6-6-1990

Comparative Impact of Selected Group Input Variables on Self-Assessments of Group Process Skills in Interdisciplinary Health Care Teams: a Field Study

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Recommended Citation
Mitchell, R. Michael, "Comparative Impact of Selected Group Input Variables on Self-Assessments of Group Process Skills in Interdisciplinary Health Care Teams: a Field Study" (1990). *Dissertations and Theses.* Paper 4129.
https://doi.org/10.15760/etd.6012

AN ABSTRACT OF THE THESIS OF R. Michael Mitchell for the Master of Science in Psychology presented June 6, 1990.

Title: Comparative Impact of Selected Group Input Variables on Self-Assessments of Group Process Skills in Interdisciplinary Health Care Teams: A Field Study.

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During the past two decades interdisciplinary health care teams have come to be considered an integral component in the efficient delivery of health care. Interdisciplinary teams dealing with the increasingly complex problems of patients are now common in many health care settings. The purpose of the present study was to investigate the individual and collective impact of several group process

inputs, common to interdisciplinary health care teams, on team members' appraisals of their own group process skills.

Outcome data was gathered on seventy-two staff and trainee members of four interdisciplinary health care teams at a Veterans Administration Medical Center using a forty-nine-item questionnaire measuring self-assessed levels of several group process skills. The teams' responses were factor-analyzed for comparison with the nine questionnaire subscales, and the resultant six factors used as dependent variables.

Results indicate that: 1) Different levels of group process skills are distributed across professional disciplines; 2) team status exists as a potent structural input to several group process skills; and 3) self-assessments, versus other-assessments, may be less vulnerable to the effects of increasing group size and individual members' time on the team.

COMPARATIVE IMPACT OF SELECTED GROUP INPUT VARIABLES ON SELF-ASSESSMENTS OF GROUP PROCESS SKILLS IN INTERDISCIPLINARY HEALTH CARE TEAMS: A FIELD STUDY

by

R. MICHAEL MITCHELL

A thesis submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE
in
PSYCHOLOGY

Portland State University
1990

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INTRODUCTION

Every year team-building programs are implemented in private and public organizations. The pervasiveness of team-building as one of the most popular organization development (OD) interventions is well recognized (Beckhard, 1972; Beckhard & Lake, 1971; Dyer, 1977; French & Bell, 1984; Plovnick, Fry, & Rubin, 1975; Porras & Berg, 1978). Among three reviews of the empirical OD literature (Cummings, Molloy & Glen, 1974; Huse & Cummings, 1985; Locke, Feren, McCaleb, Shaw, & Denney, 1980) there is a consensus that only a few OD intervention approaches have been shown to be effective via research investigations of high quality design and execution, and that team-building is one of these effective approaches.

REVIEW OF THE LITERATURE

Reviews specific to the empirical team-building research (Buller, 1986; Nicholas, 1982; Porras & Berg, 1978; Woodman & Sherwood, 1980) find inconclusive or mixed evidence that team-building interventions improved work-group performance and/or group process. Indeed, the team-building reviews themselves have varied, with findings of positive effects of team-building in 80% (DeMeuse & Liebowitz, 1981), 63%

(Woodman & Sherwood, 1980), and 50% (Nicholas, 1982) of the studies reviewed.

Reviewers have made numerous suggestions as to the sources of inconsistent results achieved generally in OD, and specifically in team-building, research. These range from problems of an operational definition of team-building (Buller, 1986; DeMeuse & Liebowitz, 1981); difficulties in measuring social system change (Porras & Berg, 1978); the use of case studies (Woodman & Sherwood, 1980) or pre-experimental designs (Buller, 1986; DeMeuse & Liebowitz, 1981); to employing only affective reactions as dependent measures (Buller, 1986; Buller & Bell, 1986; DeMeuse & Liebowitz, 1981; Nicholas, 1982; Woodman & Sherwood, 1980); and the confounding of team-building with goal setting or other OD interventions (Buller & Bell, 1986; DeMeuse & Liebowitz, 1981). DeMeuse and Liebowitz (1981) add that half of the studies they reviewed used an inadequate number of subjects, the typical evaluation period was much too short, and all of the studies lacked an adequate level of power (because of small sample size) to detect significant statistical impact. Considering these criticisms, DeMeuse and Liebowitz (1981) excluded from their empirical analysis 19 of 55 studies that "allegedly employed team building" (p. 359). And of the remaining 36 studies, they found the majority lacking sufficiently rigorous evaluations to ascertain valid outcomes of team-building, thus effectively

invalidating any positive team-building results reported by the authors. Their criteria for exclusion reflects the general consensus of all such reviews: that team-building research has been generally poor from a methodological standpoint. They state: "Indeed, the excessive weaknesses in the research methods and measurements preclude any firm conclusions concerning the efficacy of team building" (p. 369).

I concede the reviewers' point: the research methodology of the studies examining team-building has, and continues to be, poor. However, I believe that there is an additional explanation for the mixed results of the studies. Most OD diagnostic models and theories (Hornstein & Tichy, 1973; Katz & Kahn, 1978; Lawrence & Lorsch, 1967; Levinson, 1972; Nadler & Tushman, 1977; Weisbord, 1978), recognize that an organization is a socio-technical system existing in a highly complex environmental context. With this in mind, and while noting the methodological criticisms of team-building research discussed above, it appears that the OD practitioner is faced with somewhat less than laboratory conditions when called upon by an organization. Team-building (or any OD approach), is by design, often only one intervention in a system-wide program to improve organizational effectiveness. Yet this fact has been interpreted by reviewers as a confound and therefore a weakness in research methodology (Buller & Bell, 1986;

DeMeuse & Liebowitz, 1981). Moreover, while teams are not unknown in informal environments, most teams are found in large formal structured settings, where practitioners are subject to organizationally prescribed constraints on their intervention techniques and research methodologies. In addition, teams do not generally emerge spontaneously as other small groups often do, and it is unlikely that individuals can be randomly assigned to different teams, or to a non-team control condition. Moreover, team members often have non-team responsibilities, and often a team operates within many other constraints imposed by the work setting, as well as the task itself.

From the OD practitioner's point of view, then, there exists a great many organizational and group considerations which must be dealt with when considering a team-building intervention. Consequently, I believe that the variation in the perceived impact of team-building on performance outcomes is not due solely to variations in research designs. The group process and performance outcomes of a team, or any group, can vary dramatically according to the quality and quantity of certain types of organizational input to the group (Ducanis & Golin, 1979; Garner, 1988; Jewell & Reitz, 1981; Szilagyi & Wallace, 1983; Yukl, 1989). The input variables relevant to interdisciplinary health care teams, which are the focus of this study, are the following: 1) and 2) two perspectives of professional

identity; 3) amount and scope of group process training; 4) length of time on the team; and 5) team size. Let us now examine some of these input variables in greater detail, in order to understand how they might affect the processes of interdisciplinary health care teams.

GROUP INPUT HETEROGENEITY

To anyone who has worked on a committee or in a team situation, it should be obvious that the variety of individuals who compose the team is an important factor in determining the effective performance of the team. For instance, the literature on group decision-making includes an impressive number of studies which examine the effects of decreasing or increasing heterogeneity of some individual characteristic on the quality of the group decisions. Skills and abilities, age, gender, education, experience, creative potential, individual temperament, status, and a multitude of specific personality variables have been explored (Berger, Cohen, & Zelditch, 1972; Hall, 1975; Harvey, 1953; Huse & Cummings, 1985; Laughlin & Bitz, 1975; Shaw, 1976; Sorenson, 1973). The trend of this research is clear: heterogeneous groups tend to make better decisions than homogeneous groups, no matter what the attribute being studied (Jewell & Reitz, 1981).

In so far as health care teams are concerned, it would appear that professional identity variation is of

importance. In the health care field, individuals from many different medical and non-medical specialties may be incorporated into the same interdisciplinary team. In the present study, I explored the impact of professional identity on teams in two different ways. First, I examined the quantitative effects of simply the number of professional disciplines on a team, and second, the qualitative impact of differing professional discipline categories within a team.

Number of Professional Disciplines

With respect to the number of professional disciplines on a team, Steiner (1972) indicates that heterogeneous groups have some difficulty in integrating information. Nonetheless, it is generally expected that this difficulty will be outweighed by greater team effectiveness due to the diversity of the information accessible to the interdisciplinary team (Shaw, 1976; Steiner, 1972). Moreover, when overall group ability is held constant, groups whose members differ in skills and personality profiles perform more effectively than groups whose members have similar skills and profiles (Shaw, 1976).

As mentioned above, the issue of professional heterogeneity is particularly salient in the health care field. In all of the allied health care professions, the increasing complexity of patient care has created both a felt need for interdisciplinary teamwork and an increased

willingness to improve group process skills in interdisciplinary contexts.

Hypothesis 1: As the number of professional disciplines on a team increases, team members' self-assessments of group process skills will increase.

Professional Identity

Nason (1983) states that one of the potential stumbling blocks in interdisciplinary health care teams is the division of services into technical versus caring professions. More specifically, Berglund (1975) found that physicians are considered to have the highest medical competence and that socio-psychological caring goals are not seen by physicians as being relevant to health care. Engstrom (1986) proposed from her investigation of a multidisciplinary team conference, that it is probable that the physician overloads the communication at interdisciplinary team meetings with medical aspects of the patient's care. According to Kalisch and Kalisch (1977), another challenge to interdisciplinary team function may be due to physicians' feelings that nurses have placed disproportionate emphasis on the psychological aspects of patient care and are guilty of ignoring the physical needs. In like fashion, nurses were found to believe that physicians had forgotten patients as human beings.

In a sense, cultivation of an expertise is a fragmentation of knowledge. It is more often the rule

rather than the exception that all members of a health care team lack a unifying perspective, some grasp of their common problems that transcends the specialized interests of each individual discipline. Physicians are trained in autonomous decision-making, striving for personal achievement, and the importance of improving their own performance (Stoelwinder & Clayton, 1978; Weisbord, 1976). Consequently, they are often unaware that other health care professionals possess skills and knowledge unique to their individual professions (Kalisch & Kalisch, 1977). Wessen (1966), in a general hospital ward, found that communication across disciplinary lines flowed primarily in one direction, from the higher status physician to the lower status nurses. Research findings (Berelson & Steiner, 1964) indicate that one-way communication, as opposed to mutual communication, is less accurate and engenders lack of confidence. More recently, Fiorelli (1988), in an empirical study describing clinical team member responses regarding bases of social power used within team meetings, found that physicians were nominated by team members 72.1% of the time as being able to effect the majority of treatment decisions. All other disciplines were far behind in perceived decision effectiveness. Physical therapy was the second most compelling discipline (14.8%), followed by psychologists (4.1%), nurses (3.3%), speech and hearing therapists (3.3%), occupational therapy (2.5%), and social service (0%).

In the teams I investigated, there exists a number of disciplines, including physicians and nurses. Results from the research discussed above on the differences between physicians and nurses might be generalized to cover the full variety of disciplines involved in the teams of this study. The education, experience, and training required in different health care disciplines can be conceptualized as distinguishing four categories of professionals. Each category possesses contrasting viewpoints on patient care criteria and resultant expectations of interdisciplinary team function.

I propose that the first conceptual category might consist solely of physicians. Summarizing Cobbs (1975), Engstrom (1986) states that "in the physicians' training and experience, a focus is ... built into the identification and treatment of pathology." The second conceptual category proposed is comprised of the various levels of the nursing professions. In Engstrom's (1986) review of Johansson (1983), she contends that "nurses also have a symptom-orientated training." However, with respect to the ideal approach for developing working relationships between nursing and medicine, the goals of nursing, and those of medicine have been intrinsically different. Medicine has sought to define the role of nursing in terms of "physician-extenders" (Temekin-Greener, 1983), while nursing sees the

team as an agent with which to exercise their specific knowledge to direct patient care (Bullough, 1976).

The third category proposed encompasses a diverse group of therapists (physical therapists; corrective therapists; occupational therapists; respiratory therapists; speech pathologists; and dieticians), whose professional education and training each focuses on a specific physical or social component of the patient's well-being. The fourth and final category proposed here is made up of clinical psychologists and social workers. These professionals are educated in the social sciences and trained to evaluate the patient's "intrapersonal" psycho-social needs in conjunction with "interpersonal" elements of personality, intelligence, and the like.

Based on the literature reviewed above, it appears that within each of these conceptual categories of health care disciplines there may exist similar notions and utilization of group process skills available to the interdisciplinary team. Moreover, I hypothesize that between these individual categories, there exists distinctly different notions and utilization of these skills.

Hypothesis 2: Among the four categories of team members' professional disciplines discussed above (MDs, Nurses, Therapists, and Social scientists), there will be significant differences in self-assessments of group process skills.

Trainee vs. Staff Status

A third method of specifying group heterogeneity in this study is to examine differences in group process training among team members. In the present study, "staff" team members had previously undergone a probationary group process/team-building training period. By definition, "trainee" team members are entering into, or currently undergoing, this same group process training. Moreover, there is evidence that group process training increases use of group process skills and cooperation with other team members (Stahelski & Tsukuda, 1990).

Hypothesis 3: With regard to team members' "trainee" vs. "staff" status on their team, individuals with a staff standing will have higher self-assessments of group process skills than those individuals with trainee status.

LENGTH OF TIME AS A TEAM MEMBER

An important structural dimension of group process is group cohesion, with personal attractiveness among group members noted as one of the primary forces which holds groups together, and noted as the specifically recommended measure of group cohesion (Ducanis & Golin, 1979; Howell & Dipboye, 1986). Moreover, with respect to groups in working organizations, Michael Argyle (1972) emphasizes that

> working groups, unlike groups studied in the laboratory, last a considerable length of time. During this time the social system of the group

> develops slowly. One of the most important aspects of this system is the cohesiveness of the group - the extent to which the group members are attracted towards the group (pp. 114-115).

The cultivation of a team, or any work-group, requires time and communication. We should not be surprised by the fact that opportunity for interaction is a requirement for cohesion to develop. The sociologist George C. Homans (1950) noted that as frequency of interaction between two or more individuals increases, there occurs corresponding increases in their linking with each other. A high degree of group cohesion enables and encourages group members to identify themselves with the group and become involved in the group's tasks, resulting in members accepting the group's success or failure as their own (Lindgren & Harvey, 1981). All other conditions being equal, then, with greater time as a group member, frequency of member interaction increases, resulting in increased group cohesion and greater identification and involvement with the group's tasks, successes, and failures.

Not every work-group or team develops a high degree of cohesion. For a cohesive team to develop, there exists the requirements for interdependence and collaboration among members. These are both elements of cooperation (Stahelski & Tsukuda, 1990), another structural dimension of group process. Like cohesiveness, the degree of cooperation is related to group input variables such as length of time as a team member (Johnson, Johnson, & Maruyama, 1983). For

instance, paired subjects involved in a group task situation exhibited greater cooperation when their partners were alternated less frequently (Shure & Meeker, 1968). In addition, Braver and Barnett (1976) have demonstrated that cooperation is similarly increased with greater observational continuity. They required half of their subjects to observe future partners cooperating with others, while the remaining half did not have this opportunity for observation. Subsequently, the "observers" cooperated more in task interaction than did the "non-observers."

With respect to both group cohesion and cooperation, then, it appears that enhancement of group process skills occurs with increasing length of time as a member of the work-group or team.

Hypothesis 4: As the length of time on a team increases, team members' self-assessments of group process skills will increase.

TEAM SIZE

Although increasing heterogeneity of professions and increasing length of time on the team tend to increase the potential performance of the interdisciplinary health care team, there is a possible impediment to the positive impact of these two variables. While the potential quality of decisions may be much greater in a heterogeneous team, the complexity introduced by those differences may prove to be

counterproductive. As Steiner (1972) observed, "Such a group is likely to experience greater difficulty in evaluating and pooling information than a group with more homogeneous members" (p. 197). Additionally, Steiner adds, "probably heterogeneity is also more likely than homogeneity to promote antagonisms among members" (p. 107). These comments by Steiner point to a possible confound which can adversely affect positive group outcomes: often as group heterogeneity increases, group size increases as well.

Even though adding greater heterogeneity typically increases a group's overall performance on most types of tasks, groups do not perform as well as one would expect. It is pointed out by Hare (1976) that while a larger group has greater resource availability for completing task demands, the individual's contribution is reduced as group size increases and only the more aggressive members are able to make their opinions known. Furthermore, groups have been shown to perform progressively below their additive potential. To illustrate, Ingham, Levinger, Graves, and Peckham (1974) found that dyads pulling a rope pulled at 93 percent of individual capacities, triads at 85 percent, and groups of eight at a mere 49 percent. This "social loafing" phenomenon has been verified in a wide variety of situations where an individual's contribution to a group's performance is difficult to evaluate (Latane & Nida, 1981; Latane, Williams, & Harkins, 1979). In addition, as Stahelski,

Frost, and Patch (1989) have noted, evidence of group size effects has persisted in a wide range of group studies. For example, group size has been well documented as a predictor variable in both the bystander intervention (Latane, Nida, & Wilson, 1981) and the cooperation/competition (Fox & Guyer, 1978; Komorita & Lapworth, 1982; McCallum, Harring, Gilmore, Drenan, Chase, Insko, & Thibaut, 1985) literature, firmly establishing that prosocial behavior decreases as group size increases. Additional research (Porter & Lawler, 1965) has shown that members of overly large groups, relative to the demands of their tasks, are less likely to become involved and assume responsibility for the destiny of the group than are members of groups that are overly small relative to task demands.

Finally, Kane (1975), in her examination of the interprofessional health care team as a small group, summarizes the research of Berelson and Steiner (1964) and suggests that

> as the size of a group increases, greater demands are placed on the leader but the group tolerates direction from the leader better, the more active members tend to dominate the group, and the more passive members withdraw from participation. Also, the larger the group, the less intimate is the atmosphere, the more anonymous the actions, the longer it takes to reach decisions, the more acceptable it becomes to accept unresolved differences, the more subgroups form, and the more formalized are the rules and procedures of the group (pp. 21-22).

Hypothesis 5: As team size increases, team members' self-assessments of group process skills will decrease.

AGE AND GENDER

Age and gender are additional, conspicuous, inputs which individuals bring to a team. Stahelski and Tsukuda (1990), in their research on the same health care teams I am examining here, found that age and gender had no significant effect on group members' evaluations of **overall team** utilization of group process skills. Results of other small group research have to date been inconclusive. For example, mixed sex groups have been found to perform better than all-male groups (Hoffman & Maier, 1961) and worse than either all-male or all-female groups (Clement & Schiereck, 1973). The relationships between gender of individual group members and group outputs appear to be of less importance than was once believed. Previous evidence indicated that gender was related to two internal outcomes: 1) women were more likely to cooperate, and men to compete; and 2) women were able to be influenced more easily than men. However, Jewell and Reitz (1981) counter these propositions by citing Eagley's (1978) review of almost 300 studies, indicating that evidence of gender differences in interpersonal outcomes tends to be on the decline.

Various individual-difference inputs to group process have been found to be related to cooperative behavior. Both cooperation and competition are learned behaviors (Jewell & Reitz, 1981), and as Cook and Stingle (1974) found, competition is learned first, at about four years of age,

with both cooperation and competition behaviors tending to increase with age. In addition, as Ducanis and Golin (1979) have stated, "It may well be that compared to other factors such as ability and experience, age is a relatively less important variable in interdisciplinary teams" (p. 129). It should be noted that since the groups I am proposing to study are composed entirely of professionals, their age span is relatively compressed. Finally, with respect to interdisciplinary health care teams in general, age is likely to be confounded with professional experience and status, and it may therefore be impossible to isolate the effects of age alone (Ducanis & Golin, 1979).

In light of the above research, I did not propose to examine the effects of age and gender on individuals' self assessments of group process skills.

METHOD

OVERVIEW

This research study was part of a larger organization development (OD) project (Stahelski & Tsukuda, 1990) at the Veterans Administration Medical Center (VAMC) in Portland, Oregon. The methodology presented here is a case study with survey techniques, utilizing an extensive questionnaire covering all aspects of the teamwork process. The respondents were staff and trainees of the VAMC involved in some capacity with the Interdisciplinary Team Training in Geriatrics (ITTG) program for varying lengths of time. This particular study focussed on those portions of the larger questionnaire relating to each individual's self-assessed group process skills.

SAMPLE

Subjects were a convenience sample of 72 male and female VAMC employees taken from four geriatric health care teams: the Adult Day Health Care (ADHC) team, (n=12); the Geriatric Rehabilitation Unit (GRU), (n=14); the Geriatric Evaluation Unit (GEU), (n=16); and the Nursing Home Care Unit (NHCU), (n=30). Their ages ranged from 24 to 59. They represent a wide spectrum of health care disciplines

including: medicine, nursing, physical and occupational therapies, speech pathology, corrective therapy, pharmacy, psychology, social work, and optometry.

MATERIALS

The 49-item questionnaire was developed by the author's advisors over a six-month period. The development of the questionnaire was based on their extensive collective experience with group process, teamwork in general, and with the ITTG program in particular. The Appendix presents the questionnaire in the form as presented to respondents.

As indicated in the Appendix, the actual questionnaire was prefaced by a form comprised of questions used to collect the basic demographic information to be used as predictor variables of elements of group process. The remaining six pages of the questionnaire contained the 49 response items, dealing with self-assessments of a number of facets of group process, to be used as criterion measures: collaboration, (Q1-Q8); participation, (Q9-Q13); both listening, (Q14-Q17) and speaking, (Q18-Q22) components of communication; goal-setting, (Q23-Q29); problem-solving, (Q30-Q35); and conflict resolution, (Q36-Q42) as they relate specifically to formal decision-making interactions; and task production, (Q43-Q46) and consideration, (Q47-Q49) aspects of team process maintenance.

PROCEDURE

All participants were asked by the ITTG Director to complete the questionnaire. The ITTG Director, or her research assistant, hand delivered the questionnaires to participants at various locations in the VAMC. Each participant was then given the following instructions: "Please fill this questionnaire out at your convenience. Fill it out individually; that is, do not discuss your responses with your colleagues and team members. Please answer each as you really are, rather than how you would like to be. Thank you for your participation." Participants then were asked to return the completed questionnaire to the ITTG Director either by hand, or through the VA's interdepartmental mail.

RESULTS

Table I gives descriptive statistics, subscale maximums, means and standard deviations, for each of the ITTG group process subscales, across all four teams.

TABLE I

DESCRIPTIVE STATISTICS, BY ITTG GROUP PROCESS SUBSCALE (OVERALL N=70)

SUBSCALE	MEAN	MAXIMUM	MEAN MAX	S.D.
COLLABORATION	33.23	40.00	.83	6.41
PARTICIPATION	22.13	25.00	.89	4.10
LISTENING-COMMUNICATION	16.49	20.00	.82	3.62
SPEAKING COMMUNICATION	20.81	25.00	.83	4.43
GOAL-SETTING	21.66	35.00	.62	5.48
PROBLEM-SOLVING	21.23	30.00	.71	6.31
CONFLICT-RESOLUTION	22.99	35.00	.66	7.60
TASK-PRODUCTION	14.99	20.00	.75	4.41
CONSIDERATION	9.56	15.00	.64	6.54

Before testing individual hypotheses, I first addressed the problem of multicollinearity, between the five group input variables representing the five hypotheses. Pedhazur (1982) suggests that a possible solution to this problem is to delete one of the variables that have been identified as collinear. A procedure for doing this is outlined in Hair, Anderson, and Tatham (1987). A Spearman Correlation matrix was generated, obtaining all possible IV-IV and IV-DV

correlation coefficients. The second step was to delete any individual pairs of independent variables which had larger IV-IV correlation coeficients than the largest IV-DV coefficient in the matrix. Table II gives both IV-IV and IV-DV Spearman Correlation coefficients. It can be seen that none of the IV-IV correlations exceed the largest IV-DV correlation of .416. Therefore the problem of multicollinearity did not appear to be a significant one and it was not necessary to delete any of the group input predictor variables from further analyses.

TABLE II

MATRIX OF SPEARMAN CORRELATION COEFFICIENTS (IVs WITH DVs AND IVs)

	GROUP INPUTS (IVs)				
	PROFESSIONAL: HETEROGENEITY	IDENTITY	STATUS	TIME	SIZE
GROUP INPUTS (IVs)					
PROFESSIONAL-HETEROGENEITY	1.000				
PROFESSIONAL-IDENTITY	-0.119	1.000			
STATUS	***0.395**	-0.284	1.000		
TIME	-0.196	0.160	0.147	1.000	
SIZE	0.182	-0.018	0.146	-0.326	1.000
GROUP PROCESS SUBSCALES (DVs)					
COLLABORATION	0.044	0.073	0.223	0.141	-0.073
PARTICIPATION	0.014	0.174	0.224	0.224	-0.133
LISTENING-COMMUNICATION	0.240	0.201	0.090	0.080	0.080
SPEAKING-COMMUNICATION	0.003	0.337	-0.008	0.229	-0.098
GOAL-SETTING	-0.057	-0.125	0.210	0.269	-0.092
PROBLEM-SOLVING	0.085	-0.140	0.186	0.170	-0.129
CONFLICT-RESOLUTION	0.118	-0.015	0.032	0.013	-0.044
TASK-PRODUCTION	-0.069	0.180	-0.005	0.167	-0.204
CONSIDERATION	-0.088	0.024	0.243	****0.416**	-0.271

(* Greatest IV-IV Correlation)
(** Greatest IV-DV Correlation)

Similarly, with respect to the dependent measures, the issue of the independence, or lack of independence, of the nine group process criterion variables was addressed. The question was: Do each of the 49 items of the ITTG questionnaire represent an independent assessment of the item's assigned ITTG subscale. Or, is there a smaller array of explanatory factors underlying both the nine subscales, and, ultimately the 49 individual questionnaire items? I responded to this question by performing an exploratory principal components factor analysis, with rotated varimax factor loadings, in order to identify possible underlying orthogonal factors. Three criteria, based on factor conventions evolved by factor analysis researchers, were used in this identification procedure. First, only items loading greater than or equal to .50 were retained for each factor. As can be seen in Table III, all items except #10, #13, and #23 loaded to a factor at or above this level. Secondly, only factors with an Eigen value greater than 1.0 were retained for further analysis. Finally, as advocated by Cattell (1965) and as summarized in Kim and Mueller (1981), a Scree-Test was performed. They then direct one to examine the graph of eigenvalues, and to stop factoring at the point where the eigenvalues level off, forming a nearly straight line with almost no horizontal slope. As Kim and Mueller point out "Beyond this point Cattell describes the

smooth slope as 'factorial litter or scree'" (p. 44). As a result of this test, and as further described in Table III, factors one through six were extracted, while factors seven through nine were not retained in further analyses. As indicated in Table III, six factors emerged from the analysis utilizing the three criteria described above: factor 1 (Communication), eigenvalue = 20.25, 17.4% of total variance explained; factor 2 (Conflict-Resolution), eigenvalue = 4.12, 13.1% of variance explained; factor 3 (Decision-Making), eigenvalue = 3.17, 11.7% of variance explained; factor 4 (Collaboration), eigenvalue = 2.54; 9.9% of variance explained; factor 5 (Task-Production), eigenvalue = 2.35, 7.9% of variance explained; and factor 6 (Consideration), eigenvalue = 1.72, 3.6% of total variance explained. The names of the factors were selected by comparing the item loadings for each factor with the original ITTG questionnaire subscales (compare Table III and the Appendix).

TABLE III

SUMMARIZED RESULTS OF EXPLORATORY FACTOR ANALYSIS SHOWING GREATEST FACTOR LOADING, BY ITEM NUMBER

ITEM NUMBER / FACTOR LOADINGS

FACTOR 1 Communication	FACTOR 2 Conflict-Resolution	FACTOR 3 Decision-Making	FACTOR 4 Collaboration	FACTOR 5 Task-Production
Eigen = 20.25	Eigen = 4.12	Eigen = 3.17	Eigen = 2.54	Eigen = 2.35
Item/Loading	Item/Loading	Item/Loading	Item/Loading	Item/Loading
14 / .75	36 / .84	24 / .61	1 / .76	43 .84
15 / .80	37 / .85	26 / .60	2 / .50	44 .87
16 / .76	38 / .86	27 / .55	3 / .60	45 .86
17 / .78	39 / .77	29 / .73	4 / .55	46 .60
18 / .80	40 / .72	30 / .85	5 / .57	
19 / .83	41 / .80	31 / .84	6 / .57	
20 / .69	42 / .72	32 / .53	7 / .81	
21 / .79		33 / .74	8 / .68	
22 / .76				
11*/ .52				
12*/ .60				
49*/ .53				

FACTOR 6 Consideration	FACTOR 7	FACTOR 8	FACTOR 9	ITEMS NOT LOADED TO ANY FACTOR AT >.5
Eigen = 1.72	Eigen = 1.53	Eigen = 1.37	Eigen = 1.13	
Item/Loading	Item/Loading	Item/Loading	Item/Loading	
47 / .74	34 / .71	9 / .72	25 / .62	10
48 / .76	35 / .60			13
				23

* Loading from outside of expected grouping according to ITTG subscale.
(NOTE: Items #28 and #35 were virtually identically worded, therefore #28 was dropped from all analyses)

To test hypothesis 1, that increasing professional heterogeneity increases self-assessments of group process skills, a MANOVA was performed treating level of professional heterogeneity (i.e., # of professions/team) as the independent variable and the six group process factors as dependent variables. The overall multivariate test of significance (F (6,59) = 1.17; P = .336) indicates that professional heterogeneity is not significant with respect to the group of six factors.

In like fashion, the MANOVA analyses performed tested hypotheses 2 and 3, treating category of professional identity (i.e., MDs; RNs; therapists; and social scientists) and team status (trainees vs. staff), respectively, as the independent variables and the six group process factors as dependent variables.

Table IV indicates the results of both the multivariate (F (6,59) = 2.75; P = .020) and univariate tests, with category of professional identity showing significance on factor 1, Communication. Table V shows descriptive statistics for each professional identity category with respect to factor 1. Additionally, a set of post-hoc independent t-tests was conducted in an attempt to identify significance in the order (high to low) of the categories of professional identity on factor 1, Communication. Six tests were run, resulting in three significant P values, as also presented in Table V. Both the descriptive statistics and

the significance tests support the following order from high to low: Social scientists, Therapists, Nurses, and Physicians.

TABLE IV

MULTIVARIATE AND UNIVARIATE ANALYSES OF THE EFFECT OF PROFESSIONAL IDENTITY (H2) ON THE SIX GROUP PROCESS FACTORS

ANALYSIS	DF	F	P. VALUE
Multivariate	6,59	2.75	.020
Univariate			
F(1) COMMUNICATION	1,64	2.24	.001
F(2) CONFLICT-RESOLUTION	1,64	.01	N.S.
F(3) DECISION-MAKING	1,64	.40	N.S.
F(4) COLLABORATION	1,64	1.87	N.S.
F(5) TASK-PRODUCTION	1,64	2.08	N.S.
F(6) CONSIDERATION	1,64	.14	N.S.

TABLE V

DESCRIPTIVE STATISTICS AND t-TESTS FOR INDIVIDUAL LEVELS OF PROFESSIONAL IDENTITY WITH RESPECT TO FACTOR 1 (COMMUNICATION)

DESCRIPTIVE STATISTICS

	SOCIAL SCIENTISTS	THERAPISTS	NURSES	MDs
FACTOR 1				
N	8	23	28	11
MEAN LOADING	.368	.333	-.019	-.916
S.D.	.424	.561	.634	1.926

t-TESTS (t / PROB)

SOCIAL SCIENTISTS	--	-.1/.874	-1.62/.115	-1.84/.083
THERAPISTS		--	**-2.07/.043***	**-2.90/.007***
NURSES			--	**-2.22/.033***
MDs				--

(* Significant, P < .05)

Table VI displays the results of both the multivariate ($F(6,59) = 2.80$; $P = .018$) and univariate tests of hypothesis 3, with level of team status showing significance on factor 4, Collaboration. Examination of the means of "staff" and "trainee" members indicates that staff members have higher self-assessments overall and on the significant subscale, supporting hypothesis 3.

TABLE VI

MULTIVARIATE AND UNIVARIATE ANALYSES OF THE EFFECT OF TEAM STATUS (H3) ON THE SIX GROUP PROCESS FACTORS

ANALYSIS	DF	F	P. VALUE
Multivariate	6,59	2.80	.018
Univariate			
F(1) COMMUNICATION	1,64	.06	N.S.
F(2) CONFLICT-RESOLUTION	1,64	.01	N.S.
F(3) DECISION-MAKING	1,64	.68	N.S.
F(4) COLLABORATION	1,64	14.70	.000
F(5) TASK-PRODUCTION	1,64	.00	N.S.
F(6) CONSIDERATION	1,64	1.16	N.S.

Hypotheses 4 and 5, involving time-on-the-team and team size, respectively, were tested and not similarly found to be significant in the MANOVA analysis, thus indicating no support for either hypothesis.

DISCUSSION

The results from this study offer a number of contributions to the Team-building research. First, the results presented here, and summarized in Tables IV and V, demonstrate that different levels of group process skills are distributed across several professional categories. This result coincides with previous results cited above, at least insofar as nurses and physicians are concerned. Indeed, it appears that within each of these categories there exists similarity regarding group process skills, and between these identities there is dissimilarity. Table V results indicate that physicians and nurses assess their group process skills more negatively than either therapists or social scientists. These results were not found in Stahelski and Tsukuda (1990), when group process assessments of "others" were the criterion variables, using different results from the same respondents used in this study. Apparently, assessment of self is related to professional identity, but assessment of others is not. Any team member, whether staff or trainee, has had at least three years to identify with a particular profession, and three or more years is probably ample time to incorporate this identity into one's self concept. In regard to "other" assessment, it is possible that the effects of professional identity are

simply overwhelmed by the more powerful effects of one; a broader identity, that of staff or trainee; and two, the negative attributional biases associated with increasing group size (Forsyth, 1990).

Secondly, the results of this study include evidence supporting team status as a structural input to group process. As indicated in Table VI, team status is significant overall and is a significant individual predictor of Collaboration, factor 4. It is perhaps not at surprising that team status has effects on group process. The team status input appears to be made up of components other than simply the passage of time. Although most staff members have been on their teams longer than trainees, the significance of team status is clearly more than just time, as indicated by the fact that time on the team (hypothesis 4) did not reach significance in the MANOVA analysis. Stahelski and Tsukuda (1990) found similar results with time and "other" assessments. Consideration of the group development cycles literature (Tuckman & Jensen, 1977) might help to understand this lack of relationship. The stage, or point in the cycle, of a team's development varies between teams. For example, teams in a "storming" stage of development might have very different group process assessments than teams in the "performing" stage (Tuckman & Jensen, 1977).

Staff members have been exposed to the required ITTG group process/team-building training. There is evidence that group process training by staff members increases the use of group process skills, levels of cooperation, and perceptions of team cohesion (Stahelski & Tsukuda, 1990). Stahelski and Tsukuda, in their study on cooperation and teamwork involving the same subjects participating in this study, found that team status is a significant predictor of team cohesion, with staff status predicting higher team cohesion. The ITTG Questionnaire factor focusing on self-assessments of Collaboration revealed specific sensitivity to this structural input of group process. It is gratifying to observe that group process training (the team status variable) increases positive assessments of both "self" and "other" group process skills, indicating that the training increases both the usage and the observation of usage by others.

The prior research work cited above, in contrast to this study's findings, typically finds that group process skills decrease with increasing size of the group or team, hypothesis 5 of this study. For example, Stahelski and Tsukuda (1990) found that group size had an effect on communication in the team. Specifically, the number of interactions was found to decrease as group size increased. The group size effect was not found in the present study. This may appear to contradict Stahelski and Tsukuda's

findings specifically, and other group research in general, until one realizes the differences in focus of assessment involved in these studies. As stated above, Stahelski and Tsukuda's study involves subjects' assessments of their team's level of group process skill development, while the present study centers on subjects' assessments of their own development. The lack of significant results related to group size in this study is another way of pointing out the contrast between "other" assessment and "self" assessment of group process skills. Apparently, perceptions of others are more vulnerable to the effects of increasing group size. The results of studies on attribution biases indicate that it is easier to make negative assessments of others than of self (Jones & Nisbett, 1972). When a group's size increases, and the pro-social behavior of team members diminish, team members blame each other for the demise, rather than blaming themselves.

Finally, when considered simultaneously, the results indicate that professional identity and team status are significant predictors of self-assessed group process skills, while professional heterogeneity, team size, and time on the team are not. Is there any widespread meaning that can be derived from these results? Professional heterogeneity, size, and time are all strictly quantitative variables, perhaps with little or no psychological meaning for one's self concept. Professional identity and team

status are both qualitative variables, with distinctions having psychological meaning for individual team members.

It makes sense that professional identity and team status as staff or trainee would affect self-assessments. After all, in acquiring one's professional and team identities, group process skills are more or less emphasized, depending upon the specific identity. And, in hindsight, it also makes sense that the inputs external to the individual - professional heterogeneity, size, and time - would have little or no effect on self-assessments. Apparently, an individual's group process self-assessments are less vulnerable to quantitative variations in group structure than an individual's assessments of others in the group. This has both positive and negative implications for the team. On the positive side, it is good that an individual is able to remain confidently stable in the face of structural variations in the team. On the other hand, this is a disquieting result if an individual becomes deluded regarding the quality of his or her own skills and blames other team members for whatever group process deficiencies occur.

In conclusion, the results of this study, and those of Stahelski and Tsukuda (1990), mark an exciting beginning. Rather than bemoan the research methodology deficiencies in team-building studies, which are difficult to overcome, why not meta-analytically examine the effects of organizational

inputs on the process and performance criterion variables in these studies? In this way the "mapping" of the effects of these inputs on group criterion variables could be continued over a much wider sample of teams.

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APPENDIX

Date _____

Name _____

SS# _____

ITTG SURVEY

1. How many months have you been a team member? _____

2. How does your team identify itself (name)? _____

_____

3. _____ Male _____ Female _____ Age

4. What is your professional specialty? _____

_____ Trainee? _____ Staff?

5. How many teams are you a member of? _____

6. How many members does your team(s) have? _____

7. How often does your team have meetings? _____

8. How many members do you interact with regularly on the job outside of the team meetings? _____

TEAM SKILLS QUESTIONNAIRE

Circle the number that corresponds with your response using the following scale.

NO EXPERIENCE WITH THIS SKILL	ALMOST NEVER	RARELY	OCCASSIONALLY	FREQUENTLY	ALMOST ALWAYS
0	1	2	3	4	5

COLLABORATION

As a Geriatric Team Member, I:

1) express personal goals consistent with team goals	0	1	2	3	4	5
2) advocate problem solutions that benefit all team members	0	1	2	3	4	5
3) work for consensus	0	1	2	3	4	5
4) cooperate with other team members' tasks	0	1	2	3	4	5
5) do an equitable share of the group workload	0	1	2	3	4	5
6) feel an individual responsibility for the joint outcomes of the group members	0	1	2	3	4	5
7) support the team in dealing with the larger organization	0	1	2	3	4	5
8) view my contribution as belonging to the group, to be used or not, as the group decides	0	1	2	3	4	5

PARTICIPATION

As a Geriatric Team Member, I:

9) am physically present in all team activities (meetings, task assignments, etc)	0	1	2	3	4	5
10) participate fully and non-deceptively in team activities	0	1	2	3	4	5

NO EXPERIENCE WITH THIS SKILL 0	ALMOST NEVER 1	RARELY 2	OCCASSIONALLY 3	FREQUENTLY 4	ALMOST ALWAYS 5

PARTICIPATION cont.

11) provide and seek relevant information at team meetings	0	1	2	3	4	5
12) show openess to receiving information and assistance from other team members	0	1	2	3	4	5
13) provide assistance to team members when needed	0	1	2	3	4	5

COMMUNICATION (The purpose of good listening and speaking skills is to facilitate the sharing of information by demonstrating equal respect for the opinions of all team members)

Listening

As a Geriatric Team Member, I demonstrate good listening skills by:

14) clarifying the speaker's message (perception checking, questioning, paraphrasing) to make sure I understand	0	1	2	3	4	5
) making affirming responses odding, smiling, saying uh-huh, , etc)	0	1	2	3	4	5
) not interrupting (allowing the peaker to complete her or his message)	0	1	2	3	4	5
) using positive body language (eye ontact, forward lean and body orientation toward speaker)	0	1	2	3	4	5

Speaking

As a Geriatric Team Member, I demonstrate good speaking skills by:

18) presenting credible information based on my own expertise	0	1	2	3	4	5

NO EXPERIENCE WITH THIS SKILL 0	ALMOST NEVER 1	RARELY 2	OCCASSIONALLY 3	FREQUENTLY 4	ALMOST ALWAYS 5

COMMUNICATION cont.

Speaking cont.

19) making interpretations, conclusions and recommendations based on data presented, rather than personal bias	0	1	2	3	4	5
20) taking responsibility for my presented information by making 'I' statements	0	1	2	3	4	5
21) allowing the listeners to clarify my message	0	1	2	3	4	5
22) speaking only for myself and letting others speak for themselves	0	1	2	3	4	5

FORMAL DECISION MAKING INTERACTION (MEETINGS)

Goal Setting (Serves as both the desired outcomes and the guidelines which direct the team effort)

As a Geriatric Team Member, I:

23) identify and encourage others to identify the needs and wants of patients	0	1	2	3	4	5
24) identify and encourage others to identify the potential outcomes of each possible plan of response to the patient's needs	0	1	2	3	4	5
25) identify and encourage others to identify the resource and time limitations involved in each proposed plan of action	0	1	2	3	4	5
26) identify and encourage others to identify the tasks and means associated with each possible plan of action	0	1	2	3	4	5

NO EXPERIENCE WITH THIS SKILL 0	ALMOST NEVER 1	RARELY 2	OCCASSIONALLY 3	FREQUENTLY 4	ALMOST ALWAYS 5

FORMAL DECISION MAKING INTERACTION (MEETINGS) cont.

27) encourage the group to select explicit team goals from among the proposed plans of action	0	1	2	3	4	5
28) publically commit myself to the selected team goals and encourage others to do likewise	0	1	2	3	4	5
29) document the selected team goals for any particular patient, the time and resource committment required to reach the goal, and the task assignment of each team member	0	1	2	3	4	5

Problem Solving (Is necessary when the initial goal and objectives are not met according to the action plan; that is, whenever the group senses it is having trouble getting work done, it takes the time to find out why)

As a Geriatric Team Member, I:

30) evaluate the action plan by identifying the difference between the desired result and the existing conditions	0	1	2	3	4	5
31) analyze the factors contributing to this difference	0	1	2	3	4	5
32) generate and encourage others to generate possible solutions, in a non-critical, brainstorming manner	0	1	2	3	4	5
33) evaluate the potential solutions according to the original goals, the original and additional cost of resources, and the possible risks to patients and team members	0	1	2	3	4	5

NO EXPERIENCE WITH THIS SKILL 0	ALMOST NEVER 1	RARELY 2	OCCASSIONALLY 3	FREQUENTLY 4	ALMOST ALWAYS 5

FORMAL DECISION MAKING INTERACTION (MEETINGS) cont.

34) encourage the team to select a solution according to group consensus	0	1	2	3	4	5
35) publically commit myself to the selected solution and encourage others to do likewise	0	1	2	3	4	5

Conflict Resolution (deals with problems that occur between team members)

As a Geriatric Team Member, I:

36) identify my own problem and unmet needs	0	1	2	3	4	5
37) describe my problem and needs to the other team members	0	1	2	3	4	5
38) confirm the other members' understanding of the problem statement	0	1	2	3	4	5
39) solicit a problem statement from the other member(s)	0	1	2	3	4	5
40) confirm my understanding of the other members' problems and needs	0	1	2	3	4	5
41) negotiate a resolution by generating a number of possible solutions (brainstorming), evaluate the proposed solutions, and pick the best solution	0	1	2	3	4	5
42) evaluate the picked solution on a follow-up basis	0	1	2	3	4	5

NO EXPERIENCE WITH THIS SKILL 0	ALMOST NEVER 1	RARELY 2	OCCASSIONALLY 3	FREQUENTLY 4	ALMOST ALWAYS 5

MAINTAINING THE ONGOING TEAM PROCESS

Task Production

As a Geriatric Team Member, I:

43) monitor my own progress toward agreed upon goals	0	1	2	3	4	5
44) assess the appropriate use of resources in reaching the goals	0	1	2	3	4	5
45) co-ordinate my efforts with the task efforts of other team members	0	1	2	3	4	5
46) renegotiate task assignments and work roles with other team members as necessary	0	1	2	3	4	5

Consideration of the Team

47) orient and train new members in the team process and task procedures	0	1	2	3	4	5
48) re-orient and re-train old members as indicated by the group leader	0	1	2	3	4	5
49) show a positive interest in the work activities of other team members	0	1	2	3	4	5