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A COMPUTERIZED TECHNIQUE FOR THE ANALYSIS OF  
SMALL GROUP INTERACTION.

The University of Oklahoma, Ph.D., 1972  
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THE UNIVERSITY OF OKLAHOMA  
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A DESCRIPTIVE STUDY OF THE USE OF PROANA 5:  
A COMPUTERIZED TECHNIQUE FOR THE  
ANALYSIS OF SMALL GROUP INTERACTION

A DISSERTATION  
SUBMITTED TO THE GRADUATE FACULTY  
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DOCTOR OF PHILOSOPHY

BY  
WAYNE LEE MURROW  
Norman, Oklahoma

1972

A DESCRIPTIVE STUDY OF THE USE OF PROANA 5:  
A COMPUTERIZED TECHNIQUE FOR THE  
ANALYSIS OF SMALL GROUP INTERACTION

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## ACKNOWLEDGMENTS

To my wife and children I owe an immeasurable debt of gratitude for their enduring patience and willingness to live with a student rather than a husband and daddy. This acknowledgment cannot atone; but it is a beginning. Thank you, Nila, for being willing to lay aside the roles of wonderful wife and marvelous mother to become for a time a super secretary and terrific typist. Thank you Sherri, Randy, Cindy, and Jeff for being willing to postpone the stories you wanted to share, the picnics you wanted to take, and the trips that you long expected.

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## Introduction

Students of small group communication are concerned with the variables involved in communication networks and structure which interact with and/or impinge upon most other variables of the small group process. Consequently, the importance of interaction analysis is seldom questioned and the field of small group research is much in need of refined interactional-observation techniques with established normative statistics. Although there are several well known interaction measurement tools in current use, their use has not generated the kinds of basic and descriptive information about small groups that is needed.

The purpose of this study is to generate normative statistics regarding the expected proportion of occurrence of the seven characteristics analyzed by the Process Analysis known as PROANA 5. Or more specifically, to provide both point and interval estimates of frequency of occurrence of the seven variables. Up to this point the research has not provided any expected distributions of the variables. Such distributions, which are necessary for statistical inference, must be available before any research can be conducted using these promising variables.

This Process Analysis (PROANA 5) technique is a computerized program designed and tested by William B. Lashbrook (1967) at Michigan State University. This program allows seven variables to be analyzed and evaluated based upon the patterned and nonpatterned data collected and coded by observers. From the input data which consists of frequency and direction of communication behavior (content is considered only in determination of direction), the computer provides a detailed analysis of seven variables of the small group interaction process which will be detailed in Chapter I.

The research questions for this study are:

(1) What is the frequency of occurrence in the sample population of:

- (a) balanced participation;
- (b) all lines of communication used;
- (c) clique groups formed;
- (d) detrimental clique groups formed;
- (e) leadership identification, procedural and/or emergent;
- (f) isolation of member, and
- (g) dominance by member?

(2) What is the expected pattern or shape of interaction during the entire time of the discussion when plotting interaction against time as small group variables?

A random sample of 200 subjects was drawn from the students at Bethany Nazarene College in the spring semester of 1972 and were randomly assigned to 40 five-man groups (N = 40). Each group was presented with the identical case study and instructions regarding the limitations and requirements of the discussion (Appendix B).

The structure of this study is: Chapter I, Rationale and Research Questions; Chapter II, Design and Method of analysis; Chapter III, Results and Discussion; Chapter IV, Summary and Suggestions For Further Study.

## Chapter I

### Rationale and Research Questions

This chapter presents the theoretic considerations and an explication of the variables to be analyzed in this study. The chapter is organized into five sections: General Background, Review of Network Research; Bales Interaction Process Analysis; Variables; the PROANA 5 method; and the Research Questions.

#### General Background

For the past two decades researchers have been investigating the role of communication behavior and communication networks upon the other variables of the small group process. It is generally accepted that spatial arrangements determine to a significant degree the flow of communication interaction within the group. The availability and use of channels of interaction have been manipulated in various ways to test such small group variables as: Group satisfaction, task achievement, power, status, leadership emergence, formation of sub-groups within the group, and balance of participation. However, these studies have only been concerned with the antecedent and consequent conditions which affect communication in the process. No point or interval estimates of

the expected proportion of frequency of interaction have been developed. Some work on expected distribution of interactions has been done on Bales Interaction Process Analysis. For example, see Landsberger (1955) and Bales (1970). It is clear from the research that the study of interaction in the small group is necessary and can contribute to our understanding of the process.

Two assumptions for this study are made: (1) communication interaction is influenced by most other variables, which in turn are influenced by communication (Giffin, 1965) and (2) that the PROANA 5 assumptions are reasonable and that PROANA 5 is therefore a valid research tool. This second assumption will be supported in a later section of this chapter which explicates the PROANA 5 systems, its variables and assumptions.

### Network Studies

Bavelas (1948, 1950) raised several questions concerning the effect of fixed communication patterns upon group process. In his studies he calculated "relative centrality" for each position in the experimentally created networks, i.e. "Y", "Wheel", "Chain", and "Circle". In his studies, Bavelas used highly restricted communication patterns for his research, being limited to either-or, some-or-none communication opportunities between selected members of the group. A further experimental condition imposed by Bavelas was the limitation of communication to written

messages. These restrictions severely limit the inferences which can be drawn from his studies. Therefore, Bavelas' work is most important because of its influence on later studies. His development of the concepts "centrality" and "distance" are still viable aspects of communication network study. Leavitt (1951) wrote of Bavelas' research that it allows one to

explore experimentally the relationship between the behavior of small groups and the patterns of communication in which the groups operate . . . and to consider the psychological conditions that are imposed on group members by various communication patterns, and the effects of these conditions on the organization and behavior of its members. (emphasis added)  
(p. 38)

Following Bavelas, Leavitt (1951) found that different kinds of communication networks or patterns lead to (1) differences in member satisfaction; (2) accuracy in task accomplishment; and (3) differences in the leadership positions that develop within the group. Guetzkow and Simon (1955) expanded on Leavitt's findings, differentiating between kinds of tasks.

Shaw (1971) suggests that an understanding of network influences on communication must include two explanatory concepts he calls independence and saturation. Independence is explained as "the degree of freedom with which the individual may function in a group (p. 146)." Saturation refers to communication overload as experienced by group members in centralized positions of the network.

Saturation may be "channel," that is the number of channels with which a position must deal; and "message unit", that is, the number of messages which a position must handle. (p. 147). It is Shaw's contention that the concept of saturation may account for most of the differential effects of different networks upon performances.

In general, the research supports the effects of patterns of communication upon the variables of small group process. Several studies (Lawson 1964; Mulder 1960; M. E. Shaw; 1954) show that centralized networks reduce member satisfaction and enhance leadership emergence and organizational development, but hinder the successful conclusion of complex task problems. On the other hand tasks can be handled more efficiently with highly centralized nets.

This brief overview of network studies indicates that the research has manipulated the availability of channels and the consequent conditions upon small group process. Such studies are in general agreement that communication and communication patterns do influence other variables in the small group process. The research is relevant as partial justification for this study in two ways: (1) The patterns of communication behavior are important in the development of small group processes; and (2) the decentralized network or patterns are important and desired in the problem-solving process within the small groups. Both these statements are basic to the use of PROANA 5 which allows the use of all



lines of communication (a decentralized network), and which infers from communication behavior other characteristics of group members. Furthermore, PROANA 5 allows for the researcher to study the centralized-decentralized dimension as a dependent variable rather than a manipulated, or independent variable.

### Bales Interaction Process Analysis

Another study which is important in a general background review is that of Robert F. Bales (1950) who introduced the Interaction Process Analysis (IPA) which has been the most influential observation tool yet produced for small group study. This technique studies communication acts, relies upon observer judgments of content, and produces a general picture of the volume and type of content of communication. A recent (Bales, 1970) updating of the Bales system has been effected to increase the sensitivity of the tool. He describes the changes as "being concerned with the naming and content of the categories (p. 471)."

Bales has also had great influence, not only with his Interaction Process Analysis, but also with his definition of the small group as "any number of persons engaged in a single face-to-face meeting or series of meetings in which each member receives some impression of each other member . . . even though it be only to recall that the other was present (p. 33)."

Bales work is directly relational to this present study. The development of the PROANA 5 was evolved from the sociometric principles used by Bales in evolving his definition of small groups (Bodaken, Lashbrook, and Champagne, 1971).

### PROANA 5

The PROANA 5 program was developed for the purpose of the analysis and interpretation of the use and non-use of patterns of communication in small groups. It was developed for use on a 3600 FORTRAN program at Michigan State University by William Lashbrook. The program contains instructions in both source and assembler languages.

Following Bales (1950), Lashbrook defines the small group as:

Five individuals engaged in interaction with each other in a single face-to-face meeting or series of such meetings, in which each member receives some impression or perception of each other member distinct enough so that he can, either at the time or in later questioning, give some reaction to each of the others as an individual person, even though it only be to recall that the other was present (Lashbrook 1967, p. 2).

The type of interaction is limited to oral discourse and communicative behavior is limited to an analysis of the use of communication patterns and the frequency of the occurrence of non-patterned communication by individual members of the group. If a message is judged by the observer to have low relevance to the message just preceding

it and/or if the message lasts more than 45 seconds (regardless of relevancy) it is coded as a non-patterned communication.

PROANA 5 may be considered as ten lines of communication (A1, A2, A3, A4, B1, B2, B3, C1, C2, D1) and five cells of potential non-patterned communication (N1, N2, N3, N4, N5) all of which are treated as integer variables by the program. Figure 1 is a schematic representation of this conception.

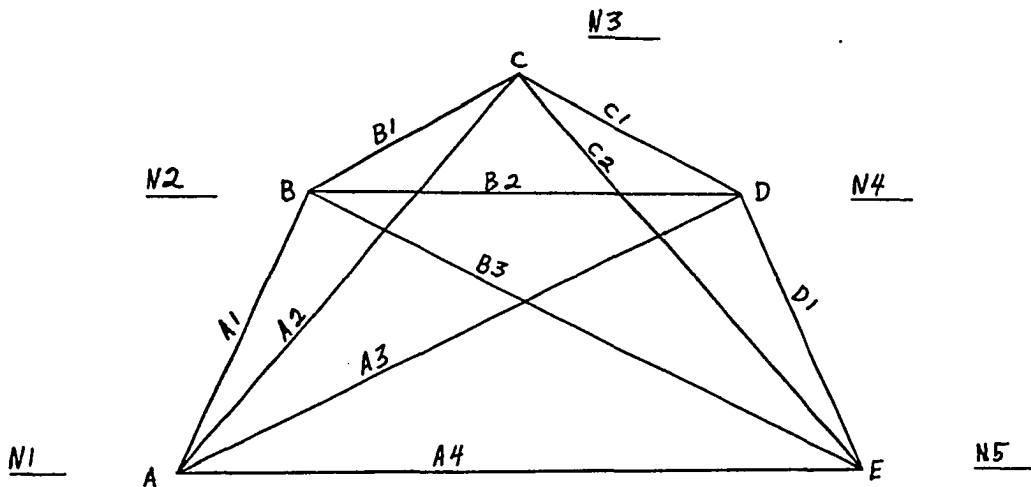


Figure 1 -- Integer Variables

A separate analysis is programmed for each of the above 15 items at the end of each of three equal time segments. By comparing these analyses the computer is able to interpret the interaction of groups in terms of certain variables programmed into the system.

The PROANA 5 Process Analysis System operates on the basis of inputs which are recorded by an observer-coder. The discussion is divided into three equal time periods

with the data being likewise divided. The observer records all information on a simple star data form (Appendix A). From this form the information is transferred to computer cards which are integrated into the prepunched PROANA 5 deck. This data then allows the evaluation and analysis of the seven variables which are discussed and defined below.

This technique is relatively new and has apparently generated little published research. However, numerous papers on PROANA 5 have been presented at the conventions of the Speech Communication Association, Western Speech Association, Central State Speech Association, and International Communication Association. The PROANA 5 may also be utilized as a classroom technique in teaching Small Group Discussion. It was used by Dr. Lashbrook at Michigan State University from 1966 through 1969. Rosenfeld and Albright (1972) report a study which validated as a pedagogical tool the use of PROANA 5 combined with Schultz's FIRO-B. Dr. H. Wayland Cummings is currently using this technique at the University of Oklahoma. The technique may be used in at least three ways: (1) data derived from classroom discussion may be processed for evaluation; (2) contrived data may be processed so as to provide the students with a printed simulation of the effects of the variables; and (3) data may be submitted by students to represent the effects of the variables discussed in class as being related to small group interaction (Lashbrook, 1967 p. 17).

Several research studies are currently in progress. Ken Fransden is currently directing a dissertation at Pennsylvania State University which utilized the PROANA 5 as an observation tool. Edward Bodaken, University of Southern California, and Marie Champagne, a graduate student at San Jose State College, are both working with this system. They are working with Dr. Lashbrook to include a who-to-whom measurement and also to enlarge the computer program to include audio inputs. The audio inputs will eliminate the need for observers. They are also attempting to revise the system to allow for generalization of the analysis from four to seven member groups. These improvements, along with a body of descriptive data, will enable a much more effective utilization of this computerized Process Analysis.

There is little of the research in the field which is directly relevant to PROANA 5. The various variables are based, at least intuitively, upon a considerable body of research relating to communication as a variable in the small group process. Generally, this research looks at communication as it affects, or is affected by, such variables as power, group size, cohesiveness, leadership, task requirements, conformity and group goals. While this body of research lends rather impressive support to the importance of communication as a research variable it does not directly relate to PROANA 5.

It is assumed by Lashbrook that communication as

analyzed by PROANA 5 reveals seven characteristics of small groups. These seven variables are arbitrarily given operational definitions by Lashbrook who does not justify his definitions. In a recent article Bodaken, Lashbrook and Champagne (1971) indicate that the seven variables were explicated from Collins and Guetzkow (1954).

This study of PROANA 5 is not directly concerned with the causes of communication behavior nor of the results of communication behavior. It is concerned with the expected proportion of occurrence of the variables. Therefore, in the following discussion of this Process Analysis System, that research which has the more obvious relationships will be reviewed. In several cases, there seems to be no direct research basis for the variables.

The degree of balance of participation is based on the assumption that effective interacting groups tend to start out deliberation with the least amount of interaction, show increase in the middle periods and taper off in the final periods. The computer is then able to state whether a discussion is reasonably well balanced with respect to interactive communication. There is a balance of participation when the interactions of Period I and III are less than the interaction of Period II. Collins and Guetzkow (1964) do not deal with this question at all. Bales and Strodtbeck (1951) studied phases in problem-solving discussions. He hypothesized that the discussion period would

move from a relative emphasis upon problems of orientation, to problems of evaluation, and finally to problems of control. Using Bales' Interaction Process Analysis (1950), they tested this hypothesis by examining the interaction pattern of 22 problem solving groups. The period was divided into thirds and the interactions analyzed. The results supported the hypothesis. This research provides some limited support for this balance of participation variables.

The degree of communication line usage between individual members of the group is derived from the assumption that group interaction is most effective when all the lines of communication are used at least once during each period of discussion. This assumption seems obvious but has not been tested. The program is able to determine when any one of the members has used any one or all of the lines linking him to the other members of the group. The analysis also indicates which lines were not used for any given period of the discussion.

This variable, as well as the clique group variable, directly relates to the issue of centralized or decentralized networks. In this program the networks are not manipulated but all lines are available, and networks may evolve and change throughout the discussion.

The degree to which clique groups are formed is based on the operational definition of a clique group as a subgroup

which is formed when the interactive communication between any two members of a group exceeds the total interactive communication with the remaining members for any given period of discussion. The formation of a subgroup is not necessarily interpreted as detrimental unless certain conditions are met.

The degree to which detrimental clique groups interfere with the total interaction of the discussion is formulated from the assumption that a clique will have a detrimental effect on group interaction if it extends over a long period of time without interruption. For the purposes of this analysis, detrimental clique groups are formed when they involve the same lines of communication for two consecutive periods of discussion.

Clique or subgroups formation is a commonly observed phenomenon in small group process. The two variables dealing with subgroup formation seem valid. There is no lack of research regarding the causes of subgroup or coalition formation. Again, however, the research is silent about the expected proportion of such formations. There is some evidence that sub-group formation and isolation are closely related. Collins and Guetzkow (1964) review research to support the following proposition: "Rejection of the deviate and subgroup formation will result in a low number of communications addressed to an unaccepted member who expresses deviant opinions (Pp. 180-181). They cite Schachter



(1951), Emerson (1954) and Gerard (1953) as support. It does appear that their proposition could provide adequate rationale for inferring clique groups from interaction.

The degree of leadership reflected in the group is based on the definition that the perceived leader of a group is that person with whom a majority of the functioning members of that group seems to communicate most, while leadership types are determined by the amount of non-patterned interaction. Operationally, the "procedural leader" of the group must have at least five non-patterned interactions over the entire discussion and a minimum of one such communication during each period. This is based on the assumption that some leadership functions will require such non-patterned communications as: information giving; orientation and organizational comments; and evaluation or summary remarks. An individual with a high amount of patterned interaction is designated as the "emergent leader" or "social emotional leader" of the group. If no leader can be designated, PROANA 5 determines that the role of leadership was shared by two or more group members.

This analysis of leadership variables enables an identification of communication propensity within a given period of discussion or throughout the discussion. This propensity is indicated by the selection of one member of a group; by a majority of the others as a receiver for their communication. This can indicate leadership or deviant

behavior with the distinction based on the interaction of this variable with others contained in the program.

Research on experimental groups has demonstrated that roles and role functions tend to appear even in the relatively short time of a laboratory experiment, and that they are functionally related to group goals, and affect the amount on interaction (Carter, 1954; Wispe, 1955; Sakoda, 1952). Another significant finding is that the amount of communication by an individual will influence or determine the role(s) the group will expect or allow a member (Kahn and Katz 1953). Leadership roles are commonly studied, and leadership is one of the most detailed aspects of the PROANA 5 analysis. However, our concern is limited to the differentiation of leadership roles. In this sense leadership is understood as a diverse activity--capable of being performed by one or many. Bales (1950, 1955, 1956, 1958) reports a fundamental tendency for leadership to be differentiated into two kinds of leaders: "task specialist" and "social-emotional specialist". Collins and Guetzkow (1964) point out that the "social-emotional specialist"

closely resembles a profile of reactive interactions. A reactive statement immediately follows a communication of another group member . . . all extended task contributions therefore, would be classed as proactive; many interpersonally rewarding communications such as approval would be classed as reactive. Bales suggests that the similarity between the interactions of the social-emotional specialist and the reactive profile further bolsters the distinction between a task and a social emotional specialist in most

groups, since the social-emotional contributions are primarily reactive (p. 218).

This distinction is basic and is incorporated into the PROANA 5 analysis of procedural and emergent leadership.

There is much research which clearly supports the high correlation between amounts of communication and leadership roles (Benne and Sheats, 1948; Sherif and Sherif, 1956; and Bales and Slater, 1955). Factor analysis of a large number of alleged role-functions was done by Sakoda, (1952), Carter (1953), and Wispe (1955). Three factors appeared in all the studies. They are: (1) Individual prominence, i.e., a high amount of communication given and received; (2) aiding group goal attainment, i.e., presentation of "best ideas" and general suggestions for group guidance; and (3) sociability, i.e., the characteristics of being well liked. The role of "prominent individual" is intuitively related to communication propensity and perceived leadership of PROANA 5. The amount of communication seems to be correlated with best ideas and guidance, but not with the sociability role. This lends further support for the PROANA 5 adoption of Bales' leadership distinctions. Perhaps no variable of the PROANA 5 technique is more clearly based upon the research than is the two-pronged leadership variable.

Isolation is the sixth variable analyzed by this program. This variable is dependent upon the assumption that isolation will be indicated by a definite and consistent

reduction of involvement between that individual and the remaining group members. As a base of involvement from which to start, PROANA 5 uses the amount of total interactive communications for an individual in the first period of discussion. Reduction is arbitrarily defined as being equal to or greater than 50%. In order to distinguish the person being isolated from the person merely reducing his involvement in the discussion, Process Analysis considers non-patterned interaction. Since an isolated individual is not allowed to interact with the membership, he must participate on a non-patterned interaction basis, as an indicator or his attempt to be part of the group. Isolation is complete when the remaining members of the group refuse or neglect to participate in the isolate's "psychological field." Isolation is declared when such an increase in non-patterned interaction is equal to or greater than 50% over the preceding time period. The measure of consistency is stated in terms of two consecutive periods of discussion. While this is quite arbitrary, there is good evidence that communication isolation does occur. The research is largely concerned with causes of isolation, but it does support the reduction of interaction as indicative of rejection (isolation) (Schachter, 1951; Festinger and Thibaut, 1951).

Dominance is the final variable. This is based upon the assumption that an individual member of a small group may be said to dominate a given period of discussion when

his total amount of communication (both patterned and non-patterned) exceeds that of the combination of the total communication of any two of the remaining members. If domination is detected, an attempt is made to find a possible explanation. PROANA 5 scans the leadership sub-routine to determine whether the domination can be explained in terms of perceived leadership, and the clique group variable to determine whether domination has its roots in clique group membership. Finally, if dominance is primarily a function of a considerable amount of non-patterned interaction, this analysis suggests that the individual might well be advocating rather than discussing.

This variable is explicated from the communication and interaction studies relating to leadership roles and the power-status studies (Hurwitz, Zander, and Hymovitch, 1953), (Taylor, 1954), and (March, 1956).

The PROANA 5 system as explained above is an observation tool which is obviously related to and derived from the Bales Interaction Process Analysis cited earlier in this chapter. As a pattern tool, PROANA 5 is somewhat more precise than the IPA of Bales. The Bales analysis requires coders to judge the content and assign to the proper category. There is considerable question about this process as the categories are not mutually exclusive. The Interaction Process Analysis also is a rather complex system and requires some 40 hours in observer training time.

In contrast, the PROANA 5 is a relatively simple system requiring little training for the observer and requiring relatively few subjective judgments. While the PROANA 5 program and its operational definitions are based on arbitrary distinctions, they seem to be in harmony with the relevant research. Empirical validation awaits studies which will generate descriptive data.

### Summary

This study investigated the proportion of occurrence and non-occurrence of each of the seven characteristics or variables of the PROANA 5 system. Specifically, what is the frequency of occurrence in the sample population of:

- (1) balanced participation;
- (2) all lines of communications used;
- (3) clique groups formation;
- (4) detrimental clique group formation;
- (5) leadership identification, procedural and/or emergent;
- (6) isolation of member, and
- (7) dominance by member.

A second question of this research is: what is the expected pattern or shape of interaction during the entire time of the discussion?

## Chapter II

### Method of Analysis

In the first chapter a rationale was developed from the research for the use and development of PROANA 5 as an interaction observation tool with which to determine seven characteristics of small groups. This chapter develops and explains the procedures and the method of data analysis.

#### Procedures

Subjects. The sample population (N = 40 5-man groups) was randomly selected from the student body of Bethany Nazarene College during the 1972 spring semester. Bethany Nazarene College is a private church-related college and requires general chapel attendance. In addition to these general chapels, each class conducts a weekly chapel or assembly at which attendance is also required. It was determined that the student population was 32% Freshman, 22% Sophomores, 23% Juniors and 23% Seniors. Utilizing a stratified sampling technique, selection of 65 Freshman (N = 13), 45 Sophomores (N = 9), 45 Juniors (N = 9), and 45 Seniors (N = 9) was made. The generalizability of the findings of this study is, therefore, possible

both to the fixed stratified factors and to the student body of Bethany Nazarene College.

Assignment. The subjects were randomly assigned within levels to form 5-man groups. Instructions were given regarding the nature of the experiment and the role of the observer. The groups were then taken to rooms in the auditorium building where the discussions took place.

Data Collection. During the discussion, the trained observer marked both patterned and non-patterned interactions on the appropriate communication lines of the star data form (Appendix A). Operationally, patterned interactions were those that utilized a two-way communication network between a given participant and any one of the remaining participants. Non-patterned interactions were operationalized as those messages that were judged to have low relevancy to the message immediately preceding or which lasted more than 45 seconds, regardless of relevancy. This data was collected in two minute intervals. This allowed grouping into ten minute periods for computer analysis of the seven variables. It also allowed the analysis of the interaction pattern development through the use of the two-minute interaction data.

The question of the reliability of PROANA 5 coders lies beyond the scope of this study. However, to insure the highest possible reliability, the Experimenter utilized two pre-coded video tapes of a 5-man discussion group as well as



live discussion sessions, as training techniques. This enabled the Experimenter to isolate and dismiss those coder-candidates who were not able to accurately code the discussion. A time keeper was also assigned to each group to assist the observer.

Variables. The seven Process Analysis (PROANA 5) variables are operationally defined by Lashbrook (1967) as:

(1) Balance of Participation: when the interaction of Periods I and III are less than the interactions of period II;

(2) Communication Line Usage: when all lines of communication are used at least once during each period of discussion;

(3) Clique Groups: A subgroup is formed when the interactions between any two members of a group exceeds the total interactions with the remaining members for any given period of the discussion;

(4) Detrimental Clique Group: A clique group (as above) which continues for two consecutive periods;

(5a) Procedural Leadership: A "procedural leader" is identified by both interactive and non-interactive communications as: (a) that person with whom a majority of the functioning members of a group communicates with most, and (b) who also has at least 5 non-interactive communications over all three periods and a minimum of one such communication in each period.

(5b) Emergent Leadership: When no procedural leader can be identified, an "emergent leader" is identified as the member with whom a majority of the functioning members communicates most.

(6) Isolation: An isolated member (one not allowed to interact with others) is a member who increases his non-patterned interactions 50% or more over the preceding period while decreasing his patterned interaction 50% or more.

(7) Dominance: When a member's total amount of communication (both patterned and non-patterned) exceeds that of the combination of the total communication of any two of the remaining members.

#### Analysis of Data

The data was analyzed to establish both point and interval estimates of the expected proportion of frequency occurrence of each of the seven variables. The data was further analyzed to establish the confidence level in percentages that future random samples of this population will have the same proportions of occurrence. The basis for the interval estimates were obtained by the following formula:

$$\sqrt{\frac{PQ}{N}}$$

where P = observed proportion of occurrence, and where Q = observed proportion of non-occurrence or the reciprocal of P, and where N = number of groups (McNemar, 1962, Pp. 49-50).

Finally, the data on balance of participation was analyzed to determine the shape of the interaction curve throughout the discussion. This data analysis was deemed necessary to determine whether the PROANA 5 notion of balanced patterned interaction in relation to equal time periods is a legitimate assumption. The best curve could be obtained on the basis of two minute intervals. Therefore, the number of interactions per 2 minute segments were determined for each group and plotted on time and frequency charts. This data was compiled to form a descriptive and comparative summary chart which indicated the mode, median, mean, range and standard deviation of the total interactions for each 2 minute time and data segment.

#### Summary

This chapter has presented and explained the procedures used in this study and the method of data analysis. In the following chapter the results will be presented.

## Chapter III

### Results And Discussion

This study examined the proportion of occurrence of seven variables defined by the PROANA 5 system. The study also investigated the expected pattern or shape of interaction during the entire time of the discussion by collecting and analyzing the data by two-minute intervals. Following a description of the study's results, discussion and conclusions will be presented.

#### Results

Subjects. The sample subjects were randomly selected from the student body at Bethany Nazarene College in the spring semester of 1972. Bethany Nazarene College is a private, church-related four-year liberal arts college with 1704 students enrolled. The student body is composed of students from 38 states and 11 foreign countries although 68% come from the states of Kansas, Oklahoma, Texas, Louisiana, and Arkansas. Class membership percentages are: Freshman, 32%; Sophomore, 22%; Junior, 22%; and Senior, 23%. Based on these proportions, a stratified sampling technique was utilized and subjects were randomly assigned to form

five-man groups. The generalizability of the finding is possible to the entire student body and fixed stratified factors. Plans were made to run 45 discussions, but due to illness of several timekeepers and observers, only 41 discussions were actually held. The adjustments were made proportionately within each strata. One of the groups terminated their discussion after 20 minutes. The remaining groups (N = 40) were utilized for analysis.

Balance of Participation. Results of the analysis showed 14 of the 40 groups in this study were balanced. Of the four levels of the stratified sample, only the Junior (N = 9) level was balanced. Of the Freshmen (N = 13) 4 were balanced while 9 were not. The Sophomore (N = 9) data showed three balanced and six unbalanced. The Juniors (N = 9) were the only sub-strata of the population which was balanced. Of the nine groups, five were balanced. The Seniors (N = 9) had only two balanced discussions. These results are shown with percentages and interval estimates in Table 1.

For unbalanced groups, the PROANA 5 identifies groups as: (1) Rushed (when the interactions of Period III are greater than I and also greater than II); (2) bogged (when the interactions of Period II are less than the interactions of Period I and of Period III); and (3) unclassified (when neither rushed nor bogged). Table 2 shows these results. In looking at the total interactions

for each stratum, the Junior stratum is balanced while each of the others are classified as rushed (see Appendix C).

TABLE 1

## Balance of Participation

| Sample    | Balanced | Percent Balanced | Standard Error* |
|-----------|----------|------------------|-----------------|
| Total     | 14       | .35              | .075            |
| Freshman  | 4        | .31              | .125            |
| Sophomore | 3        | .33              | .156            |
| Junior    | 5        | .56              | .165            |
| Senior    | 2        | .22              | .138            |

TABLE 2

## Unbalanced Groups

| Sample    | Rushed | Percent | Bogged | Percent | Unclassified | Percent |
|-----------|--------|---------|--------|---------|--------------|---------|
| Total     | 14     | .35     | 8      | .20     | 4            | .10     |
| Freshman  | 6      | .46     | 0      | .00     | 3            | .23     |
| Sophomore | 2      | .22     | 3      | .33     | 1            | .10     |
| Junior    | 3      | .33     | 1      | .10     | 0            | .00     |
| Senior    | 3      | .33     | 4      | .44     | 0            | .00     |

Lines of Communication Used. Data analysis showed three of the 40 discussions used all lines of communication

\* It will be remembered from Chapter II that the standard error was to be calculated on the basis  $SE\sqrt{\frac{PQ}{N}}$ . This standard error allows a basis for inference to the population which states that it is reasonable to assume that any new sample from the same population would yield the same observed proportions, plus or minus the standard error.

during each period. This data along with the breakdown by stratum is charted in Table 3.

TABLE 3

| Lines of Communication Used* |      |              |                |
|------------------------------|------|--------------|----------------|
| Sample                       | Used | Percent Used | Standard Error |
| Total                        | 3    | .075         | .043           |
| Freshman                     | 0    | .00          | -              |
| Sophomore                    | 1    | .11          | .104           |
| Junior                       | 1    | .11          | .104           |
| Senior                       | 1    | .11          | .104           |

Clique Groups. Twelve discussions showed clique group formation while 28 did not. Six of the 12 (or 30%) clique groups were in the Freshman stratum. The fewest clique groups were formed by Sophomores who had only one (11%) discussion characterized by such a subgroup. The Juniors had two (22%) clique groups formed while Seniors had three (33%). These results are summarized in Table 4.

Detrimental Clique Groups. The results show that while clique groups were formed in 12 of the 40 discussions (see Table 3), detrimental clique groups were formed in only six of the 40 discussions: Freshmen, two; Sophomores, one;

\* Three groups used all lines but one. Three groups used all lines but two. Two groups used all lines but four. Five used all lines but five, and four used all lines but six. The average number of lines not used was nine, the modes were five and 12, and the median was six. (See Appendix D for complete breakdown by groups.)

Juniors, two; and Seniors, one. Table 5 summarizes the frequency and percentage of occurrence and non-occurrence.

TABLE 4

## Clique Groups

| Sample    | Formed | Percent Formed | Standard Error |
|-----------|--------|----------------|----------------|
| Total     | 12     | .30            | .072           |
| Freshman  | 6      | .46            | .138           |
| Sophomore | 1      | .11            | .104           |
| Junior    | 2      | .22            | .138           |
| Senior    | 3      | .33            | .155           |

TABLE 5

## Detrimental Clique Groups

| Sample    | Formed | Percent Formed | Standard Error |
|-----------|--------|----------------|----------------|
| Total     | 6      | .15            | .056           |
| Freshman  | 2      | .15            | .098           |
| Sophomore | 1      | .11            | .104           |
| Junior    | 2      | .22            | .138           |
| Senior    | 1      | .11            | .104           |

Leadership. This variable is divided into two types of leadership, the procedural and the emergent leader. Overall, identifications of procedural leadership were more common. It is important to note that an emergent leader is identified only when no procedural leader is named. Table 6 charts the occurrence, percentage, and standard error for each type of leadership.



TABLE 6

## Leadership

| Sample    | Procedural Leadership |         |                   | Emergent Leadership |         |                   |
|-----------|-----------------------|---------|-------------------|---------------------|---------|-------------------|
|           | Occur-<br>rence       | Percent | Standard<br>Error | Occur-<br>rence     | Percent | Standard<br>Error |
| Total     | 15                    | .38     | .082              | 10                  | .25     | .068              |
| Freshman  | 6                     | .46     | .150              | 4                   | .31     | .128              |
| Sophomore | 1                     | .11     | .104              | 3                   | .33     | .155              |
| Junior    | 3                     | .33     | .155              | 2                   | .22     | .138              |
| Senior    | 5                     | .56     | .165              | 1                   | .11     | .104              |

Isolation. Isolation did not occur among any of the 40 groups analyzed in this study. A close look at the data revealed a tendency in several groups toward isolation. This indicated a marked decrease from the first through the third period. In no case were PROANA definitions of isolation satisfied.

Dominance. The PROANA 5 program identifies the member in a given period who is dominating. After this identification is made, the program provides three subroutines to find the explanation for the dominance. The possible explanations investigated are: leadership, clique group member, and advocacy. Considering all groups, there were 11 instances (28%) of dominance in Period I, seven occurrences (17.5%) in Period II, and four occurrences (10%) in Period III. Totaled, this equals 22 instances of dominance. Leadership functions accounted for 17 (77%) of the

occurrences. Clique group membership accounted for four (18%), and advocacy was declared in one instance (4.5%) of the total occurrences. Table 7 shows the occurrence, percentage, standard error, and explanation by periods and strata.

Shape of Interaction Curve. This question was included to investigate the definition of the balance of participation variable of PROANA 5. Lashbrook (1967) looked only at the ten-minute periods and postulated the balance on a generally non-monotonic curve of interaction.

For this question, the data was collected in two-minute intervals to give a more precise interaction curve. The curve of total interactions for all groups is shown in Figure 2. The mean, median, mode, standard deviation, and range are charted in Figures 3 and 4.

The Freshman stratum of the sample showed that in Period I (two-minute intervals 1-5), the interactions formed a tri-modal curve. In Period II (two-minute intervals 6-10) the curve was bi-modal and in Period III (two-minute intervals 11-15) the distribution was tri-modal. This curve is shown in Figure 5. Figure 6 shows curves derived by establishing mean, median and mode for each interval. Likewise, Figure 7 shows the curve of the measures of variability: range and standard deviation.

The Sophomore stratum data is distributed bi-modally in each of the periods. Figure 8 shows the interaction curve

TABLE 7  
 Dominance  
 Period I

| Sample     | Occurred | Percent | Standard Error | Explanation       |
|------------|----------|---------|----------------|-------------------|
| Total      | 11       | .28     | .070           | *9<br>**2         |
| Freshman   | 3        | .23     | .116           | *2<br>**1         |
| Sophomore  | 1        | .11     | .100           | *1                |
| Junior     | 3        | .33     | .155           | *2<br>**1         |
| Senior     | 4        | .44     | .165           | *4                |
| Period II  |          |         |                |                   |
| Total      | 7        | .17     | .060           | *4<br>**2<br>***1 |
| Freshman   | 3        | .23     | .116           | *1<br>**2         |
| Sophomore  | 1        | .11     | .100           | ***1              |
| Junior     | 1        | .11     | .100           | *1                |
| Senior     | 2        | .22     | .138           | *2                |
| Period III |          |         |                |                   |
| Total      | 4        | .10     | .047           | *4                |
| Freshman   | 3        | .23     | .116           | *3                |
| Sophomore  | 0        | .00     | -              | -                 |
| Junior     | 0        | .00     | -              | -                 |
| Senior     | 1        | .11     | .100           | *1                |

\* Explained by leadership functions  
 \*\* Explained by clique group membership  
 \*\*\* Explained by advocacy

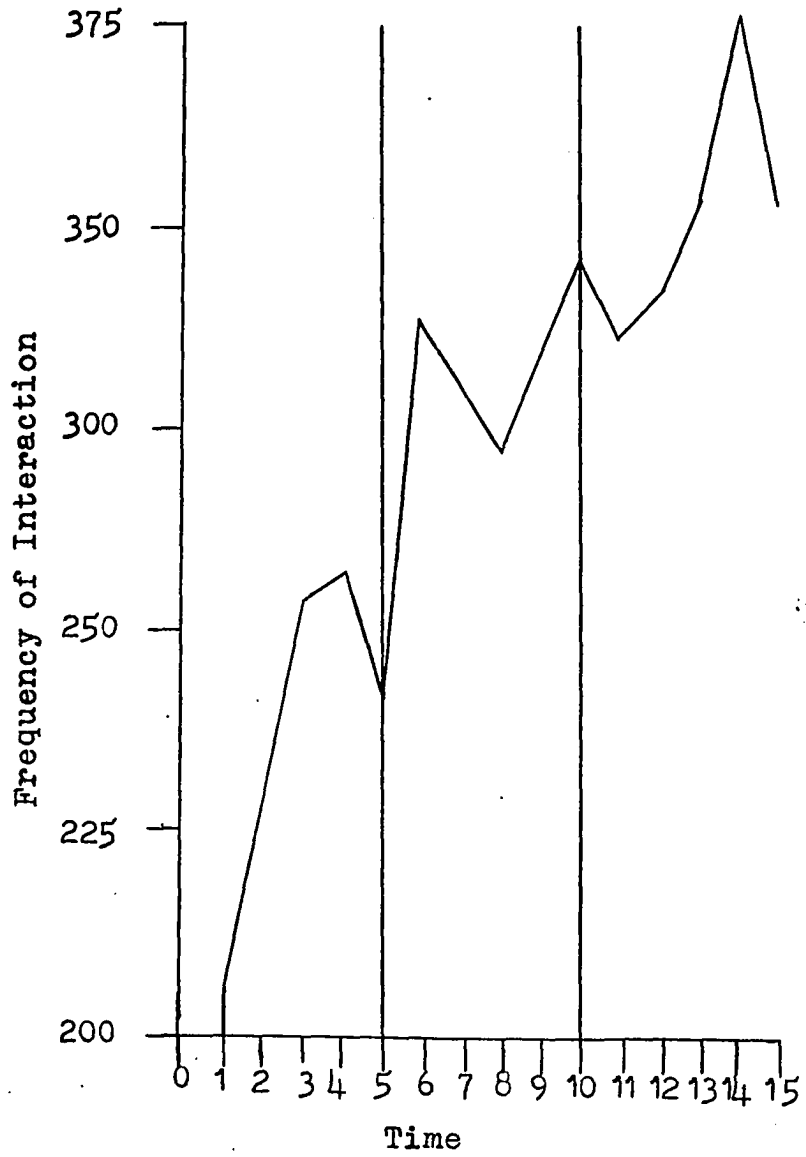


Figure 2 -- Total Interactions

All Groups N = 40

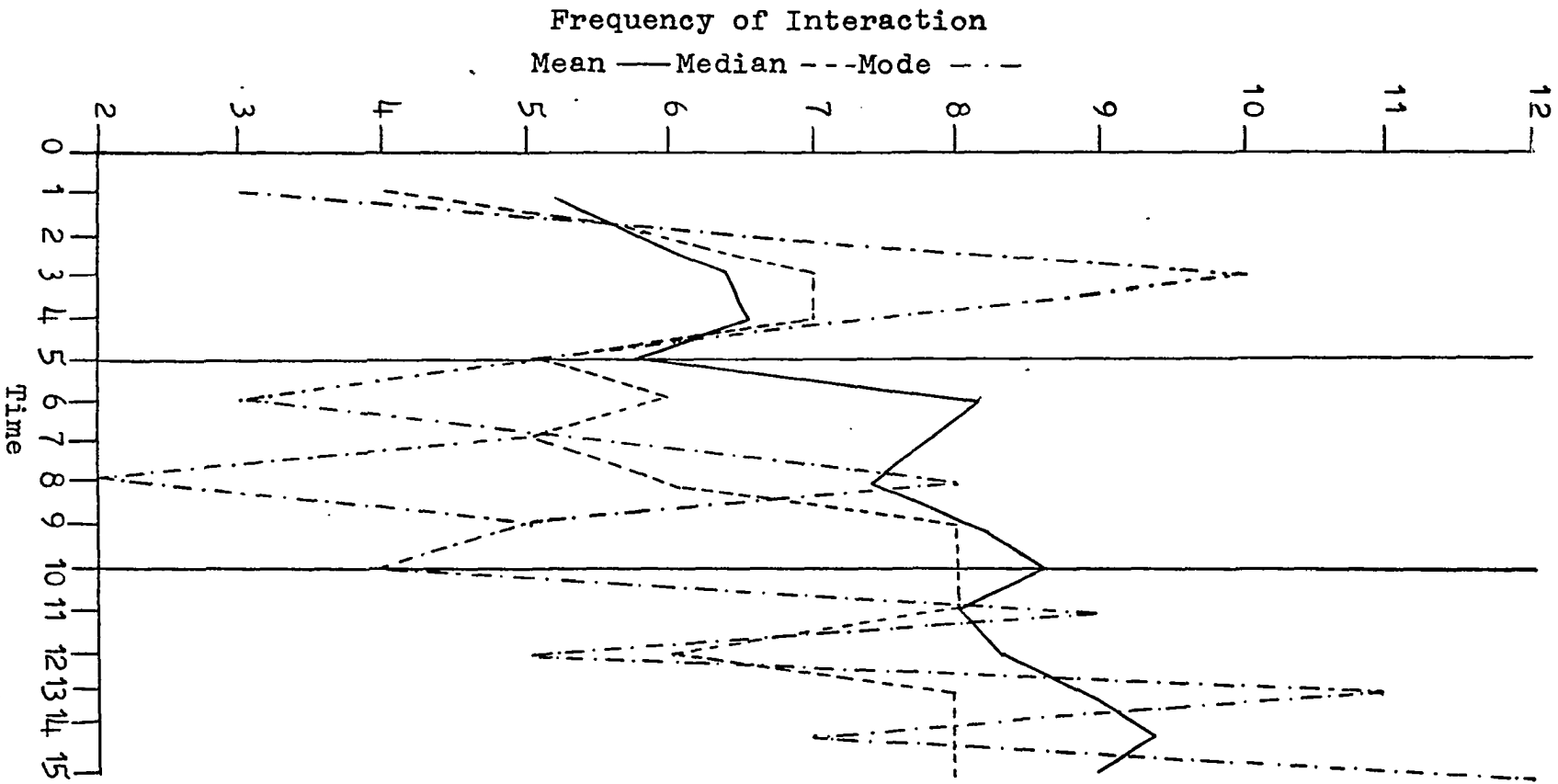


Figure 3 -- Measures of Central Tendency  
All Groups N = 40

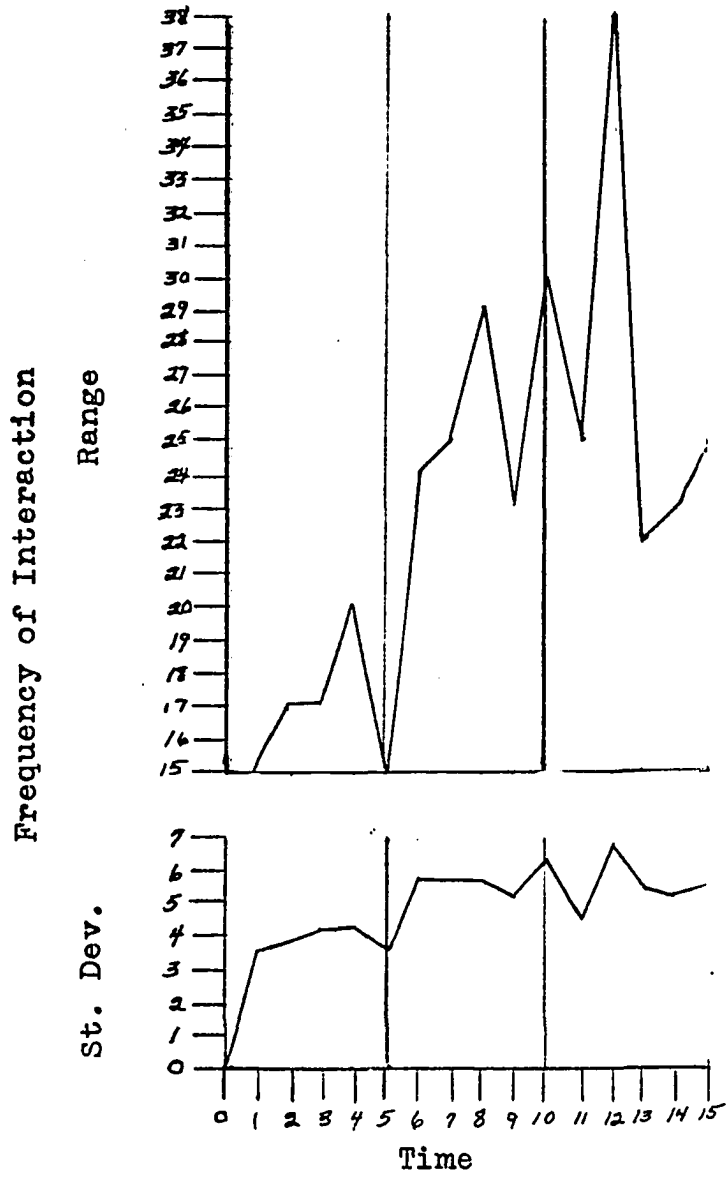


Figure 4 -- Measures of Variability

All Groups N = 40

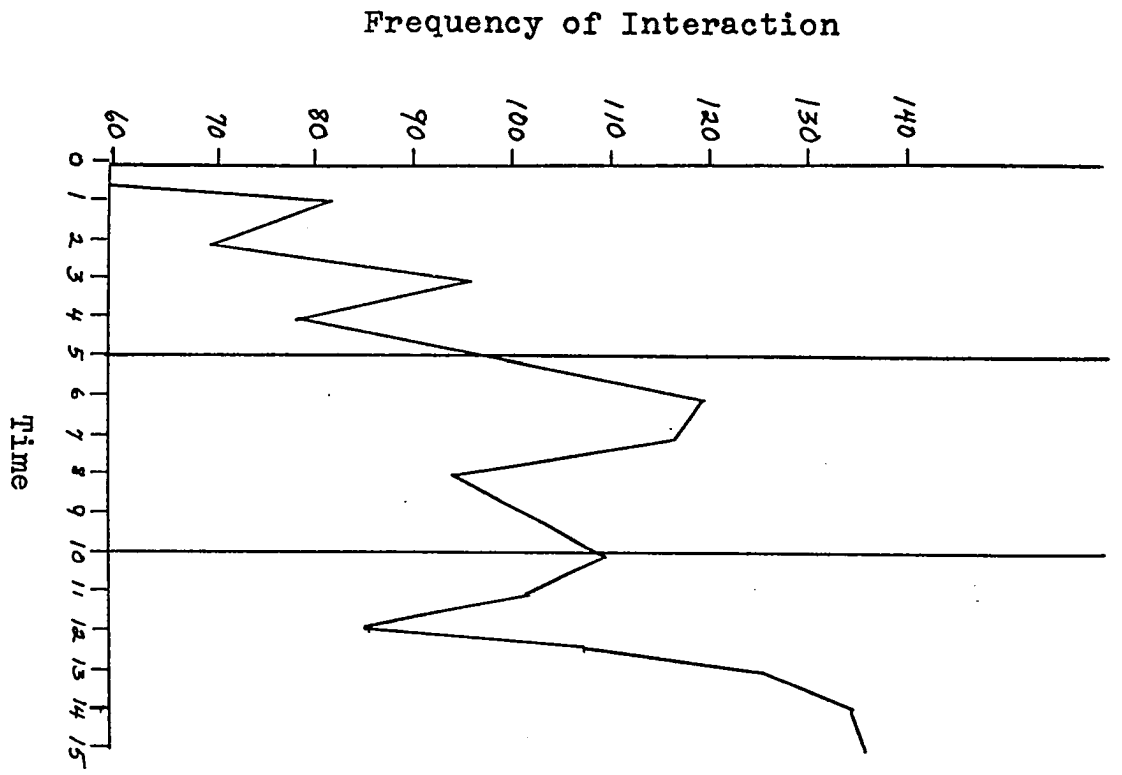


Figure 5 -- Interaction Curve  
Freshman N = 13

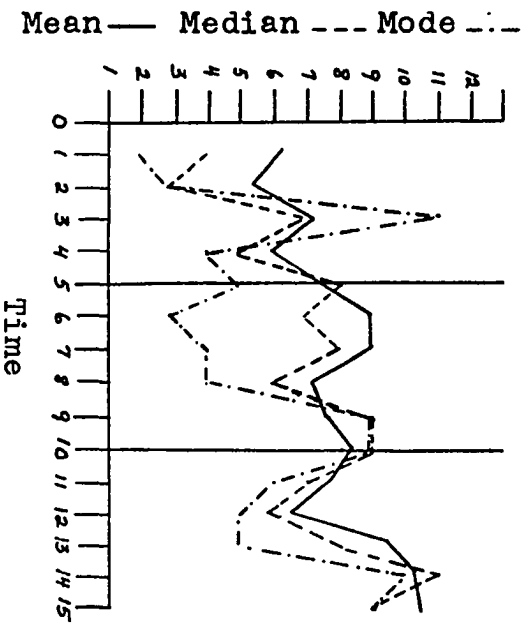


Figure 6 -- Measures of Central Tendency  
Freshman Nf = 13

Frequency of Interaction

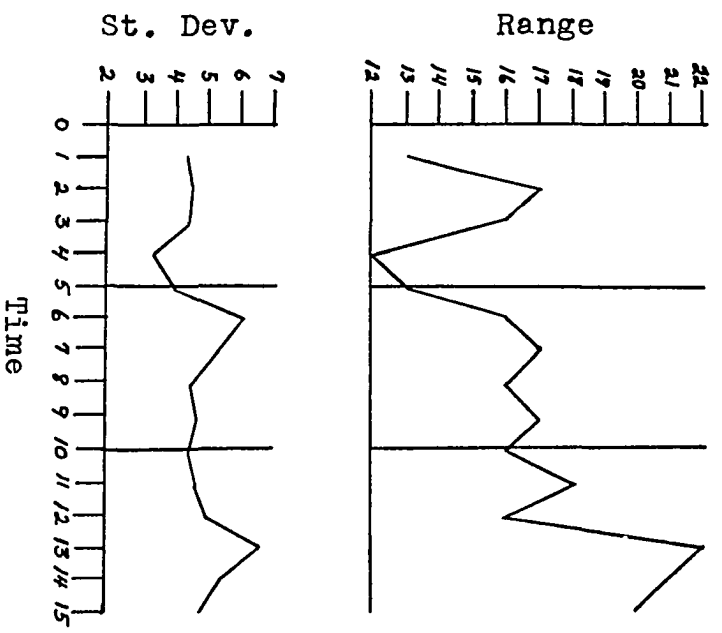


Figure 7 -- Measures of Variability  
Freshman N = 13



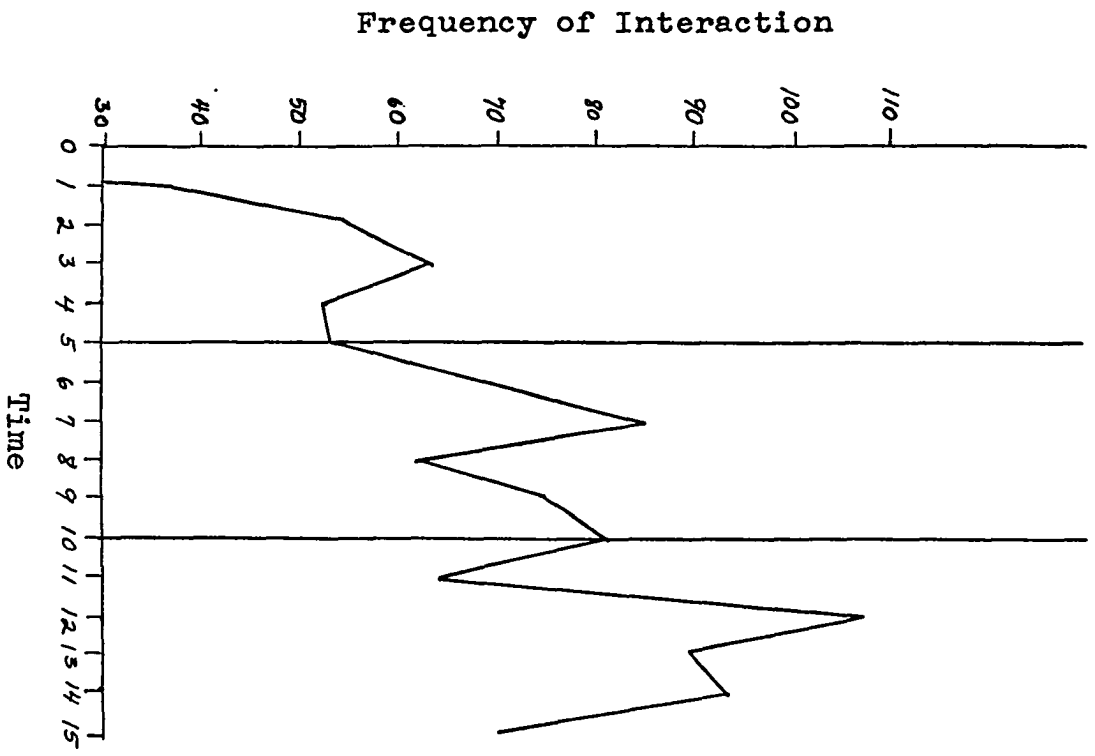


Figure 8 -- Interaction Curve  
Sophomore N = 9

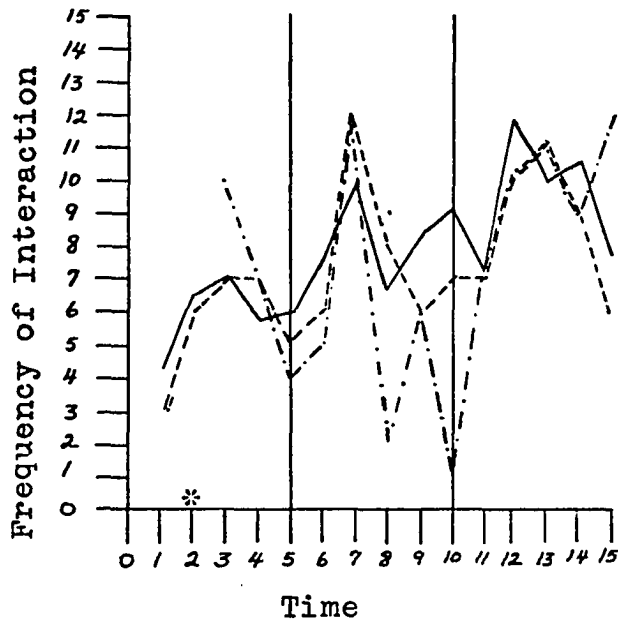


Figure 9 -- Measures of Central Tendency

Mean — Median ---- Mode - . -

Sophomore N = 9

\* The Multiple modes for this period were: 4, 7, 0, 5, 8, 10, 13, 6, and 3. These were omitted from the graph to facilitate readability.

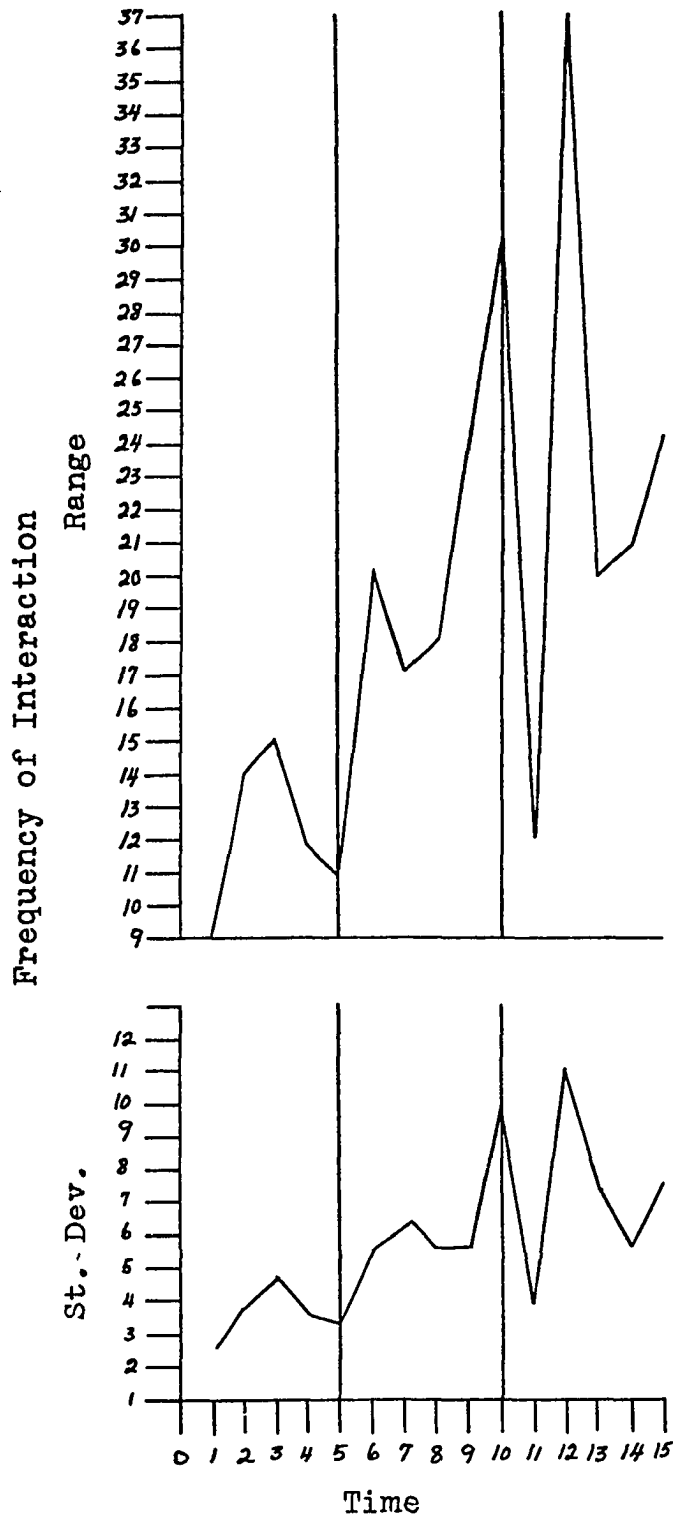


Figure 10 -- Measures of Variability  
Sophomore N = 9

and Figures 9 and 10 show the curves derived by figuring mean, median, mode, range, and standard deviation.

For the Junior stratum the distribution of interactions within the periods reveal a bi-modal, tri-modal and bi-modal curve for periods I, II, and III respectively. The highest point of the curve occurred at the eight two-minute interval. Figure 9 is the Time and Frequency Curve. Figure 10 shows the mean, median, and mode curve. Figure 11 is the interaction curve when plotted by range and standard deviation.

Table 8 shows the percentage of interactions that occurred in each two-minute interval as well as the percentages for Periods I, II, and III. Generally, there seems to be no significant difference between the total population sample and the various strata of the sample. In only three of the two-minute intervals was there a spread of more than three percentage points (Intervals 5, 8, and 12).

### Discussion

The rationale of this study was based upon these assumptions: (1) that the patterns of communication behavior are important in the development and understanding of small group processes; and (2) that the PROANA 5 technique is a somewhat refined process analysis and is highly promising as a reliable research tool. As discussed in an earlier chapter (see page 21) PROANA 5 has the advantages

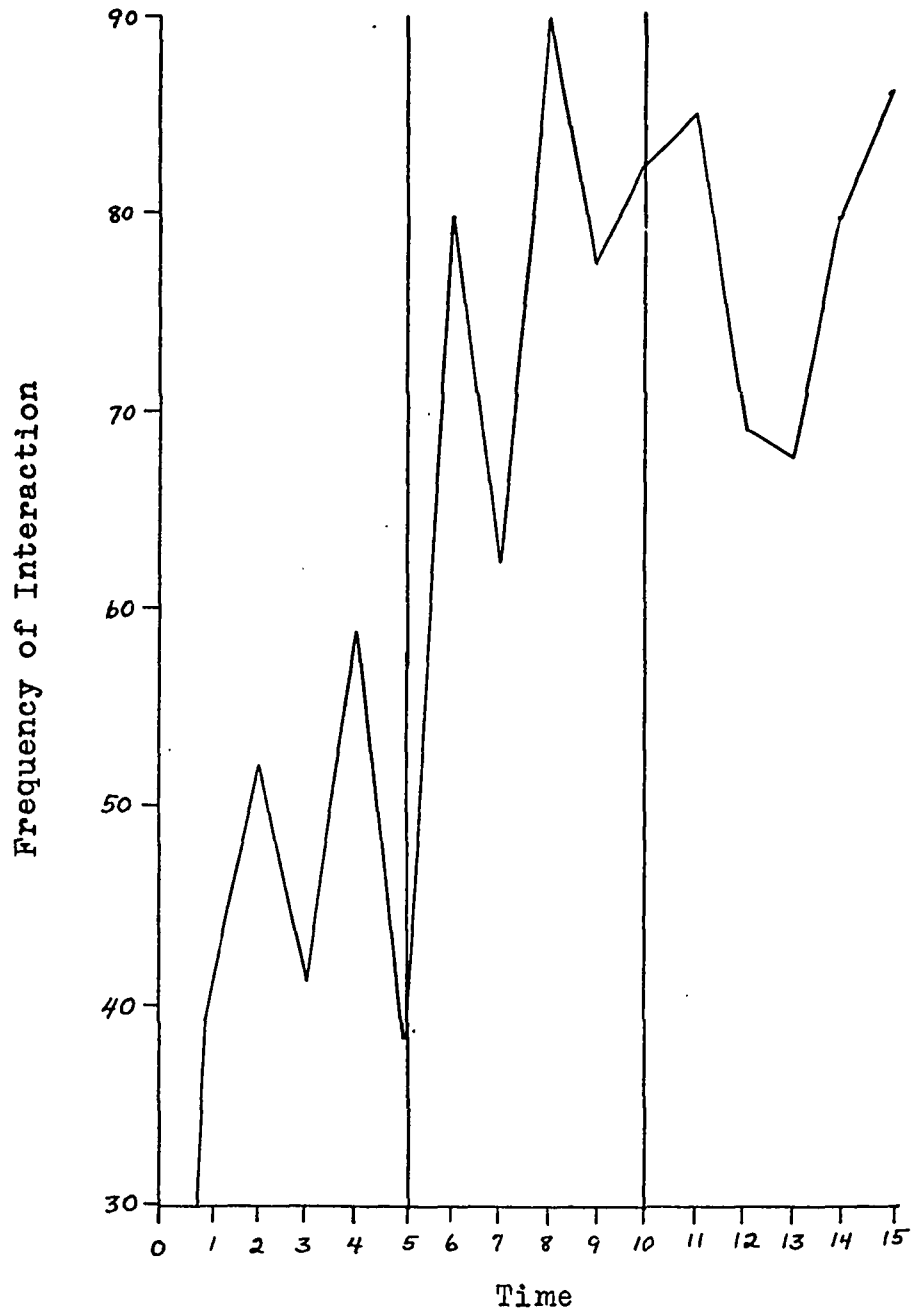


Figure 11 -- Interaction Curve  
Junior N = 9

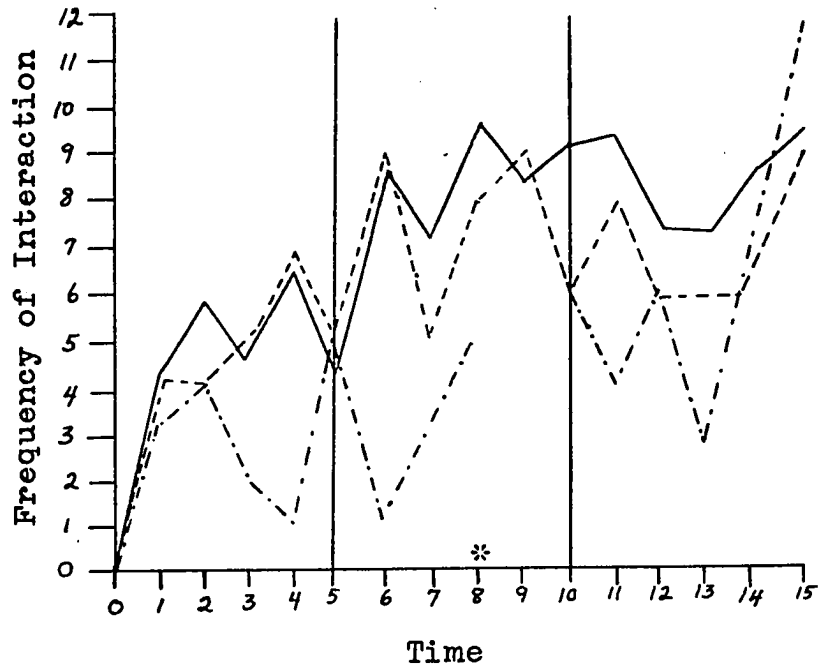


Figure 12 -- Measures of Central Tendency

Mean — Median ---- Mode ---

Junior N = 9

\* The Multiple modes for this period were: 4, 5, 7, 8, 9, 10, 13, and 21. These were omitted from the graph to facilitate readability.

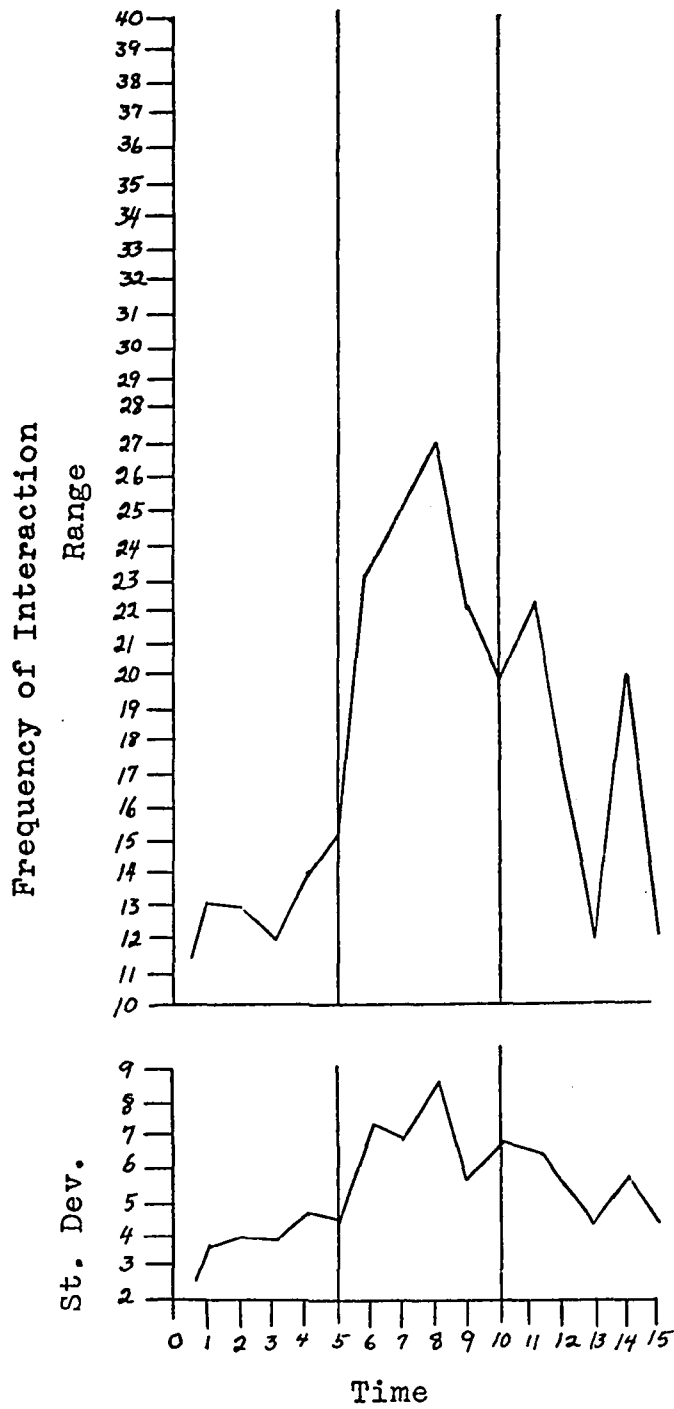


Figure 13 -- Measures of Variability

Junior N = 9

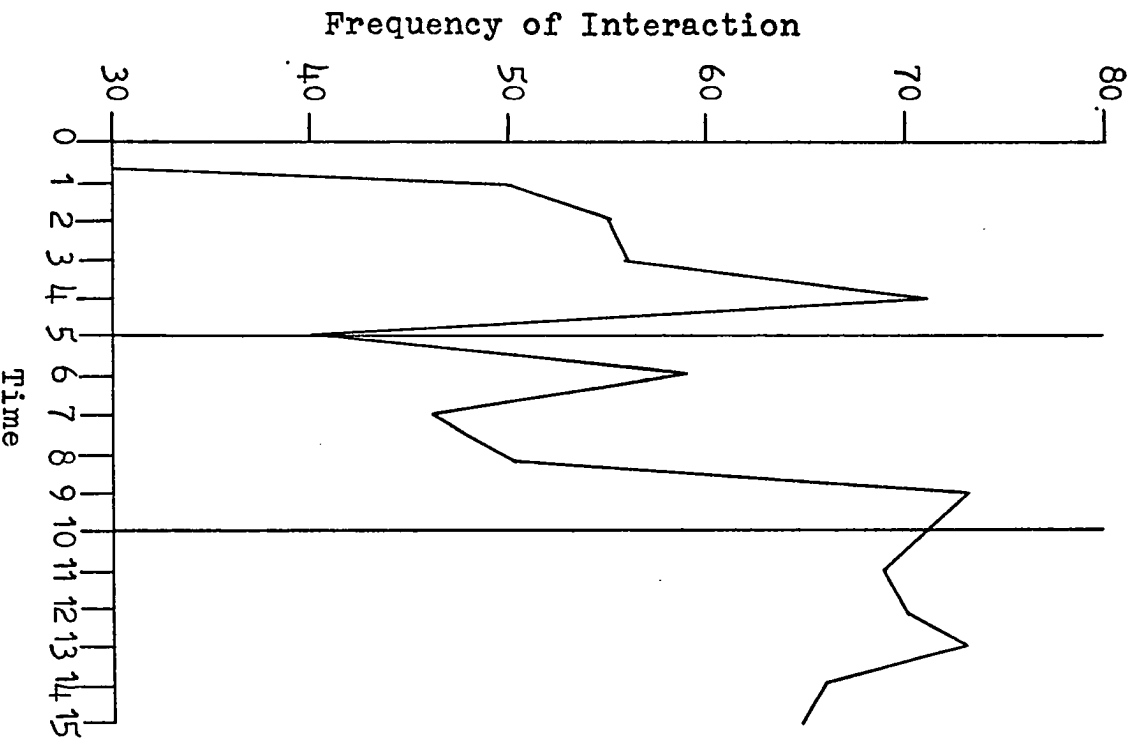


Figure 14 -- Interaction Curve  
Senior N = 9



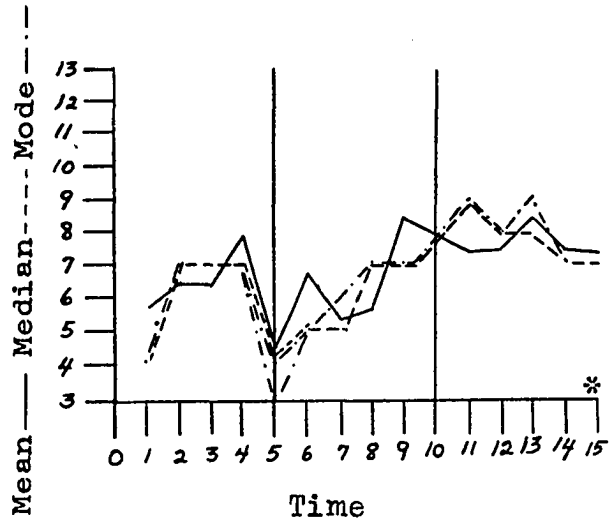


Figure 15 -- Measures of Central Tendency  
Senior N = 9

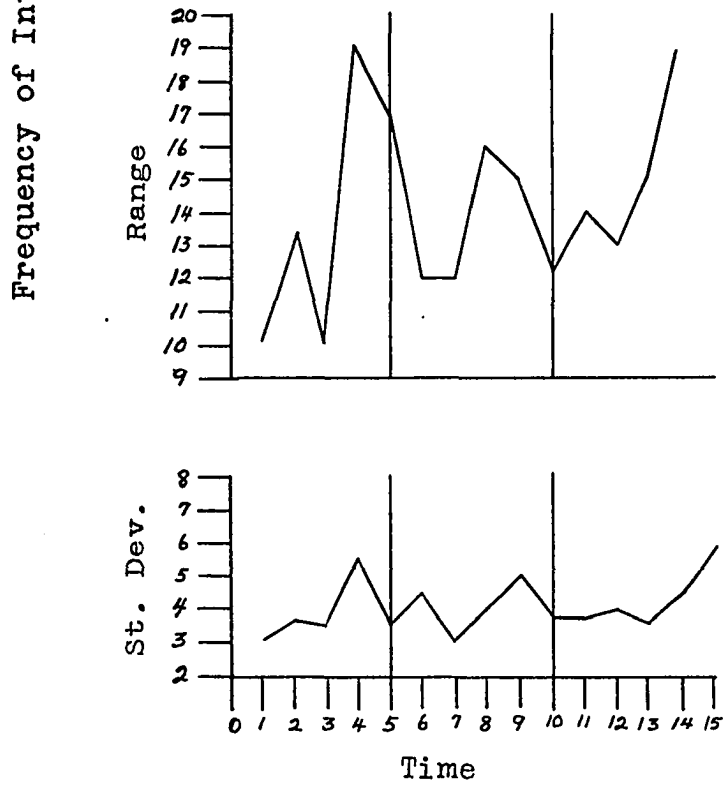


Figure 16 -- Measures of Variability  
Senior N = 9

\* Multiple modes were: 1, 13, 18, 0, 8, 7, 6, 9, and 13.

TABLE 8

Percentage Comparisons For Interactions by Two-minute Intervals

| Sample | Percentages by two minute Periods |     |     |     |     |      |     |     |     |     |     |      |     |      |     |     |     | No. of Inter-Actions |      |
|--------|-----------------------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|------|-----|------|-----|-----|-----|----------------------|------|
|        | 1                                 | 2   | 3   | 4   | 5   | I    | 6   | 7   | 8   | 9   | 10  | II   | 11  | 12   | 13  | 14  | 15  |                      | III  |
| Fr     | 5.2                               | 4.5 | 6.2 | 5.1 | 6.4 | 27.4 | 7.7 | 7.5 | 6.1 | 6.5 | 7.0 | 34.9 | 6.5 | 5.5  | 8.1 | 8.7 | 8.7 | 37.7                 | 1551 |
| Soph   | 3.5                               | 5.3 | 5.9 | 5.0 | 5.1 | 24.8 | 6.4 | 8.0 | 5.9 | 7.1 | 7.6 | 35.0 | 6.1 | 10.1 | 8.5 | 8.8 | 6.6 | 40.1                 | 1059 |
| Jr     | 3.9                               | 5.2 | 4.1 | 5.7 | 3.8 | 22.5 | 7.1 | 6.3 | 8.8 | 7.6 | 8.2 | 38.9 | 8.4 | 6.8  | 6.7 | 7.1 | 8.5 | 38.5                 | 1009 |
| Sr     | 5.5                               | 6.0 | 6.1 | 7.9 | 4.4 | 29.7 | 6.4 | 5.0 | 5.5 | 8.0 | 7.8 | 32.7 | 7.5 | 7.7  | 8.0 | 7.2 | 7.1 | 37.5                 | 914  |
| All    | 4.6                               | 5.1 | 5.6 | 5.8 | 5.1 | 26.2 | 7.1 | 6.9 | 6.5 | 7.1 | 7.6 | 35.3 | 7.1 | 7.3  | 7.9 | 8.2 | 7.9 | 38.6                 | 4533 |

of simplicity and preciseness which Bales (1970) and other existing interaction tools do not have. It is necessary, however, to generate statistical estimates regarding the expected proportion of occurrence of each of the PROANA 5 variables. Such was the purpose of this study.

In most instances the results were not surprising. Two exceptions were the balance and isolation variables. These results seem to question Lashbrook's arbitrary definitions of PROANA 5. These two failures to support PROANA 5 expectations raise several issues which in all probability affect most of the variables due to their interdependence.

First, is it not possible that the definitions of PROANA 5 are artifacts of the classroom? Lashbrook (1967) used Group Discussion classes to test and refine his notions and build the operational definitions for PROANA 5. It seems reasonable to suggest that individuals in the "real world" may differ greatly from the individual who is in the classroom. The student in the classroom is made constantly aware (whether it is by design of the instructor or simply a part of the classroom environment) of the need to do well--to fulfill expectations.

A word of caution is in order for those who have been and are using PROANA 5 as a teaching technique. The proportions and error terms of this study strongly indicate a need to examine closely factors within the classroom itself that may be intervening in getting such results as

balanced groups and isolated members. Clearly this study reveals that these are not the normal expectations for this sample.

A second consideration is that this study used a unique sample. The subjects were selected to form a random sample of the entire student body of Bethany Nazarene College, a private church controlled school. As such, it may or may not attract students much different from the subjects that comprised Lashbrook's observations. As a group, students in this study seemed oriented to ethical issues. This orientation could have interacted with the case study "An Ethical Problem", (see Appendix B) to form an involvement which could not be adequately resolved in the 30 minute discussion.

The third possible explanation is closely related to the first. Lashbrook utilized speech students. This study used a random sample of the entire student body. As a point of interest, the proportion of speech majors within the sample and the parent population was determined. Eleven of the 200 subjects which made up the 40 discussions were speech majors. This is 5.5% of the total subject sample. Speech majors comprise 4% of the parent population. These figures seem to show that the sample was not over balanced with speech majors. It seems highly probable that those with training in speech, and more specifically, with training in discussion should interact differently from the average individual.

Balance of Participation. Since only 35% of the groups were balanced, Lashbrook's expectations and definition of balance seem to be in serious question. Three of the four sample strata were classified as rushed as was the total sample when analyzed as a whole. Although only 35% of the single groups were rushed, it is clear that the generalized tendency was toward the rushed classification.

Communication Line Usage. The PROANA 5 technique postulates an "ideal" with which few would quarrel. The results of this study revealed that only 3, or 7.5%, of the groups achieved this ideal. This rather overwhelming failure to observe all-line usage would seem to rest upon the use of "natural" groups. It is not difficult to accept these findings as typical. Again, it would seem that PROANA'S ideal is based upon developmental work with students trained in discussion. This does not negate the ideal, but simply indicates that it will seldom be achieved in a random sample of "natural" groups.

Clique Groups. PROANA 5 offers no expected proportions of occurrence regarding any of the seven variables. Intuitively, the 40% observed proportion of clique groups appears to be credible. Likewise the 15% proportion of occurrence of Detrimental Clique Groups seems reasonable.

Leadership. This variable may well be one of the most promising characteristics of PROANA 5. The two leadership types (procedural and emergent) are generally supported

by the research as noted in Chapter I. It should be noted, however, that this variable does not state nor imply that a group is more cohesive, better balanced, or more effective when a leader is, or is not, identified. In fact, when no leader is identified, PROANA indicates that there was no leader due to the equality of interactive communication among members. This point is based on the assumption that groups can interact effectively without centralized leadership.

Isolation. It is somewhat surprising that no observation of isolation occurred in this study. Such a significant development would strongly suggest a need for revision of the PROANA 5 definition. Throughout the study, the author informally noted marked tendencies toward isolation. More specifically, a definite and consecutive reduction of interactions was noted from Period I to Period II to Period III. While the research does support reduction of interactions as indicative of rejection and isolation, there is no empirical support for Lashbrook's arbitrary requirements of 50% increase in non-patterned interactions simultaneously with a 50% decrease in patterned interactions. Apparently this definition is inadequate, at least within the limits of this study.

Dominance. This final variable may be the result of leadership activity, clique group membership or advocacy. The results indicated that the most common cause of dominance

was leadership (77%). Clique group membership followed with 18% and advocacy was declared in only one (4.5%) of the total occurrences.

The single occurrence of advocacy is probably the most noteworthy aspect of this variable. This finding is quite in keeping with intuitive expectations. Apparently, it is rare for a group of five to allow any one member to dominate by reason of advocacy (which is not discussion). It is common, however, for the group to allow (and perhaps encourage) one of its members to dominate as a part of his leadership. This study apparently gives added support to the PROANA 5 definition of dominance and its underlying assumptions.

Shape of Interaction Curve. This question was not as fruitful in this study as anticipated. This failure rests upon the non-support of the balance of participation variable. The discussions were not (as a whole) balanced between periods. The breakdown by two-minute intervals gives a good look at the interaction within periods. The results do not, however, support either the PROANA 5 assumption of balance between groups nor do they support balance within periods.

Taking all discussions as a whole, the highest numbers of interactions occurred during the 14th two-minute interval. In the Junior stratum, the highest peak of interaction occurred at the 8th two-minute interval or precisely

where one would predict it should in a perfectly balanced group. The other three strata showed the peak of interaction as follows: Freshman, equal number at the 14th and 15th intervals; Sophomore, the 14th interval; and Senior, 13th interval. One fallacy at looking at the two-minute data rests upon the exclusion of non-patterned interactions. Since even one non-patterned interaction of 45 seconds or more uses approximately one half of the interval, it would seem to inject added bias into the curve.

### Summary

In this chapter, the results of the study were presented. In general the PROANA 5 expectations were supported in all but two of the variables. These two were: balance of participation and isolation. The second section of this chapter discussed the results of the study along with possible interpretations of the unexpected findings. This discussion indirectly revealed the expected close interdependence of at least some of the variables (built into the analysis by definitions). For example, the unexpected results on balance had a marked effect on the dominance and leadership variables. If more of the groups were balanced, a definite change in dominance and leadership occurrences would be expected.

The results of the balance of participation and the isolation variable seemed to seriously question the underlying



assumptions of PROANA 5 regarding these two variables. In the final chapter suggestions for research to clarify these two variables will be made.

## Chapter IV

### Summary And Suggestions For Further Study

#### Summary

The rationale of this study was based upon these assumptions: (1) that the patterns of communication behavior are important in the development and understanding of small group processes; and (2) that the PROANA 5 technique of analysis is a highly promising research tool. The purpose of the study was to generate descriptive statistical estimates regarding the expected proportion of occurrence of each of the PROANA 5 variables. In addition, the intention was to examine the balance of participation variable by collecting and analyzing the interaction data by two-minute intervals. The organization of this chapter is in two parts: Summary, and Suggestions For Further Study.

The specific research questions for this study were:

(1) What is the proportion of occurrence in the population of:

- (a) balanced participation;
- (b) all lines of communication used;
- (c) clique groups formed;
- (d) detrimental clique groups formed;
- (e) leadership identification, procedural and/or emergent;

- (f) isolation of member; and
- (g) dominance by member?

(2) What is the expected pattern or shape of interaction as a function of time of the discussion?

In all but two cases, the proportion of occurrences supported the PROANA 5 assumptions. The two exceptions were the balance of participation and the isolation variables. These results raise serious questions about the balance and isolation assumptions and the PROANA 5 operational definitions.

An equal number of the discussions were "rushed" (14) and "balanced" (14). However, when compiling the interaction data into one interaction curve, the resulting shape is "rushed". Of the four strata of the sample, only the Junior stratum was balanced. The other three were "rushed." The weight of the analysis pointed to "rushed" as the normal pattern for this sample.

The Line Usage, Clique Group, Detrimental Clique Group, and Dominance variables were apparently within the intuitively reasonable expectations of the PROANA 5 system.

The Isolation variable yielded the second unexpected result. Upon analysis, it was revealed that no occurrences of isolation were experienced in the entire study. Such a significant development strongly urges another look at the isolation definition. There were tendencies toward isolation but none fully developed.

The data analysis on the two-minute interval data was not highly conclusive. Since the balance of participation variable was not supported, this question was less meaningful than expected. One noteworthy aspect of the Junior stratum was that the peak of interactions occurred precisely at the mid point of the discussion. Showing the "rushed" characteristic of the other strata, their interaction peaks were all within the last three two-minute intervals.

#### Suggestions For Further Study

Several major issues were raised by this study which would seem to demand added study. First, the balance of participation variable did not receive support in this study. Several reasons were suggested for this failure. They were: (1) the nature of the sample as it interacted with the case study, (2) the randomness of the sample as opposed to Lashbrook's sample in the developmental studies which was drawn from group discussion classes, (3) the fact that the parent population was a private, church related college rather than a state university, and (4) the time demands of the discussion topic itself.

It is suggested that these issues are reasonable and demand further study which could take the form of a partial replication, but which would sample a different population and use a more controlled discussion topic. It is possible

that the questioned expectations of PROANA 5 are artifacts of the classroom environment which can be interpreted as a threat situation. This study posed no threat to the subjects. In fact, they were reassured in writing (see Appendix B) as well as by the observer before the discussion began that there was no threat. This is quite different from the typical research that draws subjects from the experimenter's classes (as did Lashbrook's early PROANA 5 studies) in which we know subjects tend to do what is expected. Clearly, additional research needs to be done to clarify these points.

In addition to this replication, this study urges the author of PROANA 5 to review the early rationale for these two questioned variables and to give consideration to some reconceptualization. Consideration should be given to the possibility of differential time limits. It is possible that thirty minutes is not adequate for naive groups, while being entirely adequate for groups who have previously worked together. The operational definition of balance should probably be adjusted. This study showed that groups do tend to start out deliberation slowly (with less patterned interaction) during Period I. It also supports Lashbrook's notion of an increase of interaction in the middle period. It does not, however, support his notion of reduced interaction in the final period. To the extent that these results are generalizable, this study indicates

that it should not be considered abnormal for a group to be unbalanced. These results further suggest a possibility of effective interaction which is not balanced.

A final suggestion here would be to reduce the percentage of decrease in patterned interaction which is necessary to declare isolation. In all probability there were subjects in this study who "felt" isolated and who reduced interaction but not as much as necessary to satisfy PROANA 5 definitions.

A third area for further study would be in the area of running PROANA 5 studies utilizing specialized sample groups. Quite often our interest is in communication behavior in on-going groups who act and interact over time and who have established norms and status hierarchies within the group. The research question would seem to be: How relevant and useful is PROANA 5 in the study of these groups?

A fourth suggestion for research would involve a comparison of the interaction behavior of (1) students who have been trained in discussion principles and (2) students who have had no such training.

A final suggestion would be to develop research which would seek to determine levels of correlation between current methods for determining leadership and the PROANA 5 methods.

Before PROANA 5 can be utilized by the field in theory building research, it is necessary to study these

problem areas. Collectively, the results of this study and the results of the studies suggested above could reveal much about PROANA 5 and its value to the communication scholar.

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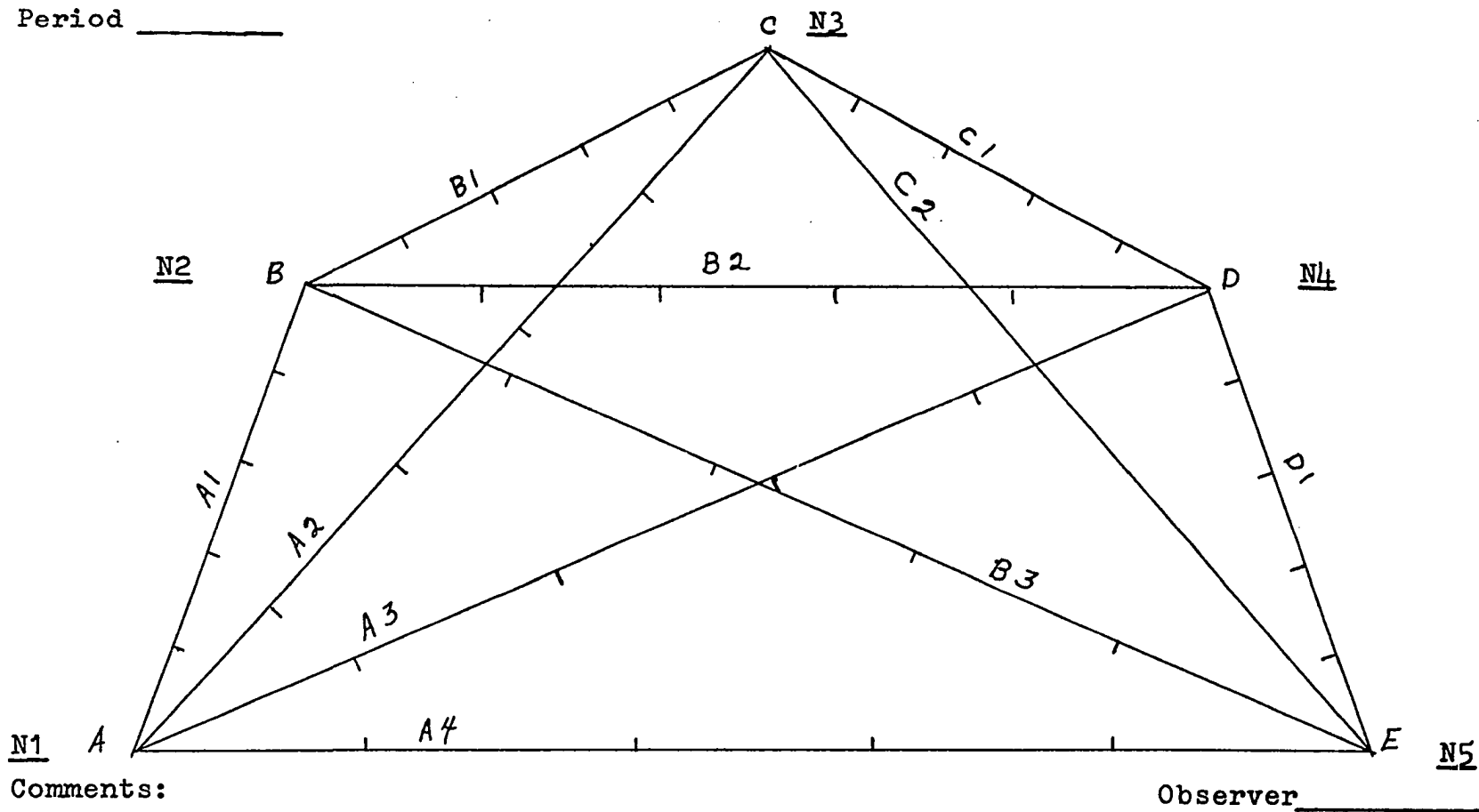
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A P P E N D I C E S

A P P E N D I X A

STAR DATA FORM

Period \_\_\_\_\_



STAR DATA FORM

A P P E N D I X B

EXPERIMENTAL MATERIALS

## ETHICAL PROBLEM

Professor Dearborn is a teacher at a large state university which does not use the honor system. Examinations are closely proctored, and other precautions are taken to prevent cheating. But Professor Dearborn believes in the integrity of the individual. He does not enforce the proctoring regulation, especially when he has a reasonable excuse for avoiding it. He had such an opportunity when a student missed a midterm examination and had to make it up. Professor Dearborn gave the student several essay questions, provided him with a chair and table in his office and left for the library after telling him to leave his examination paper on the desk when he had finished.

The professor returned in about an hour and a half to find the student gone and the examination paper on his desk. On reading the paper, he found that it had obviously been cribbed from several books he had left in his office.

The professor had authority to give the student an "F" on the paper, to give him an "F" in the course, or even to report him to the dean for disciplinary action. "However," he reflected, "I knew that this student was standing only a "D" in the course when I left him alone in my office. Did I not put temptation in his path? Am I, rather than the student mainly responsible for his dishonesty?"

Question: Is Professor Dearborn chiefly responsible for the



student's dishonesty?

**Instruction:** You have thirty minutes to reach a group decision.

## INSTRUCTION TO SUBJECTS

1. You are here to participate in a study of the patterns of communication and interaction in small group situations. You are not required to participate, but Mr. Murrow would appreciate your help if you will.

2. You will participate in a five-member group discussion of the Professor Dearborn case study which has been distributed to you. There will be an observer present during your discussion to make note of the amount and direction of the communication. A time-keeper will assist the observer. NO recording or evaluation of what you say will be made. We are not evaluating, we are only interested in describing the interaction.

3. Here are the constraints of the discussion.

- a. The discussion will be timed and the limit is 30 minutes. The observer will warn you at 25 minutes and stop you at 30 minutes.
- b. You must strive for consensus--i.e. a group position on the case study problem.

This set of instructions was duplicated and distributed to the subjects, and was also read to them by the observer.

## INSTRUCTIONS TO OBSERVERS

After your group is selected by lottery, take them to the assigned room. Please follow this pattern.

1. Introduce yourself as observer and the student timekeeper as your assistant.
2. Make sure they sit so you can see all.
3. Get their first names and fill in your data forms.
4. Quickly read the point 2 and 3 from the "Instructions To Subjects".
5. Ask for questions.
6. You are to appoint no leader and if they ask, tell them they are not to elect a leader. This is to be a leaderless discussion, but this is not to be emphasized unless they ask about it.
7. Say: Begin the discussion. Note: as emphasized in the training sessions, it is imperative that Data Forms be used in order as pre-marked.
8. At the close of the discussion, pass out the post- discussion questionnaire.
9. Dismiss the group by extending thanks for their cooperation.

## INSTRUCTIONS FOR TIMEKEEPER

1. You will sit next to and assist the observer.
2. You will signal (by exposing the correct card) the observer at the end of each 2 minute interval throughout the discussion.
3. You will warn the group at the end of 25 minutes.
4. You will say STOP at the end of 30 minutes.
5. You will time each person's comments and notify the observer if any person talks more than 45 seconds in any given communication act.
6. Return the time cards to the observer at the end of the session.

Thanks.

## POST DISCUSSION FORM

A. Answer each question with one name.

1. - Who talked most in your group?
2. Who contributed the most ideas in your group?
3. Who contributed the best ideas in your group?
4. Who did you like best in your group?
5. Who was the leader in your group?

B. Power rank each person in your group (including yourself).

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

C. Please mark your judgment of the individual you named as leader on the following scales. If you consider the concept to be neutral on the scales, mark the middle space. Mark in the middle of the space, not on the boundaries. Work at a fairly high speed and record first impressions.

Fair \_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_ Unfair

Strong \_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_ Weak

Light \_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_ Heavy

Active \_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_ Passive

Fast \_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_ Slow

Dull \_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_ Sharp

Dominant \_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_ Permissive

Confident \_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_ Unsure

Extroverted \_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_ Introverted

Authoritarian \_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_ Equalitarian

A P P E N D I X C

DESCRIPTIVE STATISTICS

2 min. intervals

Interactions Totals

Mean

Median

Mode

Standard Deviation

Range

|                     | 1   | 2   | 3            | 4   | 5      | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  |
|---------------------|-----|-----|--------------|-----|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Interactions Totals | 50  | 55  | 56           | 71  | 40     | 59  | 46  | 50  | 73  | 71  | 69  | 70  | 73  | 66  | 65  |
| Mean                | 5.5 | 6.1 | 6.2          | 7.8 | 4.4    | 6.5 | 5.1 | 5.5 | 8.1 | 7.8 | 7.6 | 7.7 | 8.1 | 7.3 | 7.2 |
| Median              | 4   | 7   | 7            | 7   | 4      | 5   | 5   | 7   | 7   | 8   | 9   | 8   | 8   | 7   | 7   |
| Mode                | 4   | 7   | 1<br>5<br>10 | 7   | 3<br>4 | 5   | 6   | 7   | 7   | 8   | 9   | 8   | 9   | 7   |     |
| Standard Deviation  | 3.0 | 3.7 | 3.4          | 5.6 | 3.4    | 4.5 | 3.2 | 4.1 | 5.0 | 3.7 | 3.7 | 3.9 | 3.5 | 4.4 | 5.7 |
| Range               | 10  | 13  | 10           | 19  | 13     | 17  | 12  | 12  | 16  | 15  | 12  | 14  | 13  | 15  | 19  |

INTERACTION SUMMARY TABLE

Senior Groups N = 9

2 min. intervals

Interactions Totals

Mean

Median

Mode

Standard Deviation

Range

|                     | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Interactions Totals | 39  | 52  | 41  | 58  | 38  | 80  | 64  | 89  | 77  | 83  | 85  | 69  | 68  | 80  | 86  |
| Mean                | 4.3 | 5.7 | 4.5 | 6.4 | 4.2 | 8.8 | 7.1 | 9.8 | 8.5 | 9.2 | 9.4 | 7.6 | 7.5 | 8.8 | 9.5 |
| Median              | 4   | 4   | 5   | 7   | 5   | 9   | 5   | 8   | 9   | 6   | 8   | 6   | 6   | 6   | 9   |
| Mode                | 3   | 4   | 2   | 1   | 5   | 1   | 3   | 5   |     | 6   | 4   | 6   | 3   | 6   | 12  |
| Standard Deviation  | 3.5 | 3.9 | 3.9 | 4.3 | 4.2 | 7.2 | 7.0 | 8.2 | 5.9 | 6.8 | 6.3 | 4.9 | 4.4 | 5.9 | 4.5 |
| Range               | 13  | 13  | 12  | 14  | 15  | 23  | 25  | 27  | 22  | 19  | 21  | 17  | 12  | 20  | 12  |

INTERACTION SUMMARY TABLE

Junior Groups N = 9



2 min. intervals

Interactions Totals

Mean

Median

Mode

Standard Deviation

Range

|                     | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12   | 13  | 14  | 15  |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|
| Interactions Totals | 37  | 56  | 63  | 53  | 54  | 68  | 85  | 62  | 75  | 81  | 65  | 107  | 90  | 93  | 70  |
| Mean                | 4.1 | 6.2 | 7.0 | 5.8 | 6.0 | 7.5 | 9.4 | 6.8 | 8.3 | 9.0 | 7.2 | 11.8 | 10  | 1.3 | 7.7 |
| Median              | 3   | 6   | 7   | 7   | 5   | 6   | 12  | 8   | 6   | 7   | 7   | 10   | 11  | 9   | 6   |
| Mode                | 3   |     | 10  | 7   | 4   | 5   | 12  | 2   | 6   | 1   | 7   | 10   | 11  | 9   | 12  |
| Standard Deviation  | 2.7 | 3.8 | 4.7 | 3.8 | 3.4 | 5.5 | 6.2 | 5.7 | 5.8 | 9.7 | 3.8 | 11   | 7.2 | 5.8 | 7.2 |
| Range               | 9   | 14  | 15  | 12  | 11  | 20  | 17  | 18  | 22  | 30  | 12  | 37   | 20  | 21  | 24  |

INTERACTION SUMMARY TABLE

Sophomore Groups N = 9

2 min. intervals

Interactions Totals

Mean

Median

Mode

Standard Deviation

Range

|                     | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14   | 15   |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| Interactions Totals | 81  | 70  | 96  | 79  | 100 | 119 | 117 | 95  | 101 | 109 | 102 | 86  | 125 | 135  | 136  |
| Mean                | 6.2 | 5.3 | 7.3 | 6.0 | 7.6 | 9.1 | 9.0 | 7.3 | 7.7 | 8.3 | 7.8 | 6.6 | 9.6 | 10.3 | 10.4 |
| Median              | 4   | 3   | 7   | 5   | 8   | 7   | 8   | 6   | 9   | 9   | 7   | 6   | 8   | 11   | 9    |
| Mode                | 2   | 3   | 11  | 4   | 5   | 3   | 4   | 4   | 9   | 9   | 6   | 5   | 5   | 11   | 9    |
| Standard Deviation  | 4.4 | 4.6 | 4.5 | 3.5 | 4.0 | 6.0 | 5.6 | 4.6 | 4.7 | 4.5 | 4.6 | 5.0 | 6.6 | 5.3  | 4.7  |
| Range               | 13  | 17  | 16  | 12  | 13  | 16  | 17  | 16  | 17  | 16  | 18  | 16  | 22  | 21   | 20   |

INTERACTION SUMMARY TABLE

Freshman Groups N = 13

2 min. intervals

Interactions Totals

Mean

Median

Mode

Standard Deviation

Range

|                     | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8      | 9   | 10  | 11  | 12  | 13  | 14  | 15  |
|---------------------|-----|-----|-----|-----|-----|-----|-----|--------|-----|-----|-----|-----|-----|-----|-----|
| Interactions Totals | 207 | 233 | 256 | 261 | 232 | 326 | 312 | 296    | 326 | 344 | 321 | 332 | 356 | 374 | 357 |
| Mean                | 5.1 | 5.8 | 6.4 | 6.5 | 5.8 | 8.1 | 7.8 | 7.4    | 8.1 | 8.6 | 8.0 | 8.3 | 8.9 | 9.3 | 8.9 |
| Median              | 4   | 6   | 7   | 7   | 5   | 6   | 5   | 6      | 8   | 8   | 8   | 6   | 8   | 8   | 8   |
| Mode                | 3   | 6   | 10  | 7   | 5   | 3   | 5   | 8<br>2 | 5   | 4   | 9   | 5   | 11  | 7   | 12  |
| Standard Deviation  | 3.6 | 3.9 | 4.2 | 4.2 | 3.9 | 5.8 | 5.7 | 5.7    | 5.2 | 6.1 | 4.6 | 6.7 | 5.6 | 5.3 | 5.5 |
| Range               | 15  | 17  | 17  | 20  | 15  | 24  | 25  | 29     | 23  | 30  | 25  | 38  | 22  | 23  | 25  |

INTERACTION SUMMARY TABLE

All Groups N = 40

A P P E N D I X D

SUMMARY TABLES FOR EACH PROANA VARIABLE

## BALANCE VARIABLE SUMMARY TABLES

| Group                        | Period | I   | II  | III |
|------------------------------|--------|-----|-----|-----|
| *F <sub>1</sub>              |        | 52  | 71  | 64  |
| F <sub>2</sub>               |        | 17  | 26  | 49  |
| F <sub>3</sub>               |        | 29  | 29  | 38  |
| *F <sub>4</sub>              |        | 26  | 50  | 34  |
| F <sub>5</sub>               |        | 53  | 14  | 40  |
| F <sub>6</sub>               |        | 17  | 15  | 310 |
| F <sub>7</sub>               |        | 55  | 64  | 72  |
| F <sub>8</sub>               |        | 38  | 35  | 32  |
| F <sub>9</sub>               |        | 27  | 47  | 80  |
| F <sub>10</sub>              |        | 19  | 33  | 33  |
| *F <sub>11</sub>             |        | 48  | 68  | 65  |
| F <sub>12</sub>              |        | 23  | 26  | 28  |
| *F <sub>13</sub>             |        | 22  | 27  | 19  |
| Subtotal N <sub>F</sub> = 13 |        | 426 | 541 | 584 |

\* Indicates balanced group

| Group                        | Period | I   | II  | III |
|------------------------------|--------|-----|-----|-----|
| *S01                         |        | 17  | 28  | 27  |
| S02                          |        | 26  | 15  | 16  |
| S03                          |        | 29  | 62  | 68  |
| *S04                         |        | 38  | 29  | 62  |
| S05                          |        | 34  | 83  | 112 |
| S06                          |        | 22  | 10  | 25  |
| *S07                         |        | 51  | 52  | 49  |
| S08                          |        | 33  | 32  | 31  |
| S09                          |        | 13  | 12  | 25  |
| Subtotal N <sub>S0</sub> = 9 |        | 263 | 371 | 425 |
| J1                           |        | 17  | 19  | 35  |
| J2                           |        | 14  | 25  | 39  |
| J3                           |        | 31  | 27  | 40  |
| J4                           |        | 4   | 14  | 23  |
| *J5                          |        | 22  | 42  | 39  |
| *J6                          |        | 64  | 70  | 65  |
| *J7                          |        | 28  | 117 | 82  |
| *J8                          |        | 13  | 28  | 21  |
| *J9                          |        | 35  | 51  | 44  |
| *Subtotal N <sub>J</sub> = 9 |        | 228 | 393 | 388 |

\* Indicates balanced group

| Group                        | Period | I   | II  | III |
|------------------------------|--------|-----|-----|-----|
| SR <sub>1</sub>              |        | 48  | 33  | 45  |
| SR <sub>2</sub>              |        | 24  | 37  | 45  |
| SR <sub>3</sub>              |        | 27  | 17  | 30  |
| *SR <sub>4</sub>             |        | 38  | 46  | 35  |
| SR <sub>5</sub>              |        | 32  | 41  | 44  |
| *SR <sub>6</sub>             |        | 11  | 38  | 15  |
| SR <sub>7</sub>              |        | 53  | 15  | 65  |
| SR <sub>8</sub>              |        | 10  | 5   | 20  |
| SR <sub>9</sub>              |        | 29  | 32  | 44  |
| Subtotal N <sub>SR</sub> = 9 |        | 272 | 299 | 343 |

\* Indicates balanced group

SUMMARY TABLE: LINE USAGE

LINES NOT USED BY GROUP AND STRATUM

| Group | Freshman | Sophomore | Junior | Senior |
|-------|----------|-----------|--------|--------|
| 1     | 6        | 12        | 6      | 18     |
| 2     | 6        | 14        | 12     | 5      |
| 3     | 12       | 5         | 8      | 14     |
| 4     | 5        | 0         | 13     | 2      |
| 5     | 5        | 6         | 13     | 1      |
| 6     | 10       | 11        | 0      | 17     |
| 7     | 2        | 1         | 2      | 0      |
| 8     | 4        | 16        | 15     | 17     |
| 9     | 5        | 8         | 11     | 4      |
| 10    | 17       |           |        |        |
| 11    | 1        |           |        |        |
| 12    | 12       |           |        |        |
| 13    | 12       |           |        |        |

SUMMARY TOTALS

| No. of Lines Not Used | No. of Group | No. of Lines Not Used | No. of Group |
|-----------------------|--------------|-----------------------|--------------|
| 0                     | 3            | 10                    | 1            |
| 1                     | 3            | 11                    | 2            |
| 2                     | 3            | 12                    | 5            |
| 4                     | 2            | 13                    | 2            |
| 5                     | 5            | 14                    | 2            |
| 6                     | 4            | 15                    | 1            |
| 8                     | 1            | 16                    | 1            |
| 9                     | 1            | 17                    | 3            |
|                       |              | 18                    | 1            |



SUMMARY TABLE: CLIQUE GROUPS

Formation by Group and Stratum

|                  | Clique<br>Groups | Det.<br>Clique<br>Groups |                   | Det.<br>Clique<br>Groups |                 | Clique<br>Groups | Det.<br>Clique<br>Groups |                 | Clique<br>Groups | Det.<br>Clique<br>Groups |
|------------------|------------------|--------------------------|-------------------|--------------------------|-----------------|------------------|--------------------------|-----------------|------------------|--------------------------|
| FR <sub>1</sub>  | yes              | yes                      | SOPH <sub>1</sub> |                          | JR <sub>1</sub> |                  |                          | SR <sub>1</sub> | yes              | yes                      |
| FR <sub>2</sub>  |                  |                          | SOPH <sub>2</sub> |                          | JR <sub>2</sub> |                  |                          | SR <sub>2</sub> |                  |                          |
| FR <sub>3</sub>  | yes              |                          | SOPH <sub>3</sub> |                          | JR <sub>3</sub> |                  |                          | SR <sub>3</sub> | yes              |                          |
| FR <sub>4</sub>  |                  |                          | SOPH <sub>4</sub> |                          | JR <sub>4</sub> |                  |                          | SR <sub>4</sub> |                  |                          |
| FR <sub>5</sub>  |                  |                          | SOPH <sub>5</sub> |                          | JR <sub>5</sub> | yes              | yes                      | SR <sub>5</sub> |                  |                          |
| FR <sub>6</sub>  | yes              |                          | SOPH <sub>6</sub> |                          | JR <sub>6</sub> |                  |                          | SR <sub>6</sub> | yes              |                          |
| FR <sub>7</sub>  |                  |                          | SOPH <sub>7</sub> |                          | JR <sub>7</sub> |                  |                          | SR <sub>7</sub> |                  |                          |
| FR <sub>8</sub>  |                  |                          | SOPH <sub>8</sub> | yes                      | JR <sub>8</sub> | yes              | yes                      | SR <sub>8</sub> |                  |                          |
| FR <sub>9</sub>  | yes              |                          | SOPH <sub>9</sub> |                          | JR <sub>9</sub> |                  |                          | SR <sub>9</sub> |                  |                          |
| FR <sub>10</sub> | yes              |                          |                   |                          |                 |                  |                          |                 |                  |                          |
| FR <sub>11</sub> |                  |                          |                   |                          |                 |                  |                          |                 |                  |                          |
| FR <sub>12</sub> | yes              |                          |                   |                          |                 |                  |                          |                 |                  |                          |
| FR <sub>13</sub> |                  |                          |                   |                          |                 |                  |                          |                 |                  |                          |

Summary Totals

|           |                  |                             |
|-----------|------------------|-----------------------------|
| Freshman  | 6 clique groups  | 2 detrimental clique groups |
| Sophomore | 1 clique groups  | 1 detrimental clique groups |
| Junior    | 2 clique groups  | 2 detrimental clique groups |
| Senior    | 3 clique groups  | 1 detrimental clique groups |
| Total     | 12 clique groups | 6 detrimental clique groups |

LEADERSHIP VARIABLE SUMMARY

| Group | Perceived Leadership |         |         | Procedural Leadership | Emergent Leadership |
|-------|----------------------|---------|---------|-----------------------|---------------------|
|       | I                    | II      | III     | Occurred              | Occurred            |
| Fr 1  | Jim                  | Jim     | Jim     |                       | Jim                 |
| Fr 2  | *                    | *       | *       |                       |                     |
| Fr 3  | *                    | Greg    | Greg    |                       | Greg                |
| Fr 4  | *                    | LaDonna | LaDonna |                       | LaDonna             |
| Fr 5  | Rita                 | *       | *       | Rita                  |                     |
| Fr 6  | Alisha               | Johnny  | *       | Alisha                |                     |
| Fr 7  | *                    | *       | Jim     |                       |                     |
| Fr 8  | *                    | *       | *       |                       |                     |
| Fr 9  | Rick                 | Rick    | *       | Rick                  |                     |
| Fr 10 | Beryl                | *       | *       | Beryl                 |                     |
| Fr 11 | *                    | Jim H   | Jim H   |                       | Jim H               |
| Fr 12 | Dennis               | Dennis  | Dennis  | Dennis                |                     |
| Fr 13 | Ruth                 | *       | Louis   | Louis                 |                     |

\* No clear leader due to equality of interaction communication among the group leaders.

### LEADERSHIP VARIABLE SUMMARY

| Group  | Perceived Leadership |      |      | Procedural Leadership | Emergent Leadership |
|--------|----------------------|------|------|-----------------------|---------------------|
|        | I                    | II   | III  | Occurred              | Occurred            |
| Soph 1 | *                    | *    | *    |                       |                     |
| Soph 2 | *                    | *    | *    |                       |                     |
| Soph 3 | *                    | Link | Link | Link                  |                     |
| Soph 4 | Paul                 | Paul | Paul |                       | Paul                |
| Soph 5 | *                    | Pam  |      |                       | Pam                 |
| Soph 6 | *                    | *    | *    |                       |                     |
| Soph 7 | *                    | *    | *    |                       |                     |
| Soph 8 | *                    | *    | *    |                       | Dianna              |
| Soph 9 | *                    | *    | *    |                       |                     |

\* No clear leader due to equality of interaction communication among the group leaders.

LEADERSHIP VARIABLE SUMMARY

| Group | Perceived Leadership |       |         | Procedural Leadership | Emergent Leadership |
|-------|----------------------|-------|---------|-----------------------|---------------------|
|       | I                    | II    | III     | Occurred              | Occurred            |
| Jr 1  | Joe                  | Joe   | Joe     |                       | Joe                 |
| Jr 2  | Carol                | *     | Michael |                       |                     |
| Jr 3  | Linda                | Jerry | Stan    | Jerry                 |                     |
| Jr 4  | *                    | *     | Joyce   | Joyce                 |                     |
| Jr 5  | *                    | *     | Bart    | Bart                  |                     |
| Jr 6  | *                    | *     | *       |                       |                     |
| Jr 7  | *                    | *     | *       |                       | Cindy               |
| Jr 8  | *                    | *     | *       |                       |                     |
| Jr 9  | *                    | *     | *       |                       |                     |

\* No clear leader due to equality of interaction communication among the group leaders.

LEADERSHIP VARIABLE SUMMARY

| Group | Perceived Leadership |     |       | Procedural Leadership | Emergent Leadership |
|-------|----------------------|-----|-------|-----------------------|---------------------|
|       | I                    | II  | III   | Occurred              | Occurred            |
| Sr 1  | Wilk                 | *   | Wilk  | Wilk                  |                     |
| Sr 2  | Gary                 | *   | *     |                       |                     |
| Sr 3  | Kathy                | *   | *     | Kathy                 |                     |
| Sr 4  | *                    | *   | *     |                       |                     |
| Sr 5  | *                    | *   | *     | Dee                   |                     |
| Sr 6  | Don                  | Don | Don   | Don                   |                     |
| Sr 7  | *                    | *   | *     |                       |                     |
| Sr 8  | *                    | *   | *     | Linda                 |                     |
| Sr 9  | *                    | Kay | Barry |                       | Barry               |

\* No clear leader due to equality of interaction communication among the group leaders.

SUMMARY TABLE: DOMINANCE

| Group | I                  |                    | II                 |                    | III                |                    |
|-------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|       | Dominance Occurred | PROANA Explanation | Dominance Occurred | PROANA Explanation | Dominance Occurred | PROANA Explanation |
| Fr 1  |                    |                    | Jim                | Leadership         | Jim                | Leadership         |
| Fr 2  |                    |                    |                    |                    |                    |                    |
| Fr 3  |                    |                    |                    |                    |                    |                    |
| Fr 4  |                    |                    |                    |                    |                    |                    |
| Fr 5  |                    |                    |                    |                    |                    |                    |
| Fr 6  |                    |                    |                    |                    |                    |                    |
| Fr 7  |                    |                    |                    |                    |                    |                    |
| Fr 8  |                    |                    |                    |                    |                    |                    |
| Fr 9  | Rick               | Clique             | Rick               | Clique             |                    |                    |
| Fr 10 | Berylene           | Leadership         | Berylene           | Clique             |                    |                    |
| Fr 11 |                    |                    |                    |                    |                    |                    |
| Fr 12 | Dennis             | Leadership         |                    |                    | Dennis             | Leadership         |
| Fr 13 |                    |                    |                    |                    | Louis              | Leadership         |

SUMMARY TABLE: DOMINANCE

| Group  | I                  |                    | II                 |                    | III                |                    |
|--------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|        | Dominance Occurred | PROANA Explanation | Dominance Occurred | PROANA Explanation | Dominance Occurred | PROANA Explanation |
| Soph 1 |                    |                    |                    |                    |                    |                    |
| Soph 2 |                    |                    |                    |                    |                    |                    |
| Soph 3 |                    |                    |                    |                    |                    |                    |
| Soph 4 |                    |                    |                    |                    |                    |                    |
| Soph 5 |                    |                    |                    |                    |                    |                    |
| Soph 6 |                    |                    | Keith              | Advocacy           |                    |                    |
| Soph 7 |                    |                    |                    |                    |                    |                    |
| Soph 8 | Dianna             | Leadership         |                    |                    |                    |                    |
| Soph 9 |                    |                    |                    |                    |                    |                    |

SUMMARY TABLE: DOMINANCE

| Group | I                  |                    | II                 |                    | III                |                    |
|-------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|       | Dominance Occurred | PROANA Explanation | Dominance Occurred | PROANA Explanation | Dominance Occurred | PROANA Esplanation |
| Jr 1  |                    |                    | Joe                | Leadership         |                    |                    |
| Jr 2  | Carol              | Leadership         |                    |                    |                    |                    |
| Jr 3  |                    |                    |                    |                    |                    |                    |
| Jr 4  | Joyce              | Leadership         |                    |                    |                    |                    |
| Jr 5  | Steve              | Clique             |                    |                    |                    |                    |
| Jr 6  |                    |                    |                    |                    |                    |                    |
| Jr 7  |                    |                    |                    |                    |                    |                    |
| Jr 8  |                    |                    |                    |                    |                    |                    |
| Jr 9  |                    |                    |                    |                    |                    |                    |



SUMMARY TABLE: DOMINANCE

| Group | I                  |                    | II                 |                    | III                |                    |
|-------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|       | Dominance Occurred | PROANA Explanation | Dominance Occurred | PROANA Explanation | Dominance Occurred | PROANA Explanation |
| Sr 1  | Wilk               | Leadership         |                    |                    |                    |                    |
| Sr 2  |                    |                    |                    |                    |                    |                    |
| Sr 3  | Kathy              | Leadership         |                    |                    |                    |                    |
| Sr 4  |                    |                    |                    |                    |                    |                    |
| Sr 5  |                    |                    |                    |                    |                    |                    |
| Sr 6  | Don                | Leadership         | Don                | Leadership         | Don                | Leadership         |
| Sr 7  |                    |                    |                    |                    |                    |                    |
| Sr 8  | Linda              | Leadership         | Linda              | Leadership         |                    |                    |
| Sr 9  |                    |                    |                    |                    |                    |                    |

A P P E N D I X E

STUDENT ASSISTANTS

## TIMEKEEPERS

Jeannie Acheson  
Margo Albright  
Geron Coale  
Janice Couch  
Jeannie Craig  
Robert Fones  
Stephanie Fuska  
Jay Griffis  
Hal Haymie  
Denise Heap  
Ron Hollingsworth  
Kep Keoppel  
Roger Kerr

Dallas McKellips  
Marcia McReynolds  
Brenda Meyers  
Dianne Murphy  
Kathy Shaw  
Richard Siders  
Kathy Sneed  
Alice Snowbarger  
Loretta Snyder  
Jan Stangland  
Dave Whitman  
Darrell Zumalt

## OBSERVERS

Charlotte Baker  
Sammee Blacklock  
Cindy Bowman  
Wayne Davis  
Rocky Gribble  
Tim Griffin  
Rick Hall  
Jim Hawkins  
Phyllis Jones  
Frank Lewis  
Susan Nobles  
Dianne McKellips

Cheryl Peters  
Pam Pryor  
Rick Rhodes  
Debbie Salter  
Dennis Sawyer  
Gary Smith  
Mary K. Stevens  
Gayla Stowe  
Pam Sullivan  
Judy Tompkins  
Nadine Thurmond