THE IMPACT ON COLLEGE STUDENT DEVELOPMENT OF SHORT-TERM, INFORMAL FACULTY-STUDENT SMALL GROUP INTERACTION

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ABSTRACT

THE IMPACT OF COLLEGE STUDENT DEVELOPMENT
OF SHORT-TERM, INFORMAL
FACULTY-STUDENT SMALL GROUP INTERACTION

by Robert Edward Alberti

In an experimental study of faculty-student relationships college students and faculty members met together in small groups, and resulting changes in student behavior were measured.

Although it has been generally assumed in higher education that close student-faculty relationships are to be desired, and college catalogs typically extol the virtues of the "small student-faculty ratio" and the "friendly academic community" that exists on the campus, research evidence to support the value of these concepts is practically negligible. The popular myths of the importance of instructional style and close student-teacher interaction are simply not supported by the available research data.

It was hypothesized that students involved in extra-class small group interaction with faculty members would show post-treatment differences in certain behaviors from students who were not exposed to such contact, and that the students in small groups which were high in interaction would change more than those in groups which were low. Experimental and control groups were set up to test these hypotheses.

Subject scores on the Omnibus Personality Inventory revealed evidence of experimental effects in the case of the dimension Altruism -- concern for the welfare and feelings of others.

When measured behavior changes were viewed in relationship to the level of interaction in a group, a significant negative relation was suggested for the Social Extroversion measure, which may suggest that this group experience tended to meet the members' needs for social contact.

There is no evidence to indicate that the amount of exposure to this experimental treatment is related to the quantity of change on any of the OPI dimensions.

The sample of engineering students who took part in the study were somewhat different from their classmates, and from engineers in general. Compared to their own population, the participants were significantly younger, more likely to be freshmen, and included a greater proportion of women than the total enrollment of the college. Their major fields were representative of the various engineering departments. Compared to engineering students in general, this group was more highly autonomous and more liberal, had greater freedom of impulse expression, and were better adjusted personally.

On a scale of attitudes toward closeness to undergraduate students, the faculty members who volunteered to participate in this project reported a significantly greater desire for personal relationships with students than did the total faculty of their college.

On a follow-up questionnaire, the discussion group participants indicated that they have found interpersonal relationships to be the most outstanding feature of their college experience. They volunteered for this project seeking to meet other students and faculty. Although they were generally favorable toward the results of their participation, they were disappointed that attendance was not better, and that their initial expectations were only partially fulfilled. Improved interpersonal relationships were a result for many participants, according to their reports. More favorable attitudes toward engineering and the faculty were other notable reported outcomes for the participating students.

The content of the small group discussions included a broad scope of topics, including curricula, the engineering profession, sexuality, politics, and university policies.

It is believed that the experimental vs. control differences in Altruism of the subjects is an actual difference in behavior which may be attributed to the effects of the experimental treatment. Supporting this finding is the self report of the subjects on the follow-up questionnaire.

A potentially significant value from close faculty-student contact is suggested by this study. However, it seems critical that such interaction take place under conditions which are purposefully designed as facilitative of growth in directions sought by the student.

THE IMPACT ON COLLEGE STUDENT DEVELOPMENT OF SHORT-TERM, INFORMAL FACULTY-STUDENT SMALL GROUP INTERACTION

By

Robert Edward Alberti

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DEDICATION

This thesis on college student development is dedicated to Mom, who never went to college, and never lacked for it; to Debby, who has sampled eight, and found them all lacking; to Lawrence and Melissa, for whom, if they choose to go, I wish a more human, loving collegiate environment than is typical today.

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CHAPTER I

INTRODUCTION

> The students are alive, and the purpose of education is to stimulate and guide their self-development.
>
> Alfred North Whitehead

Few educators, one might reasonably surmise, would express substantive disagreement with these words, yet the evidence is manifest that Professor Whitehead's advice of four decades ago has failed to guide the direction of higher education in this country. In their recent highly significant report, the Hazen Foundation's "Committee on the Student in Higher Education" (1968) concluded that in colleges and universities today:

> ...we generally act so as to reinforce the freshman trauma...
>
> ...instruction seems to extinguish curiosity and lower intellectual aspirations...
>
> ...we largely ignore...knowledge...about the environmental and developmental circumstances of learning and growth...
>
> ...students...live in a physical and social environment which is hardly conducive to moral, cultural, or esthetic growth...
>
> ...we measure the worth of our faculty by the distinctions of the scholars who serve on it...carefully protected from all but the most transitory contact with undergraduates...
>
> ...our basic models...are still aimed at an intellectual elite...

> ...we permit students little real involvement in planning their own education or shaping the educational environment in which they work and live...
>
> ...we ignore the relevance of education outside the school...
>
> ...we...permit little room for free-wheeling, wide-range curiosity...
>
> ...our schools are grimly serious and competitive...
>
> ...we do little to help students in their search for commitment... (pp. 13-14).

This is a serious indictment of institutions which proclaim dedication to preparing students for "a meaningful life," for "productive citizenship," or to developing "persons as well as intellects." Yet it appears that college and university curricula, ostensibly designed to expose the student to a broad range of academic experiences and to teach independent, critical thinking, have been developed from a continuing proliferation of subject matter which focusses upon the subdivisions of factual information. This is in sharp contrast to Whitehead's view that the purpose of what we do in education is the encouragement and guidance of the student's own self-development. Indeed, research has amply demonstrated that facts and information may be acquired by students from programmed materials -- even from "ordinary books" -- at least as efficiently as from lectures. Nicholas Hobbs (1966) observed:

> It would seem that professors are not necessary at all. A television screen will do as well. Class size doesn't matter: like a cipher, a professor is divisible by a number of any magnitude, with quotient zero. When asked to list important influences in their college years, one group of students mentioned many things, including the cafeteria, and forgot to mention the faculty. The clincher was a study showing that students who were simply assigned the text learned more than students who had benefit of both text and instructor (p. 202).

It seems evident, then, that the fundamental rationale for bringing faculty members and students together on a college campus is to provide an atmosphere within which a significant human interaction may take place. That assertion is the basic premise upon which this study was conducted.

Statement of the Problem

It is generally assumed in contemporary higher education that regular informal faculty-student interaction is a desirable feature in a college or university, presumably on the grounds that such experiences contribute positively to the intellectual development of students. Yet the literature of higher education contains no specific evidence to demonstrate that improving out-of-class relationships between faculty members and students actually has any measurable impact upon student growth. There is, in fact, little relevant research on the topic. Since the assumption of benefit to students from such contact is basic to such programs as faculty advising, small student-faculty ratios, and faculty involvement in co-curricular affairs, there appears the need for an investigation of the effects of informal faculty-student interaction.

The present study represents an experimental assessment of the effect on college students of informal faculty-student interaction in small groups. The student participants were systematically engaged in a small group situation, some with a faculty participant, others without, and the resulting impact upon student behavior was measured. Thus students in the experimental groups were exposed to much closer contact with members of the faculty of their college than they or their

colleagues would ordinarily encounter in their collegiate experience. This close contact with a professor over several weeks provided a substantive test of the value of extensive faculty-student interaction.

The study sample consists of forty-three men and women undergraduate students who were enrolled in the College of Engineering at Michigan State University during the Winter Term 1969.

The following assumptions underly the research: (1) college is a structured attempt to help students change; (2) personal interaction with significant others is an effective way of inducing change; (3) small group activity is a proven method for encouraging personal interaction; (4) informal small group interaction with faculty members may provide a means for assisting students to change in ways associated with the objectives of higher education; (5) it is possible to measure such developmental changes with a standardized paper-and-pencil instrument.

Hypotheses

The central hypothesis examined in this study was that the behavioral development of college students is enhanced by informal faculty-student contact which extends beyond that normally associated with formal classroom instruction.

The specific experimental hypotheses tested were:

(1) Students who participate in informal small group interaction with a faculty member over a period of time demonstrate a difference in certain measured

developmental behaviors from students who do not participate in such interaction.

(2) The amount of change in measured student developmental behaviors is directly proportional to the level of group interaction in experimental groups. That is, measured change would be greater for students in experimental groups which experience a high level of group interaction than for those in experimental groups with a low level of interaction.

Definition of Terms

Informal faculty-student contact -- Verbal and/or non-verbal exchanges between college students and faculty members outside the context of formal classroom instruction or functions directly related to academic course work. Thus a discussion over coffee, a bull session in a residence hall, a club meeting, or a discussion group similar to those designed for this study would be examples of such informal contact.

Informal small group interaction -- Face to face discussion among the members of an experimentally set up, non-class-related group of students (with a faculty member in the experimental groups). The group discussions were self-directed by the members on topics of mutual interest.

Level of group interaction -- Tape recordings were made of the small group meetings and later monitored to record the number of times each group member began a new unit of participation in the course of a meeting. Participation by members of each group was analyzed in terms of verbal communication only. The amount and distribution of participation serves as the

criteria for interaction analysis of each group. A low variance of participation represents balanced participation (small variation from the mean). A high average of participation units represents frequent exchange of verbal behavior. Thus the level of interaction L is defined herein as a direct function of the average of participation units M, and an inverse function of the variance of participation S^2:

$$L = \frac{M}{S^2} \qquad \text{(See Appendix B)}$$

Measured developmental behaviors -- Each student subject in the study completed the Omnibus Personality Inventory (OPI) before and after the treatment period. The scales on the Inventory represent a series of defined personal behaviors which are the criterion measures for change in this study. Thus the "measured developmental behaviors" are equivalent to the OPI scale descriptions (See Appendix A).

Participation unit -- Monitoring the tape recordings, the observer recorded a "participation unit" for a group member for (1) each new verbal communication made by a member, (2) a "restart" -- new communication after a noticeable pause -- by a member who has just been speaking, (3) each five minutes of an extended statement by a member.

Limitations

Although a careful effort was made to set up a systematic experimental investigation of the impact on student development of informal contact with faculty, several important limitations are inherent in this study:

1. The short time duration of the experimental treatment obviates the potential impact of prolonged faculty-student interaction over the four-plus years a student attends college. A fully adequate design would require a similarly controlled treatment over a longer period -- perhaps the entire four years.
2. The short range evaluation of growth planned for this study precludes the possibility that the real impact of such a program may be best demonstrated over a somewhat longer period of time, possibly even several years after college.
3. Although the Omnibus Personality Inventory is at present one of the best-researched instruments available for measuring change in selected student behaviors, it suffers from the inherent limitations of a paper-and-pencil criterion.
4. The use of volunteer subjects, which was considered necessary here to minimize subject attrition, introduces a bias which is recognized. The participating sample is compared to the total population of the college in Chapter IV.
5. The use of volunteer faculty participants, again considered a necessary procedure, may limit the generalizability of results to faculty members somewhat like those who were involved.

Overview of the Study

In this chapter it has been noted that this study attempts to assess experimentally the specific behavior changes in college students which result from increasing their contact with members of the faculty. The research has grown out of the need

to define those experiences in higher education which are most important to the development of each student.

Chapter II of this report is a review of the literature relevant to the present study. In Chapter III, the research design and experimental procedure are discussed in detail. The findings of the study are presented in Chapter IV, and the summary and conclusions appear in Chapter V.

CHAPTER II

BACKGROUND FOR THE STUDY

"College students," according to the eminent higher education historian Frederick Rudolph, "are the most neglected, least understood element of the American academic community." Paradoxically, he is able to observe in the same essay (1966, p. 47) that "unquestionably the most creative and imaginative force in the shaping of the American college has been the students."

Efforts to understand this shaping force have literally exploded in contemporary literature -- both academic and popular. In order to limit the scope of this review and to clarify its intent, it is helpful here to identify those questions which are of particular relevance to this study.

The general question to which this thesis is addressed is: "What are the effects of close interaction with faculty on the behavioral development of college students?" That question is the central theme of this review. Also examined are these related questions relevant to this area of inquiry: What are the significant dimensions of college student behavior? What are the important determinants of student behavioral development? What is known about the uses of the small group as a vehicle for student behavior change?

The following review summarizes earlier studies which may be relevant to answering these questions. This material is representative of the work which has been done in the areas of the faculty in relationship to student behavior, the general nature of student behavior and development, and the processes of the small group. At the end of the section is a summary of the implications of prior research for this study.

The Impact of the Faculty on Student Behavior

The principal concept this paper examines is that the faculty plays a key role in the developmental process of college students. Evidence reported in the literature to support that thesis is scarce indeed. Mayhew, in commenting on this seeming paradox (1966), is cautiously optimistic:

> Although the evidence about the effectiveness of college faculty can at times shake professorial egos (in one study, teachers were not even mentioned by students in response to an open-ended query about educational influences), nonetheless, feeling and logic suggest that kind and quality of faculty are somehow involved. (p. 212)

An experimental study designed to examine the effects of different degrees of faculty interaction with students in relation to specific coursework was conducted by E. K. Wilson at two colleges (Newcomb and Wilson, 1966). Students in a variety of academic subject areas were exposed to systematically differing forms of instruction, involving large lectures, small group discussions, independent study, and in each case, a different quantity and quality of contact with the professor. Outcomes of these experimental courses were assessed on a variety of criterion measures, with a uniform result: "...by

not even one of these criteria, in any course in either college, were there any significant differences between students who had much contact, limited contact, or none at all with their instructors." (Newcomb, 1966, p. 108). Newcomb is quick to add, however, that one ought not conclude that teachers are worthless, but that the powerful influence of the student peer group acts to significantly modify the specific impacts of an instructional method. The extensiveness of student-peer interaction, particularly in these small colleges, was sufficient to neutralize possible differential results from the various treatments.

Nevertheless, such results do tend to shake the collective "professorial ego." Can we demonstrate that faculty do have some influence on the behavior development of their students? It is possible to give a qualified "yes" on the basis of several non-experimental studies which have been reported.

C. R. Pace (1966), reporting on his studies with the College and University Environment Scales (CUES), has analyzed student responses to those CUES items which deal with teaching and faculty-student relationships. Professors, in the opinion of their students, are characteristically "dedicated scholars." Near-unanimity of student voice was found on this description alone for faculty members at all types of institutions (public, private, two-year, and four-year colleges, and universities). On other items there appeared a hierarchy of effectiveness -- in terms of instructional quality, personal interest in students, academic standards -- which led Pace to "grade" the various types of institutions according to this student report of faculty quality. In his evaluations, the "high prestige liberal arts

colleges" received an A, other liberal arts institutions, "strongly denominational colleges," and junior colleges got B's, and universities and state colleges "also ran" -- earning C's on the Pace-CUES scale. In the context of this single evaluation of their collegiate environment, students seem generally to feel their mentors are doing at least an adequate job.

In a more specific examination of effective teaching procedures, McKeachie (1962) reported extensively on research evaluating instructional methods. The general conclusions of his work have been confirmed in more recent research and are worthy of comment here. The evidence is quite clear that information is transmitted to the students at least as effectively by textbooks as by direct instruction, although closer faculty-student interaction in the classroom may produce changes in such non-cognitive dimensions as attitudes toward learning, interest in the subject matter, satisfaction with the learning experience, and ability to apply learning to new experience. A critical variable in many such studies is the individual instructor, and of signal importance is his enthusiasm for teaching and for the subject matter.

One specific way in which teachers have impact upon student behavior is in the role of social model. Joseph Adelson (1962) discusses this concept from the psychoanalytic viewpoint with the concepts of identification and identity, and the potential importance of the teacher-model in fulfilling the identity needs of the adolescent student. He characterizes four model teachers: The shaman, a charismatic "entertainer"; the priest,

a high status "recruiter" (and possibly "drill instructor") for his discipline; the mystic healer, an altruistic doctor to the educational ills of his students; and the anti-model or disappointing model, an example of everything the student wishes not to be. Acceptance of a teacher-model is a highly individual matter. The student may, on the one hand, actively seek out the mentor who will meet his strong need for an object of identification. At the opposite end of the spectrum is the student who has fixed on a life style and will avoid any such interaction with his teachers.

Hedegard (1968) concluded that the personality of a teacher makes a difference in the response of his students. He studied student achievement and attitudes, utilizing the Semantic Differential technique to analyze student response to the different teacher "models" identified by Adelson. He found no significant differences in academic achievement resulting from the different teaching styles, however some models were more influential in changing student attitudes than were others.

There is evidence to suggest that while a student may wish to emulate a faculty model, he may nonetheless seek to maintain a considerable distance from the chosen faculty member (Wise, 1958; Coelho, Hamburg, and Murphey, 1963). This partial identification may be very influential in certain aspects of the student's life, without his ever having had close personal interaction with the teacher beyond the classroom.

Of particular importance, according to considerable research evidence, is the impact of faculty upon the educational aspirations and vocational choices of students (Austin, 1966;

Greeley, 1962; Gurin and Katz, 1966; Lehmann and Dressel, 1962; Wilson, 1966). Although higher education traditionalists are inclined to look with some disdain on vocational choice as a criterion of collegiate success, it is nevertheless true that a significant proportion of college graduates enter regular employment (in contrast to further formal study) upon leaving their undergraduate experience (with or without degrees). Thus the influence of the faculty in the area of career decisions ought not to be minimized. Indeed, the life style and many personal decisions of an individual are intimately related to his selection of an occupation.

Austin's study of seniors at five midwestern liberal arts colleges (1966) revealed the faculty as the most influential persons in the career choices of these students. Frequent contact with faculty proved an important factor in determining faculty influence in a study of graduating seniors in thirty-one southern colleges (Grigg, 1965). Students who reported considerable personal contact with faculty members were more likely to also report greater faculty influence on their planning for the future.

Teachers and faculty advisors tend to exert particular influence on graduate school choice, according to Greeley's nationwide sample of 1961 graduates (1962). Even when academic achievement is controlled, a greater proportion of those influenced by faculty planned graduate school rather than professional school.

Raising the sights of their students can be an important, if difficult to measure, impact of the faculty. Freshmen at

predominantly black southern colleges who had the most contact with faculty members reported significantly higher vocational aspirations than their peers who had enjoyed less interaction with their teachers (Gurin and Katz, 1966).

In an effort to structure additional meaningful teacher-student contact, faculty members are typically assigned the responsibility of guiding the academic planning of students. An experimental study of the impacts upon freshman students of "improved" faculty advisement was conducted recently at Macalester College (Rossmann, 1968). A sample of incoming freshmen were randomly assigned to advisors who were given released time and special in-service training. Their achievement, persistence and attitudes toward college were compared after the freshman year with the control group of students assigned to regular faculty with full-time teaching loads. No significant differences were found except in satisfaction with the faculty advisor himself! However, at the end of the sophomore year the experimental students reported greater satisfaction with their career choice than their control group counterparts. Inevitably, the long-range impacts of experimental programs are difficult to assess, yet may be the most significant of all criteria.

Lienemann (1968) in a similar effort, studied faculty-student interaction over an academic year by comparing experimental and control groups of freshmen. The experimentals were assigned as a block to a group of faculty and given a special room for discussions and faculty-student meetings. Academic achievement was improved significantly for his experimental

group, and student-student and student-faculty self-reported interaction was greater than that experienced by the controls.

In a study of Justin Morrill College, the experimental residential college at Michigan State University, Kafer (1966) found these students "enjoyed more frequent and personal contact with faculty members," and held "high positive regard for the faculty who they felt were interested in and accessible to the students." Kafer's assumption -- and evidently that of the Justin Morrill College founders -- is that such interaction is a desirable thing.

It is obvious, perhaps, that not all individual faculty members have the same potential for impact upon students. Differences among academic fields, and varying personal styles have been shown to be generalized to some degree (Thistlethwaite, 1960, 1966). Greater influence is evidently associated with teacher enthusiasm, teaching excellence, encouragement of independence and humanism, and the extension of positive support to the student.

The total environment of an institution is itself an important determinant of the meaningfulness of faculty-student interaction. Increasing size tends to "disciplinize" the faculty, and to weaken the pervasiveness of the "community of scholars" atmosphere (Astin, 1963; Clark and Trow, 1966). Nevertheless, there is evidence to support the notion that an institutional attitude and commitment to close interpersonal relations may psychologically reduce the sheer numerical size of a population (Chickering, 1966).

Williams (1965) questions the value of informal faculty-student interaction. He found little relationship between student perceptions of good and poor teachers and the amount of teacher-student contact outside of class. The most important teacher behavior correlates of good teaching identified by his student-subjects are cultural interests, orderliness, conscientiousness, enthusiasm, optimism, warmth, and sociability.

Interestingly, when she asked faculty members to report their attitudes toward social distance between faculty and students, Knight (1968) found no significant differences between faculty members whose overt behavior had been judged high and those judged low in interaction with students outside of class. She concluded that perhaps "college teachers overtly display a certain behavior but covertly feel that social distance is necessary between teachers and students."

Thus, although we know that our limited ability to measure behavior change is an important consideration, the net result of research efforts to determine the specific impacts of faculty upon students appears to be only a suggestion of long-range influence upon academic and vocational goals. Attempts to discover measurable short-term teacher influences on student behavior have thus far yielded inconclusive evidence. Nevertheless, it is difficult to accept the idea that the faculty do not play an important role in the process of development of the college student. Perhaps additional experimental studies under controlled conditions will begin to suggest the combinations of influence patterns which

produce measurable results. And perhaps we may some day be able to devise instruments more sensitive to behavior change.

The dilemma of the nature and importance of faculty-student interaction is summarized well by Joseph Katz (1968):

> ...most students have little contact with their professors; and they may rank knowing and getting recognition from professors low, not because they consider professors undesirable to know, but because they find them relatively inaccessible. To make things more complicated, many observations show that students are highly ambivalent about closeness to professors; that they wish as much to be left alone by them as to gain their attention and approbation. This in spite of a certain kind of professional vanity that assumes that if professors would only spend more time with students, the students would be much happier -- an assumption that is frequently belied by the facts. It is the nature of the contact, not its frequency, that is crucial. (p. 27)

If the faculty are indeed not a primary determinant in the development of college student behavior, what elements of the collegiate environment may be identified as most important in producing the changes which have been observed to occur in students? Although a detailed review of the studies in this area is not directly relevant to the present research, a brief summary is in order here.

The academic environment of a college has been shown to be an important influence in the selection of students. The character of a student population seems to impose a self-selection on future students, thus perpetuating a similar population. Newcomb and Feldman have noted that "colleges' distinctive impacts tend to be cumulative: the kinds of students they admit help to determine the kinds of impacts that those students will confront." (1968, p. 146).

Studies of student residence tend to show that the nature of the student culture in a residence is a more important influence than the residence itself. (Nasatir, 1965; Siegel and Siegel, 1957; Alfert, 1966; Eckland, 1964; Greenfield, 1964; Brown, 1966; Lozoff, 1968).

It may be seen from these studies of the environment and student residences that the peer group is a pervasive influence on student development. In fact, the most frequently observed determinant of student behavior change is the culture or the peer group. Several researchers in college student development have unequivocally identified the peer culture as the single most significant force in shaping student behavior (Newcomb and Wilson, 1966; Wallace 1966; Heath, 1968; Becker, et. al., 1961).

Because the culture exerts its influence upon the individual principally through the small groups to which he belongs, it is important to look in more detail at some of the applications of group processes on the college campus and the ways in which small groups are known to influence individual behavior.

The Impact of the Small Group on Student Behavior

Implicit in the assumptions underlying this study is the concept that small group interaction is an effective approach to changing behavior, or promoting learning. The writer has been strongly influenced in this area by the work of Carl Rogers (1961), Leland Bradford (1964), Jack Gibb (1964), and William Schutz (1967). The material in this section will be

concerned principally with the application of small group processes to the development and modification of behavior in college students.

Earlier in this chapter, reference was made to comparative studies of different modes of instruction in college courses, noting that small group discussion shows no noticeable advantage over large lectures in terms of the transmission of information. Yet it is recognized that small groups do have a favorable impact on the learning of attitudes and values, in fostering positive feelings toward learning, and in understanding applications of knowledge (Bowers and Soar, 1960; McKeachie, 1962; Wilson, 1966).

The teaching-learning process has been characterized as a "transaction among persons." This concept is of particular relevance to the affective dimension of learning, wherein the medium of exchange is the behavior of the persons involved. The idea and theoretical foundations of learning through the process of interpersonal relationships has received substantial support and development in laboratory training groups, principally under the aegis of the National Training Laboratories (now "NTL Institute for Applied Behavioral Science") of the National Education Association (Bradford, Gibb and Benne, 1964). Since the earliest NTL workshops at Bethel, Maine, in the late 1940's the training group has been used extensively in the development of work teams and management personnel in business, industry and government, finding its major application in the improvement of human relations skills. The use of the small group as a vehicle for human relations

training on the college and university campus has been a more recent application (Mouton and Blake, 1961). Begun initially in connection with student leadership training, the campus t-group is today facilitating black-white confrontation, student-faculty dialogue, teacher training, interdisciplinary interaction.

Examining the impact of human relations training on college students, Dyer (1967) found that a 1½ hour meeting each week for eight weeks produced significant changes in self-report and peer ranking of interpersonal behavior.

On the other hand, L. K. Johnson (1966) found no effect on personal functioning from t-group training with college students. Similarly, LeMay (1966) compared students who had volunteered for group counseling and found no post-treatment differences between his treatment and control groups.

A dynamic program of student involvement in community services has been underway for over three years at California State College at Los Angeles (Brass, 1969; Newgarden, 1967). During 1968-69 an on-campus program on racism has involved white students, faculty and staff in small group encounters designed to make them "confront their white identity," toward the end of reducing racism and promoting racial equality. Initial evaluations of this small group project are quite favorable (Gordon and Newgarden, 1969).

Utilization of the sensitivity training group within the framework of a course was described by Lorch (1969). Boland (1969) reported a gradual expansion of the use of laboratory training methods at the University of Notre Dame. Beginning

with new student orientation, the program moved in five phases to include a large number of student and faculty-student groups throughout the University. No objective evaluation measures are reported, however, "research indicated an overwhelmingly positive response" from participants.

Such programs as those described suggest that under certain conditions the application of small group methods to the processes of higher education may have considerable value. It remains for further research, however, to provide the means for measuring outcomes more effectively, so that the worth of such learning experiences may be demonstrated more directly.

One very significant question regarding the effectiveness of the training group in changing behavior remains unanswered: "Exactly what features of the group experience produced which changes in behavior?" As in all human learning, individual differences are an important variable here. The unique emotional environment which each group creates for itself may be growth producing for some individual members and inhibiting for others. A variable largely unresearched until recently is that of personality characteristics. Are there generalizations which may be made about the types of persons who are more likely to learn in group situations? The work of Levin in the Student Development Study (Katz, 1968, pp. 376-385) suggests that authoritarianism may be one significant characteristic, since individuals who are high in authoritarian needs are likely to respond poorly to unstructured environments -- such as are usually found in the training group.

Similar findings have come from other studies of individual change in groups. Flexibility and openness have been identified as important personality attributes in the facilitation of a person's ability to learn in the laboratory group (Miles, 1960; Whitman, 1964).

Attempts to isolate those elements of the t-group which are most facilitative of change have resulted in research on (1) specific group techniques: role playing, non-verbal exercises, feedback (Gibb, 1952; Lieberman, 1958; Giffin, 1967); (2) the learning process: the specific steps involved in changing behavior (Zimet and Fine, 1955; Carkhuff, 1967; Culbert, et. al., 1968); and (3) the role and functions of the trainer in a group: is a trained leader necessary to facilitate group growth? (Blake and Mouton, 1962; Farson, 1965; Solomon, Berzon and Sprague, 1965; L. K. Johnson, 1966; Gibb and Gibb, 1968). Such work has suggested some tentative generalizations about the nature of the impact of group experiences: (1) a variety of specific group techniques have demonstrated usefulness under certain conditions; (2) participation in a human relations training group results in behavior change for some people, under certain conditions relating to individual personality, group climate, and the external environment; (3) there are identifiable steps in the process of behavior change (learning), however, the exact conditions under which change takes place vary with each individual; (4) a training group experience may be as effective without a live trainer present as with one, under certain conditions.

As Dorothy Stock observed (1964), and as is obvious from the statements above, the key to human behavior change is the conditions under which change is attempted. The processes of the small group can be used to great advantage in human development when the objectives are specific, the character of the participants and that of the environment are known, and these variables are matched with a technique designed to help the participants to move toward their desired objectives.

The Dimensions and Development of Student Behavior

In this section is a very brief overview of studies relating to the principal intellectual, personality, and value characteristics of the college student, and the process of their development.

One subject of considerable research on college students has been that of intellectual development. There is, according to the published research, a slight tendency for students to develop an increasing orientation to "intellectual" behaviors from freshman to senior years. While this trend appears in most studies (eg. Elton and Rose, 1968; Flacks, 1963; Lehmann and Dressel, 1962; McConnell, et. al., 1968; Newcomb, et. al., 1967), it is frequently not significant statistically. Moreover, when asked an "open-ended" question about how they had changed since entering college, only twelve percent of a sample of California and Stanford seniors (Katz, 1968) reported intellectual development. They were much more likely to describe personal and social gains from their college experiences.

In a study of 10,000 high school graduates, Trent and Medsker (1968) found significant differences not only from freshman to senior year for college students, but also between college and non-college youth on several personality variables. The groups were matched at graduation from high school and over the next four years the college group gained in autonomy, complexity, and thinking introversion, and decreased in authoritarianism significantly more than did their non-college counterparts. A number of research studies show that seniors demonstrate greater dominance, confidence, assertiveness, self-sufficiency, independence and autonomy than freshmen. In addition, they have lower dependency, deference and submissive needs than do their younger counterparts. While not controlling for the effects of maturation, as did Trent and Medsker (1968), these studies are relatively consistent in reflecting psychological growth on the dimensions noted (cf. Burton, 1945; Izard, 1962; Nichols, 1965; Stern, 1966; Stewart, 1964; Webster, Freedman and Heist, 1962).

Studies of spontaneity and impulse expression show seniors to be somewhat more open and less self controlled than are freshmen, who tend to be restrained and controlled (Beach, 1967; K. W. Johnson, 1966; Katz, 1968; McConnell, et. al., 1968; Stern, 1966; Webster, Freedman and Heist, 1962). Similarly, although these trends generally lack statistical significance, seniors have been shown to have need for greater flexibility and less order than the freshmen, who are typically more comfortable with structure and routine (Izard, 1962; Rowe, 1964; Webster, Freedman, and Heist, 1962).

Perhaps the most consistent and significant freshman-to-senior personality change occurs in the degree of authoritarianism exhibited. This characteristic has been variously defined in terms of dogmatism, rigidity, ethnocentrism, prejudice, stereotyping, and intolerance. The research consistently shows that seniors are less authoritarian than are freshmen (Flacks, 1963; Foster, et. al., 1961; Lehmann and Dressel, 1962; Plant, 1958; Trent and Medsker, 1968; Webster, Freedman, and Heist, 1962).

Broadly considered, the goals and values of college students change in consistent and predictable ways as an apparent result of the collegiate experience. Relative increases in aesthetic and decreases in religious values characterize the typical transition from freshman to senior. Less obvious are tendencies for theoretical and social values to increase, while the relative strength of the economic value goes down. These studies, most of which are based upon the Allport-Vernon-Lindzey Study of Values as criterion, suggest that students tend generally to adopt the value systems of their institutions (Heath, 1968; Huntley, 1965; Stewart, 1964; Twomey, 1962).

Student goals for the college experience itself change from freshman to senior years in the direction expected. Studies by Adams (1965), Baur (1965), Goldsen, et. al. (1960), and Pemberton (1963), among others, demonstrate quite conclusively that students enter college with a largely utilitarian, vocational view of purpose, and after four years are generally much more significantly oriented to a broad

"general education," and to the development of interpersonal capacities.

A note on engineering students: Because the present study was conducted in a college of engineering, and because it is common in higher education to view students within the context of their curricular emphases, a few observations from the literature which deal specifically with "engineers" are in order.

A number of studies have demonstrated conclusively that engineering students are among the top ranks in intellectual ability (Centra, 1965; Darley, 1962; Stern, 1962; Wilson and Lyons, 1961). In addition, research on the intellectual orientation of students in various curricula (derived from such instruments as the OPI and Stern's Activities Index), suggests that engineering majors are among the upper and upper middle ranks in such attitudes as thinking introversion (Warren, 1964), intellectuality (Wilson and Lyons, 1961), complexity (Warren, 1964), reflectiveness (Stern, 1962), and science interest (Stern, 1962; Wilson and Lyons, 1961). In contrast, they are low scorers in estheticism (Center for the Study of Higher Education, 1962; Warren, 1964), humanities and social sciences (Stern, 1962; Wilson and Lyons, 1961). It is difficult to generalize from these data, however, since conflicting results have been found on the same dimensions under different conditions.

Engineers are typically masculine in outlook (Blum, 1947; Sherry, 1963; Warren, 1964) and tend slightly toward

emotional distress rather than well-being (Blum, 1947; Harder, 1959; Warren, 1964). They appear dominant, self-controlled, and socially introverted (Blum, 1947; Pace, 1964; Stern, 1962; Wilson and Lyons, 1961). Their value patterns have been studied infrequently, but the minimal data available suggests elevation of the economic and religious values (Harris, 1934; Huntley, 1965). Several studies of economic, social, and political liberalism characterize engineers as highly conservative in these areas (Ferguson, 1944; Miller, 1958; Noble and Noble, 1954; Peterson, 1965).

Summary

In this chapter an effort has been made to bring into focus those reports from the literature which provide the background and foundation for the present research. In order to effectively place this material in perspective, this section contains first a brief summary of these data, then is directed to the implications for this study of earlier findings.

The college faculty are influential in the collegiate growth of undergraduates principally in relation to their impact upon aspirations and plans for further study and vocational choice. The popular myths of the importance of instructional style and close student-teacher interaction are simply not supported by the available research data.

The principal determinants of student behavior are the academic environment of the college, student residence, the peer culture, and the college faculty. Most influential

among these is the peer group, which is consistently the deciding factor in personal and social change in the college years. The environment is more important in pre-selection than as an active change agent. Systematic differences among the types of student residence relate largely to the influences of the dominant peer culture in each setting.

The processes of the small group as an agency of change in the development of individual behaviors have been shown to be effective, under those conditions wherein the group experience is specifically designed to help accomplish the behavioral objectives of the individual.

The developmental behaviors of college students which have been studied suggest that intellectual growth, personality change, and the cultivation of mature values are the principal effects of the college experience. In general it may be said that college tends to increase the individual's orientation to intellectual activities, as manifested by life-styles and scores on attitude inventories. Personality change in college is a highly individual matter, however, it may be -- cautiously -- generalized that college tends to increase autonomy and personal independence, liberalism, self-confidence, and complexity, and to decrease authoritarianism. The college educated person's value hierarchy changes toward higher regard for aesthetic and self-fulfillment values, and a lesser emphasis upon religious and economic concerns than is typically true of non-college individuals.

Engineering students as a group demonstrate some differences from students in general, in that they tend to be more highly intellectual, more conservative socially and politically, and less well adjusted personally.

What are the implications of these findings for this study of faculty-student interaction? First, the five initial assumptions of this study are generally supported by research: (1) college is a structured attempt to help students change; (2) personal interaction with significant others is an effective way of inducing change; (3) small group activity is a proven method for encouraging personal interaction; (4) informal small group interaction with faculty members may provide a means for assisting students to change in ways associated with the objectives of higher education; (5) it is possible to measure such developmental changes with a standardized paper-and-pencil instrument. Second, these data suggest several questions which this study may in part help to answer: Does contact with members of the faculty contribute to student behavior change? In what ways? How do faculty members feel about close contact with students inside and outside the classroom? How does participation in a small unstructured student group affect behavior change? Are there characteristics of a group which may be identified as related to certain behavior changes in its members? What is the attitude of students toward close interaction with teachers?

These questions led to the design of an experimental study of faculty-student interaction which brought college students and faculty members together in small groups and attempted to measure student behavior change. Chapter III describes the design and methodology of this research study.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

Included in this chapter are discussions of the methodological aspects of the research, including the research design, experimental procedure, instrumentation, data analysis procedure, and a summary of methodology.

Research Design

Ten small groups of students were formed randomly from volunteers. Six groups were "treated" experimentally, in that a faculty member was assigned to meet with them. Three served as control groups, while the tenth was a no-contact control group. Behavior differences between students in the experimental groups and students in the control groups were examined at the end of the experimental treatment.

The measure of student behavior was subject scores on the Omnibus Personality Inventory (OPI), with analysis of co-variance applied to the post-test OPI scale scores serving as the statistical test.

The experimental design was adapted from D.I. Campbell and J. C. Stanley's "Design 4: The Pre-test - Post-test Control Group Design" (1963). This procedure was selected because, although the possibility exists for "contamination" by reactive effects from a pretest, it provides a clear

"base line" measurement of the criterion characteristics, and controls for most other important variables, including the effects of maturation, history, instrumentation, regression, selection, mortality, and for interactions among these variables. In addition, undesired effects resulting from imperfections in randomization are minimized in this way.

Specifically, the design of this experiment follows the paradigm:

(1) R O_1 X_1 O_2 (Experimental Section)

(2) R O_3 X_2 O_4 (Control Section 1)

(3) R O_5 O_6 (Control Section 2)

in which the experimental and two control sections were randomly selected (R) and pretested (O_1 O_3 O_5), the experimental section was exposed to the experimental treatment (X_1), the "treatment control" section (1) was exposed to the control treatment (X_2), and a "non-participant control" section (2) was given no treatment. All three sections were then post-tested (O_2 O_4 O_6).

The deviation from Campbell and Stanley's Design 4 was the inclusion of both a "non-treatment" control section, in which the students participated only in the pre- and post-tests, and a "modified treatment" control section, in which the student subjects met in small groups but without a faculty member. This "parallel control" design provided control for possible changes resulting from the group interaction itself, and for possible experimental ("Hawthorne")

effects, thus isolating the presence of a faculty member as the major independent variable in the experimental groups.

Experimental Procedure

The following steps describe the procedure followed in setting up and carrying out the project:

(1) The College of Engineering at Michigan State University, through the Dean and Department Chairmen of the College, was invited and agreed to serve as the population within which the experiment could be conducted. This college was asked to participate because of a personal background and interest in engineering and the physical sciences on the part of the experimenter.

(2) Six faculty volunteers from the college were sought by letters announcing the nature of the project, followed by personal contacts with individual faculty members who had been suggested by the department chairmen.

(3) At the beginning of the Winter term, 1969, seventy-two student volunteers were sought from the student enrollment of the college by letters to a random sample of one-third of the student population. The sample was selected by taking every third name from an alphabetical list, after throwing a die to

determine the starting point. Only sixty subjects volunteered, of which forty-three completed the project.

(4) The entire faculty of the participating college was asked to complete a faculty-student "Social Distance Scale" (See Appendix C), anonymously reporting their desire for informal relationships with students. The responses of the six participating faculty members were identified, however, to permit comparison with the entire faculty. A total of seventy faculty members completed the scale.

(5) The student volunteers were divided, following a table of random numbers, into the experimental ($N_x = 30$) and two control sections ($N_{c1} = 15$, $N_{c2} = 15$).

(6) The participating students were pre-tested on the Omnibus Personality Inventory prior to the beginning of the experimental treatment. Fifty-four students completed the pre-test and began the project.

(7) The experimental subject students were then placed, following a table of random numbers, into six groups, of five students with a professor. It was necessary, in the case of six students, to deviate from the original random number assignment in order to accommodate incompatible time schedules. In every instance,

however, the vacancy was filled from the pool of "non-treatment" control subjects using a new random number sequence to make the selection.

(a) The experimental groups were instructed, by written communication identical for all groups, regarding the group's purpose and guidelines for operation (See Appendix D).

(b) The groups were given no specific discussion topics or rigid structure, but were encouraged to freely discuss any matters of mutual interest.

(c) In a meeting prior to the beginning of the experimental session, all participating faculty members were told that their role was not to "lecture" (although discussion of academic topics was noted as appropriate), but to interact informally with the students and to encourage free participation.

(d) The experimental groups were scheduled to meet for two hours each week for eight weeks.

(8) The control students in Section 1 (the modified treatment groups) were similarly placed by a table of random numbers into three groups. Again, four instances of incompatible time

schedules made adjustments necessary. These were handled as described above for the experimental cases.

(a) These groups received written guide lines identical to those of the experimental groups (Appendix D). Thus they were essentially identical to the six experimental groups except there was no faculty member present.

(b) These groups, like the experimentals, were given no specific discussion topics or rigid structure, but were encouraged to freely discuss any matters of mutual interest.

(c) The Section 1 control groups were also scheduled for two hours each week for eight weeks.

(9) The students in Section 2 (the non-participant controls) received no treatment.

(10) Tape recordings were made of the experimental and control Section 1 group sessions, and selected tapes were analyzed to determine the nature of the group interaction.

(a) The experimenter monitored each tape and recorded the verbal participation of members. Thus an entry was made (See Appendix E for sample interaction score sheet) for each participant every time

he expressed an audible communication by initiating, responding, interrupting, or beginning again after a noticeable pause.

(b) A "level of interaction index" was computed for each group (See Appendix B).

(11) At the end of the eight-week treatment period, all experimental and control subjects (final N = 43) were post-tested on the OPI.

(12) OPI results were analyzed, utilizing an analysis of co-variance procedure to assess differences between experimentals and controls on each of the fourteen scales, thus testing Hypothesis 1.

(13) Group level of interaction indices were compared with OPI results, utilizing a rank correlation analysis, to assess any relationship which may exist between level of group interaction and changes in OPI scores, as a test of Hypothesis 2.

(14) Two to three weeks following the post-test, each experimental and control Section 1 participant was invited to take part in a half-hour interview with the experimenter. At that time the subject was asked to respond to a series of questions about his reactions to the project (See Appendix F). His OPI scores were interpreted to him, and he was given the opportunity to ask any questions he had about the

research. This was the final contact with the participants.

Instrumentation

The Omnibus Personality Inventory, Form F (Heist and Yonge, 1962, 1968) consists of 385 true-false personality items, most of which were reportedly derived from the Minnesota Multiphasic Personality Inventory and the California Psychological Inventory. The Inventory was, according to its manual:

> ...constructed to assess selected attitudes, values and interests, chiefly relevant to the areas of normal ego-functioning and intellectual activity. Almost all dimensions included in the Inventory were chosen either for their particular relevance to academic activity or for their general importance in understanding and differentiating among students in an educational context. The fourteen scales represent the final selection after a long developmental process in which over twenty psychological dimensions were studied (p. 1).

Thus, this instrument was selected because it is specifically designed to measure those dimensions of student behavior which correspond to the commonly stated objectives of the college experience, and because of its extensive use as a research device on college student development. Several reports of student development research utilizing the OPI appear in the review of literature section of this report. Appendix A contains brief descriptions of the OPI scales. The fourteen scales constituting Form F include: Thinking Introversion, Theoretical Orientation, Estheticism, Complexity, Autonomy, Religious Orientation, Social Extroversion, Impulse Expression,

Personal Integration, Anxiety Level, Altruism, Practical Outlook, Masculinity-Femininity, and Response Bias. The following statements from the Sixth Mental Measurements Yearbook (Buros, 1965) help to describe the OPI and summarize early validation research:

> The OPI, a multiscale, true-false, self-administering personality inventory, was developed to assess the personality characteristics of normal, especially the intellectually superior, college students... Although more evidence is needed, it would appear that most scales are sufficiently stable to permit their use where one is interested in intra-individual comparisons over time...OPI scales are correlated with appropriate scales from the Study of Values, California Psychological Inventory, Myers-Briggs Type Indicator, Stern Activities Index, and Strong Vocational Interest Blank... This instrument would be most useful in research on group differences involving relatively normal subjects.
>
> Paul M. Kjeldergard
> Harvard University

> ...although the authors do not advocate the clinical use of this instrument, the reliability and validity of data are about as impressive (or unimpressive) as for any existing inventories. For the purpose of describing and comparing college groups, the norms based on a defined college group are an attractive feature.
>
> Norman F. Wallen
> University of Utah

The method of analysis of group interaction utilized was based on a simplified recording of units of participation and a quantitative comparison among groups. The concept "level of interaction" has been defined to describe a simple quantitative index of the amount and balance of participation in a group meeting. There are two principal reasons for the choice of this methodology:

(1) This study is an attempt to determine the impact of faculty-student interaction under conditions which are as "natural" as possible. Under conditions in vivo, the content of such interaction varies widely. In the experimental situation, the amount of interaction is considered a more realistic criterion than any attempt at analysis of content.

(2) The content analysis systems (e.g., Bales, 1950) require, for adequate reliability of recording interactions, quite extensive training of observers. Because the "participation unit" procedure described herein does not require that the observer make a judgment among qualitative categories but only a quantitative record, the training process is greatly simplified, and is thus more practicable for the present research.

The "Level of Interaction" index has been defined as a single measure which is descriptive of the quantity of interaction among all the members in a group. The level is directly proportional to the mean number of participation units (i.e., how much verbal activity there is in the group), and inversely proportional to the variance of participation (i.e., how much the participation was dominated by a few members). Thus the level increases with increased group verbal activity and with broadly balanced participation. Conversely, the level will be lower for a group in which there

is little talking and/or in which one or two persons dominate the discussions. Participation was measured by monitoring tape recordings of selected group meetings, and "scoring" each verbal comment by each member (see Appendices B and E).

Several methodological difficulties were encountered in this aspect of the study. A combination of mechanical difficulties (tape recorder malfunction), attendance patterns, and group "extra-curricular" interests (for one session, held in the faculty member's home, the tape consisted primarily of the audio portion of a television program the group watched that evening!), made it necessary to select only three tapes from each experimental group with which to undertake a comparable analysis. The criteria used in choosing the tapes were: (1) the first tape of each group; (2) the last tape of each group; (3) a tape near the middle of the project -- third or fourth session; (4) "representative" attendance -- sessions with only two members present were avoided whenever possible; and (5) sessions of full-length -- usually one and three-quarter hours -- were chosen whenever possible. Some compromise among these criteria was necessary in order to make use of those sessions judged most "representative" for each group.

It was planned initially that level of interaction would be assessed only by means of the single index L. Following the preliminary calculations of these data, it became evident that an attempt to represent this variable only as a single statistic could result in a blurring of group differences on the two components thereof -- quantity and variance

of participation. The final analysis utilized the original index and the mean and variance as separate variables, contrasting these data for each experimental group on each OPI scale, by means of a rank order correlation coefficient.

A consideration important to this analysis is the sensitivity of the measurement technique to the subtleties of small group interaction. While it was neither intended nor anticipated that this analysis would produce a highly sophisticated picture of group interaction, it could have been somewhat more sensitive had the scoring procedure utilized a standard of one unit for every minute of an extended discourse, rather than the unit-per-five-minutes which was used. This consideration was most apparent when it became necessary to analyze a tape involving just one student and a faculty member (only one such two-person group was included in the analysis). The index for level of interaction tends to break down for a two person group, since the variance remains low for a "dialogue." A more sensitive measure, however, would have more accurately described the tendency for one person to dominate this group and would have contributed to the accuracy of measurement, and the ultimate usefulness of the statistic L.

Thus, although the concept of a quantitative index to assess the "level" of interaction in a group was not demonstrably effective, it did provide a rough source of additional descriptive data for use in analyzing the small experimental groups. It may be worthy of refinement and

further application to assess the relationship of the quantity and spread of group interaction to measures of process and content outcomes.

A social distance scale was administered to one hundred and ten members of the regular teaching faculty of the participating college to compare the attitudes of the faculty members taking part in the project with those of the general population of the college faculty on the dimension of desired social distance between faculty and students. The social distance scale itself, adapted from the work of Bogardus (1925) (see also Kadushin, 1962), was devised as an eleven-point attitude continuum which permits the faculty member to express his personal feeling about "closeness" to undergraduate students. A sample of the scale appears in Appendix C. Although the scale as administered had no quantitative values attached, the responses were scored by assigning values 0 - 10 to the scale points to permit the computation of statistical data regarding the responses.

Individual perceptions of the meaning of the scale items are, of course, an important consideration in interpreting the results. One professor -- a participant in the project -- suggested that the scale items did not necessarily represent different points on a single continuum (he checked only one response however). It is true that, for example, the "close" end of the scale ("personal friends") does not state explicitly that it represents the extreme on a continuum of closeness, although it was intended when the scale was designed. However, it is recognized that this interpretation is not necessarily obvious.

Despite these apparent limitations of exact meaning of the social-distance scale, it does provide a useful index for comparison of the attitudes of the volunteer faculty participants with those of the general faculty of the college.

The administration of a follow-up survey questionnaire to elicit student participant response to the project was something of an afterthought -- not a part of the original research design. Nevertheless, it plays an important role in terms of the usefulness of the data acquired.

Each of the participants in an experimental or a control Section 1 group were invited to meet with the experimenter at the beginning of the Spring term for a one-half hour interview. The purpose of the interview, for the participants, was to receive an interpretation of their OPI profile of scores and, insofar as they might be interested, an explanation of the purpose of the project. Prior to giving this "feedback", however, the twenty students who volunteered for interviews were asked to complete the nine-item follow-up questionnaire (Appendix F), giving their evaluation and response to participation in the project. All participants who did not respond to the initial letter and telephone call extending the opportunity for a personal interview were sent a second letter and a copy of the follow-up questionnaire which was pre-addressed and stamped for return to the project director. An additional fourteen questionnaires were returned from this mailing.

The questions were devised by the experimenter to elicit a self-report of the impact of the project on the participant. Specifically, he was asked to identify the outstanding features of his college experience, his initial expectations from the project, his assessment of how well his expectations had been met and why, his recommendations for change in the project, his self-report of learning from the project, an over-all evaluation of the experience, and, in an open-ended item, his attitude about informal faculty-student relationships. The data collected from this interview is described in Chapter IV. A sample of the questionnaire appears in Appendix F.

Data Analysis Procedure

Seven dimensions of data analysis were carried out in this research. In reviewing these procedures it will be useful to first summarize the data collected as a part of the experiment. They are, for each student participant: the project group to which he belonged; age; sex; year in college; major field of study; attendance in his project group; pre-test scores on fourteen OPI scales; post-test scores on fourteen OPI scales; interaction index for his group; his responses to each of eight follow-up questions.

The data analysis has been designed to deal with the seven dimensions in the manner described below:

Student demographic data -- Chi-square analyses of difference were run, for each of the four demographic variables (age, sex, major, year), between

the student participants and the total student population of the college. Chi-square provides a good non-parametric test with which to compare the sample with the population on variables which are divided into discrete categories.

Hypothesis 1 -- Analysis of co-variance is used to test the significance of the differences between the experimental section and control Sections 1 and 2 on the group means of OPI post-test scores, utilizing the pre-test scores as a co-variate. The analysis of co-variance procedure provides a highly sophisticated and powerful test of significant difference. The program used in the University's CDC 3600 computer was that developed by Jeremy Finn of the State University of New York at Buffalo.

Hypothesis 2 -- A rank order correlation co-efficient (Spearman rho) is used to test the hypothesized relationship between mean group OPI score changes and the level of interaction for the group. Thus group mean change scores are compared directly with the mean of interaction participation units, the variance of participation, and with the interaction index L. The rank order co-efficient is used here because the assumptions required for a parametric test (notably linearity of relationship between variables) are not met, and the sample size is very small (N = 6 groups).

Number of meetings -- A rank order correlation coefficient is also used to assess the presence of a relationship between group mean OPI score changes and the number of meetings held by the group, since not all groups were able to meet for the scheduled eight sessions.

Faculty social distance scale -- To determine the relationship of participating faculty to the total faculty population on the dimension of desired social distance from undergraduates, a Z distribution analysis (t-test) was made of difference of the social distance scale means. This test was chosen because of its appropriateness in testing for difference between the sample and population means in a one-sample analysis with the population variance known.

Follow-up interview data -- Results of the follow-up interviews have been treated as descriptive data and no attempt was made at statistical analysis.

Group discussion content -- The content of the group discussions is reviewed as a part of the descriptive data resulting from the study.

Summary

It is hypothesized that students involved in extra-class small group contact with faculty members would evidence a difference on certain behavior measures from students who

were not exposed to such contact, and that students in such small groups which were high in interaction would change more than those in groups which were low. Experimental and control groups were set up to test these hypotheses.

The student participants were pre-tested and post-tested on the Omnibus Personality Inventory. Analysis of co-variance was applied to the post-test scores to examine the experimental vs. control group differences on each OPI scale. A rank order correlation coefficient was used to compare the group difference scores with the level of group interaction for the experimental groups, as measured by an index devised for this experiment.

Relationship of the number of group meetings to change scores is also examined, using correlation techniques.

Faculty participants in the study completed a faculty-student social distance scale, the results of which were compared with those of the total faculty population of the college, utilizing a t-test for significance.

Follow-up interviews were held with student participants to assess their responses to the project, as a source of supplementary descriptive data.

A detailed analysis of the project data is reported in Chapter IV.

CHAPTER IV

ANALYSIS OF THE DATA

Each of the measures utilized in this study will be separately analyzed in this chapter. No attempt will be made here to draw conclusions or make substantive inferences about these data, since those topics are treated in some detail in Chapter V.

Student Demographic Data

Comparisons of the participants in the project with the general population of the College of Engineering in terms of age, sex, major field, and year in college are summarized in Table 1.

It is evident from the table that the sample was not closely representative of the total student population of the College of Engineering at Michigan State University. The distribution of participants by major field is the only variable on which the Chi-square analysis did not show a significant difference. The sample includes an over-representation of freshman students ($p < .02$), and as a related factor, of younger students ($p < .12$). There are also a significantly higher number of women ($p < .01$) than would be expected in a random sample of engineering students.

TABLE 1

DEMOGRAPHIC CHARACTERISTICS OF STUDENT PARTICIPANTS AND ALL M.S.U. ENGINEERING STUDENTS

AGE	17	18	19	20	21	22+	Mean	χ^2	Signif.
N participants	0	18	10	5	7	3	19.2		
N all engineers	6	516	500	355	312	247	19.0	2.52[1]	$p < .12$

SEX	Male	Female	χ^2	Signif.
N participants	39	4		
N all engineers	1882	46	6.71	$p < .01$

YEAR IN COLLEGE	1	2	3	4	χ^2	Signif.
N participants	24	7	5	7		
N all engineers	640	479	375	434	10.61	$p < .02$

MAJOR FIELD*	AE	CHE	CE	CPS	EE	Eng. Sci.	ME	MMM	SYS	UNDCL.	χ^2	Signif.
N participants	1	1	0	4	7	1	5	0	0	24		
N all engineers	39	132	208	121	332	23	306	27	19	721	12.23	N.S.

*AE = Agricultural Engineering
CHE = Chemical Engineering
CE = Civil Engineering
CPS = Computer Science
EE = Electrical Engineering
Eng. Sci. = Engineering Science
ME = Mechanical Engineering
MMM = Mechanics, Metallorgy, Materials Science
SYS = Systems Engineering
UNDCL. = Undeclared (all freshmen)

[1] 2 X 2 table: 17-18-19 vs. 20-21-22+

Compared with the normative sample for the OPI, the student participants in this project are more theoretically oriented, autonomous, religiously liberal, and able to express their impulses, as may be seen in Table 3.

Omnibus Personality Inventory Scores: Experimental vs. Control Groups

The difference between experimental and Section 1 or Section 2 control groups on the post-test of the Omnibus Personality Inventory is statistically significant (using an alpha level of .05) only for the Altruism scale.

The analysis of co-variance procedure yields a confirmation of the existence of a difference but does not describe the nature or direction of that difference. It is necessary to examine those data in greater detail.

Group mean Omnibus Personality Inventory scale score changes are presented for each group in Table 2. As may be seen in the table, experimental group mean differences are small. Raw OPI data for each participant is found in Table 8 in the back of this report.

The Altruism (Am) column in Table 2 contains evidence that the experimental groups actually changed little on this dimension over the course of the eight weeks of the project. The maximum pre-test - post-test difference for a single experimental group is an increase of 2 raw score points, and two of the six groups decreased, while one had no change. The total net change for all experimental groups

TABLE 2

GROUP MEAN CHANGE SCORES - OMNIBUS PERSONALITY INVENTORY

GROUP	OPI SCALE														
	TI	TO	Es	Co	Au	RO	SE	IE	PI	AL	Am	PO	MF	RB	TOTAL
X1	3.50	3.25	0.75	2.25	1.50	0.75	-0.75	-0.75	1.50	0.00	-1.00	-1.75	2.75	2.25	15.25
X2	0.25	-0.50	0.50	2.00	2.50	2.25	-1.25	4.25	-2.75	-1.50	0.00	0.00	-2.00	0.00	3.75
X3	1.00	1.25	2.75	1.50	-2.25	2.75	-1.75	0.75	-2.00	-2.00	-1.50	3.75	-0.25	1.50	5.50
X4	-0.33	-3.33	-1.67	-1.67	0.67	0.33	-1.33	2.00	-4.33	-1.67	0.67	0.67	-2.00	-0.33	-9.00
X5	4.25	0.50	-1.00	0.50	1.75	1.75	-0.25	0.00	1.25	2.00	2.00	0.50	2.00	0.25	15.50
X6	-2.25	0.50	0.50	2.50	-0.25	-0.25	-3.25	-2.50	1.25	0.25	2.00	-1.00	-1.25	-0.50	-4.25
C1	-1.25	-2.75	-0.75	-1.25	-0.50	-3.00	-1.00	-0.75	-2.00	-2.75	-3.00	1.25	2.00	-1.75	-17.50
C2	-0.50	-1.50	-0.50	4.00	1.25	0.00	-3.00	5.75	-5.75	-2.25	-4.00	-1.00	1.00	-2.00	-7.50
C3	0.00	1.25	1.25	0.25	0.75	0.75	-1.25	-1.50	-2.75	-1.00	-3.25	-1.75	-0.25	-4.00	-11.25
Non-Treatment Controls	0.00	0.14	0.14	-1.28	-2.28	1.14	0.57	-0.28	-1.28	-1.28	-3.00	1.57	1.28	0.43	-4.14

was only eight raw score points, an average gain of 1.33 points per group, or about one-third point per individual.

Since the analysis of co-variance controls for pre-test differences, the source of this result is found in examination of the control group data in Table 2. The total net change for all control groups was sixty-two raw score points, an average total decrease of 15.5 points per group, or 3.1 points for each individual control group participant.

The differential change between experimental and control groups -- approximately 3.4 raw score points -- is something less than one-half standard deviation on the Altruism scale of the OPI.

With these considerations in mind, it may be said with appropriate caution that hypothesis 1:

> Students who participate in informal small group interaction with a faculty member over a period of time demonstrate a difference in certain measured developmental behaviors from those students who do not participate in such interaction.

is supported for the Altruism dimension. As noted in Appendix A, the OPI Altruism scale measures the individual's affiliative tendencies and his concern for the welfare and feelings of others.

The difference within experimental groups or between experimental and either the Section 1 or Section 2 control groups is not statistically significant on any of the other

thirteen scales of the Inventory. Table 3 contains the means and standard deviations for the pre-test and post-test on each of the fourteen scales. Post-test analysis of co-variance data and the tests of significance for each of the scales, adjusted for effects of the co-variate pre-test, are presented in summary form in Table 4 within the experimental groups, between the experimental and control groups, and among the section one control groups.

Since these analyses yielded a significant difference on only one of the OPI scales, a single example analysis of co-variance table is given in Table 4, demonstrating how the analysis was carried out for the Altruism scale.

The matrix of intercorrelations among the fourteen OPI scales for the pre-test and post-test is presented in Table 9 at the end of this report. It should be noted that the within-group pre-test - post-test correlations are quite high for each scale. P-values less than .0001 were found for each of these correlations, indicating a very high relationship and presenting strong evidence of precision in the analysis of treatment effects.

Level of Group Interaction

It was hypothesized that the amount of activity in a group discussion and the breadth of member participation would be related to the effect of the group on its members. Specifically, the hypothesis was stated:

TABLE 3

OPI PRE-TEST AND POST-TEST MEANS AND STANDARD DEVIATIONS

SCALE	PRE-TEST		POST-TEST		NORMS*	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Thinking Introversion	24.5	7.0	25.0	6.8	25.3	7.9
Theoretical Orientation	22.8	4.5	23.8	4.4	19.6	5.7
Estheticism	10.0	5.4	10.2	5.0	12.2	5.2
Complexity	16.6	5.4	17.3	5.1	15.3	5.5
Autonomy	28.8	5.7	28.5	6.3	23.4	8.9
Religious Orientation	16.6	5.5	16.9	5.0	11.8	6.2
Social Extroversion	21.8	7.2	20.1	7.5	23.4	7.1
Impulse Expression	30.1	9.6	30.8	9.7	25.6	8.9
Personal Integration	32.0	8.5	31.0	10.3	29.9	10.5
Anxiety Level	13.5	3.4	12.5	4.1	12.3	4.6
Altruism	21.2	5.2	19.9	7.1	20.8	5.6
Practical Outlook	13.1	5.2	13.6	5.5	14.8	6.4
Masculinity - Femininity	32.7	6.0	33.0	5.8	28.4	7.1
Response Bias	14.2	3.7	13.6	3.6	13.4	4.4

*From OPI Manual

TABLE 4

ANALYSIS OF CO-VARIANCE SUMMARY DATA -
OPI ALTRUISM SCALE

SOURCE	Degrees of Freedom	Adjusted Sum of Squares	Adjusted Mean Squares	F	P
Between Experimental Groups	5	46.8560	9.3712	0.5844	$<$ .7117
Experimentals vs. Controls	2	143.5604	71.7802	4.4765	$<$ .0194
Between Control Groups	2	8.7270	4.3635	0.2721	$<$ .7636
Within Experimental Groups (Error)	32	523.3878	16.3559	—	—

The amount of difference in measured student developmental behaviors is directly proportional to the level of group interaction in experimental groups.

That is, measured change on the OPI scales would be greater for students in experimental groups which experienced a high level of interaction than for those in experimental groups with a low level of interaction. The interaction data appear in terms of these variables for each group in Table 5.

A review of the data in Table 6 demonstrates a significant correlation between group interaction level and group behavior (OPI score) change for the Social Extroversion scale. Rhos of -.94 for variance and -.89 for the index L suggest that a higher level of interaction within the group is related to decreases in scores on the Social Extroversion dimension. None of the other OPI scale changes were related to the level of interaction in the groups.

Exposure to the Treatment:
Attendance Data

The design of this project called for eight meetings of the experimental and Section 1 control groups. Unfortunately with volunteer subjects it was not possible to maintain attendance at a high level for the entire eight-week treatment period. Only one experimental and one control group actually held eight full sessions. One other group met seven times, five groups each held six meetings, and one experimental group was together for only four of the planned eight discussions. Tables 5 and 6 contain the data

TABLE 5

OPI GROUP MEAN CHANGE SCORES vs INTERACTION LEVEL

GROUP		INTERACTION			OPI SCALES -- GROUP MEAN CHANGE SCORES													
ID	NO. MTGS	MEAN	VARIANCE	L	TI	TO	Es	Co	Au	RO	SE	IE	PI	AL	Am	PO	MF	RB
X1	4	82.2	5398	.0152	3.50	3.25	0.75	2.25	1.50	0.75	-0.75	-0.75	1.25	0.00	-1.00	-1.75	-2.75	2.25
X2	6	165.1	3890	.0424	0.25	-0.50	0.50	2.00	2.00	2.25	-1.25	4.25	1.25	-1.50	0.00	0.00	-2.00	0.00
X3	8	57.5	955	.0602	1.00	1.25	2.75	1.50	-2.25	2.75	-1.75	0.75	-4.33	-2.00	-1.50	3.75	-0.25	1.50
X4	6	88.0	2152	.0409	-0.33	-3.33	-1.67	-1.67	0.67	0.33	-1.33	2.00	-2.00	-1.67	0.67	-0.67	-2.00	-0.33
X5	6	104.7	6327	.0165	4.25	0.50	-1.00	0.50	1.75	1.75	-0.25	0.00	-2.75	2.00	2.00	0.50	2.00	0.25
X6	7	106.3	1314	.0809	-2.25	0.50	0.50	2.50	-0.25	-0.25	-3.25	-2.50	1.50	0.25	2.00	-1.00	-1.25	-0.50
RANK ORDER CORRELATION COEFFICIENTS			Δ OPI vs MEAN		-.37	-.56	-.44	.26	.60	-.26	.03	.14	.50	.49	.64	.11	.30	-.66
			Δ OPI vs VARIANCE		-.66	-.01	.39	.14	-.37	.03	-.94*	.03	-.04	-.66	-.30	.20	.19	-.31
			Δ OPI vs L		-.71	-.19	.21	.31	-.54	-.03	-.89*	-.03	.19	-.26	.10	-.26	.10	-.60
			Δ OPI vs NO. MTGS.		-.31	.04	.33	.09	-.60	.26	-.66	.03	-.19	-.26	.05	.60	.68	-.74

* Significant, $p < .05$

TABLE 6

OPI CHANGE SCORES VS. INTERACTION LEVEL

SOCIAL EXTROVERSION

Group	Mean Change S.E.	Rank	Participation Units Mean	Rank	Participation Units Variance	Rank	Interaction Index L	Rank	Number of Group Meetings	Rank
X1	-0.75	2	82.2	5	5398	5	.0152	6	4	6
X2	-1.25	3	165.1	1	3890	4	.0424	3	6	4
X3	-1.75	5	57.5	6	955	1	.0602	2	8	1
X4	-1.33	4	88.0	4	2152	3	.0409	4	6	4
X5	-0.25	1	104.7	3	6327	6	.0165	5	6	4
X6	-3.25	6	106.3	2	1314	2	.0809	1	7	2
Correlation			Δ S.E. vs. Mean = .03		Δ S.E. vs. S^2 = -.94*		Δ S.E. vs. L = -.89*		Δ S.E. vs. Mtgs. = -.66	

*Significant, $p < .05$

related to the number of group meetings. Although an effort was made to encourage attendance through written notices and telephone contact, many participants found other demands on their time had higher priority.

Because of this variability in exposure to the experimental treatment, it was considered important to analyze possible systematic differences which may have been associated with the number of sessions held by a group. This analysis was treated by an observation of the relationship between change on the various scales of the OPI and the number of experimental sessions.

A rank order correlation coefficient was used to compare the mean group changes on the OPI scales with the number of meetings held by the group. No significant correlations were found for any of the scales on this dimension. Thus no relationship between amount of treatment and amount of change is suggested by the data here.

It should be noted that no legitimate means were determined for this study to analyze a possible relationship of individual attendance to change scores, since randomization to control for relevant variables is not possible.

Faculty-Student Social Distance Scale

A frequency distribution of the faculty responses to the faculty-student social distance scale is presented in Table 7. Seventy faculty members returned the scale, representing sixty-three percent of the one hundred and ten regular faculty to whom the scale was sent.

TABLE 7

FACULTY-STUDENT SOCIAL DISTANCE SCALE - FREQUENCY DISTRIBUTION

SCALE		ALL FACULTY	PARTICIPANTS
(0)	I prefer to have nothing to do with undergraduate students.	1	0
(1)		0	0
(2)	I prefer to deal with undergraduates only in the formal classroom or laboratory situation.	0	0
(3)		0	0
(4)	I am willing to teach undergraduate students and to work with them in academic-related situations.	11	0
(5)		15	0
(6)	I am interested in working with undergraduate students in out of class activities as well as academic-related and classroom situations.	7	1
(7)		15	1
(8)	I am interested in helping undergraduate students with personal as well as academic matters.	7	2
(9)		5	1
(10)	I am interested in having undergraduate students as my personal friends.	9	1

All Faculty: N = 70, M = 6.5, s = 2.10

Participants: N = 6, M = 8.0, s = 1.41

s_x = .63

z = -2.38

Seventeen percent (twelve) of the engineering faculty who responded would choose to limit their interaction with undergraduates to academic situations. Another fifteen professors -- for a total of thirty-eight percent -- listed their interest in undergraduates as something short of participation in "out of class activities." Evidently more than one-third of the faculty of the college -- if we may assume this sixty-three percent to be representative -- prefer to limit their teaching role to class-related functions. One professor indicated his desire to avoid undergraduates altogether.

At the other end of the scale, twenty-nine percent (twenty-one) of the respondents expressed a desire to work with students in personal matters (twelve) and/or to maintain personal friendships with their students (nine).

The mean response of the total faculty falls slightly above the item "I am interested in working with undergraduate students in out of class activities as well as academic-related and classroom situations," suggesting that the engineering faculty in general are supportive of students and student programs in the college.

Despite several indications in the statement of instructions that only a single response was requested, five individuals checked more than one item. In those cases, the result was recorded as an average of the checked responses, with acknowledgement of the possible dilution of the intent of the respondent by this averaging.

Table 7 shows that the all-faculty mean is 6.5 (one-half scale point above the "out of class activities as well as academic related" item). For the six faculty participants (whose responses to the scale were not confidential -- a fact which they knew prior to responding), the mean was 8.0, "I am interested in helping undergraduate students with personal as well as academic matters." A t-test for the significance of the difference between the all-faculty and participant means revealed the difference to be significant at the .01 point (one-tailed test), indicating that considerable confidence may be placed in the existence of an actual difference here.

This statistical confirmation of a difference which is clearly evident on inspection lends substance to the interpretation of the results. It may be said with considerable confidence that those faculty members who volunteered to take part in this project choose to associate with undergraduate students at considerably closer range than do most of their faculty colleagues.

Descriptive Data: The Follow-up Survey

The follow-up survey questionnaire was completed by a total of thirty-four (ninety-five percent) of the thirty-six participating (experimental and control Section 1) students who completed the project. Twenty of these were filled out by students who took part in a follow-up interview.

A brief summary of the questionnaire responses is presented here for each item. A detailed tabulation of the cumulative ranking of responses appears in Table 10.

Classes, friends and personal freedom are listed as by far the "most outstanding features" in the college experience for the student participants in this project. While classes are clearly ranked first on this item, the combined rankings of "male friends," "female friends," and "roommates" place peers on a par with classes at the top position. The intellectual atmosphere of the university and the faculty have evidently made little impression on these students thus far since they fall near the bottom of this ranking. A further examination of the original responses, however, reveals that those who did indicate the faculty or the intellectual atmosphere as outstanding features tended to be the upperclassmen, perhaps an unsurprising finding. Thus this sample in which freshmen are over-represented might be expected to weight heavily the influence of peers, because of the great importance of the peer culture in the first months of college (see Chapter II). The high ranking of personal freedom as an outstanding feature of college is a result which should be recognized here as consistent with the relatively high OPI scores for Autonomy.

Comments in response to this item ranged from one cynical male freshman who observed that "Come to think of it, no feature in my college experience has been outstanding,"

to a more optimistic female -- also a freshman -- who claims to have "learned a lot about life that I didn't have opportunity to in (my home town)."

An element of loneliness is suggested by the reported expectations of these participants at the beginning of the project. Their most often expected gain was to meet other students, followed by nearly equal hopes to meet faculty and to learn about engineering. It was interesting to note the number who hoped to "recommend changes" through their participation in the project. And a number of responses indicated that a "bull session" was the anticipation of some participants.

Interpretation of the responses to this item must take into account the inaccuracy and unreliability of post hoc recall. What one actually expects from an activity may differ from his stated objectives, and differ more widely yet from his recollection eight weeks later of what he expected.

It is evident that these student expectations were fulfilled only partially at best. The comments of one faithful participant characterize some of the sense of disappointment:

> I had hoped that the small group project would be a catalyst for change within the College of Engineering as well as the University College, toward a greater involvement of the individual with his academic surroundings. ...I did get to know some people...engineers tend to be a rather staid lot. I guess I also learned that engineers would not like to get involved with these changes.

Another, however, noted that he "gained other things" from participating, so that he felt his response (his

expectations were "little" met) did not represent his "true feelings."

The group members themselves were clearly identified by the respondents as the factor primarily responsible for meeting their expectations from the project. The members were considered a positive influence on the achievement of expectations, while lack of structure, the second ranked factor, was generally considered to impede goal accomplishment for participants, although a number responded positively to the unstructured group. An important set of negative influences was grouped under the category "outside factors," the single most important of which was, as might be expected, class work.

Few comments were made regarding this item, however, it was evident that poor attendance was thought a significant inhibitor of group success. On the positive side, one student noted that "Meeting with the guys who have been through a lot of what I have to go through helped to prepare me for what to expect..."

Group members chastized each other again on the item which offered them an opportunity to suggest changes in the project. Better member attendance was the first choice for change, followed by other changes in member behavior, including more even participation and a request for more talking on the part of the faculty members. The latter proposal, not surprisingly, was related to the individual faculty members, since there were also a few suggestions that the faculty participant talk <u>less</u>!

One student observed that the faculty member should have been a "good leader," and that student participants should have been more carefully selected. Another noted that the "tape recorder inhibited some of the things that might have been said." There was some support for assigned topics, as suggested by the comment that the discussions "were stimulating...but to assign subject matter would give some outline to go on."

The principal self-reported gains from participation in the project were "help in getting along with others," "more favorable attitude toward engineering," and "more favorable attitude toward faculty." Information about himself, and job and technical information were other major gains reported by group members. Although a few observations of a less favorable attitude toward engineering did appear, no one reported feeling less favorable toward the faculty as a result of participation in the small group project. Viewed together with the one-third of the participants who now feel more favorable toward the faculty (one-half of those who were actually in a group <u>with</u> a faculty member), there may be a "hidden value" suggested here.

Several student comments noted that they had gained from learning how others feel about a variety of subjects, and having the opportunity to share their own ideas with others.

In an over-all evaluation from the participants, the project was rated "favorable" by twenty, "very favorable" by

two, and "mediocre" to "very poor" by twelve. Emphasis in this item was on the value of the experience for the respondent, not on any generalized estimation of its worth. Nevertheless, some bias in the direction of a response which would please the project director is probably represented here. A further analysis to identify the respondents at each evaluation level yielded no systematic pattern of differences among experimentals and controls, among classes, or among attendance patterns.

A number of comments on this item are of interest:

> I felt I gained from the group, but no more than I gain from bull sessions in the dorm.
>
> I found that my ideas were also held by others including faculty.
>
> The small group project and I seemed to have two different ends in mind.
>
> I enjoyed meeting with other students with viewpoints different than mine -- I may have helped myself become better adjusted to MSU.
>
> This was my first experience in a small group and I enjoyed it and benefitted very much.
>
> I enjoyed it!

The final question was open ended, and asked for the student's view about "the importance of informal relationships between faculty and students outside the classroom." The responses were somewhat varied, although nearly all the student participants were favorable toward the idea of informal relationships with faculty. Because of the central importance to this study of student opinion regarding faculty-student

relationships, selected student responses to this item are presented here in their entirety, with no editing -- even spelling and grammatical errors have been left in. These statements are considered more effective in accurately expressing representative student attitudes than could be on edited commentary. The balance of the student responses to this item appear in Appendix G.

> I believe outside relationships are very important, especially in a university of this size because the material gained in class is very cut and dried and can usually be obtained in any text.
>
> I think it is important for the faculty and student to have some relationship outside the classroom. It helps in learning and creates a better atmosphere.
>
> I feel that their should be more outside contact because you realize the professor is not just a machine who presents the material to the class, but an individual with his own motives and desires.
>
> I feel it is fairly important on the basis that the faculty get to know just how the students feel about him and the way he is teaching.
>
> I believe they are important to the education of the individual. Without them a student could not become <u>fully</u> educated. However they must be a spontaneous thing and cannot be artificially created.
>
> It is helpful but not necessary.
>
> I see no need for informal relationships with faculty members outside of a persons major, unless of course it is on a friendship basis. Within a persons major he has some one to go to for help with problems, course selection, and career opportunities other than just his academic advisor.

During the discussion of their OPI scores with the experimenter, the twenty students who were interviewed were

nearly unanimous in their endorsement of the profiles as accurately descriptive of their self-perceptions of their behavior.

Descriptive Data: The Content of Group Discussions

The amount of interaction in an experimental group has been considered herein as a more useful criterion for assessment than the content, since discussions in more "natural" situations may deal with a wide variety of content.

Nevertheless, this report would be incomplete without at least a cursory look at "what went on" in the group discussions. First, it is worth noting that the similarities among the groups "outweighed" the differences. The presence or absence of a faculty member made a difference in some cases, but the differences were not systematic. The same was true of a female member. More readily observable were the differences resulting from personality distinctions among the members. When a faculty member acted in a dominant or leadership role, the group tended to respond accordingly, permitting him to control the direction of activity. If the faculty member of an experimental group, however, operated as "just another member," the group tended to ignore his outside "status" and to be relatively uninhibited by his presence.

Typically beginning with some form of personal introductions, the groups then often diverted to a discussion of a major field, hometown, residence hall, or course which was

held in common by two or more members. Many of the first and second sessions were characterized by questions from freshmen or sophomores to a faculty member or upper division student about curricular matters (e.g., "Will I have to take...?" "What is the policy regarding...?").

Residence halls were a common topic during the first weeks in the life of these groups, largely because of the then-current proposals for change in University policy regarding opposite-sex visitation in residences.

Boy-girl relationships were another frequent topic -- as often in mixed as in single-sex (all male) groups. An all-University colloquy on sexuality, conducted during the course of the Winter term, made discussions of sexual concerns a more open phenomenon than is typical -- although it is doubtful that the frequency of occurrence of this topic increased significantly across the campus. There was some evidence in the discussion tapes that the colloquy had increased the students' awareness, and perhaps their knowledgeability, regarding sexuality.

The campus newspaper had an almost predictable impact upon some groups. The current issues already noted were regularly updated via the University daily, and other matters of note were often brought into groups by this news vehicle. The prospect of a new University president, the non-reappointment of a controversial psychology professor, and the national political scene were commonly brought up in the groups as a result of an article or editorial in the day's paper.

The engineering profession and the engineering curriculum as a vehicle of preparation were often discussed. Job prospects were very much a concern of seniors, and underclassmen wanted to know "how the going was" for those nearing commencement. Faculty members and older students with work experience were typically asked many questions about what an engineer "does" on the job. The curriculum was a source of considerable controversy as students questioned the value of certain courses they had taken -- or would have to take -- and faculty members attempted to explain the relevance of those programs with which they were familiar. Because of the random assignment of subjects to the groups, there were few instances in the groups of professor and student from the same department within the college. Even in as seemingly esoteric a field as engineering, departmental differences are sufficient to cause some communication difficulties. Nevertheless, these discussions seemed to be of value for the underclassmen as they sought to understand what lay ahead.

There was one group in the control section which began with an active -- perhaps activist -- dialogue apparently aimed at recommending major changes in the engineering curriculum, including more flexibility and opportunity to choose courses more freely. Somehow their enthusiasm evaporated after the second meeting, and they never did complete a substantive proposal.

In all, the discussion content seemed of interest to the participants if for no other reason than as a source of stimulation to broaden their perspectives. Although limited to engineering students and faculty, nearly all of the groups ranged widely in their choice of topics. Student response in the follow-up interviews was generally enthusiastic, and as has been noted, their written evaluations were generally favorable.

Summary

Students who participated in this study were not a representative sample of their classmates in the College of Engineering. The participants were significantly younger, more likely to be freshmen, and included a greater proportion of women than the total population of the college. Their major fields, however, were reasonably representative of the enrollments in the various engineering departments.

Samples of student behavior, in the form of scores on the Omnibus Personality Inventory, were the principal measures of the outcomes of this project. Analysis of covariance applied to the experimental vs. control group OPI score differences resulted in significance only in the case of the dimension Altruism.

When behavior change is viewed in relationship to the level of interaction in a group, a significant (negative) relation is suggested for the Social Extroversion measure.

There is no evidence to indicate that the amount of exposure to the experimental treatment (i.e., the amount of small group interaction with a faculty member) is related to the quantity of change on any of the measured dimensions.

On a scale of attitudes toward closeness to undergraduate students, the faculty members who volunteered to participate in this project reported a significantly greater desire for personal relationships with students than did the total faculty of their college. The faculty generally favored moderately close relationships with the students.

In a follow-up survey of the discussion group participants, much of the previous research on student attitudes and life-styles was confirmed. These students have found interpersonal relationships to be the most outstanding features of their college experience. They volunteered for the small group project seeking to meet other students and faculty. Although they were generally favorable toward their small group participation, they were disappointed that attendance was not better, and that their initial expectations were only partially fulfilled. Improved interpersonal relationships were -- perhaps predictably from the preliminary expectations -- improved for many participants. This and a more favorable attitude toward engineering were notable reported outcomes of participation.

A review of the content of the small group discussions revealed a broad scope of topics, including curricula, the

engineering profession, sexuality, politics, and university policies.

In Chapter V, conclusions and implications for higher education and student development are presented for these findings.

CHAPTER V

DISCUSSION, SUMMARY, AND IMPLICATIONS

This study has attempted to demonstrate experimentally the impact on the behavior of college students resulting from close informal interaction with a professor in the environment of a small group. In addition, several related issues in the general area of faculty-student relationships in higher education were investigated. What is the meaning of the results? What conclusions may be drawn from these findings? What are the implications of this research for practice in higher education? What further research is suggested by these data?

Discussion

The assumption in higher education that the faculty plays a critical role in the educational development of the students is so firmly established by tradition as to be considered a truism. Research, however, has failed to support the traditional faculty position that students benefit from close contact with their teachers. It is noted in Chapter II that little evidence exists to suggest that the faculty significantly influence student behavior development.

The results of this study of faculty impact on students generally corroborate the findings of prior research, with one important exception. The data herein suggest that close contact with a professor under these experimental conditions may have produced in students a greater concern for others, and a greater tendency toward personal, trusting relationships. With the number of different behavior measures represented by the fourteen OPI scales, it is possible that the resulting significant difference on one scale could be a statistical artifact. Nevertheless, when these data are viewed in the perspective of the over-all results of the study, a pattern of corroborating evidence appears.

The students who volunteered to participate in this project were younger than a representative sample of their fellows, more likely to be women, and more likely to be in their first year of college. Thus, in many ways they represented a relatively isolated segment of the student population. Younger students face many personal and academic uncertainties. Women are largely regarded as strangers in engineering. Underclassmen do not yet have identity with a specific major field, and are still "finding their way" in the multiversity.

The participants volunteered primarily to meet other students and faculty, evidencing a need for contact with other persons beyond their present circle. They met with faculty members who were extraordinarily interested in personal relationships with students. The more lively experimental

group interaction was more likely to meet their social needs. As a result of this experimental interaction with a caring faculty member, these students developed or maintained a greater concern for the welfare and feelings of others, while their peers who did not have such contact with the faculty were decreasing in the same behavior. Moreover, they gained help in interpersonal relations and a more favorable attitude toward faculty as well.

It was also noted in these groups that with a high level of group interaction and well-balanced participation, the members' expressed need for being with others tended to decrease. This level of interaction during the meetings was evidently a more important contributor to the outcomes than was the number of times the group got together.

The attitude toward students of the participating faculty was evidently an important factor. Compared with their teaching colleagues, these professors represent a sample of those who are highly concerned about students as persons, thus modelling that behavior which was found to change in the student participants.

It will be recalled from the expressed interests of the students in voicing their expectations from the discussion group meetings, that they sought to meet other students and faculty members. After the treatment they identified improved interpersonal relations as the most frequent gain from participation. They came <u>seeking</u> an environment within which to enjoy social exchange, and -- given the essential freedom to

"create their own" environment -- produced a social situation which yielded personal growth in the area of interpersonal relationships, "help in getting along with others" and a "more favorable attitude toward engineering."

These findings must be interpreted within the parameters of this study, yet with some optimism as well. The experimental controls and corroborating data present considerable support for the results. It may be concluded that such out-of-class faculty-student contact can have a measurable impact upon student behavior. The need to match the nature of that contact with the objectives of the students -- as we theoretically attempt to do in the classroom -- appears to be the critical variable which must be controlled.

College and university programs involving the faculty in various forms of contact with students are common. Professors are typically called upon to serve as "advisors" to students, to sponsor organizations, to attend and participate in a variety of campus activities. Deans, department chairmen, and student personnel workers regularly encourage faculty members to become "involved" with students outside the classroom.

The result of this research calls into question the assumption which apparently underlies the unquestioning support of such programs: that any contact between faculty members and students is valuable and will contribute to the desired growth of the students. The evidence from this and prior research is clear: most faculty-student interaction

has little measurable impact upon students. However, when a faculty member is selected, because of particular competencies, to interact with students who are seeking those behaviors for which he may be an effective guide, measurable student behavior change may be effected.

A haphazard, catch-as-catch-can approach to interaction between students and faculty has been shown of questionable usefulness. Interactions which have been purposefully designed to accomplish specific objectives may provide a means to demonstrate the value of close faculty-student contact beyond the classroom.

Summary of the Study

It has been generally assumed in higher education that close student-faculty relationships are to be desired, and college catalogs typically extol the virtues of the "small student-faculty ratio" and the "friendly academic community" that exists on the campus. Research evidence to support these concepts, however, is practically negligible. There is considerable need to define those educational experiences which are most important to student development, including the most educationally effective forms of human interaction on the campus.

The literature of higher education reveals that the faculty are influential in the collegiate growth of undergraduates principally in relation to their aspirations and plans for further study and vocational choice. The popular

myths of the importance of instructional style and close student-teacher interaction are simply not supported by the available research data.

The processes of the small group as an agency of change in the development of individual behaviors have been shown to be effective under certain conditions. The greatest value of such programs seems to be when the group experience is specifically designed to help accomplish the behavioral objectives of the individual.

These findings from prior research in higher education led to the design of an experimental study of faculty-student interaction, bringing students and faculty members together in small groups and attempting to measure changes in students' behavior which resulted. It was hypothesized that students involved in extra-class small group interaction with faculty members would develop in certain behaviors more than students who were not exposed to such contact, and that students in small groups which were high in interaction would change more than those in groups which were low. Experimental and control groups were set up to test these hypotheses.

The principal measures of outcomes of the project, scores on the Omnibus Personality Inventory, revealed evidence of experimental effects only in the case of the dimension Altruism. Further examination of the data suggest cautious optimism in the interpretation of this result.

When measured behavior changes were viewed in relationship to the level of interaction in a group, a significant negative relation was suggested for the Social Extroversion

measure. This finding may be interpreted as indicative of the tendency of group interaction to meet members' needs for social contact.

There is no evidence to indicate that the amount of exposure to this experimental treatment is related to the quantity of change on any of the measured dimensions.

The student sample who took part in the study were somewhat different from their classmates in the College of Engineering, and somewhat different from engineers in general. When compared to their own population, the participants were significantly younger, more likely to be freshmen, and included a greater proportion of women than the total enrollment of the college. Their major fields were reasonably representative of the various engineering departments. Compared to engineering students in general, this group was more highly autonomous, more liberal, had greater freedom of impulse expression, and were better adjusted personally.

On a scale of attitudes toward closeness to undergraduate students, the faculty members who volunteered to participate in this project reported a significantly greater desire for personal relationships with students than did the total faculty of their college.

A follow-up survey of the discussion group participants confirmed much of the previous research on student attitudes and life-styles. These students have found interpersonal relationships to be the most outstanding features of their college experience. They volunteered for the small group

project seeking to meet other students and faculty. Although they were generally favorable toward their participation, they were disappointed that attendance was not better, and that their initial expectations were only partially fulfilled. Improved interpersonal relationships were -- perhaps predictably from the preliminary expectations -- improved for many participants. This and a more favorable attitude toward engineering and the faculty were notable reported outcomes for the participating students.

The content of the small group discussions revealed a broad scope of topics, including curricula, the engineering profession, sexuality, politics, and university policies.

It is hypothesized that the experimental vs. control differences in altruism of the subjects is, although small, a difference in behavior which may be attributed to the effects of the experimental treatment. Supporting this concept are the data from the self-report of the subjects on the follow-up questionnaire.

A potentially significant value in close faculty-student contact is suggested by this study, when this interaction takes place under conditions which are purposefully facilitative of growth in directions sought by the student.

Implications for Research and Practice in Higher Education

Joseph Katz (1968) has observed that the key to faculty-student interaction in the university is not "how much" but "how": "It is the nature of the contact, not its frequency,

that is crucial" (p. 27). The findings of this study certainly support that view.

The experimental treatment involved the presence of a faculty member in six of ten randomly assigned groups of students. The groups were given no agenda, no program to follow, no specific objectives, no topics to discuss, and essentially no structure except the membership and an adjustable meeting schedule. The assumption implicit in the design of these groups was that simply exposing students to a weekly small group discussion with a faculty member would produce behavior change. In the light of the findings reported herein, and in accord with the known principles of human learning, it is hypothesized that behavior change will take place as a result of an experience specifically designed to produce that change. Thus for the present research, greater changes in student behavior could have been expected to result from interaction with a faculty member if that contact had been structured to provide the conditions leading to the desired change.

To the degree one may legitimately generalize from the results of this research, the following implications for the future of higher education are suggested:

1. College students seek certain learning experiences in terms of their perceptions of the ways in which they will benefit therefrom. They look for contact with a faculty member in terms of their view of the role the professor may play

in student learning. Typically, they see faculty members as information sources, and seek them out for information. If colleges wish to have teachers sought by students as models for certain behaviors, the faculty role in relation to students must change considerably.

2. Much research is needed on the applications of the social learning model to the area of faculty-student relations in higher education. For example, what structures for faculty behavior in <u>this</u> project might have produced other specific changes in the student participants?
3. The real impacts of participation in the kind of human interaction which took place in the small discussion groups are likely to appear over a longer period of time. Thus, some type of follow-up study on the participants in this project should be made after perhaps one year and three years to assess such factors as persistence in college, persistence in engineering, attitudes toward the college, the faculty, and the profession, and scores on the OPI personality variables.

4. Colleges and universities should stop promoting "close faculty-student relations" except when the closeness is accompanied by a purposeful program to aid the growth and development of students toward their own goals. It is evident that the student peer group will continue to be the primary source of their satisfactions in interpersonal relationships, however, involvement with selected faculty members in situations designed to accomplish specific objectives can be of significant value.
5. Additional research, toward the application of the principles of human learning to the definition of the conditions which may produce desired behavior change, should be undertaken. By defining the ways in which faculty members may be of maximum value in influencing student self-development, we may determine important new and purposeful directions for faculty-student interaction in higher education.

Alfred North Whitehead's statement with which this thesis began provides a particularly fitting summary upon which to conclude:

> The students are alive, and the purpose of education is to stimulate and guide their self-development.

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T A B L E S

TABLE 8

OMNIBUS PERSONALITY INVENTORY SCALE SCORES FOR INDIVIDUAL PARTICIPANTS, WITH GROUP MEAN DIFFERENCE SCORES

		TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
GROUP X1															
Member	Test														
A	Pre	16	16	03	09	24	10	23	15	42	17	20	09	27	18
	Post	27	27	11	16	31	13	28	22	52	18	28	12	37	22
B	Pre	21	18	13	15	22	11	21	40	28	13	22	20	32	10
	Post	21	15	11	18	20	11	19	30	26	09	15	12	33	13
C	Pre	33	24	09	17	27	08	26	14	45	12	28	07	36	23
	Post	36	26	09	19	29	07	20	15	43	15	26	06	35	24
D	Pre	30	22	08	14	24	14	20	21	43	17	25	14	36	19
	Post	30	25	05	11	23	15	20	20	43	17	22	13	37	20
Group Mean Difference		3.5	3.25	0.75	2.25	1.50	0.75	-0.75	-0.75	1.50	0.00	-1.00	-1.75	2.75	2.25

TABLE 8 CON'T.

GROUP X2 Member	Test	TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
A	Pre	19	16	12	26	27	17	31	42	07	06	19	16	17	06
	Post	23	19	14	25	32	16	33	47	08	03	25	13	18	08
B	Pre	22	22	07	11	22	14	20	33	28	08	19	12	36	10
	Post	16	20	07	18	25	22	14	38	23	06	15	11	33	11
C	Pre	10	23	07	15	28	22	19	38	32	11	11	22	41	11
	Post	15	25	05	16	26	23	20	40	27	06	11	22	34	08
D	Pre	14	22	04	15	22	02	21	33	21	11	14	15	40	08
	Post	12	17	06	16	26	03	19	38	19	15	12	19	41	08
Group Mean Difference		0.25	-0.50	0.50	2.00	2.50	2.25	-1.25	4.25	-2.75	-1.50	0.00	0.00	-2.00	0.00

TABLE 8 CON'T.

		TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
GROUP X3															
Member	Test														
A	Pre	15	20	05	18	33	20	24	26	36	12	21	14	38	15
	Post	22	22	07	13	31	23	19	25	37	12	23	17	41	16
B	Pre	18	18	09	15	23	18	22	41	33	11	14	17	34	10
	Post	18	22	09	14	23	20	23	34	36	12	16	19	38	13
C	Pre	22	20	07	12	24	10	24	28	37	14	17	17	34	14
	Post	20	20	14	16	19	17	21	34	32	08	15	25	31	15
D	Pre	27	26	11	10	19	16	32	34	26	08	25	17	31	12
	Post	26	25	13	18	17	15	32	39	19	05	17	19	26	13
Group Mean Difference		1.00	1.25	2.75	1.50	-2.25	2.75	-1.75	0.75	-2.00	-2.00	-1.50	3.75	-0.25	1.50

TABLE 8 CON'T.

		TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
GROUP X4															
Member	Test														
A	Pre	22	23	08	19	29	22	21	24	25	09	23	15	34	10
	Post	21	18	08	18	33	21	18	31	13	07	19	16	34	11
B	Pre	31	26	22	24	23	07	20	37	32	19	19	14	28	17
	Post	29	23	19	24	22	06	20	37	29	16	20	15	27	16
C	Pre	23	19	11	17	29	11	26	30	44	20	24	15	35	14
	Post	25	17	09	13	28	14	27	29	46	20	29	11	30	13
Group Mean Difference		-0.33	-3.33	-1.67	-1.67	0.67	0.33	-1.33	2.00	-4.33	-1.67	0.67	0.67	-2.00	-0.33

TABLE 8 CON'T.

GROUP X5 Member	Test	TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
A	Pre	21	28	03	20	36	24	18	30	34	16	19	12	46	13
	Post	27	28	04	19	34	24	16	27	28	15	18	15	45	14
B	Pre	29	27	08	10	33	16	31	32	44	14	17	18	31	20
	Post	26	25	03	07	32	19	30	30	48	18	21	19	38	17
C	Pre	26	14	13	17	27	06	12	15	45	16	24	06	25	16
	Post	33	17	12	25	35	13	14	21	52	19	30	06	30	17
D	Pre	22	24	10	18	29	19	26	31	36	12	21	19	29	14
	Post	29	21	11	16	31	16	26	32	36	14	20	17	26	16
Group Mean Difference		4.25	0.50	-1.00	0.50	1.75	1.75	-0.25	0.00	1.25	2.00	2.00	0.50	2.00	0.25

TABLE 8 CON'T.

GROUP X6 Member	Test	TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
A	Pre	31	30	20	27	38	20	29	38	33	16	28	07	30	14
	Post	28	28	16	23	39	20	24	32	37	16	29	07	32	13
B	Pre	14	15	01	13	33	20	11	33	17	14	18	18	39	09
	Post	11	17	04	16	30	16	13	44	15	11	19	19	35	08
C	Pre	29	25	11	14	12	12	22	40	23	10	21	19	33	14
	Post	24	22	12	19	13	17	22	39	24	13	25	18	27	11
D	Pre	23	19	09	09	20	15	26	42	23	04	16	22	28	12
	Post	25	24	11	15	20	13	16	28	25	05	18	18	31	15
Group Mean Difference		-2.25	0.50	0.50	2.50	-0.25	-0.25	-3.25	-2.50	1.25	0.25	2.00	-1.00	-1.25	-0.50

TABLE 8 CON'T.

GROUP C1 Member	Test	TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
A	Pre	29	26	07	16	27	19	25	20	49	18	29	11	33	19
	Post	27	23	07	14	28	12	28	16	50	19	28	09	36	22
B	Pre	27	19	15	14	25	19	15	28	27	09	17	13	34	14
	Post	28	18	15	13	23	17	11	27	26	09	10	15	36	10
C	Pre	17	23	06	17	34	22	13	40	14	14	16	14	33	11
	Post	13	14	05	13	33	17	13	39	15	07	12	19	33	08
D	Pre	35	27	15	23	36	17	25	34	44	17	31	03	28	21
	Post	35	27	13	25	36	19	22	43	35	12	31	03	31	18
Group Mean Difference		-1.25	-2.75	-0.75	-1.25	-0.50	-3.00	-1.00	-0.75	-2.00	-2.75	-3.00	1.25	2.00	-1.75

TABLE 8 CON'T.

		TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
GROUP C2															
Member	Test														
A	Pre	19	21	05	11	27	20	09	27	46	16	21	13	37	19
	Post	17	21	03	18	21	19	09	44	39	12	08	13	40	13
B	Pre	16	18	07	12	33	10	12	07	34	10	23	13	31	13
	Post	16	16	08	14	35	13	13	11	31	08	23	11	31	14
C	Pre	37	28	20	28	39	21	33	43	38	17	30	02	30	17
	Post	37	27	21	30	40	21	32	48	30	16	31	02	27	14
D	Pre	30	28	16	20	35	13	28	19	44	18	25	12	27	17
	Post	30	25	14	25	27	11	16	16	39	16	21	10	25	17
Group Mean Difference		-0.50	-1.50	-0.50	4.00	1.25	0.00	-3.00	5.75	-5.75	-2.25	-4.00	-1.00	1.00	-2.00

TABLE 8 CON'T.

		TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
GROUP C3															
Member	Test														
A	Pre	21	22	04	20	34	18	11	30	33	18	22	07	39	15
	Post	25	25	06	17	39	15	12	28	26	18	19	08	37	18
B	Pre	08	16	05	09	29	24	11	41	29	11	10	19	35	07
	Post	12	17	06	11	30	24	07	39	27	09	06	20	35	09
C	Pre	35	27	18	20	27	09	15	17	34	12	31	09	25	21
	Post	32	28	19	20	24	11	12	16	29	10	32	11	22	19
D	Pre	23	28	06	12	30	19	29	31	34	15	22	16	35	18
	Post	23	27	08	13	29	21	32	31	39	16	19	18	33	15
E	Pre	34	21	20	20	33	19	17	29	16	11	18	09	24	12
	Post	29	22	19	21	34	21	15	28	14	10	14	10	30	11
Group Mean Difference		0.00	1.25	1.25	0.25	0.75	0.75	-1.25	-1.50	-2.75	-1.00	-3.25	-1.75	-0.25	-4.00

TABLE 8 CON'T.

		TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
GROUP CØ		(Non-treatment control)													
Member	Test														
A	Pre	33	21	09	20	37	17	26	37	31	14	23	04	24	09
	Post	31	28	11	21	32	21	28	43	19	09	22	08	26	11
B	Pre	26	24	12	17	26	17	19	28	27	17	21	09	34	15
	Post	24	26	10	19	29	19	26	30	22	12	17	14	36	10
C	Pre	23	24	07	10	23	22	16	11	27	14	13	22	35	13
	Post	19	20	08	08	21	22	17	11	34	14	12	23	36	14
D	Pre	32	30	11	20	36	24	17	32	33	15	22	10	35	16
	Post	38	30	13	15	31	22	19	32	33	15	17	08	36	19
E	Pre	30	26	10	16	30	11	22	18	43	15	29	10	36	16
	Post	29	25	08	16	29	13	21	19	42	14	28	08	36	17
F	Pre	28	28	09	15	31	24	09	41	27	10	18	16	39	11
	Post	24	24	08	14	26	25	13	41	25	13	11	22	41	11
G	Pre	31	29	17	26	40	21	33	44	40	18	24	06	31	19
	Post	36	30	18	22	39	22	34	33	44	17	22	05	32	20
Group Mean Difference		0.00	0.14	0.14	-1.28	-2.28	1.14	0.57	-0.28	-1.28	-1.28	-3.00	1.57	1.28	0.43

TABLE 9

OPI PRE-TEST -- POST-TEST INTERCORRELATION MATRIX

PRE-TEST	TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
TI	1.00													
TO	.57	1.00												
ES	.74	.34	1.00											
CO	.52	.36	.63	1.00					(PRE-TEST DATA)					
AU	.06	.19	.07	.60	1.00									
RO	-.28	.11	-.22	.07	.37	1.00								
SE	.53	.49	.43	.40	.26	-.02	1.00							
IE	.05	.15	.24	.30	.23	.40	.25	1.00						
PI	.23	.29	.01	.00	.10	-.23	.24	-.25	1.00					
AL	.08	.24	.03	.33	.34	-.12	.15	.01	.53	1.00				
AM	.67	.44	.40	.54	.24	-.29	.47	-.18	.43	.24	1.00			
PO	-.54	-.18	-.38	-.66	-.48	.23	-.27	.03	-.31	-.39	-.67	1.00		
MF	-.43	.17	-.59	-.32	.03	.30	-.43	-.05	.17	.18	-.27	.25	1.00	
RB	.53	.56	.26	.19	.02	-.29	.35	-.27	.70	.42	.53	-.36	-.01	1.00

TABLE 9 CON'T.

(PRE-TEST - POST-TEST DATA)

POST-TEST	TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
TI	.84													
TO	.60	.72												
ES	.66	.22	.89											
CO	.58	.19	.66	.77										
AU	.01	.01	.07	.59	.86									
RO	-.18	.04	-.14	.01	.33	.84								
SE	.40	.37	.29	.35	.24	.03	.88							
IE	.00	.00	.04	.19	.20	.36	.06	.81						
PI	.08	.16	.01	-.08	.02	-.24	.23	-.29	.88					
AL	.17	.30	.01	.20	.15	-.22	.20	-.12	.62	.76				
AM	.53	.21	.36	.52	.27	-.38	.50	-.25	.44	.32	.83			
PO	-.57	-.15	-.49	-.67	-.43	.21	-.40	-.01	-.38	-.31	-.76	.86		
MF	-.48	-.01	-.59	-.36	.08	.29	-.46	-.08	.15	.13	-.40	.15	.82	
RB	.47	.43	.21	.20	.08	-.30	.42	-.35	.70	.28	.55	-.34	-.18	.80

TABLE 9 CON'T.

POST-TEST	TI	TO	ES	CO	AU	RO	SE	IE	PI	AL	AM	PO	MF	RB
TI	1.00													
TO	.72	1.00												
ES	.74	.32	1.00											
CO	.67	.40	.72	1.00					(POST-TEST DATA)					
AU	.23	.15	.12	.34	1.00									
RO	-.13	.10	-.19	-.12	.24	1.00								
SE	.47	.50	.36	.26	.28	.01	1.00							
IE	-.01	.07	.06	.28	.11	.38	.19	1.00						
PI	.23	.31	-.04	-.15	.05	-.12	.27	-.39	1.00					
AL	.25	.33	-.01	.01	.20	-.22	.30	-.18	.72	1.00				
AM	.65	.46	.42	.50	.42	-.25	.53	-.23	.40	.36	1.00			
PO	-.73	-.42	-.48	-.69	-.57	.11	-.33	.01	-.25	-.29	-.72	1.00		
MF	-.49	-.11	-.68	-.52	.05	.25	-.43	-.07	.15	-.29	-.46	.30	1.00	
RB	.61	.59	.27	.17	.10	-.29	.35	-.44	.70	.47	.61	-.46	-.15	1.00

TABLE 10

PARTICIPANT RESPONSES TO FOLLOW-UP QUESTIONNAIRE-FREQUENCY DISTRIBUTION

2. What do you consider to be the three most outstanding features in your college experience thus far?

53	classes	7	residence
29	personal freedom	5	activities
25	male friends	5	faculty members
14	roommates	4	athletics
13	female friends	2	books read
13	social events	0	job
12	other	0	small group project
11	intellectual atmosphere		

3. At the beginning, what did you expect to gain from participation in the small group project?*

51	meet students	14	break up routine
31	meet faculty	10	vocational advice
29	learn about engineering	9	other
26	recommend changes	3	help with coursework
23	bull session	1	discuss politics

4. How well have your expectations (item 3) been met by your participation in a group?

3	completely	5	little
7	almost fully	1	not at all
18	partially		

5. What factors are responsible for your expectations being met (or not met) to the extent you noted in item 4?*

65	group members	16	time schedule
28	lack of structure	8	group disagreements
25	faculty members	3	meeting place
25	outside factors	2	others
22	yourself		

*Weighted Rank Totals (1st choice = 3; 2nd choice = 2; 3rd choice = 1).

6. What would you change if the project were starting again and you could control what happens?*

26	better attendance	5	join different group
25	change members' behavior	5	faculty listen better
19	faculty talk more	4	change faculty behavior
18	more even participation	4	members stay on topic
14	not participate	4	change faculty (other)
13	other	3	change members (other)
12	assign topics	3	faculty talk less
12	meet at different time	3	faculty be friendlier
8	switch faculty	2	faculty stay on topic
7	eliminate tape recorder		

7. Can you identify specific things you have gained from participating?

12	help in getting along with others
12	more favorable attitude toward engineering
12	more favorable attitude toward faculty
11	information about yourself
7	job information
6	technical information
5	nothing
4	help with coursework
3	curriculum planning
3	less favorable attitude toward engineering
3	other
2	social acitivities information

8. What is your over-all evaluation of the small group experience <u>for</u> <u>you</u>?

2	very favorable
20	favorable
9	mediocre
2	poor
1	very poor

APPENDICES

APPENDIX A

OMNIBUS PERSONALITY INVENTORY (FORM F)
DEFINITIONS OF THE FOURTEEN SCALES[1]

Thinking Introversion (TI) -- 43 items: Persons scoring high on this measure are characterized by a liking for reflective thought and academic activities. They express interests in a broad range of ideas found in a variety of areas, such as literature, art, and philosophy. Their thinking is less dominated by immediate conditions and situations, or by commonly accepted ideas, than that of thinking extroverts (low scorers). Most extroverts show a preference for overt action and tend to evaluate ideas on the basis of their practical, immediate application, or to entirely reject or avoid dealing with ideas and abstractions.

Theoretical Orientation (TO) -- 33 items: This scale measures an interest in, or orientation to, a more restricted range of ideas than is true of TI. High scorers indicate a preference for dealing with theoretical concerns and problems and for using the scientific method in thinking; many are also exhibiting an interest in science and in scientific activities. High scorers are generally logical, analytical, and critical in their approach to problems and situations.

Estheticism (Es) -- 24 items: High scorers endorse statements indicating diverse interests in artistic matters and activities and a high level of sensitivity and response to esthetic stimulation. The content of the statements in this scale extends beyond painting, sculpture, and music, and includes interests in literature and dramatics.

Complexity (Co) -- 32 items: This measure reflects an experimental and flexible orientation rather than a fixed way of viewing and organizing phenomena. High scorers are tolerant of ambiguities and uncertainties; they are fond of novel situations and ideas. Most persons high on this dimension prefer to deal with complexity, as opposed to simplicity, and very high scorers are disposed to seek out and to enjoy diversity and ambiguity.

Autonomy (Au) -- 43 items: The characteristic measured by this scale is composed of liberal, non-authoritarian thinking and a need for independence. High scorers show a tendency to be independent of authority as traditionally imposed through social institutions. They oppose infringements on the rights of individuals and are tolerant of viewpoints other than their own; they tend to be realistic, intellectually and politically liberal, and much less judgmental than low scorers.

Religious Orientation (RO) -- 26 items: High scorers are skeptical of conventional religious beliefs and practices and tend to reject most of them, especially those that are orthodox or fundamentalistic in nature. Persons scoring around the mean are manifesting a moderate view of religious beliefs and practices; low scorers are manifesting a strong commitment to Judaic-Christian beliefs and tend to be conservative in general and frequently rejecting of other viewpoints. (The direction of scoring on this scale, with religious orientation indicated by low scores, was based chiefly on the correlation between these items and the first four scales, which measure a general intellectual disposition.)

Social Extroversion (SE) -- 40 items: This measure reflects a preferred style of relating to people in a social context. High scorers display a strong interest in being with people, and they seek social activities and gain satisfaction from them. The social introvert (low scorer) tends to withdraw from social contacts and responsibilities.

Impulse Expression (IE) -- 59 items: This scale assesses a general readiness to express impulses and to seek gratification either in conscious thought or in overt action. High scorers have an active imagination, value sensual reactions and feelings; very high scorers have frequent feelings of rebellion and aggression.

Personal Integration (PI) -- 55 items: The high scorer admits to few attitudes and behaviors that characterize socially alienated or emotionally disturbed persons. Low scorers often intentionally avoid others and experience feelings of hostility and aggression along with feelings of isolation, loneliness, and rejection.

Anxiety Level (AL) -- 20 items: High scorers deny that they have feelings or symptoms of anxiety, and do not admit to being nervous or worried. Low scorers describe themselves as tense and high-strung. They may experience some difficulty in adjusting to their social environment, and they tend to have a poor opinion of themselves. (Note the direction of scoring on this scale: a high score indicates a low anxiety level, and vice versa.)

Altruism (Am) -- 36 items: The high scorer is an affiliative person and trusting and ethical in his relations with others. He has a strong concern for the feelings and welfare of people he meets. Low scorers tend not to consider the feelings and welfare of others and often view people from an impersonal, distant perspective.

Practical Outlook (PO) -- 30 items: The high scorer on this measure is interested in practical, applied activities and tends to value material possessions and concrete accomplishments. The criterion most often used to evaluate ideas and things is one of immediate utility. Authoritarianism, conservatism, and non-intellectual interests are very frequent personality components of persons scoring above the average.

Masculinity-Femininity (MF) -- 56 items: This scale assesses some of the differences in attitudes and interests between college men and women. High scorers (masculine) deny interests in esthetic matters, and they admit to few adjustment problems, feelings of anxiety, or personal inadequacies. They also tend to be somewhat less socially inclined than low scorers and more interested in scientific matters. Low scorers (feminine), besides having stronger esthetic and social inclinations, also admit to greater sensitivity and emotionality.

Response Bias (RB) -- 28 items: This measure, composed chiefly of items seemingly unrelated to the concept, represents an approach to assessing the student's test-taking attitude. High scorers are responding in a manner similar to a group of students who were explicitly asked to make a good impression by their responses to these items. Low scorers, on the contrary, may be trying to make a bad impression or are indicating a low state of well-being or feelings of depression.

APPENDIX B

CALCULATION PROCEDURE -- LEVEL OF INTERACTION INDEX

Level of Interaction is defined for purposes of the present study as the ratio of average participation units to the variance of participation. Thus

$$L = \frac{M}{s^2}$$

where L = Level of Interaction

M = Average of participation units for a group session (total units divided by number of members present)

s^2 = Variance of participation, a statistical term which represents the "spread" of participation scores. If one or two members dominate a discussion, s^2 will be high; if a discussion is well balanced among those present, s^2 will be low.

The calculation procedure, therefore, is as follows:

1) The participation unit scores for each member during a session are to be used as the raw data (X). Scores are arranged in a vertical column, with a parallel column for the squares of these scores (X^2).

2) The scores (X) and squares (X^2) are summed for the total group (ΣX and ΣX^2).

3) The average of participation units (M) is calculated simply by dividing ΣX by the number of participants (N).

4) The variance s^2 may be calculated according to the formula

$$s^2 = \frac{\Sigma X^2 - \frac{(\Sigma X)^2}{N}}{N - 1}$$

5) The level of interaction (L) is then calculated simply by definition formula

$$L = \frac{M}{s^2}$$

It may be seen that it is theoretically possible, if a discussion is "perfectly balanced" (i.e., each member participates equally) for the index L to be infinite (since $s^2 = 0$). The probability of such an occurrence in a group of six persons is, however, negligible.

This index is purely a mathematical convenience used as a representation of the amount of interaction which takes place in a group. Obviously the term "level" has nothing to do with the qualitative aspects of a discussion such as might be measured in a content analysis profile.

The formula defining the index was devised to provide an increase in level of interaction when the amount of participation increases, and when the participation is more balanced among the members. The procedure for scoring participation provides that one "participation unit" will be recorded for (1) each new verbal communication by a member, (2) a "restart" by the same member after a noticeable pause, (3) each five minutes of an extended communication.

APPENDIX C

FACULTY-STUDENT SOCIAL DISTANCE SCALE

The following series of statements represent several possible attitudes faculty members may hold toward undergraduate students. You are asked to check that item which most closely represents your own feelings -- either one of the items listed or a point on the scale between two items. Your answer will be completely anonymous, so please be honest in your response.

____ I prefer to have nothing to do with undergraduate students.

____

____ I prefer to deal with undergraduates only in the formal classroom or laboratory situation.

____

____ I am willing to teach undergraduate students and to work with them in academic-related situations.

____

____ I am interested in working with undergraduate students in out of class activities as well as academic-related and classroom situations.

____

____ I am interested in helping undergraduate students with personal as well as academic matters.

____

____ I am interested in having undergraduate students as my personal friends.

APPENDIX D

College of Engineering Small Group Project
Guidelines for Discussion Groups

The following guidelines are presented in an attempt to maximize the benefit to each participant in the group, and to assure a very broad comparability between groups. A purposeful attempt to minimize unnecessary structure has been made, and you are encouraged to feel unbound by any concern for "what we <u>should</u> do." The group and the time are yours.

(1) The group is to meet for two hours each week for eight meetings, at a time convenient for all members.

(2) Each member is asked -- but in no way coerced -- to attend all sessions of the group.

(3) Each member will be asked to assume a minor "housekeeping" responsibility such as picking up the tape recorder.

(4) The group meetings are for your own benefit and may be organized (or disorganized!) in any way you choose. It is suggested that you make an honest effort to get to know the members of your group personally.

(5) As noted, discussion topics are open to the group. Two suggestions may be helpful to you:

   a) Some possible areas of interest may include the academic process, your individual hobbies and interests, personal philosophies, professional interests, developing friendships, politics, dating, this group, personal adjustment to college and/or life in general.

   b) It is recommended that specific matters dealing with your current course work -- for example a <u>particular</u> homework problem, exam, or class assignment -- <u>not</u> become topics of discussion, primarily because so few in the group are likely to be interested.

(6) Any material (comments, questions, criticisms, feelings, problems, suggestions) which is presented in the group meetings will, although tape recorded, be maintained as strictly confidential by the project director. However, if any member has comments about the program of the University or the College of Engineering which he wishes to be passed on anonymously, an effort will be made to report such items to the Office of Engineering Student Affairs. Obviously, no promise of results from such items is expressed or implied.

(7) The group may meet anywhere and at any time which is mutually convenient for the members, however, each group session is to be tape recorded for the project director. The small third floor conference rooms are available for the scheduled meeting time and may be arranged for other times upon request.

(8) I sincerely hope you and the members of your group find this experience to be rewarding and stimulating. Please feel free to contact me at any time.

Robert E. Alberti
Project Director
355-0921

APPENDIX E

Observer Score Sheet for Group
Discussion Participation Units

Member 1	Member 2	Member 3	Member 4	Member 5	Member 6

Note: One participation unit is to be scored for:

(1) each new verbal communication by a member
(2) a "restart" by the same member after a noticeable pause
(3) each 5 minutes of an extended communication by one member

APPENDIX F

FOLLOW-UP QUESTIONNAIRE

1. Name _____ Group _____

   Age _____ Major _____ Year ____ Group Attendance ____

2. What do you consider to be the three most outstanding features in your college experience thus far? (Rank 1, 2, 3):

   __ class
   __ male friend(s)
   __ female friend(s)
   __ roommates
   __ residence
   __ intellectual atmosphere
   __ social events
   __ activities
   __ faculty members
   __ athletics
   __ other (list)
   _____
   _____
   __ personal freedom
   __ small group project
   __ job
   __ books read

   Comment:

3. At the beginning, what did you expect to gain from participation in the small group project? (Rank 1, 2, 3):

   __ meet faculty
   __ meet students
   __ learn about engineering
   __ bull session
   __ vocational advice
   __ break up routine
   __ help with coursework
   __ discuss politics
   __ recommend changes
   __ other (list)
   _____
   _____

   Comment:

4. How well have your expectations (item 3) been met by your participation in a group?

__ completely __ almost fully __ partially
__ little __ not at all

Comment:

5. What factors are responsible for your expectations being met (or not met) to the extent you noted in item 4? (Rank 1, 2, 3, and mark + by positive factors, - by negative factors).

__ group members
__ faculty members
__ yourself
__ others (list)
_____
_____

__ lack of structure
__ time schedule
__ group disagreements

__ meeting place
__ outside factors (job, class work, etc.) specify _____

6. What would you change if the project were starting again and you could control what happens? (Rank 1, 2, 3):

__ join different group
__ switch faculty
__ not participate
__ change members' behavior
  __ more even participation
  __ better attendance
  __ stay on topic
  __ other

__ assign topics
__ eliminate tape recorder
__ meet at different time
__ change faculty behavior
  __ talk less
  __ talk more
  __ listen better
  __ stay on topic
  __ be friendlier
  __ other (list)
  _____

__ other (list)
_____
_____
_____

Comment:

7. Can you identify specific things you have gained from participating?

__ nothing
__ technical information
__ job information
__ help with coursework
__ social activities information
__ other (list) _____
_____
__ curriculum planning
__ information about yourself
__ help in getting along with others
__ more favorable attitude toward engineering
__ less favorable attitude toward engineering
__ more favorable attitude toward faculty
__ less favorable attitude toward faculty

Comment:

8. What is your over-all evaluation of the small group experience <u>for you</u>?

__ very favorable __ favorable __ mediocre
__ poor __ very poor

Comment:

9. Would you please describe briefly your point of view about the importance of informal relationships between faculty and students <u>outside the classroom</u>.

APPENDIX G

STUDENT PARTICIPANT COMMENTS ON FACULTY-STUDENT RELATIONSHIPS

I think it is a very good idea for faculty and students to get along informally.

Without some type of outside contact, many members of the faculty would have little knowledge of how their students think, and in general, would make grading much harder if the students were not known outside of class.

Students are relaxed and not afraid their question might be laughed at by other students when in an informal atmosphere. Many students can gain more insight in a problem area when a personal relationship between instructor and student is acquired.

A relationship would help break the feeling that the faculty are out to screw everyone to the wall, and too to prove to the student that they are just as human as the students are.

In our group I never saw a faculty member but I would be in favor of more informal relationships.

I believe, "I think," that faculty-student relationships and informal communication can be a very great help to students (and perhaps even to the faculty), but only if the student is interested and willing -- he should not (could not) be forced into such a relationship.

Faculty members are human beings and it is important that students see them in a different light than the lecture hall.

Helps strengthen the students interests in the faculty.

I think it is important for students to become aware of the fact that profs are human.

It helps you to realize that faculty members are human and don't always consider you subordinate to them.

This lets a person get to see a prof and gain more respect for him. Also gives a person ( ) to ask questions.

It gives the student something to grab on to while swimming in the sea of higher education.

It helps you to understand them. Therefore, acting better toward classwork.

I feel it would help both groups. It would be easier to learn from some one whom you know, some one who doesn't seem like a robot placed in the room to spout formulas for an hour. An all Engineering Bull Session (with alcohol to remove inhibitions) would do much to improving student morale and interest. Maybe a study session at Revere's or Monty's.

I think that they could be a good thing. The teacher could get a feel for what the student wants to learn and how he wants to learn it. The student would be able to understand the teacher and his teaching habits better.

Most students don't want to talk to their professors outside of the classroom about anything but classwork and grades. My opinion is alot of profs. have too much to do to sit around and shoot the bull. If I see a professor I know in the hall or elsewhere I merely say hi and it ends at that. There are, however, a few profs. on campus I do talk freely with. Informal relationships are, therefore, of little importance to the student and faculty member except in certain cases.

Such relationships are highly desirable, but more important is the feeling of esprit d'accord among engineering students.

I feel that the faculty student relationship, speaking for myself, is very far but I am trying to get to know my profs. and try to break down an illusion of the prof. residing in some impregnable castle with his time for the student limited and have a friend and someone to help with problems.

Professors are just people outside the classroom.

As the experience with Dr. _____ showed, it is definitely an advantage. Also Dr. _____'s interest was stimulating towards communications with students.

Generally you never get to know faculty members very well which is too bad because many of them are so interesting and it would be both beneficial and interesting to talk with them and get to know them better.

I feel that a student should have a friendly, but not a real close relationship with faculty. Mainly a student will feel free to see a faculty member to ask questions or work out problems freely; not nerves or scared to speak to a faculty member. A student will benefit more with a friendly relationship in the future.

More important for students who are overawed by the curriculum or the faculty to get to know one or more faculty members informally than for a more mature student or one who is less challenged by his course of study.

Relationships with students are invaluable for many reasons the most important of which may be lessons in how to deal with people, how different people react to different situations, and how to live and work with someone you may not especially like. Relationships with faculty are important but I wouldn't rate them as important as those with your peers. I would have enjoyed getting to know several of the faculty better but I feel that those that I do know have been very helpful.

I don't have any point of view.

No.