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STATUS AND POWER WITHIN PROFESSIONAL WORK GROUPS

by

Mildred Ann Field

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A Dissertation Submitted to the Faculty of the

DEPARTMENT OF SOCIOLOGY

In Partial Fulfillment of the Requirements  
For the Degree of

DOCTOR OF PHILOSOPHY

In the Graduate College

THE UNIVERSITY OF ARIZONA

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GRADUATE COLLEGE

I hereby recommend that this dissertation prepared under my  
direction by Mildred Ann Field

entitled Status and Power Within Professional Work Groups

be accepted as fulfilling the dissertation requirement of the  
degree of Doctor of Philosophy

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## ABSTRACT

This study of differentiation in task groups focuses on valued behaviors and the rewards given to individuals who can perform them. Two exchange models which differently specify the reward system of groups are used to investigate three types of reward: status, likeability and power. Model I reflects a cooperative model of differentiation in which competent people are rewarded with both status and liking while Model II reflects a competitive process in which highly competent people are respected but not liked. In both models, it is suggested that individuals who are respected will also have greater power.

In addition, it is suggested that the nature of the reward system of groups may be related to their effectiveness, more specifically that groups which give greater status for task competency will be more effective. Further, because of extensive research evidence, it is suggested that the relation between variables in the proposed models will best be described by a power, rather linear function.

A mathematical correlation design incorporating the following principles was used: (1) control by constance, (2) multiple and simultaneous ratio measurements of all variables, (3) the averaging out of random measurement error, and (4) the summarizing of the relations by the

fitting of the appropriate algebraic equation. Ratio measurement of the variables was achieved by magnitude estimation procedures.

Subjects were 125 registered nurses employed in a university hospital. Two types of variables were measured: (1) individual attributes and (2) group effectiveness. Measurement of individual attributes included five independent, three dependent, and one control variables. These variables were respectively: knowledge, skill, creativity, professional demeanor, willingness to help, status, likeability, power, and familiarity. The quality of nursing care given on each of twelve nursing units was used as a measure of effectiveness.

Four variables representing a competency dimension (knowledge, skill, creativity, and professional demeanor) were, as expected, highly correlated. These variables were combined into a competency index to avoid the problem of multicollinearity. The relations between variables were described equally well by a linear and power function, but because of previous research, a power function was used. The data were logarithmically transformed making possible the use of statistics which require linear, additive assumptions. Path analysis, incorporating path regression coefficients, was used to examine the two proposed models.

The results of the study give unequivocal support to neither model but instead support portions of both. On

Willingness to Help, status has a moderately large effect ( $b = .64$ ). The  $R^2$  is .43. On Status, competency has a strong positive effect ( $b = .98$ ) while the effect of willingness to help ( $b = .09$ ) is statistically not significantly different from zero. The  $R^2$  is .82. On Likeability, willingness to help has a strong positive effect ( $b = .86$ ) while competency has a moderate negative effect ( $b = -.27$ ). The  $R^2$  is .74. On Power, status has a moderately large effect ( $b = .66$ ), competency a moderately positive effect ( $b = .58$ ), willingness to help a moderately negative effect ( $b = -.30$ ), and likeability a small ( $b = .06$ ) and statistically non-significant effect. The  $R^2$  is .90. The effect of competency on status is larger in the low ( $b = 1.12$ ) than in high ( $b = .82$ ) quality of care grouping.

In summary, the three rewards, status, likeability and power seem to be used for specific purposes in the group of nurses studied. Status given for behavior is scarce and valued. In the present study, work competency is assumed to be such a characteristic and the data show that competency is, in fact, the sole determinant of a person's status. Power is also a reward for valued behavior, for the power one has comes directly from her status and competency. Greater power, however, would seem to accrue to competent people who are also more aloof, for willingness to help negatively affects one's power. Likeability is given to individuals who are willing to help others and thus, it is suggested,

that likeability is a reward given for personally pleasing rather than normatively valued behavior. Thus, it would seem, that status and likeability, while positively correlated, arise from divergent sources.

## CHAPTER 1

### A THEORETICAL FRAMEWORK

A primary sociological characteristic of all groups is that of differentiation. Individuals, within groups, possess differing amounts of status and power; individuals are also more or less liked. The purpose of this study is to examine and delineate the bases of status, power, and liking within several groups and to explore whether differences in status-power structures may have an effect on group functioning. The study will focus on elementary social behavior or status-power systems which arise spontaneously within groups. Exchange theory will be used to explore this process; two alternative exchange models will be examined.

#### Status, Power and Likeability: An Exchange Framework

The central thesis of exchange theory as proposed by Homans (1961) is that social interaction may best be understood as an exchange of behavior (activities and sentiments) between men; the nature of the exchange is believed to be determined by the value and quantity of the behavior involved in the exchange. Status and power differentials within groups result from the fact that group members are not equal in the type of contributions they are able to make; the

behavior of some members is more valuable in exchange transactions than the behavior of other group members.

Status or esteem<sup>1</sup> is a function of the amount of social approval given to a group member by other group members and is defined as: "The greater the total reward in expressed social approval a man receives from other members of his group, the higher is the esteem in which they hold him" (Homans, 1961:149). Social approval is given for the performance of an activity valued by the group. The value of an activity is determined both by its importance to the group and the availability of the activity within the group. Activities which are both important and in short supply are more valuable than those which are less important and in great supply. Greater social approval is given for more valuable activities and thus greater status is earned by individuals who perform them. Empirical support for this proposition is provided by Hamblin and Smith (1966) who found that professorial status was a function of the degree to which professors possessed attributes admired by others.

Social approval is, however, a generic term used by Homans (1961) to describe a range of favorable sentiments exchanged within groups and encompasses not only esteem but

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1. Homans (1961:149) makes a distinction between esteem (the social approval given to a group member) and status (the stimuli which a group member presents to others). The two terms will, however, be used interchangeably in this study to refer to the amount of social approval a person receives from others in the group.

also liking. It may therefore be assumed that esteem and liking vary together in groups; individuals who contribute valuable services to the group are also better liked. Homans, in fact, bases much of his discussion on this assumption. Furthermore, the many empirical studies used by Homans to delineate the process of esteem giving, measure only sociometric or liking responses.

Power<sup>2</sup> is defined by Homans (1961:268) as the consistent ability to influence other group members and is seen to be a function solely of the esteem or status commanded by individuals within the group: "The higher a man's esteem in a group, the higher his [power] is apt to be." Hamblin (1973), investigating Homans' model in an academic setting, found power to be a function of organizational status and Bucher (1970), also in a study of an academic organization, found that while power was associated with official administrative positions, a major source of power was the assessed stature of individuals in the organization. Gold (1958) found that among school children, power was related to the possession of valued resources.

In summary, Homans (1961) suggests a general model in which status and liking are earned by individuals who are

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2. Homans (1961:283) uses interchangeably the terms power and authority. Power in this study will be defined as the general potential to influence others, regardless of its source. Authority is considered to be a specific type of legitimated power found in association with bureaucratic positions.

able and do make valuable contributions to the group. The power structure of the group is a direct reflection of the status system; individuals who earn superior status also have greater power.

Blau (1955), in a study of a governmental agency, found that status was in fact based on the possession of valued attributes. His analysis serves as a paradigm for an exchange formulation of status-power differentiation within task groups. Within the government agency, employees who were most competent in their work were usually accorded greater status. However, willingness to help others was found to be an equally important attribute and only agents who were both competent and willing to help others were given high status. As he stated "The two experts who were considered uncooperative by their colleagues were generally disliked and received only few contacts. To become accepted, an expert had to share the advantages of his superior skill with his co-workers" (Blau, 1955:119). Willingness to help, a valued attribute in this group, was then positively related to status and likeability. Blau further noted that agents with superior status were also the most influential within the group; they made and had accepted the most suggestions. The findings of Blau and Homans have been incorporated into a proposed exchange model (Model I) diagrammatically represented in Figure 1.

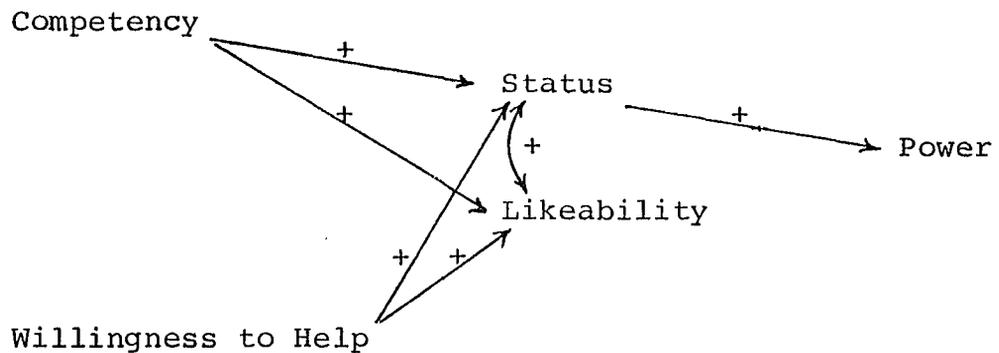


Figure 1. Model I

Blau (1960:545), however, has astutely noted the inconsistencies of human response to competence: "A fundamental dilemma of social life is that between being looked up to and being liked by associates. Both the respect and the affection of our associates are important to us, but our efforts to win the one often hurt our chances to win the other." As Blau points out, critical remarks about a colleague's paper may increase his respect for you but not his liking, while flattering remarks may have the opposite effect. Status and likeability are thus negatively related.

Blau (1964) refers to this process as the paradox of integration for it alternatively facilitates and hinders integration into groups. He assumes that in new or continuing groups, members compete for status. This underlying competition affects members responses to each other. The possession of valued behaviors (or in task groups, competency) first necessitates that less competent members

exchange respect for these characteristics. The paying of respect is a form of deference and places the less competent person in a dependent and inferior position. This process arouses resentment and negative feelings; competency has a negative effect on one's likeability. Within task groups, therefore, competent individuals are accorded greater respect or status and they are also less liked.

Blau's analysis reflects a second model of group differentiation. This model would seem to suggest that integration into groups may be accomplished in one of two ways. An individual may be competent and thus gain status in the group or he may be pleasant and non-threatening, gaining group acceptance and liking. Competency is a partially learned and partially innate characteristic while being pleasant is a behavior which can be carried out by anyone who so desires. It would seem that one is first more or less competent and that the degree of competency possessed by an individual would then have a direct effect on his socio-emotional relations with group members. If one is competent, it is not necessary to gain group acceptance through socio-emotional routes. If the plausible assumption is made that willingness to help reflects a pleasant, amiable characteristic, then competency should have a negative effect on willingness to help. The more competent a person, the less he needs to gain group acceptance by being helpful.

The relation between willingness to help and status, however, remains undefined in this model. Blau suggests that socio-emotional characteristics of a deprecatory nature will be inversely related to status; if willingness to help is interpreted in this manner, one would expect a negative relation between willingness to help and status. Blau, however, also suggests that in order to be granted status, competent individuals must be willing to share their skills with their fellow workers. On this basis, one would predict a positive relation between willingness to help and status. Leaving in question, then, this relation, a second model (Model II) of differentiation within task groups is depicted in Figure 2.

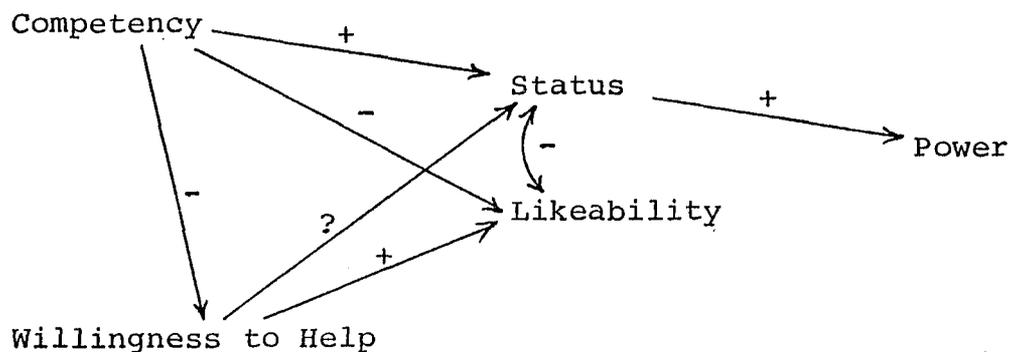


Figure 2. Model II

### The Problem of Group Effectiveness

The nature of the status-power systems of groups may further be used to explore the problem of group effectiveness, for within task groups, the question of the ability of the group to meet objectives is one of crucial importance. Reward theory has been a classical approach to the study of group effectiveness although the focus has been on the structure of the reward distribution to group members rather than on the fundamental question of the basis for rewards. Rewards may be given for different types of activities within groups and it is suggested that the basis of rewards may have an effect on group functioning. Exchange theory, with emphasis on an earned status system, may provide a means for analysis of this question. Homans (1961) postulates that under conditions of *ceteris paribus* men will emit behaviors for which they are rewarded; behavior which is not rewarded will not be emitted. This principle has been confirmed and further specified by Hamblin and his associates. Based on experimental research with normal and disturbed children, Hamblin et al. (1971:248) have delineated the acceleration-deceleration principles which relate the strength of a reward to rate of behavior. As the strength of a reinforcer increases, the frequency of the behavior increases; as the reward decreases, the behavior decreases.

Social approval is a generalized reinforcer which can be used to reward many behaviors. Esteem, as the

highest form of social approval is thus a most valuable reward. The giving of esteem or status to group members for certain valued behaviors then constitutes an informal reward system and it may therefore be predicted that within groups, the rewarding of certain behaviors by the giving of status will lead to an increase in these behaviors.

It would seem to follow that if behaviors which contribute to goal attainment are increased that effectiveness in meeting these goals will also be increased. Within work groups it may be suggested that competency in one's job is most important to goal attainment and therefore that the differential reinforcement of work competency via a status assignment system may be associated with differences in group effectiveness.

The question may be raised: Are differences in the status-power systems of groups related to their effectiveness?

#### The Professional Work Group

It is suggested that the study of professional work groups may be useful for analysis of the theoretical questions previously posed. Such a suggestion is based on several considerations. First, such groups are goal-oriented work groups and secondly, it is believed that the process of status, power and liking differentiation is epitomized among professionals. This is because the

professional model of differentiation represents an explicit form of behavior exchange. Primary characteristics of the professional model include an achieved status system and a collegial based control system. Blau and Scott (1962), in a delineation of the professional model note that professional status is achieved by an individual through competency in his work. Persons with greater expertise earn greater esteem in the eyes of their colleagues.

At the heart of the professional model is the area of professional autonomy, characterized by control through a colleague group of equals. Blau and Scott (1962) note two aspects of this system. First, professionals, during an extensive training period, acquire specialized knowledge and an internalized code of ethics. Secondly, only colleagues who possess such skills and knowledge are in a position to evaluate the work of other members.

The professional model thus has reference to a group of peers in which status and power are earned without regard to a formal hierarchy of authority. That this model is applicable in the context of complex organizations was demonstrated in a study by Goss (1961) in which influence and authority among physicians was examined in a bureaucratic setting. Physicians who functioned as administrative supervisors issued directives concerning procedural details but had no direct control, in their administrative role, over the area of professional practice. They could, however,

as fellow physicians offer advice concerning treatment matters but acceptance of advice was dependent on the respect accorded to them. This respect was to a large extent a function of professional competence.

The work of professionals, however, is highly complex and perhaps requires further delineation of the areas on which competency is to be evaluated. In a previous study of professional nurses (Hinshaw and Field, 1974), two broad characteristics, interpreted as reflecting a competency dimension, were found to be significantly related to status. These attributes were professional demeanor and expertise.

Expertise which leads to the effective and creative delivery of patient care was found to be highly valued. Expertise is here conceptualized to be composed of three components: knowledge, skill, and creativity. Knowledge is related to the possession of expert information while skill is related to the ability to implement or carry out professional or technical tasks. These two components may be related, although individuals may possess only one or the other of the characteristics. The third component of expertise, creativity, reflects the professional expectation of the quality of service given. As Vollmer and Mills (1966:14) state:

The expectation is that his [the professional's] work performance will display a considerable amount of individuality and uniqueness--the professional person is not expected to provide a carbon copy of some master plan. Rather he is expected to bring

his own creative abilities into the work situation, utilizing ideal patterns of work norms as a point of departure.

The conduct of professional practice rests on a normative framework inculcated into the practitioner during a lengthy socialization process. Professional demeanor reflects adherence to these norms which Greenwood (1957: 52) states "cover every standard interpersonal situation likely to occur in professional life."

#### The Form of the Relations

It has most frequently been assumed in sociological research that relations between variables are best described by a linear, additive equation, an assumption based primarily on methodological considerations. However, recent evidence from extensive psychophysical and social-psychological research has raised serious questions about its validity. Stevens (1957) working with psychophysical data, first demonstrated that the magnitude of a psychological response ( $\psi$ ) always increases as a power function of the magnitude of the physical stimulus ( $\phi$ ) as expressed in the equation:

$$\psi = c\phi^n$$

where  $c$  and  $n$  are empirically determined parameters.<sup>3</sup>

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3. For a further review of the psychophysical law see: Stevens (1957, 1960, 1962, 1966, 1970); Hovland and Reiser (1940); Stevens, Mack, and Stevens (1960); Ekman (1961); Stevens and Guirao (1963); Bartoshuk (1964); and Luce (1969).

This work has been applied in the behavioral sciences and the applicability of this equation to conditionable, non-voluntary, social-psychological responses has been demonstrated in many cases. Hamblin (Hamblin and Smith, 1966) has postulated a general form of this equation:

$$R = cS^n$$

where R, a non-voluntary response, is seen to increase as a power function of the magnitude of a stimulus (S) with c and n as empirical parameters.

It has been suggested (Hamblin and Smith, 1966) that this bivariate form may also be extended to multivariate relationships. Evidence to support both a bivariate and multivariate stimulus-response is widespread. Hamblin (1971a, 1971b) cites evidence of studies undertaken as methodological prototypical research in this area: independent investigations of social status by Hamblin, Shinn, and Rainwater revealed, in each case, the existence of a power function between the dependent variable, status, and the independent variables, income, education, and occupation. Power functions have been found to best describe relations between variables in areas as diverse as studies of aggressive behavior (Hamblin et al., 1963), delinquency (Sellin and Wolfgang, 1964), voting behavior (Soares and Hamblin, 1967), national power (Shinn, 1969), acquisition of appropriate behavior (Hamblin et al., 1971), poverty

(Rainwater, 1974), and gambling decisions (Hamblin, Clairmont, and Chadwick, 1975). The present study, like the status studies, examines attributes related to esteem and influence.

It is therefore suggested that the relationship between the variables under study will be described by either a bivariate power function, or, where appropriate, the multivariate form of the equation:

$$R = cS_1^{n_1} \cdot S_2^{n_2} \cdot S_k^{n_k}$$

Status and Power Within Professional Work  
Groups: A Summary

In summary, two models representing alternative exchange formulations of task group differentiation have been presented. Both predict that status is earned by individuals who make valuable contributions to the group; the power possessed by an individual is then a function of his status. Model I, however, is based on a harmonious view of social life and predicts that liking, as status, will result from competency. Model II, based on a conflict perspective, predicts that the two forms of social approval, status and likeability, will be negatively correlated, that competency in task groups will result in respect but dislike. It is suggested that the relation between variables in both models will be best described by a power function.

The study of professional work groups has been suggested as a useful approach for the analysis of questions posed: (1) Which if either of these models, adequately describes the process of differentiation in task groups? and (2) Are differences in the status-power systems of groups related to their effectiveness?

## CHAPTER 2

### METHODS

#### The Design

A mathematical correlation design utilizing magnitude estimation procedures was used to examine the proposed models. This type of design, recently introduced into the social sciences by Hamblin (1971a), permits a precise specification of the nature and form of the relationships that exist between variables in the model. The design incorporates: (1) control by constancy, (2) multiple and simultaneous ratio measurements of the variables periodically across the effective continua of the independent variables, (3) the averaging out of measurement error, and (4) the summarizing of the relationships which obtain in the average simultaneous measurements by fitting the appropriate algebraic equation or equations.

Control by constancy was achieved for each of the twelve groups of respondents by having all subjects respond to the same set of stimulus conditions but in a different random order. A magnitude estimation procedure was used to achieve a ratio level of measurement. Magnitude estimation essentially involves the presentation of a series of stimuli to the subject and the subsequent rating, by the subject,

of the response in terms proportional to a standard stimulus. In attitudinal research studies, this rating is most frequently based on the assignment of numbers. Thus, if the standard is set as 10 units and the magnitude of the response to a stimulus in the series is perceived to be twice as great, the subject assigns it a value of 20 units, a third as great,  $3\text{-}1/3$ , etc.

A standard for the rating process may be established in two ways: (1) the investigator may present a stimulus which is designated as the standard and request that responses to all other stimuli be ranked proportionally to it, or (2) the investigator may request that the subject select a stimulus which he considers to be average in terms of the variable and then judge responses to all other stimuli in proportional terms to the one selected. The latter procedure was used in this study.

That this method does in fact result in ratio measurement has been demonstrated in both psychophysical and sociological research. Blalock and Blalock (1968:79) point out that two types of evidence have been offered as support in psycho-physics: (1) the presentation of varying subsets of stimuli to subjects, and (2) cross modality validation. The second method, developed by Stevens et al. (1960), matches the response to a stimulus to another physical scale, for example, the loudness of a sound to force on a hand grip dynamometer. Such a procedure obviates

the use of numbers and negates criticism that the method depends too heavily on experience with the number system. Rather than examining only the empirical data describing the relation between the two scales, Stevens and Hamblin algebraically derived the formula expressing the relationship which should exist between these scales if they were power functions of their respective stimuli. In a series of experiments they then determined the fit between the predicted and empirically derived exponents. Hamblin (1971b) details their mathematical derivation and summarizes the results. A close fit between the empirically derived and predicted exponents was found over nine different stimulus continua. These results support both a ratio level of measurement and the power function law.

Hamblin has carried out cross modality matching experiments with sociological data. In an initial experiment (Hamblin et al., 1963), level of disliking was matched with force on a hand grip dynamometer while in a later experiment (Hamblin et al., 1975) estimations of the utility of winning various amounts of money were matched to force of handgrip. In both experiments, the relations between the sets of estimates closely approximated those predicted and subsequently found by Stevens.

### Subjects

Subjects in the study were 125 registered nurses who were employed on twelve nursing units in a university hospital setting. As can be seen in Table 1, the age, education, and experience of the subjects is fairly consistent across the twelve units. In addition, seven administrative personnel from the nursing service department gave estimates of the effectiveness of each of the twelve units.

The selection of registered nurses as subjects reflects the substantive and professional interests of the researcher. While nurses were expected to adhere to a professional model of status and power differentiation, this choice did introduce the necessity of explicitly considering organizational variables within the study. Nurses, as well as social workers and teachers, have frequently been cited as groups which manifest numerous professional characteristics but whose autonomy is less complete than other professionals (see Etzioni, 1969; Hall, 1968). Thus while nursing groups per se may be characterized by professional status and power systems, these groups are nevertheless subject to an organizational hierarchy of authority. As the purpose of the study is to identify and describe basic exchange relations within groups, the focus of the analysis was on nurses working in peer group situations. Only staff nurses were therefore included in the study.

Table 1. Description of the Sample

Unit	N	Mean Age (In Years)	Mean Education (In Years <sup>a</sup> )	Mean Length of Experience (In Years)
Pediatric A	14	33.5	3.2	5.0
Pediatric B	12	25.5	3.3	5.0
Surgical A	11	28.2	3.4	6.5
Surgical B	9	25.1	2.9	2.4
Surgical C	6	31.3	3.1	6.7
Medical A	9	31.2	3.5	8.4
Medical B	7	29.7	2.8	7.8
OB-GYN A	8	32.7	2.8	4.5
OB-GYN B	9	25.1	3.6	3.3
ICU A	15	26.3	3.4	3.2
ICU B	9	28.8	3.3	5.1
ICU C	16	28.7	3.2	5.5

<sup>a</sup>M.S. = 5 years  
 B.S. = 5 years  
 Dip. = 3 years  
 A.D. = 2 years

As these nurses were asked to rate the other staff nurses employed on the unit on the variables under study, it was necessary that they know each other. Therefore, only nurses who had been employed on the unit for at least three months were asked to participate in the study. To insure, however, that the subject's responses were not determined only by how well they knew their fellow workers, a control variable, familiarity, was employed in the study.

#### Operationalization and Measurement of the Variables

Two types of variables were measured in the study: individual attributes related to the status-power system of the groups and measures of group effectiveness. Magnitude estimation procedures were used for both sets of measurements.

Although it was believed that nurses, experienced in ratio and proportional measurements, would have little difficulty using the magnitude rating procedure, an initial training period was included in the interview to give confidence to both the subject and the experimenter that the subjects were able to make magnitude estimation judgments. (See Appendix A for a detailed description of the training session.) The training period consisted of two parts. During the first part, the subjects were asked to give a series of numbers proportionally related to a

standard of 10; i.e., given the number 10, what number was five times as large as 10, two-thirds as large as 10, etc.

During the second part of the training period, the subjects were asked to estimate the distance of a series of dots above a horizontal line. These estimates were to be given in relation to a standard dot which was designated as 10 units above the base line. The subject's estimates were then plotted on logarithmic coordinates and the subjects were told "to the extent that your answers approximate a straight line then you have the method down correctly." As Hamblin (1974) notes, the approximation is usually very good and the procedure demonstrates graphically to the subjects their ability to use the techniques.

#### Measurement of Individual Attributes

The proposed models of task group differentiation incorporated five independent, three dependent and one control variable which required measurement in each of the twelve nursing groups. These variables were respectively: Knowledge, skill, creativity, professional demeanor, willingness to help, status, likeability, power, and familiarity. Measurement of each variable was achieved by using other staff nurses on the unit as stimuli. Thus, each subject was asked to select from a list of staff nurses, one colleague whom she thought was average on a particular variable. The colleague was used as the standard; the names

of all other nurses on the unit (other than the subject herself) were presented in random order by the researcher. The subject was asked to estimate proportionally, the amount of the characteristic possessed by that person in relation to the standard or average colleague. This procedure was repeated for each of the nine variables. The order of presentation of the variables to each subject was determined by random assignment.

The measurements were taken in a private interview conducted during the subject's work shift. The nurse was approached by the researcher and was asked if she would be willing to participate in the study. If she agreed, and only one nurse approached refused to take part, a time was established for the interview. The instructions to the subject (the operational definitions of the variables) were as follows:

I would like for you to use this same technique (as in the training session) in rating other nurses on this unit. I will present to you a series of characteristics on which individuals may differ. For each characteristic I would like for you to think of an individual you consider to be average on this particular characteristic. This individual will be assigned 10 units. As I read off the names of other nurses on the unit I would like for you to compare this person to the nurse who you consider to be average. Be sure your numbers are proportional. For example if you think the person has twice as much of the characteristic as the average person--assign them 20 units; if one-fourth, give them 2,5 units. If the person has none of the characteristic, give them a 0.

KNOWLEDGE

As you probably have noticed, some of the nurses on the unit have a greater store of basic information or knowledge about patient care than others. Thinking only of knowledge (as opposed to technical skill), who would you say is about average on this characteristic?

SKILL

Among the staff, some have more technical skill in performing nursing tasks than others. Thinking only of skill (as opposed to basic knowledge) who would you say is about average on this characteristic?

CREATIVITY

Some of the nurses on the unit are probably more successful in working out effective and creative solutions to nursing problems and others are less able to be creative in this way. Among the nurses on the unit, who would you consider to be average in this type of creativity?

PROFESSIONAL Demeanor

You probably have noticed that some of the nurses on the unit have more and others have less professional demeanor. They are more or less professional in their behavior, bearing and conduct. Among the nurses on the unit, who would you consider to be average on this characteristic?

WILLINGNESS TO HELP OTHERS

Some of the staff are probably more helpful and others are less helpful to their coworkers in working out nursing problems. Among the nurses on this unit, who would you consider to be average in helpfulness?

STATUS

You probably have noticed that some of the nurses on the unit are looked up to and some looked down on more than others--they have different amounts of prestige, respect, esteem or status. Among the nurses on this unit, who would you consider to have average status?

LIKEABILITY

As I'm sure you know, some people are more likeable than others. Among the nursing staff on this unit, who would you say is about average in likeability?

POWER

Some people are more able to influence others, i.e., they have more power than others do. Among the nurses on this unit, who would you consider to have average power?

FAMILIARITY

Usually we know some people better than others. Among the nurses on the unit, who do you know about average?

An important aspect of a mathematical correlation design is the averaging out of random measurement error. Such a procedure is accomplished by obtaining a sufficiently large number of estimates and taking an appropriate measure of central tendency of these estimates. The larger the number of estimates, the more stable the averaged result; however, Hamblin and Smith (1966) suggest that approximately twenty such estimates may be a sufficient number. If each subject gives one set of estimates, the number of estimates is equal to the number of subjects. For the groups under study, the number of subjects ranged from six to sixteen which is less than the desired twenty or more.

It is possible, however, to increase the number of sets of estimates, by having each subject give more than one. Such a technique has been used successfully by Stevens (1956) in psychophysics and by Hamblin (1974) in sociological research. In the present study, the subjects were asked to give either two or three sets of estimates, depending on the number of nurses on the unit. For units with fewer than

eleven nurses, three sets of estimates were obtained; for units with eleven or more nurses, two sets were obtained. The majority of these sets of estimates were taken over a two day period; the length of time between estimates was never longer than one week.

A test-retest reliability coefficient was computed for each variable based on the scores from the first and second estimates or from the first and second, second and third, and first and third estimates when there were three sets. The average correlation between the estimates, across all units were: knowledge, .90; skill, .86; creativity, .87; professional demeanor, .81; likeability, .76; willingness to help, .76; familiarity, .84; status, .85; and power, .84. (See Appendix B for a table of reliability coefficients by units.)

#### Measurement of a Group Attribute

It has been suggested that the nature of the status-power system of groups may be related to their effectiveness. Effectiveness can be characterized as the ability of groups to meet specific objectives and for groups of professional nurses, these specific objectives involve nursing care. At least Georgopoulos and Mann (1962), in a study of the effectiveness of general hospitals, identified as the primary goal of the organization, the delivery of patient care. Patient care consisted of two components:

(1) medical care delivered by individual physicians and (2) nursing care given on the various units in the hospital.

Magnitude estimation was again used to obtain estimates of the quality of nursing care given on the twelve units. Seven individuals, at or above the level of Assistant Director of Nursing, participated in this part of the study.

After completion of the training session, the following measurement instructions were given to the subjects:

In most hospitals, the quality of nursing care given on some nursing units is of superior quality while the care given on other units may be of a lesser quality. Among the nursing units in this hospital, which one would you consider to give average care?

The nursing unit selected as average was assigned 10 units. The researcher then presented, in random order, the names of the other eleven nursing units and the subjects evaluated the quality of nursing care given on each unit in terms proportional to the average unit.

Again, three sets of estimates were obtained from each subject. Since only one variable was being considered, in contrast to nine variables in the individual attribute measurement series, it was assumed that memory bias might be a more serious factor. Therefore, for the majority of subjects, the three interviews were conducted during a ten-day to two-week period.

A test-retest reliability coefficient was computed for measurements obtained for each unit. These correlations were: Pediatric A, .96; Pediatric B, .99; Surgical A,

.67; Surgical B, .99; Surgical C, .99; Medical A, .99; Medical B, .97; OB-GYN A, .98; OB-GYN B, .17; ICU A, .99; ICU B, .96; and ICU C, .99.<sup>4</sup>

### Data Analysis

The initial step in data analysis was to average out the random measurement error. The averaging out of random measurement error, in conjunction with a mathematical experimental design, has long been employed in the physical sciences, but the methodology has only recently been used in the social sciences. The reduction of random measurement error achieved by such a procedure is evidenced by the higher levels of explained variance. In fact, in psychophysical and sociological research using these methods, the level of explained variance approaches that of many of the physical sciences, i.e., circa .98 (Hamblin, 1974).

In averaging out random measurement error, it is necessary that the responses of all subjects be based on the same standard. This may be accomplished in one of two ways. First, a standard or average value may be established by the investigator and presented to the subjects in the

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4. It may be noted that Surgical A and OB-GYN B were both units which presented administrative difficulties at the time of measurement. It was perceived by the supervisory personnel that the quality of care significantly changed on these units during the measurement period. The reliability coefficients thus seem to accurately reflect this perception.

instructions. Thus, the subjects may be told that the average stimulus condition will be assigned 10 or 100 units. Secondly, the data may be standardized after they are collected. In this procedure, the subjects are allowed to establish their own standard for the average stimulus condition and, after all data have been collected, they are mathematically manipulated to standardize them to a common value (either 10 or 100). The first method was used in the present study. The number 10 was established as the standard by instruction to the subjects.

A median was calculated for each stimulus condition. Data obtained by magnitude estimation, are usually log normally distributed and, according to Stevens (1957), the best measure of central tendency is thus either the median or the geometric mean. When zero values are anticipated, however, as in this study, the median is the appropriate statistic.

In this process individual differences are averaged out. The data are thus a collective representation of the group rather than of specific individuals within the group and interpretation of the data can be made in terms of the status-power-liking differentiation process of the group as a whole.

Before the postulated models were tested, the interrelations among the variables were examined by correlation and regression analyses. The matrices of intercorrelations

of the variables from each of the nursing groups were examined with particular reference to the correlations between the competency variables. (See Appendix C for the correlation matrices of the twelve units.) It was anticipated that there might be high correlations between the four competency variables: knowledge, skill, creativity, and professional demeanor. The median correlation coefficients of the competency variables from the twelve units are presented in Table 2. As can be seen, they are highly intercorrelated.

Table 2. Median Correlation Coefficients Competency Variables

	Demeanor	Creativity	Knowledge
Skill	.74	.91	.95
Demeanor		.78	.74
Creativity			.90

These data thus indicate a serious multicollinearity problem. Multicollinearity refers to the situation in which one or more of the independent variables are highly correlated. Gordon (1968) points out that the problem has two aspects: high correlation between variables (redundancy) and the number of redundant variables (repetitiveness).

Serious multicollinearity may lead to extremely misleading regression results. Increasingly high correlations lead to increasingly serious problems; which a perfect correlation is reached, the equation can no longer be uniquely solved.

It was therefore necessary to consider methods to reduce this problem before further analysis could be undertaken. The problem could have been approached in two ways: (1) the creation of a composite variable which included the set of highly correlated variables and (2) the use of only one of the correlated variables. The former approach was used. A composite variable, competency, was formed by taking the mean of the correlated variables: knowledge, skill, creativity, and professional demeanor.

Regression analyses were undertaken to determine the nature of the relations between the independent variables and status, with particular attention to the control variable, familiarity. Familiarity had no statistically significant effect on status on any of the twelve units.

The form of these relations, i.e., a linear or power function, was also examined. Data, described by a power function, when logarithmically transformed, became linear, thus making possible the use of statistics which require linear, additive assumptions. Regression procedures were therefore carried out with arithmetic and logarithmic data; the amount of variance explained by each of the mathematical functions was used as a criterion of the fit of the

function. Seventy-five separate relations were examined. The mean  $R^2$ , when a linear function was used, was .73; the mean  $R^2$ , when a power function was used, was .74. Thus there was no significant difference in fit. However, because the power function has been so consistently supported in past research, it was used in the reported analyses.

Path analyses, incorporating the composite variable, competency, and using logarithmically transformed data, were then carried out to test the postulated differentiation models. Path analysis, a method of interpretation for the relationships hypothesized between causally ordered variables, is a technique developed by Wright, a biologist, in the 1920's and introduced into sociology by Duncan (1966). It is a form of analysis which is frequently used with correlational data; however, it is not a method for establishing causal relations beyond doubt. When the temporal assumptions of the statistic are met, however, it does approximate experimental analysis and permits a weak causal interpretation.

Heise (1969) points out that in undertaking path analysis, the usual assumptions involved in regression analyses must be met, plus the assumptions of causal ordering and independence of the disturbance terms. While the latter in the present research must rest on assumption, the theory specifies the causal ordering of the variables.

Many of the premises of exchange theory have been empirically verified.

Bohrnstedt and Carter (1971) speak further to this point and demonstrate the robustness of the statistic except in the presence of specification and measurement error. The former refers to the inclusion and causal ordering of the variables in the model while the latter has reference to the familiar problem of measurement reliability. Bohrnstedt and Carter state that the effect on parameter estimation can become quite severe as the reliability coefficients fall further below a "high" point of .80. As previously shown, the reliability coefficients of the individual measures in this study are quite high; the mean coefficient is .83.

Path analysis permits interpretation of the effect of one or more variables on a series of variables. Land (1969) points out that variables in a path model are of two types. Variables for which a specification of causal determination is of no interest are termed endogenous; variables which are assumed to be dependent on other variables in the system are called exogenous variables. Exogenous variables may be dependent on both endogenous and prior exogenous variables, therefore the effect of an independent variable on a dependent variable directly and via an intervening variable may be determined.

These effects are interpreted by means of path coefficients. Path coefficients, as introduced by Duncan, are standardized measures. Unstandardized path coefficients (referred to as path regression coefficients by Wright, 1960) may also be used in path analysis. Blalock (1967) suggests that unstandardized regression coefficients are more appropriate for describing causal processes that operate across populations. He points out that standardized path coefficients are formed by using the standard deviations of the variables, and that these may vary from population to population, thus affecting comparisons of the coefficients across populations. As the purpose of this study is the delineation of general theoretical relationships which may hold across populations, the unstandardized path coefficients were used in the analysis. Since the variables were measured on the same scale, however, interpretation of the unstandardized coefficients is unambiguous.

Prior to data analysis, a statistical level of significance was selected to be used throughout the study as a criterion for acceptance or rejection of the hypothesized relations between variables. Two tailed tests were used in the study for both theoretical and methodological reasons. First, several theoretical questions in the study were concerned with the direction of the relation between variables, i.e., whether positive or negative.

Secondly, and more generally, the use of one tailed tests may lead to the rejection of hypothesized relations between variables because the sign of the relation has been incorrectly predicted. Thus a strong negative relation between variables may be rejected if the relation has been predicted to be a positive one and a one tailed test is performed. Since two tailed tests were used, a .10 probability level was established as the level at which the null hypothesis would be rejected. This level corresponds to the standard .05 level used with one tailed tests of significance.

A path analysis was first performed on pooled data, i.e., data grouped together as a whole. These data reflect the general differentiation process found with the hospital. In carrying out this analysis, the canon of control by constancy was relaxed. Such relaxation was expected to be reflected in lowered explained variances but not in the parameters of the model. Path analyses were also performed on data from each of the twelve nursing units.

The data were also grouped by area of specialization in order to examine the consistency of the differentiation process across types of groups. Nursing specialization, within hospitals, is comparable to the service divisions of medical practice. Five nursing service groups were thus identified: pediatric, surgical, medical, obstetrics-gynecology, and intensive care units. Path analysis was

also carried out on the basis of the quality of care given. The data were divided into two groups, high and low quality of nursing care, using the estimates obtained from the directors. These estimates, like the others, were first averaged. The units were listed in rank order from the lowest to highest, quality of care score. The data from the bottom six units were grouped as low quality of care and the data from the top six as high quality of care units.

#### A Summary

In summary, the study incorporates the principles of a mathematical correlational design. Control by constancy was achieved for each nursing unit by having the subjects evaluate all other registered nurses on the unit. These nurses served as stimulus conditions and multiple and simultaneous measurements were thus taken across a broad continuum of each independent variable. Ratio measurement was achieved by using magnitude estimation procedures and measurement error was averaged out by taking the median estimate for each of the stimulus conditions. Finally, the fits of the data to both linear and power functions were examined. The fits were not significantly different; because of past research a power function was selected to describe the data in the remainder of the analysis. The data were therefore logarithmically transformed before path analysis was undertaken.

Path analyses were then carried out on the data grouped as a whole, on data from each of the twelve units, on data grouped by type of service, and by high or low quality of care. The variables in the analysis included a composite variable, competency, formed by taking the mean of the four highly correlated variables: knowledge, skill, creativity, and professional demeanor. Variables measured directly were status, likeability, willingness to help, and power.

## CHAPTER 3

### RESULTS

Two conflicting exchange interpretations of differentiation in task groups have been presented and the question has been raised, Which, if either, of these models adequately describes this process? Further, it has been suggested that the nature of the status-power assignment system may be related to group effectiveness. The results are presented in tabular form in Tables 3 and 4 and as a path diagram in Figure 3.

The pooled data reflect the general differentiation process found within the hospital. They incorporate a much larger number of cases ( $N = 125$ ) than do the unit and service data. For these reasons, the results are reported in terms of the pooled data. Control constancy has, however, been relaxed with these data and it is anticipated that the amount of variance explained in the model will be lower than the  $R^2$ 's associated with the unit data.

#### A General Model

##### Willingness to Help

The initial dependent variable in the model is willingness to help. In Model I no prediction is made

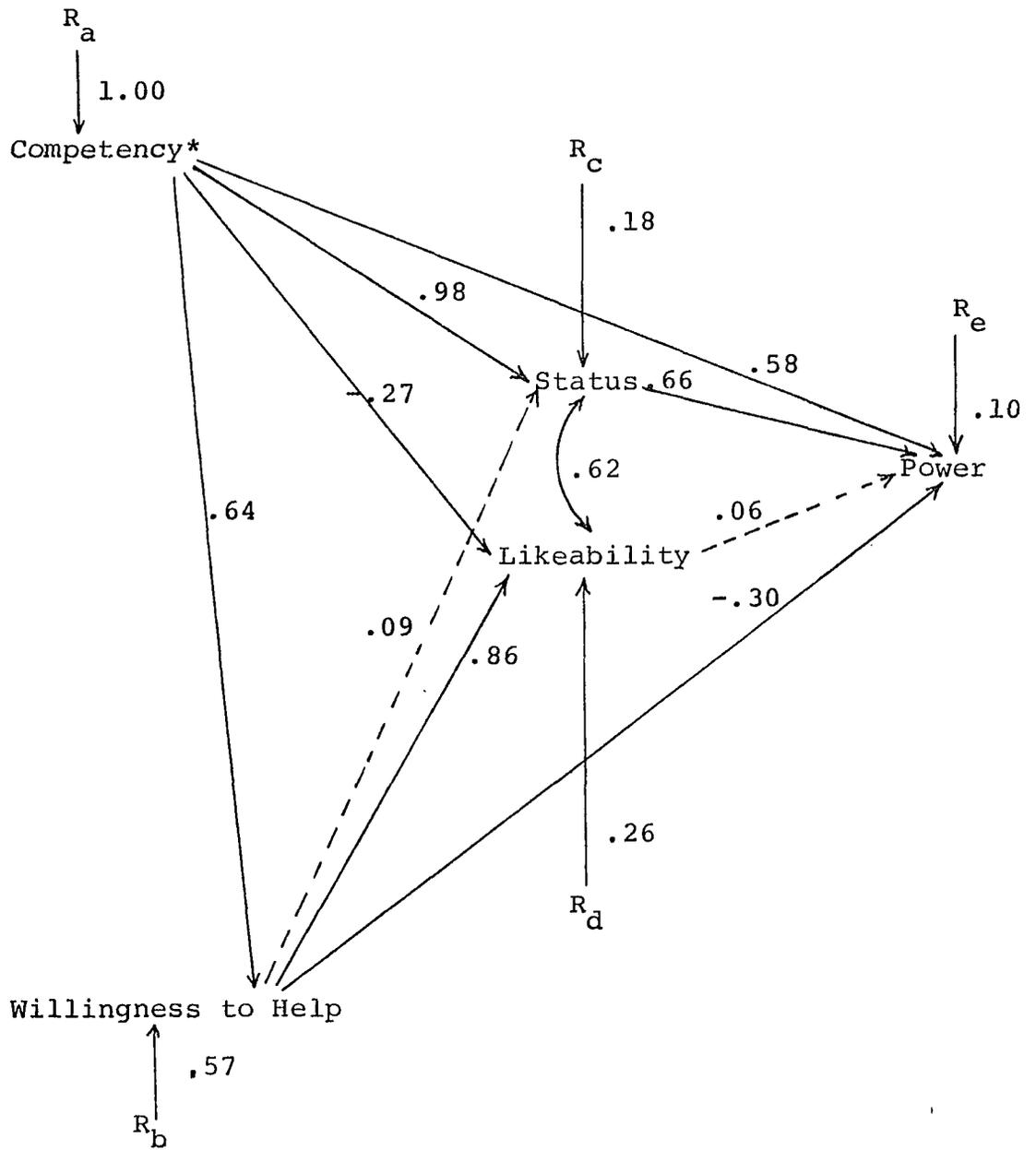
Table 3. Path Regression Coefficients and Explained Variance for Pooled, Service, and Unit Data

	$b_1$	$b_2$	$b_3$	$b_4$	$R^2$
<u>WILLINGNESS TO HELP = cCompetency<sup>b<sub>1</sub></sup>:</u>					
Pooled Data	.64				.43
Service Data (Median)	.70				.56
Unit Data (Median)	.58				.48
<u>STATUS = cCompetency<sup>b<sub>1</sub></sup> · Willingness to Help<sup>b<sub>2</sub></sup>:</u>					
Pooled Data	.98	.09			.82
Service Data (Median)	.84	.14			.89
Unit Data (Median)	.90	.22			.95
<u>LIKEABILITY = cCompetency<sup>b<sub>1</sub></sup> · Willingness to Help<sup>b<sub>2</sub></sup>:</u>					
Pooled Data	-.27	.86			.74
Service Data (Median)	-.37	.81			.73
Unit Data (Median)	-.64	.98			.84
<u>POWER = cCompetency<sup>b<sub>1</sub></sup> · Willingness to Help<sup>b<sub>2</sub></sup> · Status<sup>b<sub>3</sub></sup> ·</u>					
<u>Likeability<sup>b<sub>4</sub></sup>:</u>					
Pooled Data	.58	-.30	.66	.06	.90
Service Data (Median)	.82	-.18	.45	.03	.94
Unit Data	.84	-.23	.54	.08	.96

Table 4. Path Regression Coefficients and Explained Variance for High and Low Quality of Nursing Care Groups

	$b_1$	$b_2$	$b_3$	$b_4$	$R^2$
<u>WILLINGNESS TO HELP = cCompetency<sup>b<sub>1</sub></sup>:</u>					
High Quality of Care	.48*				.26
Low Quality of Care	.74*				.54
<u>STATUS = cCompetency<sup>b<sub>1</sub></sup> · Willingness to Help<sup>b<sub>2</sub></sup>:</u>					
High Quality of Care	.82*	.15			.84
Low Quality of Care	1.12*	.07			.83
<u>LIKEABILITY = cCompetency<sup>b<sub>1</sub></sup> · Willingness to Help<sup>b<sub>2</sub></sup>:</u>					
High Quality of Care	-.45*	.72*			.63
Low Quality of Care	-.14	.91*			.80
<u>POWER = cCompetency<sup>b<sub>1</sub></sup> · Willingness to Help<sup>b<sub>2</sub></sup> · Status<sup>b<sub>3</sub></sup> ·</u>					
<u>Likeability<sup>b<sub>4</sub></sup>:</u>					
High Quality of Care	.52*	-.44*	.78*	.17	.86
Low Quality of Care	.64*	-.17	.60*	-.04	.92

\*Significant at .10 level.



\*All variables in logarithmic form

—————> Significant at .10 level

- - - - -> Non-Significant

Figure 3, Path Model: Pooled Data

regarding this relation; in Model II a negative effect of competency on willingness to help is predicted. The prediction of Model II is not supported by the data (see Figure 3). There is instead a moderately large positive effect ( $b = .64$ ) of competency on willingness to help.<sup>5</sup> Competency also explains a moderate portion of the variance (43 per cent) in willingness to help. It is reasonable to conclude that in these nursing groups, more competent nurses were more willing to help others.

#### Status

The second dependent variable under consideration is status. In both models, a positive relation between competency and status is predicted. As can be seen in Figure 3, this relation is indeed positive and very strong ( $b = .98$ ),

In Model I, a positive effect of willingness to help on status is predicted. In Model II, no prediction is made regarding this relation. The data show that, in the group studied, willingness to help had no statistically significant effect on status. Status results solely from one's competency; it may further be noted that 82 per cent of the variance in status is explained in the model.

In summary, the data support the mutual prediction of both models; competency does exert a strong positive

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5. The relations discussed refer to path regression coefficients unless otherwise specified.

effect on status. In neither model, however, is the lack of effect of willingness to help on status predicted.

### Likeability

The third dependent variable is likeability. In both Model I and Model II a positive relation is predicted between willingness to help and likeability. The data support these predictions; a large positive effect ( $b = .85$ ) is found. In Model I, a positive relation between competency and likeability is predicted and thus it is also predicted that status and likeability will be positively related. In Model II, a negative effect of competency on likeability is predicted and thus, since the effect of competency is predicted as positive, the correlation between status and likeability is expected to be negative.

As can be seen in Figure 3, the data support portions of both models. A moderate negative effect of competency on likeability ( $b = -.27$ ) is found as predicted by Model II, but the positive correlation ( $r = .62$ ) between likeability and status as predicted by Model I is also found. Together competency and likeability explain 74 per cent of the variance in likeability.

These results reflect the direct and indirect effect of competency on likeability. Competency leads directly to dislike, but the more competent individuals are evidently more willing to help and for this reason are better liked. Since competent individuals are accorded greater

status and are also better liked, likeability and status are positively correlated. In summary, willingness to help has a positive effect on likeability while competency has a direct negative effect but an indirect (via willingness to help) positive effect. The data again support parts of both Models I and II.

#### Power

The last variable under consideration is power. In both Models I and II, a positive effect of status on power is predicted. It is assumed that the effects of competency on power will be transmitted via status and that this direct path will be negligible. Neither model predicts effects of likeability and willingness to help on power.

The effects of status on power are, as predicted, positive. The path regression coefficient is moderately large ( $b = .66$ ); however, competency too has a direct effect on power which is moderate and positive ( $b = .58$ ). Likeability, as predicted, has no direct effect on power; the coefficient ( $b = .06$ ) is statistically not significantly different from zero. Willingness to help, however, does have a moderately negative ( $b = -.30$ ) direct effect on power. The four variables together explain 90 per cent of the variance in power.

In summary, competency is the major determinant of power, both directly and indirectly. The more competent the

nurse, the more power she has. Also, the more competent, the more status and the more status, the more power. Willingness to help has a small negative effect on power.

Pooled, Service, and Unit Data:  
A Comparison

The pooled data, representing a general differentiation process have been reported. The question must be raised, Are the data from the pediatric, medical, surgical, OB, and ICU groups, as well as the smaller units, consistent with this picture? In order to facilitate comparison of these three sets of data, a median value has been computed for each of the path regression coefficients and  $R^2$  (explained variance) values from the service and unit data. These values are found in Table 3 and the complete set of data for the service and unit groups may be found in Appendix D.

Comparison of the three sets of data first reveals the effects of relaxation of control by constancy and the subsequent introduction of extraneous factors in the measurement process. The explained variance is consistently lower in the pooled than in the unit data. Thus, pooling drops the  $R^2$  of willingness to help by 5 per cent (from .48 to .43), of status by 13 per cent (from .95 to .82), of likeability by 10 per cent (from .84 to .74) and of power by 6 per cent (from .96 to .90).

The path regression coefficients, as expected, show great similarity across the three sets of data. Examination of the pattern of relations for each of the four dependent variables, demonstrates little variation. Thus the calculated effects of competency on willingness to help are rather stable:  $b = .64, .70,$  and  $.58$  for the pooled, service and unit data respectively. On status, the effects of competency are stable ( $b = .98, .84,$  and  $.90$  for the pooled, service, and unit data) as are the effect of willingness to help ( $b = .09, .14,$  and  $.22$ ). On likeability, the effects of competency vary but slightly more ( $b = -.27, -.37,$  and  $-.64$  for the pooled, service, and unit data) while the effects of willingness to help are essentially unchanged ( $b = .86, .81,$  and  $.98$ ). On power, the effects of competency vary little ( $b = .58, .82,$  and  $.84$ ) as do the effects of willingness to help ( $b = -.30, -.18,$  and  $-.23$ ), status ( $b = .66, .45,$  and  $.54$ ) and likeability ( $b = .06, .03,$  and  $.08$ ).

#### Group Effectiveness

The results of the analysis by quality of care are presented in Table 4. The results are similar to those of the pooled data, but the two groups do differ significantly from one another.

On willingness to help, the effects of competency in both models, as in the pooled data, are moderately large

and positive ( $b = .48$  and  $.73$  for the high and low quality of care groups respectively). On status, the effects of competency in both groups are strong and positive; however, the path regression coefficient in the low care grouping ( $b = 1.12$ ) is larger than that of the high care group ( $b = .82$ ). The effects of willingness to help on status in both groups as with the pooled data, are not statistically significant.

The effects of willingness to help on likeability are similar in both groups, being  $.72$  for the high and  $.91$  for the low care grouping. The effects of competency are negative in both groups; however, in the low quality of care group, this effect is statistically non-significant.

On power, the effects of competency, status, and likeability are quite similar for the two groups. The effects of willingness to help on power are negative in the two groups but again the path regression coefficient for the low quality of care group is statistically non-significant.

In summary, differences between the high and low quality of care groups are found in several areas of the differentiation process. First, there is a larger effect of competency on status in the low quality of care group. Secondly, only in the low quality of care groups are the effects of competency on likeability and willingness to help on power statistically non-significant.

## CHAPTER 4

### DISCUSSION

The results of the study in relation to the two postulated models will first be discussed. A description of the differentiation process in high and low quality of care groups and the theoretical implications of the study will then be presented.

#### Differentiation and Reward in Task Groups

The present study of task group differentiation focuses on valued behaviors and the rewards given to individuals who can perform them. Two models which differently specify the reward system of groups have been used to investigate three types of reward: status, liking, and power. Model I, based on the work of Homans and Blau, reflects a cooperative model of differentiation in which competent people are rewarded with both status and liking. Model II, based primarily on additional work by Blau, reflects a competitive process in which highly competent people are respected but not liked. In both models, it is suggested that individuals who are respected will also have greater power. The results of the study give unequivocal support to neither model, but instead support portions of each.

### Willingness to Help

Willingness to help is, in Model I, an independent variable and in Model II, an intervening variable, dependent on competency. In Model II, it is suggested that: (1) status and being liked (referred to here as likeability) are distinct types of rewards associated with two modes of integration in groups and (2) competency is the major determinant of which of the two a group member may follow. Competency is rewarded with status; less competent people may be pleasant and thus liked. It is therefore suggested that competency will negatively affect willingness to help since, if one is competent, it is not necessary to be pleasant in order to gain group acceptance.

The relation between status and likeability (as will be discussed in the next section) is positive and competency has a positive ( $b = .64$ ) rather than negative effect on willingness to help. Thus the underlying assumption of Model II, that individuals attempt to maximize only one type of reward, seems incorrect. Competent individuals are more willing to help and, if willingness to help and likeability are positively related as predicted, may gain liking as well as status.

### Status-Likeability

Status and being liked will be considered together as dual rewards granted to group members. The questions

under consideration are the relation of status and likeability: (1) to each other, and (2) to preceding variables in the model (competency and willingness to help). In Model I, status and likeability are assumed by Homans to be forms of social approval which are found in conjunction with one another. Thus it is assumed that status and likeability arise from the same sources (competency and willingness to help) and are positively correlated. In Model II, as noted, status and likeability are predicted to be negatively correlated since it is suggested that on status, competency will have a positive effect but on likeability, a negative one.

Status and likeability, as predicted by Model I, are positively correlated ( $r = .62$ ); however, the relation between these variables and the independent variables, competency and willingness to help, are those predicted by Model II. These relations result from direct and indirect effects.

Status. Competency first is the major determinant of status within the professional groups studied. This relation exemplifies a basic premise of exchange theory: status is exchanged for valued behavior. The giving of status for competent behavior may, however, arise from either self-centered or altruistic motives. Competency may first be valued by other workers as an attribute which will

help them individually in their work, i.e., group members can work a direct exchange with competent individuals by exchanging useful help and advice for status. This type of exchange was found by Blau (1955) among federal agents.

The norm of selflessness is, however, an integral part of the professional ethic and professionals are expected to adhere to moral standards which place the client's interest above their own. Competency then, in and of itself, may be valued by nursing group members for its values in meeting patient's needs. Blau (1971:68) speaks directly to this point:

Professional standards give rise to indirect exchange inasmuch as a practitioner's treatment of clients in accordance with these standards wins him the approval of his colleagues. Shared values that define common objectives enable a man to earn the appreciation of a large number of others without engaging in direct exchange with each by contributing to the achievement of these objectives and thus to the common welfare.

In order for individual workers to benefit from a direct exchange of competency and status, it is necessary that competency be used in their behalf. Blau (1955) for example, describes how only competent agents who were also willing to help, were given status. Although, in the present study, more competent individuals are on the average more helpful, willingness to help is not a factor in the giving of status. There is no statistically significant relation between willingness to help and status; competency is the sole determinant of status. It would seem, therefore,

that in the group of nurses studied, competency is valued for the good it can do patients rather than peers.

Likeability. Willingness to help, while not related to status, does exert a strong positive effect ( $b = .86$ ) on likeability. As predicted by both models, individuals better like people who help them than those who do not. The relation between competency and likeability, as predicted by Model II, is negative ( $b = -.27$ ), although small. Thus to a certain extent, the more competent a person, the less she is liked. This response may be a consequence of and reflect the deference associated with respect; one does not necessarily like the person to whom she must "bow." It may be more fundamentally, evidence of the continuing rivalry for status which leads to jealousy and dislike among group members. The competent person is the one with the competitive advantage. This promotes resentment towards and jealousy of her by less competent individuals and results in a lack of liking if not outright dislike.

Summary. Status and likeability are not antithetical rewards in the group studied, for they vary together. Thus the results of the present study, contrary to Homans' (1961) assumption, seem to indicate that status and liking do not arise from the same source. Status, in the present study, is accorded solely on the basis of competency while likeability is negatively affected by competency and positively

determined by willingness to help. Status and likeability then seem, in the present study, to be rewards given for two different types of behavior. Status, it seems, is given for behavior valued by the group; liking, on the other hand, would seem to be given for behavior which is apparently less valued by the group as a whole, but which is beneficial or pleasing to individual members. Further, it may be noted, competent individuals can and do maximize both types of rewards. Competent individuals are respected and, as a function of their willingness to help, are also liked.

#### Power

Power, defined in the present study as the potential to influence others, reflects a third type of reward for it represents acquiescence and the giving of influence on the part of the person influenced. Both models predict that power will be determined by status and the data demonstrate a strong positive relation ( $b = .66$ ) between the two; the more status a nurse has, the more able she is to influence her co-workers. Competency and willingness to help others also contribute to power. Competency, in fact, has a large positive, direct effect ( $b = .58$ ) on power, in addition to a large indirect effect via status. Within task groups, however, this is perhaps functional. Competency reflects greater knowledge and skill than others in the group possess. That the group members should accept advice and suggestions

from the more knowledgeable person because of her expertise seems reasonable.

There is finally, a negative effect of willingness to help on power ( $b = -.30$ ). Homans (1961:310) has pointed out the need for leaders to maintain their social distance from followers and aptly characterizes this relation in the familiar maxim "familiarity breeds contempt." Willingness to help, a pleasant, amiable characteristic, thus results in greater likeability but negatively affects one's power so competent individuals who are helpful have, on the average, less power.

#### Summary

The three rewards, status, likeability, and power, seem to be used for specific purposes in the group of nurses studied. As predicted by Homans and Blau, status is given for behavior which is scarce and valued. In the present study, work competency is assumed to be such a characteristic and the data show that competency is, in fact, the sole determinant of a person's status. As suggested by Blau and Homans, power is also a reward for valued behavior, for the power one has comes directly from her status and competency. Greater power would, however, seem to accrue to competent people who are also more aloof, for willingness to help negatively affects one's power. Likeability, in the present study is given to individuals who are more willing to help

others and therefore, it can be suggested that likeability is a reward given for personally pleasing rather than normatively valued behavior. Thus, contrary to Homans' prediction, status and likeability, while positively correlated, arise from divergent sources.

Thus, in this group of nurses, competent individuals are, on the average, accorded greater status and power. Their competency seems to cause some resentment; however, this is apparently overcome by their willingness to help. When competent individuals are willing to help, as they tend to be, they are better liked; however, they may in the process, lose some power they otherwise would have earned.

#### Group Effectiveness

Contrary to theoretical predictions, the results of the study show that in the nursing group that gives the lower quality of care, competency results in greater status ( $b = 1,12$ ) than in the group which gives better care. Further, in the low quality of care group, socioemotional characteristics seem to be divorced from competency, for competency has no effect on likeability nor willingness to help on power. Thus a clear competency-status-power dimension is found in the low quality of care group.

While these results can be clarified only with further research, several suggestions may be worth considering. First, it could be that the premises of the

differential reinforcement argument may be incorrect. This would not seem to be the case, however. Evidence supporting the acceleration principle is too widespread to doubt its truth. The reward value of status may be questioned, and while the reward value is not measured in the present study, it seems doubtful that status could not be rewarding.

These results may simply reflect the complexity of social life. Group effectiveness is a complex phenomenon dependent on the effects of many variables, and the examination of only the status-power system in relation to effectiveness may be an oversimplification of the process. Thus while two variables may be related, their relation may be overshadowed by a multiplicity of other factors. This study was designed only incidently to examine the effects of group differentiation on group effectiveness. A study designed to examine this relation would necessitate a multivariate approach which exceeds the present design.

#### Limitations of the Study

It must again be pointed out that the study does not attempt to test directly the causal nature of the exchange transactions discussed. The conclusion, for example, that competency is exchanged for status is based on correlational rather than experimental data. Demonstration of a causal relation requires: (1) the accounting for of other variables (either by control or randomization) and (2) evidence of the

temporal ordering of the variables. The accounting of other variables is achieved, in this study, for each nursing unit, through the technique of control by constancy. This study, however, does not incorporate the first canon of mathematical experimentation, manipulation of independent variables. The ordering of the variables rests therefore on theoretical assumptions rather than on experimental design.

It must further be pointed out that this study, like most research, focuses on one particular group. It is first a task group, second a professional group, and third a group composed almost entirely of women. Thus the generality of the differentiation process found must be questioned. As Homans (1961:287) states: ". . . followers in some groups find some of the damndest things valuable." Thus, it is necessary to specify for each group, the type of behavior valued. Easy, direct generalization from this study to other types of professional and work groups is not possible. However, this study supports an exchange conceptualization of status-power-liking differentiation, and this framework may be used with greater confidence in the study of other groups.

Finally, the question of specification error must be raised. Specification refers to the inclusion and causal ordering of variables in the model. The variables in the empirical model account for only 96 per cent of the variance in the final dependent variable, power, when unit data are

used. The explained variances are lower with the other dependent variables. Since mathematical experimental-correlation designs are accurate enough to result in  $R^2$ 's of .98 or above, the questions must be asked: Are there other variables which affect the differentiation process in professional work groups? and Are the relationships between the variables best described by power functions as assumed? Once again these are questions which should be answered in future research.

#### Theoretical Implications

The results of the study support a general exchange framework. However, they contradict an empirical finding of Blau and place in doubt a basic assumption of Homans. Blau (1955) found that the federal employees he studied gave status only to those agents who were helpful. In the present study, willingness to help is not a factor in the giving of status. The divergent nature of the two groups must again be pointed out. The subjects in the present study, as opposed to Blau's subjects, are professional employees who value the service ethic. Thus, status, in an indirect form of exchange, is given to nurses who contribute most to the group objective of patient care.

Homans' assumption that status and likeability are inseparable characteristics must be questioned. The apparent inaccuracy in Homans' analysis may result from two sources,

either the basic assumptions of his theory or his lack of preciseness and consistency in definition and usage of words. Since the general thesis of Homans' work has not been negated, the latter source of error must be considered.

Homans (1961) identifies esteem and liking as forms of social approval. He then uses the terms in two ways: (1) as distinct concepts and (2) as interchangeable concepts. Thus he states ". . . the subjects in this experiment in fact received only one [reward] a sentiment that the investigators called 'liking' and that we call social approval" (p. 89), and "We define esteem as follows: the greater the total reward in expressed social approval a man receives from other members of his group, the higher is the esteem in which they hold him" (p. 149). One could conclude therefore from these passages that the more a person is liked, the more esteem or status he has. Homans, however, differentiates between the two forms of social approval; "We may have to distinguish between different kinds of social approval instead of lumping them all together as we have done so far. In particular we may have to distinguish between a principal ingredient of esteem that most Americans might call 'respect' and another kind of social approval that most Americans might call 'liking'" (p. 197). Having distinguished the two concepts, he then proceeds, on the same page, to use them interchangeably: "Note that 'status' here is not the same thing as esteem for

each girl was not asked to name the others she personally liked most but rather the others she perceived as being generally best liked" (p. 197). Homans thus points out that the study does not measure esteem because it reflects perceived rather than personal liking.

The confusion in Homans' discussion would seem to be a result of his secondary analysis. Perhaps unable to find more suitable studies, Homans uses studies of "liking" to exemplify "esteem." The inaccuracies produced by this practice, while indiscriminantly mixing these two forms of social approval, do not invalidate Homans' entire analysis, however. His work may be used as a basis of study and, in this manner, exchange theory can be further specified and concepts more clearly delineated.

Exchange theory, as presented by Homans, has reference to exchanges between only two or three people while Blau (1964), by using the simpler properties of individual exchanges as a basis for explanation, has attempted to describe more complex exchanges. The concept of indirect exchange underlies Blau's attempt, for shared values serve as the medium of indirect social exchange and make possible the extension of exchanges from only a personal, individual level to a more complex level. "Commonly accepted social values serve as media of social transactions that extend the range of social process beyond the limits of direct social contacts through large

collectivities and long periods of time" (Blau, 1964:280). Support for the concept of indirect exchange, found in the present study as an indirect exchange of competency and status, then offers some tentative support for Blau's expanded exchange conceptualization.

## APPENDIX A

### THE TRAINING SESSION

The following training session was carried out with each subject prior to the obtaining of magnitude estimation judgments:

Let's work for a while on the method by which you will be giving your responses. For these responses I would like for you to be thinking in proportional terms. Now, this may sound simple and rather silly, but to be sure we are together in our thinking, let's practice with a few numbers: Given the number 10--I'd like for you to give me a number which is

5 times as large (50)

1/2 as large (5)

2 times as large (20)

2/3 as large (6.6)

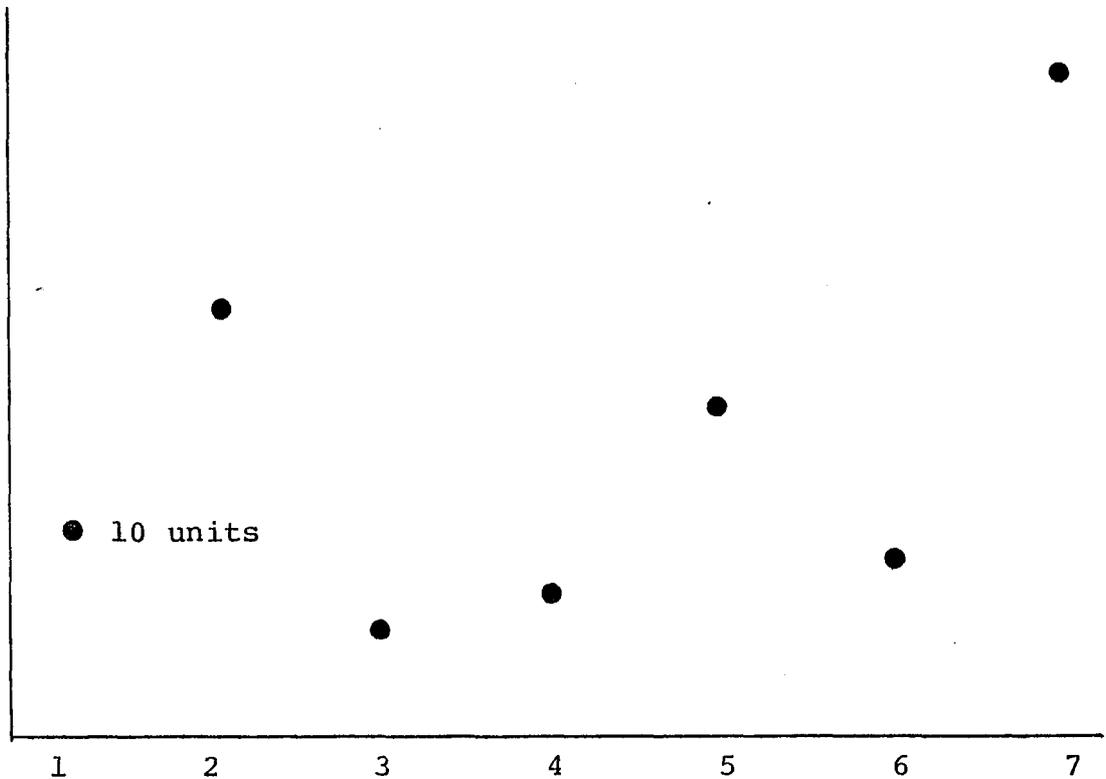
10 times as large (100)

3/4 as large (7.5)

1/3 as large (3.3)

Now, note what you have done. You have given all these numbers in proportion to the first number--10; i.e., 50 is 5 times as large and 5 is 1/2 as large.

Let's take another practice run thinking in proportional terms. Here are a series of dots. I'd like you to estimate the distance of the dots above the line; I will mark down your responses on this graph paper. To the extent that your answers approximate a straight line then you have the method down correctly. OK, the first dot is 10 units above the line . . .



The above figure was presented to the subjects on a 5 x 8 card. Each subject's responses were charted on log-log graph paper as she gave them. A line was then drawn connecting the subject's charted responses. If the correct responses were given:

#1--10  
#2--20  
#3--5  
#4--6.6  
#5--15  
#6--7.5  
#7--30

this line was perfectly straight.

APPENDIX B

TEST-RETEST RELIABILITY COEFFICIENTS

<u>Units</u>	<u>K</u>	<u>SK</u>	<u>C</u>	<u>PD</u>	<u>L</u>	<u>WH</u>	<u>F</u>	<u>ST</u>	<u>P<sup>a</sup></u>
Pediatric A 1-2 <sup>b</sup>	.93	.94	.93	.91	.91	.96	.47	.94	.96
Pediatric B 1-2	.89	.74	.76	.70	.66	.73	.76	.72	.79
Surgical A 1-2	.94	.69	.69	.78	.66	.59	.56	.72	.76
Surgical B 1-2	.67	.93	.91	.89	.88	.43	.94	.90	.68
Surgical C 1-2	.93	.89	.75	.71	.73	.70	.86	.88	.84
2-3	.90	.85	.87	.88	.86	.68	.89	.81	.88
1-3	.88	.87	.73	.80	.81	.66	.75	.70	.70
Medical A 1-2	.92	.87	.92	.83	.87	.91	.88	.97	.73
2-3	.97	.96	.97	.54	.82	.92	.94	.93	.91
1-3	.96	.91	.87	.59	.73	.77	.88	.86	.84
Medical B 1-2	.88	.86	.92	.89	.83	.89	.97	.89	.95
2-3	.95	.99	.96	.85	.93	.93	.92	.91	.95
1-3	.89	.92	.90	.85	.81	.87	.94	.86	.94
OB-GYN A 1-2	.95	.88	.90	.82	.80	.86	.87	.86	.94
2-3	.95	.89	.96	.82	.88	.86	.79	.88	.91
1-3	.92	.88	.87	.83	.82	.84	.78	.85	.90
OB-GYN B 1-2	.88	.66	.77	.88	.54	.50	.83	.73	.91
2-3	.95	.97	.96	.92	.88	.92	.95	.98	.96
1-3	.88	.82	.82	.91	.66	.50	.80	.74	.92

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<u>Units</u>	<u>K</u>	<u>SK</u>	<u>C</u>	<u>PD</u>	<u>L</u>	<u>WH</u>	<u>F</u>	<u>ST</u>	<u>P<sup>a</sup></u>
ICU A									
1-2	.92	.88	.88	.82	.76	.52	.93	.82	.86
ICU B									
1-2	.89	.66	.85	.93	.86	.79	.94	.87	.74
ICU C									
1-2	.76	.92	.87	.72	.80	.89	.83	.94	.54

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<sup>a</sup>K = Knowledge  
SK = Skill  
C = Creativity  
PD = Professional Demeanor  
L = Likeability  
WH = Willingness to Help  
F = Familiarity  
ST = Status  
P = Power

<sup>b</sup>1-2 = First and second set of estimates.  
2-3 = Second and third set of estimates.  
1-3 = First and third set of estimates.

APPENDIX C

CORRELATION MATRICES

	<u>ST</u>	<u>F</u>	<u>WH</u>	<u>L</u>	<u>PD</u>	<u>C</u>	<u>SK</u>	<u>K</u>
<u>PEDIATRIC A</u>								
P	.92	.82	.71	.64	.80	.83	.90	.84
ST		.72	.76	.75	.66	.91	.93	.82
F			.85	.71	.69	.85	.74	.78
WH				.95	.63	.94	.68	.74
L					.53	.91	.59	.61
PD						.61	.73	.65
C							.82	.83
SK								.83
<u>PEDIATRIC B</u>								
P	.97	.85	.71	.72	.86	.82	.94	.95
ST		.86	.71	.72	.90	.79	.94	.93
F			.65	.72	.77	.84	.88	.86
WH				.89	.66	.80	.66	.67
L					.64	.89	.77	.74
PD						.74	.82	.83
C							.87	.89
SK								.98
<u>SURGICAL A</u>								
P	.64	.28	.17	-.04	.40	.93	.71	.82
ST		.44	.66	.52	.78	.54	.55	.58
F			-.02	.14	-.09	.20	.26	.01
WH				.87	.85	.16	.36	.38
L					.71	.12	.24	.20
PD						.36	.54	.58
C							.83	.81
SK								.76





	<u>ST</u>	<u>F</u>	<u>WH</u>	<u>L</u>	<u>PD</u>	<u>C</u>	<u>SK</u>	<u>K</u>
				<u>ICU C</u>				
P	.93	.81	.46	.26	.75	.90	.92	.95
ST		.86	.69	.49	.89	.83	.76	.82
F			.59	.43	.75	.87	.67	.71
WH				.91	.85	.36	.20	.27
L					.71	.16	.01	.08
PD						.69	.57	.62
C							.90	.91
SK								.97

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<sup>a</sup>K = Knowledge  
SK = Skill  
C = Creativity  
PD = Professional Demeanor  
L = Likeability  
WH = Willingness to Help  
ST = Status  
P = Power  
F = Familiarity

APPENDIX D

PATH ANALYSES--SERVICE AND UNIT DATA

$$\text{WILLINGNESS TO HELP} = c \frac{b_1 \text{Competency}}{R^1}$$

	<u>b<sub>1</sub></u>	<u>R<sup>1</sup></u>
<u>Service:</u>		
Pediatric	.75*	.72
Surgical	.48*	.18
Medical	.86*	.81
OB-GYN	.70*	.16
ICU	.40*	.16
<u>Unit:</u>		
Pediatric A	.83*	.70
Pediatric B	.72*	.74
Surgical A	.60	.12
Surgical B	.57	.40
Surgical C	.30	.12
Medical A	.91*	.86
Medical B	.79*	.72
OB-GYN A	.95*	.88
OB-GYN B	.29	.16
ICU A	.54*	.55
ICU B	.17	.06
ICU C	.28	.05

$$\text{STATUS} = c \text{Competency}^{b_1} \cdot \text{Willingness to Help}^{b_2}$$

	<u>b<sub>1</sub></u>	<u>b<sub>2</sub></u>	<u>R<sup>2</sup></u>
<u>Service:</u>			
Pediatric	1.43*	.28	.89
Surgical	.81*	.04	.82
Medical	.84*	.19	.92
OB-GYN	.89*	.09	.94
ICU	.80*	.14	.81
<u>Unit:</u>			
Pediatric A	1.54*	.91*	.95
Pediatric B	1.73*	.99*	.96
Surgical A	.65*	.11	.63
Surgical B	.56*	-.16	.80
Surgical C	.96*	-.09	1.00
Medical A	.15	.97*	.95
Medical B	1.17*	-.25*	1.00
OB-GYN A	.91*	.35	.95
OB-GYN B	.94	-.93	.97
ICU A	.84*	.34	.94
ICU B	.63*	-.24	.76
ICU C	.88*	.44	.91

$$\underline{\text{LIKEABILITY} = c \text{Competency}^{b_1} \cdot \text{Willingness to Help}^{b_2}}$$

	<u>b<sub>1</sub></u>	<u>b<sub>2</sub></u>	<u>R<sup>2</sup></u>
<u>Service:</u>			
Pediatric	.14	.94	.83
Surgical	-.31	.90*	.82
Medical	-.50	.80*	.64
OB-GYN	-.77	.35	.59
ICU	-.37*	.81*	.73
<u>Unit:</u>			
Pediatric A	-1.22*	1.55	.96
Pediatric B	.85*	.69	.93
Surgical A	-.26	.83*	.86
Surgical B	-.52	1.14*	.85
Surgical C	-1.77	.74	.97
Medical A	-.25	1.16	.84
Medical B	-4.14	1.01	.83
OB-GYN A	-.87	-.02	.49
OB-GYN B	-1.57	.58	.73
ICU A	.03	1.14*	.65
ICU B	-.76*	.51	.68
ICU C	-.01	.92*	.90

$$\text{POWER} = \frac{c \text{Competency}^{b_1} \cdot \text{Willingness to Help}^{b_2} \cdot \text{Status}^{b_3} \cdot \text{Likeability}^{b_4}}{b_4}$$

	<u>b<sub>1</sub></u>	<u>b<sub>2</sub></u>	<u>b<sub>3</sub></u>	<u>b<sub>4</sub></u>	<u>R<sup>2</sup></u>
<u>Service:</u>					
Pediatric	.87*	.12	.45*	-.24	.96
Surgical	.66*	-.18	.44*	-.04	.84
Medical	.82*	-.19	.36*	.03	.97
OB-GYN	1.05*	-.66*	.51	.34	.85
ICU	.43*	-.42	.86*	.23*	.94
<u>Unit:</u>					
Pediatric A	1.03	-.24	.40	-.01	.91
Pediatric B	1.30*	.48	.18	-.51	.97
Surgical A	.80	-.23	.48	-.13	.86
Surgical B	.69*	-.65	.67	-.11	.90
Surgical C	1.14	-.17	-.23	.36	1.00
Medical A	.85*	-.07	.41	-.13	.96
Medical B	.15	-.10	.91*	.05	1.00
OB-GYN A	1.62	-.33	-.18	.78	.79
OB-GYN B	1.24*	-1.02*	.73	.16	.98
ICU A	.58*	-.22	.63*	.12	.98
ICU B	.45	-.22	.67	.44	.87
ICU C	.62*	-.34	.68*	.15	.95

\*Significant at .10 level.

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