

INTERDISCIPLINARY HEALTH CARE TEAMS  
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ROLE RELATIONSHIPS ON INTERDISCIPLINARY  
HEALTH CARE TEAMS

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An important assumption of any small group research is that role relationships are a vital part of the functioning of any team or group. In the past, roles have been studied largely through self-report or survey data. Recently, social scientists have begun to study the relationships between team or group members in terms of communication behavior, utilizing interaction analysis, a method developed by Bales (1950) and others. This paper attempts to examine the role relationships on the interdisciplinary health care teams at the University of Nevada, Reno\* in the light of data obtained from an analysis of the communication behavior of these teams. A more detailed presentation of the research plan of the Interdisciplinary Team Training and Curriculum (Team-TRAC) Program\* is presented elsewhere (Thornton, et al, 1979).

Since teams and their members are seen as parts of a complex system (Thornton, 1976, and Baldwin, et al., in press), one of the major efforts of the Team-TRAC longitudinal research project was to apply a systems perspective to the study of roles on health care teams. Seen in this manner, roles can be defined by the kind of interaction that occurs between members of the team as they interact together and as they deal with outside environments. The content and relationship dimensions of interaction, derived from general systems theory (Watzlawick, et al., 1967), are an important part of such a systems analysis.

For members of the health professions, values and norms tend to be complex,

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individually and organizationally. Not only are these persons heavily socialized into rigid professional roles, but those who join health teams are resocialized and reconditioned to new norms and values such as egalitarianism. Health team members often are called on to switch roles or change enactment of their roles as they meet with more traditional members of their particular discipline or with other members of the health team. The impact of outside forces on the team also affects these roles. This can be energy draining for individuals and for the team, as has been elaborated elsewhere (Baldwin, et al., in press).

Role negotiation must be viewed not only in a systems perspective, but in terms of tasks such as decision making, goal setting and leadership. Sarason (1972) alludes to the difficulty of accomplishing such tasks in settings where the project is new and exciting and the leadership is charismatic. He notes that as the excitement of the original mission fades and the group gets down to work, role and task issues become paramount.

Role negotiation is made more complex in an academic setting, where team issues are complicated by academic vs. real-world issues. For example, deciding whether academic health teams should use a "health" or a "medical" model for practice can take important team time and negotiation.

### Methods

To gather specific data relating to roles, the communicative interactions of student and faculty teams at the University of Nevada, Reno, were audio recorded, coded according to interaction analysis schema, and the results key-punched and placed on the computer. The computer generated matrices for each dyad on the health team, so that the interaction of the dyad could be analyzed in terms of the relationship categories (RELCOM) of dominance, structuring, equivalence, deference and submission (Ellis, et al., 1977). The statistic used to indicate whether the dyadic interaction was homogenous (similar) to the team interaction was a homogeneity test based on the chi-square for homogeneity (Kullback, et al., 1962). The matrices for the team and for the dyads are not included in this paper because of their volume and complexity, but are available from the authors. More complete

information on interaction analysis has been reported elsewhere in this proceedings (Thornton, et al., 1979).

Student health teams usually consisted of a second-year medical student, a nursing student or practicing nurse and a psych-social student. The latter might be from communication, social work or psychology. A faculty member was assigned to each team, attended all meetings of the student teams and was considered a member of the team.

The faculty team consisted of two nurses, one physician, one communication-researcher and a social worker. A psychologist was also a member of the team. The clinic coordinator and the Project Director played minor roles at team meetings, and their interaction is not discussed in this paper.

### INTERACTION ANALYSIS OF STUDENT AND FACULTY TEAMS

#### Student Teams

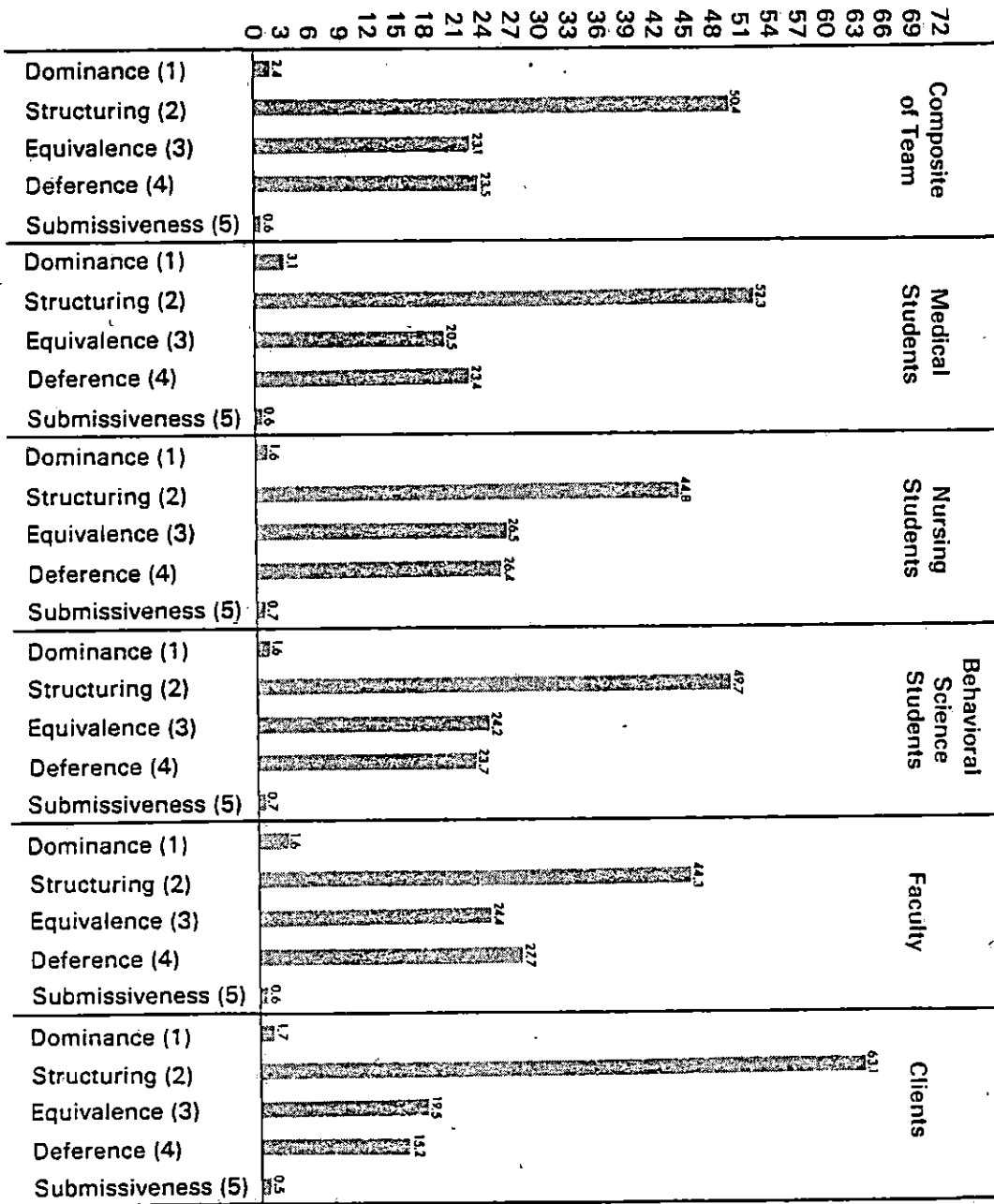
Through statistical analysis, significant dyads on the teams were identified and the proportion and kinds of interaction used by individuals in each role on the team showed the style of participation of each role. Out of the 22,085 acts recorded for composite student teams, faculty members who were included as members of student teams produced 22.0% of the interaction, medical students accounted for 21.1%, nursing, and third person role students followed with 12.8% and 12.1% respectively. Patients accounted for 8.0%. The remaining roles on the teams, which were many and diverse throughout the project, together only contributed 24% of the interaction\*. (See Figure 1) It would appear that if frequency of interaction was the only measure of leadership, the faculty members and the medical students directed the teams.

While the differences in frequency of participation are striking, the differences in type of participation are also important. The use of various RELCOM states

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\*The other members of the team included many diverse disciplines such as physical therapy, medical technologists, etc.

PERCENTAGE OF INTERACTION OF EACH RELCOM STATE



RELCOM STATES USED BY SELECTED ROLES OF STUDENT HEALTH CARE TEAMS  
 COMPOSITE OF ALL STUDENT TEAMS

Figure 1

(Dominance, Structuring, Equivalence, Deference and Submissiveness) by all students on the composite matrix and by roles is also displayed in Figure 1. Similar to the matrix for the composite of all the teams, the dyad matrices show a minimal use of the submissiveness state (state 5) and infrequent use of the dominance state (state 1). (See Figure 2 for the outstanding cells of the student teams.) Even though the use of states 1 and 5 is infrequent, it should be noted that the low useage of state 5 is consistent across most roles. However, there is considerable variation in the use of dominance, with the faculty and the medical students using dominant acts about twice as frequently as persons in other roles. On the composite, 50.4% of the total interaction occurs in the structuring state (state 2). Medical students exceed this figure by using structuring 52.3% of the time, as compared to the less frequent use of structuring by nursing and psych-social students (44.8% and 49.7% respectively). Medical students used less equivalence (state 3) than student teams in general (20.5% as compared to 23.1% for the team), and approximately the same amount of state 4, deference (23.4%). Student nurses and behavioral science students were higher than medical students and higher than the composite in their use of both equivalence (state 3) and deference (state 4). With the student teams, patients showed the highest usage of structuring (63.1%), while faculty members used structuring the least (44.3%). Faculty members used slightly more deference than either student nurses or psych-social students (27.7%), while patients used very little deference (only 15.2%).

#### Longitudinal Faculty Health Care Team (LFT)\*

The LFT composite, like the composite of all student teams, reveals the same basic patterning of interaction into six cells out of the potential 25. (See Figure 3.) Dyadic analysis of the LFT shows that only three of the 64 dyads on the team differ significantly from the composite matrix. These significant dyads involve the following roles: doctor, psychologist, social worker, and the communications specialist. Generally speaking, these dyads differ from the team composite, not in

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\*Throughout the paper LFT refers to longitudinal faculty team.

**RELATIONSHIP PATTERNS:  
Combined Student Teams  
(Prominent Cells are Outlined)**

Antecedent States	Subsequent States					TOTALS
	1	2	3	4	5	
	Dominance	Structuring	Equivalence	Deference	Submissiveness	
Dominance 1	64 (a) .1190 (b)	221 .4108	106 .1970	138 .2565	9 .0167	538 2.4%
Structuring 2	261 .0235	4576 .4113	2799 .2516	3444 .3095	46 .0041	1126 50.4%
Equivalence 3	118 .0232	2498 .4907	1552 .3049	899 .1766	24 .0047	5091 23.1%
Deference 4	91 .0175	3757 .7243	608 .1172	670 .1292	61 .0118	5187 23.5%
Submissiveness 5	5 .0350	71 .4965	28 .1958	36 .2517	3 .0210	143 0.6%
Totals	539 2.4%	1123 50.4%	5093 23.1%	5187 23.5%	143 0.6%	22085

Matrix Stereotype = .3141

Explanation of Cells: (a) Cell Frequency  
(b) Transitional Probability  
Total column shows number of acts  
and percentage of total interaction for each state.

Figure 2

**RELATIONSHIP PATTERNS:  
Longitudinal Faculty Team  
(Prominent Cells are Outlined)**

Antecedent States	Subsequent States					TOTALS
	1 Dominance	2 Structuring	3 Equivalence	4 Deference	5 Submissiveness	
Dominance 1	42 acts (a) .1634 (b)	115 acts .4475	48 acts .1865	50 acts .1946	2 acts .0078	257 acts 3.52%
Structuring 2	122 acts .0315	1799 acts .4640	929 acts .2396	1009 acts .2603	18 acts .0046	3877 acts 53.2%
Equivalence 3	57 acts .0351	894 acts .5505	433 acts .2666	234 acts .1441	6 acts .0037	1624 acts 22.27%
Deference 4	34 acts .0228	1040 acts .6971	210 acts .1408	192 acts .1287	16 acts .0107	1492 acts 20.5%
Submissiveness 5	2 acts .0465	28 acts .6512	4 acts .0930	8 acts .1860	1 act .0233	43 acts 0.6%
Totals	257 acts 3.52%	3876 acts 53.2%	1624 acts 22.27%	1493 acts 20.5%	43 acts 0.6%	total acts 7293

Matrix Stereotype = .3068

Explanation of Cells: (a) Cell Frequency  
(b) Transitional Probability  
Total column shows number of acts and percentage of total interaction for each state.

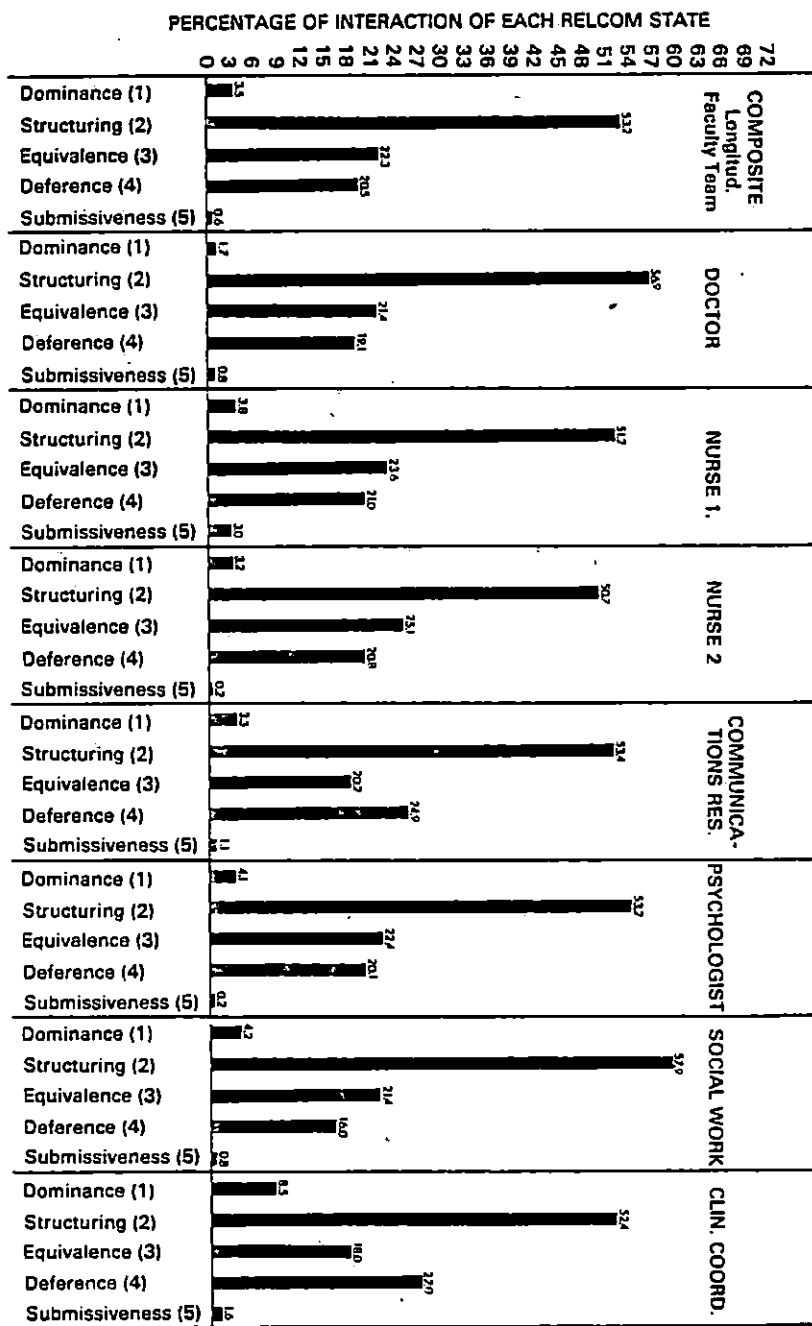
Figure 3



prominence of new cells, but in the frequency of structuring (state 2) acts and the proportion of deferential (state 4) responses.

As in the analysis of student teams, only the identification of significant dyads is possible. Nevertheless, the percentage of total team interaction contributed by each team member provides some insight into the relative importance of various roles on the team. (See Figure 4) The proportion of interaction contributed by several team members was similar, with the psychologist contributing 16.4% of the interaction, the physician 15.3%, the nurses 14.2% and 13.6% respectively, and the social worker 13.8%. The communications specialist followed closely with 11.1%. However, the research assistant and other team members contributed only 7.3%, while the small role played by the clinic coordinator is graphically demonstrated by the low participation of that role (2.6%). If team members are grouped into the three categories of medical personnel, behavioral scientists, and members of other disciplines, the proportion of interaction contributed by members of each category is 43.1%, 41.3% and 9.9% respectively. Clearly, on the faculty team, in contrast to the student teams, the medical roles did not overshadow the roles of the behavioral scientists in terms of amount of participation, although both these roles clearly dominated those of other professions.

Differences in the type of interaction each role contributed to the faculty team were summarized earlier in Figure 4. For all roles, dominance (state 1) comprised only a small proportion of the interaction, with the physician using that state half as frequently as it is used on the composite, the nurses and the communications specialist using approximately the same amount as on the composite, and the psychologist, the social worker, and especially the clinic coordinator exceeding the composite frequency for this state. Submissiveness (state 5) was seldom utilized by the composite or by members of the team, although it should be noted that one of the nurses employed submissive responses five times more often than the composite frequency. Over 50% of the interaction of each role involved structuring (state 2), with the doctor exceeding the composite in use of structuring by 3.7% and the social worker by 4.5%. The communications specialist,



RELCOM STATES USED BY SELECTED ROLES ON  
LONGITUDINAL FACULTY TEAM  
Figure 4

the clinic coordinator, and the psychologist used approximately the same amount of structuring as the composite, while the two nurses employed structuring slightly less frequently than the composite (2% and 2.5% less structuring respectively). The doctor and the social worker used the least deference of any member of the LFT, while the communications specialist and the clinic coordinator exceeded the composite frequency for deference. The remaining roles were similar to the composite. The range in frequency of use of equivalence (state 3) was small for all members of the LFT, except for the clinic coordinator, who employed equivalence 4.3% less than the composite.

#### Medical Student-Physician Role

The medical student-physician role differed from that of other team members. On the student teams, the medical students made more attempts to control the team than did other team members. This was done through the use of a slightly greater proportion of dominant acts than team members in general (3.1% compared to 2.4%) and more structuring (52.3% compared to 50.4%). They also used less equivalence (20.5% compared to 23.1%).

It should be noted that of the five student dyads that were statistically different from the composite student team interaction, four involved medical students: (1) the medical student when initiating discussion to allied health science team members ( $X^2=31.7588$ ,  $df=20$ ,  $p<.05$ ), (2) the medical student initiating to the nursing student ( $X^2=35.385$ ,  $df=20$ ,  $p<.05$ ), (3) the nursing student initiating to the medical student ( $X^2=37.0010$ ,  $df=20$ ,  $p<.025$ ), and (4) the psych-social students initiating to the medical student ( $X^2=43.1787$ ,  $df=20$ ,  $p<.005$ ).

In all of these significant dyads, medical students initiated by the use of more structuring, while the respondent (nurse, allied health professional or psych-social student) responded with more equivalence or deference.

The composite of the physician's interaction on the LFT differs from the composite of total team interaction in several ways. (See Figure 4) His interaction deviated from the interaction of the team across four of the five states. The physician used state 1, dominance, 1.8% less frequently than the team as a whole.

He used 3.7% more structuring acts, 0.9% more equivalence, and 0.6% less deference. The types of responses received by him also differed from the composite of the team. His use of state 3 (equivalence) was less likely to be followed by structuring or deference and more likely to be followed by reciprocal equivalence as compared to the team composite. It should be noted that the two dyads in which the physician was involved that deviated from the composite faculty pattern involved the physician as respondent to the social worker and the physician as respondent to the psychologist.

#### The Role of Nurses and Nursing Students

The composite interaction of nursing students (Figure 1) differed in percentage from the overall composite of student teams for three of the five states. Nursing students used 5.6% less structuring, 3.4% more equivalence, and 2.9% more deference than was used by students as a whole. In return, nursing students received 1.2% more structuring and 1.5% less deference than students in general.

The significant dyad involving nurses on the student teams which deviated from the composite was the nurse-psych-social dyad ( $\chi^2=37.0010$ ,  $df=20$ ,  $p<.025$ ), where the student nurse assumed the previously described pattern of the medical student by using more structure with less equivalence and deference.

The interaction of the two nurses on the LFT differed in minor ways from the composite and from each other. (See Figure 4) Neither nurse, however, participated in dyadic interaction which was statistically different from the composite team interaction.

#### Nurse-Physician Interaction

Data from the student teams indicates that nursing students talked less than medical students, structured less and used more equivalence and deference in their initiating relationships except with the psych-social students. Medical students, however, structured to nursing students more frequently than they did to other members of the health teams. Additionally, the medical students showed less equivalence and deference to their nursing colleagues, (as well as to their allied

health science and psych-social colleagues). Nursing students often responded to them with equivalence and deference as did other members of the team.

On the faculty teams, the physician talked more, and used more structure than did nurses. Nurses followed the same patterns as the student nurses by using more equivalence and deference. It is particularly interesting that the nurse leader of the faculty team used less structure and more equivalence and submission than did other members of the team.

Participant observation validates these findings, indicating that while the nurses had an expressed desire to change traditional doctor-nurse interaction patterns, their communication patterns indicated use of the traditional "doctor-nurse game" (Stein, 1967) to get tasks accomplished.

#### Psych-Social Students and Faculty

The students and faculty representing the behavioral sciences on the student teams came from the disciplines of psychology, social work and communication. Figure 1 referred to previously, also summarizes the interaction of the psych-social students on the student teams. Their pattern did not differ significantly from the composite of the team as a whole. When dyads were analyzed, the only significant difference occurred when psych-social work students initiated comments to medical students ( $\chi^2=43.1787$ ,  $df=20$ ,  $p<.005$ ). This dyadic interaction involved 4.2% less structuring and 3.4% more equivalence than did the composite of student interaction. Furthermore, the structuring comments of psych-social work students were more likely to be followed by structuring on the part of medical students than by the other members of the team. The use of equivalence by the psych-social work student was more likely to be followed by structuring by the medical students and less likely to be followed by reciprocal equivalence than for the composite of the student team.

Each of the behavioral scientists on the longitudinal faculty team (LFT) had a significant dyadic pattern with one other member of the health team. The psychologist and the team physician's dyadic interaction was significantly different from the team composite: ( $\chi^2=32.6019$ ,  $df=20$ ,  $p<.05$ ). When they talked, there

was greater use of structuring by the psychologist. Also, in their interaction there was less deference than in other dyads on the team.

The social worker (Figure 4) differed from the overall composite in a 3.5% higher use of structuring, a 0.8% smaller use of equivalence, and a 4.5% smaller use of deference. The one significant dyad involving the social worker as initiator and the physician as respondent, ( $\chi^2=37.0847$ ,  $df=20$ ,  $p<.05$ ), follows, but exaggerates, the general pattern of interaction for the social worker with the rest of the LFT. The social worker used more structuring, less equivalence, and less deference in her interaction with the physician than she used with members of the LFT in general. In response, she received more structuring, less equivalence, and more deference from the physician than she did from the team in general.

The communications specialist, on the other hand, was fairly similar to the LFT composite in her use of structuring, but differed from the composite in her use of equivalence and of deference (See Figure 4). In response to her initiating, the communicator received more structuring and less equivalence than members of the LFT in general. One dyad, involving the communicator as respondent and the clinic coordinator as initiator, differed significantly from the LFT composite ( $\chi^2=31.8037$ ,  $df=20$ ,  $p<.05$ ). For no other dyad on the LFT was deference so likely to follow structuring.

### Discussion

As stated previously, out of the total interacts for the student teams, faculty members produced 22% of the interaction, medical students 21.1%, nursing students 12.8% and psych-social (or third person role students) 12.1%. Patient interaction was minimal, 8% (Figure 1). This figure, however, should not be emphasized, as patients did not meet together with teams beyond the first year. The figures regarding the other roles, however, do indicate that in terms of interaction, faculty and medical students tended to dominate student meetings. While frequency of interaction is not a measure of leadership, the data support the Collins and Guetzkow proposition (1964, p.165) that high power or high status persons initiate a greater total number of communications in the group.

The relationship patterns of the group indicate how group members utilized the different relationship states of dominance, structuring, equivalence, deference and submission. While little dominance is used by the team as a whole (Figure 1), it should be noted that faculty and medical students used dominant acts almost twice as frequently as did persons in the other roles. The use of equality relationship modes, while low for medical students, was high for faculty. Nurses and psych-social students were higher than the medical students and higher than the composite in their use of equivalence and deference, two of the relationship modalities which can be utilized to equalize relationships in any group (Drecksel, 1978). An additional finding of interest was the high use of deference by the faculty on the student teams. Over 27.7% of their interactions were deferential as compared to 26.4% for the nursing students, 23.7% for the psych-social students and 23% for the medical students. (Figure I)

In the literature, deference is discussed as a way to get ideas from others, as well as to accept the leadership of others and conform to custom (Drecksel, 1978). These implications of deference seem appropriate to the teaching situation. The faculty were anxious for students to "like" the health team course and wanted the team to be successful in the eyes of many people. Deference is a common mode of behavior under these circumstances.

The student health team patterns were of interest. They indicate that even though general patterns of the whole team tended to be egalitarian, roles within the team still maintained hierarchical patterns. The medical students, for example, spoke more and had more control patterns. The nursing students, in turn, were more hierarchical to the psych-social students, as well as to the other members of the team.

It is our impression that these hierarchical patterns can be explained by the realization that the student health teams were dealing with medically-related tasks in a medical environment, and that a "medical" model clearly establishes traditional hierarchical relationships. We would posit that a major factor affecting role relationships on health teams is related to the setting in which the team operates and the model (health vs. medical) which it espouses.

Figure 5 attempts to look at health teams and health team training along two axes representing the major ideological concepts--health and disease--and the major structural systems--education and care. Viewed in this manner, the differences between health care teams and medical care teams become apparent, as do the differing orientations between health team training programs and the usual professional training programs. Even more interesting are the implications of this model for the definition of professional roles. In the Education/Health quadrant, where most team training programs are defined, the Behavioral Scientist and the Health Professional are more or less equal in status and power, as well as in task and role. As the team becomes more clinically oriented, and moves into the Health/Care quadrant, performing preventative and health maintenance activities, task priorities become focussed on specific skills and, while team members are theoretically and idealistically equal, some of the role distinctions begin to manifest themselves, and physicians and nurses begin to assume more traditional characteristics.

With the assumption of responsibility for medical care and illness, the role of the physician assumes its full dimensions of power and status, while that of the nurse resorts to its traditional disposition as handmaiden to the medical profession. While variations of the Doctor-Nurse game (Stein, 1967) make the relationship between these two roles infinitely interesting, the preeminence of these two roles in the medical arena is unchallenged by representatives from the other health professions, with the behavioral scientist marginally, if at all, accepted in most hospital settings.

Most professional school programs (medicine, nursing, allied health, etc.) have adopted the bio-medical model of Flexner (1910) and lie securely within the Illness/Education quadrant, where bio-medical scientists are accorded higher academic prestige, but not higher salaries!

Examining the Team-TRAC Program in this light, it can be seen that as the Program moved progressively from an education and health orientation towards a care and illness focus, the respective roles of team members shifted towards more traditional medical care roles, with behavioral scientists experiencing less and less inclusion and fulfillment on the team. This undoubtedly explains why many primary



POLARITIES AFFECTING  
ROLE RELATIONSHIPS

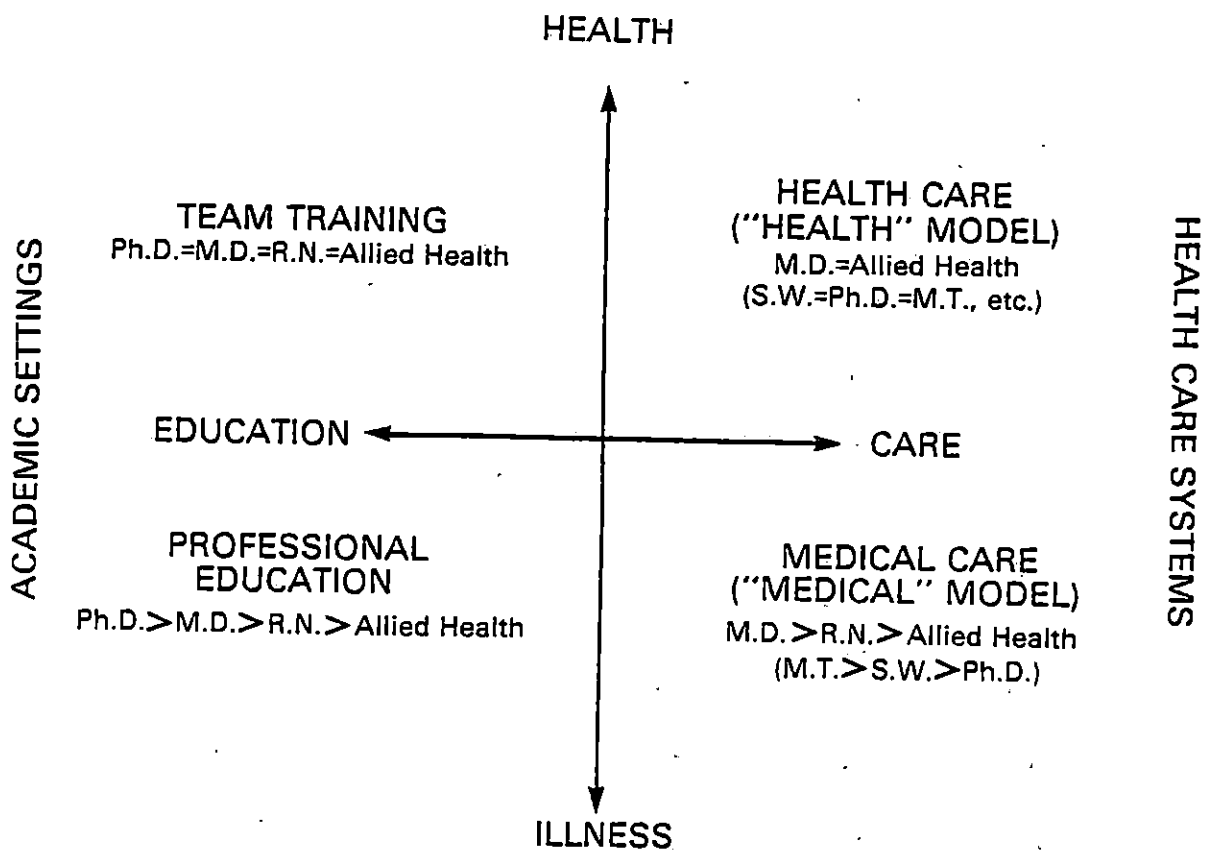


Figure 5

care teams in practice consist mainly of physicians and nurses. Indeed, the authors would pose the hypothesis that roles and relationships on teams are dependent upon the model of care and the settings in which they operate and that changes in these will lead inevitably to changes in the role relationships on teams.

Throughout this discussion, there has been the implicit assumption that health care teams represent a viable and meaningful innovation in health care delivery, one which represents better care for patients as well as more effective and satisfying relationships for providers. Increased mutual participation and collaboration between health professionals are desirable ends, not only in health care delivery, but also as means for enhancing egalitarianism and combatting sexism and racism in health care. It is clear that the team concept calls forth a healthy and constructive reexamination of many of the traditional assumptions, practices and relationships in medical care. However, given the enormous rigidities and resistance to change of existing interests and structures in medicine and the health professions, one would be foolish, indeed, to hope for short term success in implementing the health team concept without significant support from and changes in other societal systems. For the present, teams exist as a creative approach to working together, and, hopefully, to providing better care, as well as a rallying point for a variety of health and other educational professionals who dream of better things.

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