SheetData : SheetDta;
   VaData : File of SheetDta;
   PatientFile : File of Pat;
   PatVar : Pat;
   Senders, Receivers : List;
   TypeIn, PresentIn, PlanIn, BoardIn, Subject, Manner : Shortlist;
   Num, DateIn, AbsentIn, PersonC : String[6];
   Code, Sum, Sum2, SendPtr, RecPtr, I, J, K, L, N, A : Integer;
   Patient, PatientC, Line : String[15];
   RepReceivers, RepSenders : RepRSlst;
   RepManner, MM, MM2 : RepMan;
   RepSubject, SS, SS2, First : RepSub;
   Wrong, View, Enter, Quit : Boolean;
   PP, Person : RepRS;
   RS, RS2 : SheetRS;
   Resp : Char;

Procedure Update(Var Senders, Receivers : List; Var Subject, Manner :
   Shortlist);

Var
   I : Integer;
Begin

RepManner := NoMAN;
RepSubject := NoSUB;
For I := 1 to 8 do
Begin
  RepReceivers[I] := None;
  RepSenders[I] := None;
End;
For I := 1 to 8 do
Begin
  If Senders[I] = 'Y' Then RepSenders[I] := Sec;
  If Senders[I] = '1' Then RepSenders[I] := NP1;
  If Senders[I] = '2' Then RepSenders[I] := NP2;
  If Senders[I] = '3' Then RepSenders[I] := NP3;
  If Senders[I] = '4' Then RepSenders[I] := NP4;
  If Senders[I] = 'M' Then RepSenders[I] := MD;
  If Senders[I] = 'S' Then RepSenders[I] := Soc;
  If Senders[I] = '0' Then RepSenders[I] := 01;
  If Manner = 'A' Then RepManner := Answ;
  If Manner = '+' Then RepManner := Posi;
  If Manner = 'N' Then RepManner := Nsub;
  If Manner = 'NL' Then RepManner := NLsub;
  If Manner = '?' Then RepManner := Ques;
  If Subject = 'MP' Then RepSubject := MP;
  If Subject = 'SP' Then RepSubject := SP;
  If Subject = 'OP' Then RepSubject := OP;
  If Subject = 'AP' Then RepSubject := AP;
  If Subject = 'OB' Then RepSubject := OB;
  If Subject = 'MI' Then RepSubject := MI;
  If Subject = 'SI' Then RepSubject := SI;
  If Subject = 'OI' Then RepSubject := OI;
  If Subject = 'AI' Then RepSubject := AI;
  If Subject = 'PN' Then RepSubject := PN;
  If Subject = 'IM' Then RepSubject := IM;
  If Subject = 'C' Then RepSubject := CC;
  If Subject = 'E' Then RepSubject := EE;
ClrScr;
GotoXY(1,2);
writeln('SENDING':17, 'RECEIVING':17, 'SUBJECT':15, 'MANNER':14);
For I := 1 to 75 do write('-');
GotoXY(1,4);
For I := 1 to 8 do writeln(Senders[I]:14, Receivers[I]:16);
GotoXY(46,4);
writeln(Subject, Manner:14);
GotoXY(1,15);
  For I := 1 to 75 do write('-');
GotoXY(36,16);
write('MENU');
GotoXY(1,17);
For I := 1 to 75 do write('-');
writeln;
writeln(' 1)Add Senders  5)Change Subject  9)ENTER  W)PRINT');
writeln(' 2)Remove Senders  6)Change Manner  S)Change Sender');
writeln(' 3)Add Receivers  7)View Data Sheets R)Change Receiver');
writeln(' 4)Remove Receivers  8)QUIT  P)Change Patient');
writeln; write('>');
End;

Procedure Reduce(Var Object : List);

Var M, N, O : Integer;

Begin
  For M := 1 to 15 do
  Begin
    For N := (M+1) to 16 do
      If (Object[M] = Object[N]) Then OBJECT[N] := ' ';
  End;
  For I := 1 to 15 do
  Begin
    For M := 1 to 15 do
    Begin
      If (Object[M] = ' ') Then
        For O := M to 15 do Object[O] := Object[O+1];
        Object[16] := ' ';
      End;
    End;
  End;
  For M := 15 downto 1 do
  If (Object[M] = ' ') Then SendPtr := M;
End;

Begin {Main Program}
  {Initialize}
ChangePatient:
  For PP := Sec to OT do
  For RS := Receive to Send do
  For SS := MP To EE Do
  For MM := Pesi to NLsub do SheetData[PP,RS,SS,MM] := 0;
Repeat
  ClrScr;
  Write('PATIENT? ');
  Readln(Patient);
  Patient := Concat('B:',Patient);
  ClrScr;
  Write('ARE YOU SURE? ');
  Read(Resp);
Until (Resp = 'Y');
Assign(VaData, Patient);
Assign(PatientFile, 'B:PatientFile');
{$I-}
Reset(VaData);
If (IOResult <> 0) Then
Begin
Rewrite(VaData);
Repeat
ClrScr;
Writeln(Patient);Writeln:
Write('TYPE? ');
Readln(TypeIn);
Write('PRESENTER? ');
Readln(PresentIn);
Write('PLANNER? ');
Readln(PlanIn);
Write('BOARD? ');
Readln(BoardIn);
Write('DATE? ');
Readln(DateIn);
Write('ABSENT? ');
Readln(AbsentIn);
Writeln; Write('IS DATA CORRECT? ');
Read(Resp);
Until (Resp = 'Y');
Reset(PatientFile);
If (IOResult <> 0) Then Rewrite(PatientFile);
Seek(PatientFile,FileSize(PatientFile));
With PatVar do
Begin
Who := Patient;
TypeP := TypeIn;
Present := PresentIn;
Plan := PlanIn;
Board := BoardIn;
Date := DateIn;
Absent := AbsentIn;
End;
Write(PatientFile, PatVar);
Close(PatientFile);
End;
Close(PatientFile);
Quit := False;
SendPtr := 1; RecPtr := 1;
If (FileSize(VaData) <> 0) Then Read(VaData, SheetData) Else
Write(VaData, SheetData);
For I := 1 to 16 do
Begin
Senders[I] := ' ';
Receivers[I] := ' ';
End;
Manner := ' ';
Subject := ' ';

Update(Senders, Receivers, Subject, Manner);
While Not Quit do
Begin
  Readln(Resp);
  Case Resp of
    '1' : Begin
      GotoXY(1,18);
      For I := 1 to 6 do
        writeln("");
      GotoXY(1,18);
      write(' ADD SENDERS: ');
      Readln(Line);
      If (Pos('ALL',Line) <> 0) Then
        Begin
          SendPtr := 1;
          Line := 'S1234YMO';
        End;
      If (Pos('1',Line) <> 0) Then
        Begin
          Senders[SendPtr] := '1';
          SendPtr := SendPtr + 1;
        End;
      If (Pos('2',Line) <> 0) Then
        Begin
          Senders[SendPtr] := '2';
          SendPtr := SendPtr + 1;
        End;
      If (Pos('3',Line) <> 0) Then
        Begin
          Senders[SendPtr] := '3';
          SendPtr := SendPtr + 1;
        End;
      If (Pos('4',Line) <> 0) Then
        Begin
          Senders[SendPtr] := '4';
          SendPtr := SendPtr + 1;
        End;
      If (Pos('Y',Line) <> 0) Then
        Begin
          Senders[SendPtr] := 'Y';
          SendPtr := SendPtr + 1;
        End;
      If (Pos('M',Line) <> 0) Then
        Begin
          Senders[SendPtr] := 'M';
          SendPtr := SendPtr + 1;
        End;
      If (Pos('O',Line) <> 0) Then
        Begin
          Senders[SendPtr] := 'O';
          SendPtr := SendPtr + 1;
        End;
      If (Pos('S',Line) <> 0) Then

Begin  
Senders[SendPtr] := 'S';  
SendPtr := SendPtr + 1;  
End;  
Reduce(Senders);  
Update(Senders, Receivers, Subject, Manner);  
End;

'2' : Begin  
GotoXY(1,18);  
For I := 1 to 6 do  
writeln(']');  
GotoXY(1,18);  
write(' REMOVE Senders: ');  
Readln(Line);  
If (Pos('ALL',Line) <> 0) Then Line := '1234SYM';  
For I := 1 to 8 do  
If (Pos(Senders[I], Line) <> 0) Then Senders[I] := ' ';  
Reduce(Senders);  
Update(Senders, Receivers, Subject, Manner);  
End;

'3' : Begin  
GotoXY(1,18);  
For I := 1 to 6 do  
writeln(']');  
GotoXY(1,18);  
write(' ADD Receivers: ');  
Readln(Line);  
If (Pos('ALL',Line) <> 0) Then  
Begin  
RecPtr := 1;  
Line := 'S1234SYM';  
End;  
If (Pos('1',Line) <> 0) Then  
Begin  
Receivers[RecPtr] := '1';  
RecPtr := RecPtr + 1;  
End;  
If (Pos('2',Line) <> 0) Then  
Begin  
Receivers[RecPtr] := '2';  
RecPtr := RecPtr + 1;  
End;  
If (Pos('3',Line) <> 0) Then  
Begin  
Receivers[RecPtr] := '3';  
RecPtr := RecPtr + 1;  
End;  
If (Pos('4',Line) <> 0) Then  
Begin  
Receivers[RecPtr] := '4';  
RecPtr := RecPtr + 1;  
End;  
If (Pos('Y',Line) <> 0) Then
Begin
    Receivers[RecPtr] := 'Y';
    RecPtr := RecPtr + 1;
End;
If (Pos('M',Line) <> 0) Then
    Begin
        Receivers[RecPtr] := 'M';
        RecPtr := RecPtr + 1;
    End;
If (Pos('0',Line) <> 0) Then
    Begin
        Receivers[RecPtr] := '0';
        RecPtr := RecPtr + 1;
    End;
End;
If (Pos('S',Line) <> 0) Then
    Begin
        Receivers[RecPtr] := 'S';
        RecPtr := RecPtr + 1;
    End;
Reduce(Receivers);
Update(Senders, Receivers, Subject, Manner);
End;
'4' : Begin
    GotoXY(1,18);
    For I := 1 to 6 do writeln(' ]);
    GotoXY(1,18);
    write(' REMOVE RECEIVERS : ');
    Readln(Line);
    If (Pos('ALL',Line) <> 0) Then Line := '1234SYMO';
    For I := 1 to 8 do
        If (Pos(Receivers[I], Line) <> 0) Then Receivers[I] := ' ';
    Reduce(Receivers);
    Update(Senders, Receivers, Subject, Manner);
End;
'5' : Begin
    GotoXY(1,18);
    For I := 1 to 6 do writeln(' ]);
    GotoXY(1,18);
    write(' CHANGE SUBJECT : ');
    Readln(Line);
    Subject := Line;
    Update(Senders, Receivers, Subject, Manner);
End;
'6' : Begin
    GotoXY(1,18);
    For I := 1 to 6 do writeln(' ]);
    GotoXY(1,18);
    write(' CHANGE MANNER : ');
    Readln(Line);
    Manner := Line;
    Update(Senders, Receivers, Subject, Manner);
End;
'7' : Begin
View := True;
GotoXY(1,18);
For I := 1 to 6 do Writeln('');
GotoXY(1,18);
Write(' PERSON? ');
Readln(Line);
If (Line = 'Y') Then Person := Sec Else
If (Line = 'M') Then Person := MD Else
If (Line = 'I') Then Person := NP1 Else
If (Line = '2') Then Person := NP2 Else
If (Line = '3') Then Person := NP3 Else
If (Line = '4') Then Person := NP4 Else
If (Line = 'S') Then Person := Soc Else
If (Line = 'O') Then Person := OT Else
View := False;
If View Then Begin
  ClrScr;
  Write('SEND':23,'RECEIVE':41);
  Write('+':8,'An':6,'?':6,'N':6,'NL':7,'+':13,
       'An':6,'?':6,'N':6,'NL':7);
  Write('MP'); Write('SP'); Write('OP');
  Write('AP'); Write('OB'); Write('OB');
  Write('MI'); Write('SI'); Write('OI');
  Write('AI'); Write('EN'); Write('EN');
  Write('IM'); Write('C'); Write('C');
  Write('E'); Write('E');
  I := 3;
  For RS := Send downto Receive do
  Begin
    L := 3;
    Sum := 0;
    GotoXY(I,L);
    For SS := MP to AP do
    Begin
      K := 0;
      For MM := Posi to NLsub do
      Begin
        Write(SheetData[Person,RS,SS,MM]:6);
        K := K + SheetData[Person,RS,SS,MM];
      End;
      Write(K:6);
      L := L + 1;
      GotoXY(I,L);
    End;
    J := 0;
    For MM := Posi to NLsub do
    Begin
      K := 0;
      For SS := MP to AP do
      K := K + SheetData[Person,RS,SS,MM];
      Write(K:6);
J := J + K;
End;
Write(J:6);
Sum := Sum + J;
L := L + 2;
GotoXY(I,L);
K := 0;
For MM := Posi to NLsub do
Begin
Write(SheetData[Person,RS,OB,MM]:6);
K := K + SheetData[Person,RS,OB,MM];
End;
Write(K:6);
Sum := Sum + K;
L := L + 2;
GotoXY(I,L);
For SS := MI to PN do
Begin
K := 0;
For MM := Posi to NLsub do
Begin
Write(SheetData[Person,RS,SS,MM]:6);
K := K + SheetData[Person,RS,SS,MM];
End;
Write(K:6);
L := L + 1;
GotoXY(I,L);
End;
J := 0;
For MM := Posi to NLsub do
Begin
K := 0;
For SS := MI to PN do
K := K + SheetData[Person,RS,SS,MM];
Write(K:6);
End;
End;
End;

'8': Begin
GotoXY(1,18);
For I := 1 to 6 do writeln("");
GotoXY(1,18);
write(' ARE YOU SURE? ');
Readln(Line);
If (Line = 'Y') Then
Begin
Quit := True;
ClrScr;
End
Else
Update(Senders, Receivers, Subject, Manner);
End;
'9' : Begin
    I := 1;
    Enter := True;
    If (RepManner = NoMAN) OR (RepSubject = NoSUB)
        Then Enter := False;
    If (RepReceivers[1] = None) OR (RepSenders[1] = None)
        Then Enter := False;
    If Not Enter Then Write('G) Else
        Repeat
            Begin
                N := 0;
                GotoXY(2,18);
                For I := 1 to 6 do Writeln(']);
                Repeat
                    GotoXY(2,18);
                    Write('HOW MANY TIMES? ');
                    Read(Num);
                    Val(Num,N,Code);
                    Until (Code = 0);
                    GotoXY(2,18);
                    Write('DID YOU ENTER THE CORRECT NUMBER? ');
                    Read(Resp);
                End;
                Until (Resp = 'Y');
                I := 1;
                While (RepSenders[I] <> None) AND (Enter) do
                    Begin
                        J := 1;
                        While (RepReceivers[J] <> None) do
                            Begin
                                K := SheetData[RepSenders[I],Send,RepSubject, RepManner] + N;
                                SheetData[RepSenders[I],Send,RepSubject,RepManner] := K;
                                K := SheetData[RepReceivers[J],Receive,RepSubject, RepManner] + N;
                                SheetData[RepReceivers[J],Receive,RepSubject, RepManner] := K;
                                J := J + 1;
                            End;
                        End;
                        I := I + 1;
                    End;
                If Enter Then
                    Begin
                        Reset(Vadata);
                        Write(VaData, SheetData);
                    End;
                Update(Senders,Receivers,Subject,Manner);
            End;
    'S' : Begin
        GotoXY(1,18);
        For I := 1 to 6 do writeln(']);
        GotoXY(1,18);
        Write('CHANGE SENDER: ');
Readln(Line);
For I := 1 to 16 do Senders[I] := ' ';
For Resp := '1' to '4' do
  If (Pos(Line, Resp) <> 0) Then Senders[I] := Line;
If (Pos(Line, 'Y') <> 0) OR (Pos(Line, 'M') <> 0) OR
  (Pos(Line, 'O') <> 0) OR (Pos(Line, 'S') <> 0) Then
  Senders[1] := Line;
SendPtr := 2;
Update(Senders, Receivers, Subject, Manner);
End;
'R' : Begin
  GotoXY(1,18);
  For I := 1 to 6 do writeln('·
  GotoXY(1,18);
  Write('CHANGE RECEIVER: ');
  Readln(Line);
  For I := 1 to 16 do Receivers[I] := ' ';
  For Resp := '1' to '4' do
    If (Pos(Line, Resp) <> 0) Then Receivers[I] := Line;
    If (Pos(Line, 'Y') <> 0) OR (Pos(Line, 'M') <> 0) OR
      (Pos(Line, 'O') <> 0) OR (Pos(Line, 'S') <> 0) Then
      Receivers[1] := Line;
    RecPtr := 2;
    Update(Senders, Receivers, Subject, Manner);
  End;
'P' : Begin
  Close(Vadata);
  Goto ChangePatient;
End;
'W' : Begin
  GotoXY(1,18);
  For I := 1 to 6 do writeln('·
  GotoXY(1,18);
  Write('...Printing...(To Stop, Hit any Key)');
  For Person := Sec to OT do
    Begin
      PatientC := Copy(Patient, 3, 3);
      Case Person of
        Sec : PersonC := 'Y';
        OT : PersonC := 'O';
        MD : PersonC := 'M';
        NP1 : PersonC := '1';
        NP2 : PersonC := '2';
        NP3 : PersonC := '3';
        NP4 : PersonC := '4';
        Soc : PersonC := 'S';
      End;
      Writeln(Lst, 'Patient : ', PatientC, 'Person : ', PersonC);
      Writeln(Lst);
      Writeln(Lst, 'Send': 23, 'Receive': 41);
      Writeln(Lst, '+' : 14, 'An': 6, '?': 6, 'N': 6, 'NL': 7, '+' : 14,
        'An': 6, '?': 6, 'N': 6, 'NL': 6);
      For SS := MP to EE do
Begin
If KeyPressed Then Goto StopPrint;
Case SS of
  MP : Write(Lst,'MP');
  SP : Write(Lst,'SP');
  OP : Write(Lst,'OP');
  AP : Write(Lst,'AP');
  OB : Write(Lst,'OB');
  MI : Write(Lst,'MI');
  SI : Write(Lst,'SI');
  OI : Write(Lst,'OI');
  AI : Write(Lst,'AI');
  PN : Write(Lst,'PN');
  IM : Write(Lst,'IM');
  CC : Write(Lst,'C');
  EE : Write(Lst,'E');
End;
For RS := Send downto Receive do
Begin
  K := 0;
  For MM := Posi to NLsub do
  Begin
    Write(Lst,SheetData[Person,RS,SS,MM]:6);
    K := K + SheetData[Person,RS,SS,MM];
  End;
  Write(Lst,K:6);
  If (RS = Send) Then Write(Lst,' ');
End;
Writeln(Lst);
If KeyPressed Then Goto StopPrint;
If (SS = AP) Then First := MP Else
If (SS = PN) Then First := MI Else
If (SS = CC) Then First := IM;
If (SS = AP) or (SS = PN) or (SS = CC) Then
Begin
  For RS2 := Send downto Receive do
  Begin
    Sum := 0;
    K := 0;
    If (RS2 = Send) Then Write(Lst,' ');
    Begin
      For MM2 := Posi to NLsub do
      Begin
        J := 0;
        For SS2 := First to SS do J := SheetData[Person,
          RS2,SS2,MM2] + J;
        Write(Lst,J:6);
        Sum := Sum + J;
      End;
      If (RS2 = Send) Then Write(Lst,Sum:6,' ') Else
        Write(Lst,Sum:6);
    End;
  End;
End;
Writeln(Lst); Writeln(Lst);
End;
If (SS = OB) or (SS = EE) Then Writeln(Lst);
End;
Writeln(Lst);
If KeyPressed Then Goto StopPrint;
For RS2 := Send downto Receive do
Begin
  Sum := 0;
  If (RS2 = Send) Then Write(Lst, ' ') Else Write(Lst, ' ');
  For MM2 := Posi to NLsub do
  Begin
    Sum2 := 0;
    For SS2 := MP to EE do
      Sum2 := Sum2 + SheetData[Person, RS2, SS2, MM2];
    Write(Lst, Sum2:6);
    Sum := Sum + Sum2;
  End;
  Write(Lst, Sum:5);
End;
Writeln(Lst); Writeln(Lst); Writeln(Lst); Writeln(Lst);
If KeyPressed Then Goto StopPrint;
End;

StopPrint:
  End;
Else
  Update(Sender, Receivers, Subject, Manner);
End;
End;
Close(VaData);
End.
REFERENCES


Banta, D., & Fox, R. (1972). Role strains of a health care team in a poverty community. Social Science and Medicine, 6, pp. 697-722.


