THE COMMUNICATION PATTERNS AND THE STRUCTURE OF SOCIAL RELATIONSHIPS AT A LARGE UNIVERSITY

Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
R. LANCE SHOTLAND
1970

This is to certify that the

thesis entitled

The Communication Patterns and the Structure of Social Relationships at a Large University

presented by

R. Lance Shotland

has been accepted towards fulfillment of the requirements for

Ph.D. degree in Psychology

Date 20 July

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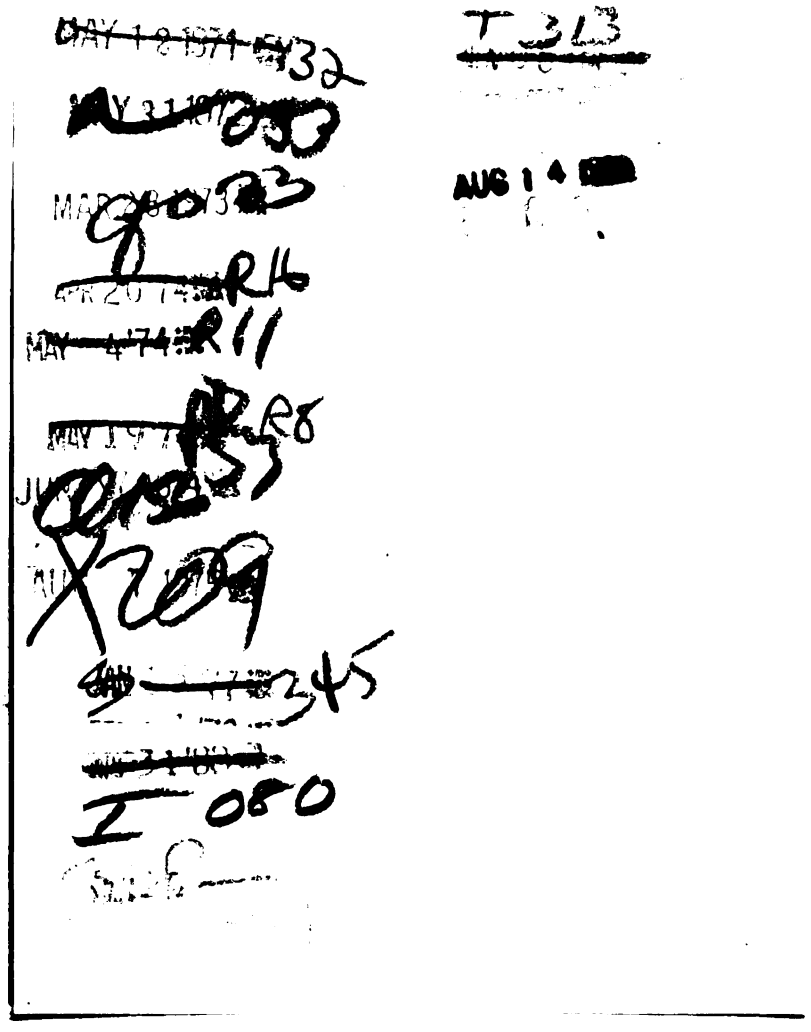

ABSTRACT

THE COMMUNICATION PATTERNS AND THE STRUCTURE OF SOCIAL RELATIONSHIPS AT A LARGE UNIVERSITY

by R. Lance Shotland

Within the literature produced by several student movements some very specific complaints pertaining to the social structure of the university appear. Two student movements on two different campuses were viewed with regard to complaints about the social structure of the university. The activist students complained that they were socially separated from the faculty, from the administrators and from other students.

It was hypothesized that students would be connected to other students, faculty members and administrators by the longest informal communication channels. On the basis of Leavitt's (1958) study, it was also hypothesized that administrators would have the shortest informal communication channels to other administrators, faculty and students.

The technique used in the present study to measure the length of informal communication channels was first used by Milgram (1967). Milgram called the technique the "Small World Method." Using the Small World Method, two sets of individuals are selected. One set of individuals is designated the starter persons, a second set of

individuals is designated the target persons. A starter person is asked to try to pass an instructional booklet to the target person by only passing the booklet to people they know according to a certain criterion (e.g., knowing the person on a first name basis, etc.). If the starter person does not know the target person according to the criterion the starter person is then instructed to pass the booklet to an acquaintance he does know according to the criterion, who has a better chance of being acquainted with the target person. The number and characteristics of the intermediary persons between the starter and target serve as the dependent variables.

Student, faculty and administrators were randomly selected to serve as starter and target persons from the population of a large university. Each starter person was asked to start two booklets to student targets, two booklets to faculty targets and two booklets to administrator targets. Each target person was asked to receive a possible two booklets from student starters, two booklets from faculty starters and two booklets from administrator starters. The starter and target persons were randomly paired.

The results confirmed the hypotheses. Students had the longest informal communication channels while the administrators had the shortest communication channels. Thus, in Leavitt's terminology administrators may be said to be the most central group while the students are the most

peripheral group within the university. The results were discussed in terms of the peripherality of the students and their contentment with the social structure of the university. Suggestions were made for the modification of the social structure of the university.

Approved: Robert H. Davis
Committee Co-Chairman

John E. Hunter
Committee Co-Chairman

Date: 20 July 1970

Thesis Committee:
Robert H. Davis, Co-Chairman
John E. Hunter, Co-Chairman
Charles Hanley
Lawrence A. Messé

THE COMMUNICATION PATTERNS AND THE STRUCTURE OF SOCIAL RELATIONSHIPS AT A LARGE UNIVERSITY

By

Robert Lance Shotland

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

1970

Our youth today have luxury. They have bad manners, contempt for authority, disrespect for older people. Children nowadays are tyrants. They contradict their parents, gobble their food and tyrannize their teachers.

Socrates

There is a time when the operations of the machines become so odious, make you so sick at heart, that you can't take part, you can't even tacitly take part. And you've got to put your bodies upon the wheels, upon the levers, upon all the apparatus, and you've got to make it stop. And you've got to indicate to the people who run it, to the people who own it, that unless you're free the machine will be prevented from working at all.

Mario Savio

DEDICATION

To Joseph Katz and Hans Toch - through their classes I became interested in the relationship between people.

ACKNOWLEDGMENTS

I would like to thank Dr. Robert H. Davis and the Learning Service of Michigan State University for supporting this research. Without this early sign of confidence this research would never have been accomplished. I would like to thank Dr. John E. Hunter for providing me with invaluable assistance both with computer programming and the Markov model within this dissertation. I would also like to thank Doctors Charles Hanley and Lawrence Messé, who with Doctors Davis and Hunter, provided me with many thoughtful suggestions which improved the quality of this work.

PREFACE

The research to be presented developed from some very specific complaints by activist students on two different college campuses between the years of 1964-1966. These complaints concern the informal communication networks and a feeling of a lack of community within a large university. It is precisely these complaints that will be explored within this dissertation. The author, however, takes a much broader scope in reviewing two student movements in the following section. The complaints of a lack of community within the academic community are placed in the context of a larger set of complaints in which they occurred. It is hoped that the presentation of these specific complaints within the larger context of the background of the student movements will enable the reader to view these complaints with perspective.

The two student movements selected for review were chosen for several reasons. One, both student movements occurred within several months of each other. Two, both student movements occurred on campuses with relatively large student bodies. Three, the Free Speech Movement is the best known student movement and thus many of the pamphlets produced by the movement have been published. Four, the study to be described was carried out at Michigan State University,

the campus where the Committee for Student Rights took place.

It should also be mentioned that the results of this study, which support student complaints about the informal communication channels and social structure, is not the entire cause of student dissent. Other factors are involved and interact with the student's place in the social structure which may result in student activism. This point is explored within the discussion section.

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CHAPTER I

INTRODUCTION

A university is often called an "academic community," implying that students, faculty, and administrators share common goals and objectives. During the middle 1960's student disturbances began to upset the normal functioning of the larger, more prestigeous institutions, showing a clash of objectives and goals, and thus calling the concept of an "academic community" into question.

Peterson (1966) performed a national survey to determine what issues were related to student unrest. His data can be interpreted to indicate that 62% of the disturbances were in response to objections of the students' role in the university.[1] Within the literature produced by several student movements some very specific complaints pertaining to the social structure of the university appear. The following two sections will concern themselves with the events on two campuses.

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[1] The 62% is composed of 28% of protests over living group arrangements, 18% over student participation in campus policy making, 9% over rules regarding "controversial" visitors to campus, and 7% over curriculum inflexibility.

One campus, The University of California at Berkeley, has a history of political activism among its student population and had the first student protest of the 1960's that gained national publicity. This protest, perhaps more aptly referred to as a revolt, was named the Free Speech Movement (FSM). The second set of events took place at Michigan State University, a campus with little history of political activism among its student population. A series of incidents will be discussed leading up to The Committee for Student Rights (CSR), Michigan State University's first student movement of any size or consequence.

The Free Speech Movement

The revolt at The University of California at Berkeley which began in September of 1964 is possibly one of the best known student disturbances and perhaps the disturbance with the widest consequences. Berkeley has been described as the model for future public education in the United States; the revolt brought it to the edge of collapse and called the basic premise of the modern university into question.

The FSM pamphlet writers concentrated on two issues during the course of the movement, i.e., "Free Speech" from which the movement took its name and the relationship of the student to the rest of the university.

The topic of Free Speech as an issue of protest was not a new one at Berkeley. In October of 1934 several

students at the University of California at Los Angeles were suspended for supposed Communist activities. In addition, the editor of the student newspaper at the University of Santa Clara was replaced as a result of a story condemning the R.O.T.C. program. A one-hour student strike at Berkeley was scheduled and held in protest over the denial of free expression. In the late 40's with the close of the war and the passage of the G.I. Bill there was a preponderance of veterans on campus whose attitudes seemed to dampen any attempts at political activity. The early 1950's were not any more eventful. Starting in the late 1950's political protest once more arose.[2]

Robert G. Sproul, a prior president of the University of California sought to control the influx of public speakers on campus. It was under his administration that Rule 17 was passed. Rule 17 stated in effect that it was the perogative of the university (the administration) and the university alone to decide what speakers would be permitted on campus. In 1957 Sproul, under pressure from the political reawakening of the students relaxed Rule 17. Under this revision, unrecognized off-campus groups composed entirely of University of California students were permitted to use campus facilities if the events were judged of interest to the total student body. In 1958 and 1959 there were public

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[2] M. Heirich & S. Kaplan, "Yesterday's Discord," in S. Lipsit & S. Wolin (Eds.) The Berkeley Student Revolt: Facts and Interpretations (Garden City, N.Y.: 1965) pp. 10-37.

expressions of disapproval (a Daily Californian editorial and a student government statement) over what was the remainder of Rule 17. In addition to this there were objections to the relocation of the Sather Gate Free Speech area to a new location at Telegraph and Bancroft Streets. The administration, at this time, was attempting to liberalize the rules in addition to searching for a formula that would make it clear that student and faculty activities off campus did not speak for the university.[3]

On October 23, 1960 Clark Kerr, the president of the University of California, issued what was later to be called the Kerr directives. These rules stated that:

> (1) The preamble of the student government constitution on each campus shall be changed to make it clear that the student governments are directly responsible to the appropriate chancellor's office,
>
> (2) student governments are forbidden to speak on off-campus issues,
>
> (3) amendments to student government are subject to the prior approval of campus officials,
>
> (4) to be recognized, student organizations must have an active advisor who is a faculty member or a senior staff member; such groups must declare their purposes to be compatible with the educational objectives of the university; they must not be affiliated with any partisan political or religious group; and they must not have as one of their purposes the advocacy of positions on off-campus issues.[4]

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[3]Heirich & Kaplan, p. 20.

[4]Heirich & Kaplan, p. 21.

Kerr, at the same time, modified Rule 17 so that it was no longer exclusively a "university responsibility" to engage qualified speakers on important societal issues but in addition it also was to be a student's responsibility to obtain these speakers. Rule 17 now read that the university recognized the intellectual value of discussion of public issues on campus. In short, on October 23, Kerr made two moves: One was to attempt to control the amount and variety of political advocacy on university campuses that he felt would reflect on the university. The second was to liberalize "free speech" by public speakers on campus. Students all over the university system protested the Kerr amendment.

In February, 1961, Kerr modified regulations to allow the distribution of non-commercial literature on campus. This change came about as a result of a law suit brought against the university by a UCLA student.

In August of 1961, another statement was made by Kerr relating to the political rights of students. These new rules prohibited political action groups from establishing headquarters on campus and denied the use of the university's name in describing themselves.

The following academic year (1961-62) a debate took place in the Daily Californian between Kerr and two members of SLATE (the Berkeley "Activist" Party). Kerr replied that it was not true that previously held student rights had been denied; if the students believe that the Kerr directives are

less liberal than the previous rules, they could ask for a return to Rule 17.

During the next academic year (1962-63), Kerr announced that off-campus political groups could use University facilities provided their meetings were not used to plan political action.

In June of 1963, the regents voted to lift the Communist speakers ban as a result of a suit brought against the University by four Riverside students.

During the 1963-64 school year, "radical" students began to spend increasing amounts of time in civil rights activity in the San Francisco Bay area learning the tactics of non-violent protest.

Up to this point in the Free Speech controversy, Berkeley students attempted to reach a peaceful solution amenable to both themselves and the administration.[5]

On September 16, 1964, Dean of Students, Katherine Towle, sent a letter to all "presidents, chairmen, and advisors" of students activities stating that henceforth no tables used by political groups to collect money and recruit would be allowed in the Bancroft and Telegraph entrance, and that the dissemination of unapproved literature

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[5] Heirich & Kaplan, p. 22.

and other activities on off-campus political issues would be prohibited.[6,7]

On September 17, twenty organizations formed a United Front to protest the new rules. The groups ranged in interest from radical-socialist groups, religious groups, Young Democrats and Republican Clubs, including Youth for Goldwater.[8]

Interested students at first tried to reason with the university and expressed their opinion that the new ruling was unjust. As the university was unwilling to yield,

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[6]Editors of the California Monthly, "Chronology of Events: Three Months of Crisis," Lipset & Wolin, p. 100.

[7]There has been much controversy over the reasons for this attempt at reducing political activity on campus. Most speculation, however, seems to center around the Oakland Tribune, a newspaper owned by former California Senator William Knowland. The fact that the newspaper was picketed for allegedly discriminatory hiring practices during the summer of 1964 by Campus CORE certainly was not looked on with an approving eye at the "Tribune," not to mention the Civil Rights activity in the San Francisco Bay area the preceding fall. The final straw came, however, at the Republican Convention in July of 1964. Scranton supporters organized a pro-Scranton rally originating on campus and taking place at the convention without getting official permission from the university. Senator Knowland, a Goldwater supporter asked why this had been permitted in an editorial. FSM supporters felt that this editorial caused pressure to be brought to bear on the university.

[8]Hal Draper, Berkeley: The New Student Revolt (New York, 1965) p. 32.
It should be noted that once the tactics of the FSM turned to civil disobedience the political right groups tended to leave the FSM as they disagreed with these tactics.

the students' next move was to disobey the university ruling. They set up their tables and handed out unapproved literature against the university regulation. Five students were suspended and legal charges were placed against one of these students. The FSM was born out of these actions.

Thus one issue of the FSM was very clearly that of "free speech." Yet a great many pamphlets and flyers of the FSM complained about education at Berkeley, i.e., the students' role in the university in comparison to the role of other segments of the university. The FSM members, as put forth through their literature, believed that the two issues of free speech and the quality of education were inseparable:

> "In contrast to this tendency to separate the issues, many thousands of us, the Free Speech Movement, have asserted that politics and education are unseparable, that the political issue of the first and fourteenth Amendments and the educational issue cannot be separated. In place of "great university" we have said "impersonal bureaucracy," "machine" or "knowledge factory" ...[9]

From the point of view of the FSM, the issues were not separable because it was the administration's use of coercion that violated their constitutional rights and this same use of coercion which hindered their education.

> "We get a four-year-long series of sharp staccatos: eight semesters, forty courses, one hundred twenty or more "units," ten to fifteen impersonal lectures per week, one to

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[9]The Free Speech Movement, "We Want A University," Lipset and Wolin, p. 211.

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> three oversized discussion meetings per week led by poorly paid graduate student "teachers." Over a period of four years the student-cog receives close to forty bibliographies; evaluation amounts to little more than pushing the test button, which results in one hundred regurgitations in four years; and the writing of twenty to thirty-five "papers" in four years, ...[10]

The FSM pamphlet writers implied and made direct references to divisions between various segments of the academic community. For instance a FSM pamphlet entitled "We Want A University" complained of the divisions between students and faculty and between faculty and faculty:

> He (the student) loses contact with his professors as they turn more to research and publishing and away from teaching. His professors lose contact with one another as they serve a discipline and turn away from dialogue.[11]

Again we get a glimpse through the eyes of the FSM into a gulf they felt divides the students and the faculty.

> ...the overwhelming majority of faculty members have not been permanently changed, have not joined our community, have not really listened to our voices--at this late date. For a moment on December 8th, eight hundred and twenty-four professors gave us all a glimpse--a brief, glorious vision--of the university as a loving community. If only the Free Speech Movement could have ended that day.[12]

FSM participants not only saw a gulf between faculty and students, and one between faculty, but they also saw an

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[10]The Free Speech Movement, Loc. cit., p. 211.

[11]Heirich & Kaplan, p. 214.

[12]Heirich & Kaplan, p. 210.

isolation of the student from other students. Gerald Rosenfield, a pamphlet writer for the FSM, describes the feeling of communality obtained from a civil rights demonstration and then related it to the emotions derived from the FSM. Rosenfield states:

> "...we stayed and lived together that night and through the next day, and when it was over we were no longer strangers to one another. For twenty-four hours we were a community."[13]

Again, in another pamphlet the same issue of the students' isolation from his fellow student is found.

> "Although our issue has been free speech, our theme has been solidarity. When individual members of our community have acted, we joined together as a community to jointly bear the responsibility for their actions. We have been able to revitalize one of the most distorted, misused, and important words of our century: comrade. The concept of living cannot be separated from the concept of other people. In our practical fragmented society, too many of us have been alone. By being willing to stand up for others, and by knowing that others are willing to stand up for us, we have gained more than political power, we have gained personal strength. Each of us who has acted, now knows that he is a being willing to act."[14]

Another possible division of the academic community exists between the administration and the students. It is the administration that is seen as the enemy by the FSM.

> "The University's power structure is explicitly modeled after that of the corporation. We have a Board with final and total authority; a President and Chancellors responsible only to it; and

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[13]Gerald Rosenfield, "Generational Revolt and the Free Speech Movement." Paul Jacobs & Saul Landau, The New Radicals: A Report With Documents (New York: 1966) p. 215.

[14]The Free Speech Movement, p. 208.

> a mass of students and faculty with no rights except those they can extract by the threat of direct action."[15]

Again, we find this same complaint of the administration holding all the power to the exclusion of other segments of the university.

> "At the present time, University regulations governing the form of expression on the campus are promulgated by the administration, while other segments of the University community are limited to a purely advisory capacity."[16]

If the administration has full power there might be little need for contact with students in order to run the university. Thus there might be little contact between administrators and students.

The FSM membership thus felt they had two interrelated problems; the problem of a stifling of free speech by the administration and the problem of the students' lack of power and isolation within the academic community in comparison with the faculty and administration. These problems were felt to be so severe that Mario Savio, a leader of the FSM, stated from the steps of the Administration Building:

> "There is a time when the operations of the machine become so odious, make you so sick at heart, that you can't take part; you can't even tacitly take part. And you've got to

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[15] Marvin Garson, "The Free Speech Movement," In Draper, p. 220.

[16] ACLU "The Campus And The Constitution," In Draper, p. 240.

> put your bodies upon the gears and upon the wheels, upon the levers, upon all the apparatus, and you've got to make it stop. And you've got to indicate to the people who run it, to the people who own it, that unless you're free the machine will be prevented from working at all."[17]

The Committee for Students Rights

Prior to the academic year of 1962-1963, there was almost no radical activity on the East Lansing campus of Michigan State University. There appeared to be only one radical or leftist organization, "The Young Socialist Alliance."

As of 1962-1963, however, some Michigan State students became vitally interested in university rules and regulations. The first sign of political activity occurred in response to the "Speaker Rule" then in effect on campus. The Speaker Rule stated that no non-university person could be brought on campus for the purpose of giving a public speech unless he was first cleared by the "Speaker Committee." During the week of October 18, 1962 the Campus Club Conference (CCC) was organized, composed of the Presidents of the:

> All University Student Government (AUSG)
> The Young Socialist Alliance
> The Young Democrats
> The NAACP
> The International Club
> The Campus United Nations

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[17] Paul Jacobs and Saul Landau, The New Radicals: A Report With Documents (New York: 1966) p. 61.

The Forensic Union
The National Student Association

The reason for the formation of the CCC were twofold according to Jim Garrett, President of the Young Socialist Alliance:

> "(1) the Speaker Committee was in direct violation of freedom of speech; and (2) because it denied the student the right to judge for himself, what and whom he could hear."[18]

On October 18, 1962 the CCC held a gathering off-campus at which three unapproved "Student Non-Violent Coordinating Committee" (SNCC) leaders gave speeches in violation of the Speaker Rule. Dean of Students, John Fuzak, Head of the Faculty Committee on Student Affairs then asked the committee to investigate the reasons for the CCC violation of this university regulation. As a result of the committee investigation, those students involved in the CCC were placed on strict disciplinary probation. Bob Howard, the President of AUSG was removed from office by the Faculty Committee on Student Conduct after he refused to resign.

Judging from the letters to the editor column of the State News, Michigan State University's newspaper, and the reaction of the Student Congress, the students were distressed by this act. In spite of this free speech issue no major active protest occurred along the lines of the FSM. Rather, on October 31, 1962 approximately ten to twelve protestors picketed a lecture by the Director of the Honors

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[18] C. Chiri, "Ignored Permits For Meeting," State News (East Lansing, Michigan), October 19, 1962, p. 1.

College in addition to twenty students picketing the administration building and the football stadium prior to a football game. Petitions circulated the East Lansing Campus condemning the University's actions and asking for the reinstatement of Bob Howard. Seventeen hundred names were signed to this petition. The head of the Campus United Nations resigned along with the Vice President of AUSG and another AUSG functionary. In addition a flyer was circulated on campus (authors unknown) which said:

> "...tell your MHA (Men's Housing Association), WIC (Women's Inter-Dormitory Council), or Pan-Hel representative to get off campus as Bob Howard, the AUSG President has done and let's stop students from betraying students."[19]

This flyer foreshadowed by approximately two years the FSM complaint of a segmentation of the student body and the feeling of a lack of community among students.

The reason, as far as can be ascertained, for the lack of active protest over the issue of free speech, an issue that caused a tremendous stir on the Berkeley campus two years later, apparently was the desire of the student to effect the change through established channels. For example, on November 2, 1962, an editorial appeared in the State News entitled, "Let's Fight Through Legal Channels." The editorial said in effect that Howard was wrong for disobeying the rules even if the rules were wrong. If students are to protest, they should do it through established legal channels.

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[19]The flyer was not titled or dated.

Spring term and the following school year the first activist group deeply concerned with students' rights on campus surfaced and asserted itself. This group was first known as the Byzantine Anarchist Party and later as the Basic Action Party (BAP). BAP, according to one member, was composed of members of the "liberal left, radical right and moderate middle" ends of the political spectrum. Robert Mazess, the Co-President of BAP, indicated it had 50 adherents and 200 sympathizers and had the following three general aims:

> "(1) increase student awareness, (2) to return control of the University to students and faculty, and to (3) make AUSG an organization important and significant to students."[20]

BAP members also stated one of their objectives was the elimination of en loco parentis, a cry that was going to be echoed by CSR.

Spring term elections were held to select the AUSG president and congress for the next coming school year. Bob Kerr, the winning candidate, campaigned on the assertion that if he could not make AUSG effective as a student organization he would do his best to dissolve AUSG. This had a fairly strong appeal to certain segments of the student body at this time as a result of the impotence of student government as demonstrated by the seemingly arbitrary suspension and removal from office of Bob Howard, the past

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[20]Anonymous, "Byzantine Anarchists Hit Administration Control," State News (East Lansing, Michigan), May 15, 1963, p. 2.

AUSG president. Bob Kerr's campaign manager during this period of time was Bob Hencken, the President of the "Young Democrats" who was suspended with Howard. A number of charges were printed in the State News to the effect that Kerr was a member of BAP and that Hencken was an extreme leftist both of which were denied by Kerr as he supported Hencken for the "Speaker's Post" in the student congress.

During the academic year 1964-1965, a new group concerned with student rights came into being. This was the Committee for Student Rights (CSR). CSR did not apply for a charter which would license it as a legitimate student group in the eyes of the student government and the administration. CSR developed out of a group with an extremely short history, the Federation for Student Rights (FSR). FSR applied to AUSG for a charter but was turned down because at that time there was a law in the AUSG Constitution forbidding the granting of a charter to two groups with the same professed function. As BAP was still officially active, a charter for FSR was refused.

CSR concerned itself with such campus issues as en loco parentis, women's dormitory hours, requirements for living in off-campus housing, disciplinary procedures, the distribution of unapproved literature, the abolishment of dormitory Resident Assistants reports on students, Civil Rights, and communication channels between students and other segments of the academic community.

CSR issued an undated flyer entitled, "A Descriptive Outline of The Committee for Student Rights (CSR)." The flyer, in stating the reasons for the existence of CSR, listed as its first point a complaint about student participation in the university and as its second point a complaint about the current communication channels.

> "CSR grew from a group of students committed to certain principles; they were dissatisfied with the lack of student participation in the university community and the ineffectiveness of the present "channels" for voicing student opinion..."

Again, we hear the same complaint about poor communication channels from an irregularly published series of pamphlets entitled Logos (CSR's official publication): "Official Channels Cannot be Secret Channels"[21] was printed in bold face.

CSR, like the FSM, and like a previous flyer printed after the removal of AUSG President Bob Howard, complained of a lack of community among students:

> "The future status of students at MSU will largely depend on whether students stand up for other students who have been treated unjustly."[22]

CSR, like the FSM, sees the administration as the enemy and feels isolated from other segments of the academic community, i.e., the faculty and other students:

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[21] P. Schiff (Ed.), Logos, East Lansing, Michigan: Mimeographed, Volume 1, Number 4 (March 30, 1965)

[22] P. Schiff (Ed.), Logos, East Lansing, Michigan: Mimeographed, Volume 1, Number 7 (August 3, 1965)

> "The prevailing feeling at M.S.U. (and for good reason) is that once the administration acts--that's it: no one cares, no one will stand up for you if you've been wronged. But when a portion of the faculty comes alive with discussion and action 'the times they are a changing'--for the better."

Like the FSM, the CSR also found the university to be coercive and impersonal:

> "What is a multiversity? ... it is impersonality, it is 300 students in one lecture hall with one professor; it is vocational training instead of the search for knowledge; it is an IBM card and a student number instead of a student; it is paternalism and en loco parentis instead of responsibility and freedom; it is production of graduates instead of education of students; it is courses and credits instead of learning; and finally it is a business run by administrators instead of a community of scholars run by scholars. It is unfortunately, the modern American university."[23]

Another similarity between the CSR and the FSM was the issue of free speech. Paul Schiff, a former graduate student at Michigan State, was denied re-admission as a result of writing a Logos editorial advocating the right of students to distribute unapproved literature and denying that the university had a right to prohibit such action. Schiff sued the university. After several months, Court sessions, university committee meetings on the subject, Schiff was again denied re-admission and then was finally re-admitted after making moves to resume his suit.

The similarities between the two student movements ends at the comparison of the extent to which students took

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[23]Stuart Dowty, "The American University: Is Democracy Possible," Organon, East Lansing, Michigan: Mimeographed, Number II (February 1966). Organon is a CSR publication in magazine form which was published after the printing of Logos was terminated.

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part. The largest demonstration in which CSR played a part had between 300 and 400 demonstrators with 59 arrested. The FSM had 800 arrested at one demonstration and had crowds estimated at several thousand at their rallies.

Summary of Student Movement Complaints

In summary, during the early and middle 1960's student demonstrations began to appear on many campuses throughout the United States. In viewing two separate student movements at two large university campuses, the two movements protested common issues:

(1) free speech
(2) students felt isolated from the faculty
(3) students felt isolated from other students
(4) students felt isolated from the decision making processes, i.e., the administration.
(5) students seemed to be unhappy with the education at large universities; they found it to be coercive and depersonalizing.
(6) students at Michigan State University specifically complained of poor communication channels.

This research will be concerned with complaints number 2, 3 and 4 only. It will not be concerned with the rest of the complaints listed above.

The Diffusion of an Idea

A university is an institution concerned with the communication of ideas. One question then that could be asked is given that an idea exists somewhere within the university, in what directions would the idea disseminate

through the social structure? Would the idea be more likely to spread from students to faculty or from students to administrators? For example, if a group of freshmen are in favor of a Pass-No Credit grading system, how would it most likely spread through the academic community?

Social scientists within many disciplines have concerned themselves with the diffusion of an idea, or more specifically an innovation, through a given social system. Rogers (1962) has reviewed over 500 articles concerning the diffusion of an innovation in an attempt to unify this literature. The kind of innovations covered in this review ranged from hybrid corn to new medical drugs. The diffusions were attempted in many diverse social systems ranging from a community in India to a group of medical doctors in the American Midwest.

Rogers presents the traditional conceptualization of the process an individual passes through in adopting an innovation. This view consists of five stages. First the individual becomes aware of the existence of the innovation. Secondly the individual becomes actively interested in the innovation and seeks new information about it. Thirdly the individual attempts to evaluate the innovation and come to a decision of whether or not to try the innovation. The fourth stage in the process is the stage at which the innovation is tried on a temporary basis with the fifth stage being the adoption of the innovation.

Rogers and Shoemaker (in press) recently arrived at an alternative to the traditional five stage process of the adoption of an innovation. This model, like the previous one, represents the mental process through which an individual passes in making the decision to adopt or reject an innovation. It is not a description of how the innovation is diffused through a social system. According to Rogers and Shoemaker, among the advantages of the new model are that it does not imply that the process always ends in an adoption decision and it does not state the stages which have to occur in a specified order.

The new conceptualization is more explanatory than descriptive when compared to the traditional five stages. Several discreet psychological mechanisms such as "selective perception" and "dissonance reduction" often play a role in the new formulation. The individual within the process is afforded an active decision making role. The new "conceptualization consists of four functions or stages:

(1) Knowledge--where the individual is exposed to the innovation's existence, and gains some understanding of how it functions.

(2) Persuasion--where the individual forms a favorable or unfavorable attitude toward the innovation.

(3) Decision--where the individual engages in activities which lead to a choice to adopt or reject the innovation.

(4) Confirmation--where the individual seeks reinforcement for the innovation decision he has made, but where he may reverse his previous decision if exposed to conflicting messages about the innovation."

Rogers indicates that several studies have shown that the adoption rate of an innovation by individuals within a social system approximates a normal distribution. Therefore an individual's rate of adoption can be expressed as a normal score. Rogers has given names to groups of individuals that adopt the innovations at different times and thus fall on different areas of the normal curve. The group of individuals two standard deviations below the mean or the first 2 1/2% of the population to adopt the innovation are called "innovators." The next two standard deviations or the next 47 1/2% of the population to adopt the innovation up to the mean are called the "early majority." The population of adopters falling in the first standard deviation after the mean are called the "late majority" and account for 34% of the adopter population. The remaining 16% of the population of adopters are classified as "laggards."

Many different variables affect both the manner and rate with which an individual passes through the adoption process and determines whether an individual will be among the "innovators" or "laggards" in the frequency distribution of adopters. For example an individual's innovativeness depends on a modern rather than a traditional orientation and "varies directly with the norms of his social system on innovativeness." Another important variable is the individual's position in his informal social structure and the nature of the informal social structure itself.

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Coleman, Katz and Menzel (1966) explored the relationship between the time of first prescribing a new drug and the physician's integration into the medical community. Coleman, et. al., investigated several different networks of social and professional relationships among physicians in four different cities. This research had the advantage of using a "hard" dependent variable. Instead of relying on the individual physician's memory of when he first started to use the new drug Coleman, et. al., used written records of behavior by utilizing pharmacists' prescription files.

One professional relationship that was investigated was hospital affiliation. A doctor may have various statuses at a hospital from a full appointment to courtesy privileges. Coleman, et. al., found that doctors with full appointments at hospitals tended to introduce the drug sooner than those with lower level appointments. They also discovered that those doctors who attended three or fewer staff meetings at the local hospital (in a two-month period) were 3.6 months slower to try the new drug and were much less likely to adopt the new drug than the doctors who attended more meetings.

Many physicians shared offices with other doctors or were part of private clinics. Again it appears that those doctors with medical contacts, i.e., office or clinic partners, used the new drug sooner than those doctors without these contacts.

Coleman, et. al., interviewed the physicians in order to obtain sociometric data. They asked questions designed to explore "Advice and Information Networks," "Discussion Networks," and "Friendship Networks," in which the doctors are immersed.

To investigate the "Advice and Information Networks" doctors were asked: "When you need information or advice about questions of therapy, where do you usually turn?" From this answer a network of relationships were mapped which indicated that most physicians are connected to one another either directly or indirectly. Coleman, et. al., found that doctors named as advisors tried the new drug earlier than his colleagues who were not named as advisors. They concluded that the early use of the new drug was disproportionately located at the centers of the "Information and Advice Networks."

To explore the "Discussion Networks" physicians were asked: "Who are the three or four physicians with whom you most often find yourself discussing cases or therapy in the course of an ordinary week - last week for instance?" The "Discussion Networks" while resembling the "Information and Advice Networks" were distinct from it. The "Discussion Networks" showed many more reciprocating relationships than did the "Information and Advice Networks" which were primarily one way (a doctor who is chosen as an advisor rarely names as an advisor the doctors who have chosen him). Coleman, et. al., found as hypothesized that the more a

doctor was chosen as a discussion partner, the sooner was his first trial of the new drug. The authors conclude that "day to day shop talk" among doctors is important to the decision to try the new drug.

The doctors were next asked: "Would you tell me who are your three friends whom you see most often socially?"[24] This question enabled the authors to construct sociograms representing the "Friendship Networks." This network is similar to the "Discussion Networks" in structure and in the relationship between the amount one is chosen as a friend and the time of the first trial of the new drug.

Thus the results for all the networks indicates that the doctor who is integrated into the medical community is more likely to try the new drug earlier than those doctors who are not integrated. Coleman, et. al., indicate that while their results are correlational a causal relationship can be inferred. The cumulative curve of new drug adoptions by integrated doctors is S shaped indicating new drug adoption in each month appears to lead, according to the authors, to a larger number of adoptions in the following month; i.e., a contagion process is at work. S-shaped curves in previous diffusion literature have been alternately interpreted as the result of this "contagion process" or of a normally distributed "readiness

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[24] If fewer than three physicians were named the doctor was asked "which three fellow physicians he saw most often socially?"

to adopt." It is only the integrated physician that showed this S-shaped function in the drug diffusion research. Coleman, et. al., suggest that the preceding fact argues in favor of the contagion hypothesis and thus indicates the integration variable is causal with the time of first trial of the new drug being the effect.

Coleman, et. al., found that the different networks tended to have their effect on the adoption process sequentially. First, interpersonal influences on the adoption of the new drug operated through professional ties or professional relationships between doctors. Secondly, the socially oriented relationships such as the "Friendship Networks" exhibited their influence in the adoption process. In addition the authors found that different communication channels have their effect during different stages of the "traditional" adoption process previously cited from Rogers. The "detail man" (the drug company salesman) and drug company mail dominate the "Awareness Stage." The "Interest Stage" is effected by many different communication channels. During the "Evaluation Stage" which leads to the decision to try the new drug, the informal and the more professional networks influence the doctor's decision (in addition to professional journals).[25]

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[25]The authors presented communication channels for only the first three stages of the five-stage process. It is likely that the "Trial Stage" and "Adoption Stage" use the same channels of communication (plus their own experience) as in the third stage as further evaluation would be taking place.

Coleman, et. al., concluded that while the formal or institutional communication networks of the medical community are determinants of the speed of drug adoption it was not as important as the informal communication structure. The informal communication network of a large university is the topic of investigation of this dissertation.

The University as a Stratified Social System

The study of the university also offers an opportunity to investigate a simplified stratification system. A university, unlike some other social systems, has only three primary functions to be performed, or roles to be played; that of student, faculty and administrator. Within the population playing the student role, it is possible to make status distinctions between individuals at the freshman, sophomore, junior, senior and graduate student levels. Within the population playing the faculty role status distinctions can be made between individuals at the Instructor, Assistant Professor, Associate Professor and Professor levels.

Sociologists, according to Tumin (1967), differentiate three paths to the attainment of a status. A status can be ascribed (assigned or inherited), achieved (gained by one's own effort) or obtained through maturation (reaching a certain age, e.g., voting age). Tumin states that while there are three distinct methods for attaining a

status, in no society is there only one method of acquiring a given status.

At a university a status change among students, i.e., a change of class levels, is accomplished through the student's classroom achievements. When a student's records indicate that he has enough academic credits to become a sophomore he gains the status and rights of a sophomore.

Among the faculty the criterion for changing rank or status is not as clear as it is for undergraduates. Again it would appear as if the major road to the attainment of a higher status is again achievement. If a junior faculty member exhibits academic success represented by scholarly publications, carries out his administrative responsibilities, and is reputed to be a good teacher (or at least not a bad teacher), he is a likely candidate for promotion. Maturation, however, in addition to achievement can also play a role in the attainment of a higher status for a faculty member. A faculty member's age, date of receiving his doctorate, the amount of time since his last promotion, etc., can influence the decision to promote the faculty member.

According to Tumin the essence of social stratification is the assignment of members of a social group to a hierarchy of positions that are unequally rewarded with "power" (the ability to obtain one's goals even against opposition), "property" ("rights over goods and services") and "evaluation" (the "societal judgment that a status is more prestigious and honorable than others"). At a

university the inequality of rewards in terms of property is striking. Undergraduates do not receive a salary for playing the role of a student, in fact they pay the university tuition for the right to be a student.[26] Faculty members and administrators on the other hand do receive salaries for fulfilling their functions. Again, an inequality of rewards is noted, for individuals fulfilling different functions in the university. Students are not allowed to drive on campus during the day and must keep their cars in specially designated lots. Graduate assistants on the other hand, are permitted to drive on campus and park in any lot on approximately half the campus. While faculty and staff are permitted to drive on campus and park in any lot they desire.

Not only are rewards distributed unequally to individuals playing different roles or fulfilling different functions, but rewards are distributed in an unequal manner to different strata within a role. For example, freshmen and sophomores are officially not allowed to declare a major until they are juniors or seniors. Seniors are given the first opportunity to select football tickets, followed by juniors, sophomores and freshmen.[27] In viewing the

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[26]Students, of course, receive an education from the university in exchange for their tuition.

[27]The rewards being discussed are indigenous to Michigan State University with many of these rewards being idiosyncratic to this campus. The author feels, however, that at other campuses the reward structures are similar.

faculty, the same step progression in the distribution of rewards is recognizable. For example, in looking at faculty pay guidelines it is found that Instructors are the lowest paid faculty members, followed by Assistant Professors, Associate Professors, with Professors being the most rewarded segment of the faculty. Administrators, on the average, are probably at least as well rewarded financially as are the Professors.[28]

It would appear that administrators, in some matters, have more power to exert than do either students or faculty. For example, students, in order to change university regulations, must seek the approval of either some branch of the administration or the faculty. A faculty member also has more power than a student. A faculty member gives grades, assigns work to be performed by the student, etc., while the student has little effect on the teaching methods of this faculty member. The faculty in regard to some matters, are dependent on the administration. For example, administrators have control of the purse strings. Academic departments can only request certain fundings; however, Deans and other administrators have some latitude in rewarding funds. A Dean could decide to strengthen one department at the expense of another. A Dean also has a rarely used option to approve promotions and pay raises among the faculty of his

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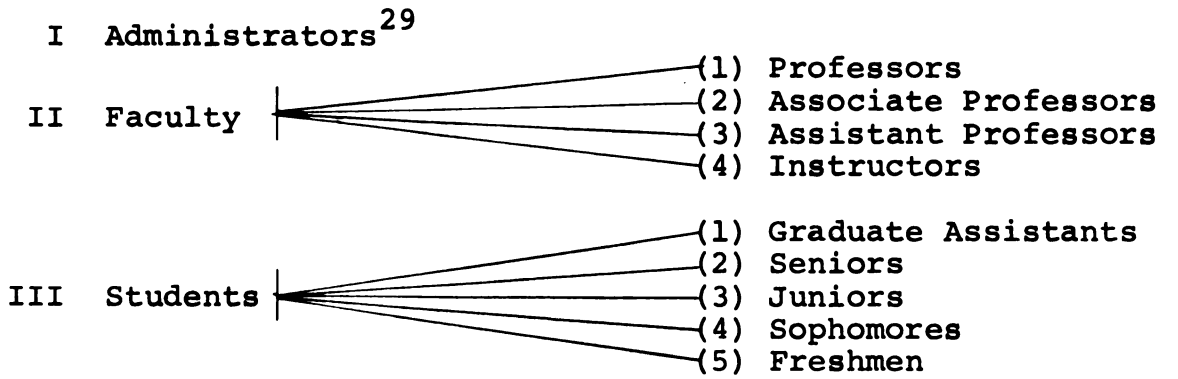
[28] See the Ss section for the definition of administrators as used in this study.

college thus possibly overriding a decision of the tenured faculty. In addition, faculty members are elected to the "Academic Council," a governing body of the university, while Deans and some central administrators are members via their administrative position.

In conclusion, it would appear that when the roles played in an academic community are ordered according to their status administrators are on top, the faculty second and the students third. If the strata within each of these roles are viewed they would appear as diagrammed in Figure 1.

FIGURE 1. The university viewed as a stratified social system



The Advantages and Disadvantages to Viewing the University As a Stratified Social System.

The advantages to viewing the university as a stratified social system are relatively clear cut. Unlike a small

[29]Administrators are treated as one undifferentiated group in the present study despite the fact that administrators also are differentiated into statuses. Administrators were treated as an undifferentiated group as the hypotheses to be presented does not call for finer distinctions.

city the various strata of a university are well defined by the social system itself. There is no question of whether an individual is a sophomore or a junior, his records clearly indicate his status. In contrast, the usual classification scheme used in a city, i.e., lower middle class, upper middle class, etc., are not "clear" and are determined by a number of variables such as income, occupation, etc. In addition the university has relatively few roles, and those roles that do exist are clearly interrelated in regard to function.

There are dangers and disadvantages in viewing the university as a stratified social system. The university is only an upwardly mobile system. The failures do not lose status, they leave the social system. There also could be a danger in generalizing from a simple system to one that is more complex. Many important variables may not exist in the simplified system that do have an effect in a more complex system.

Objectives of the Current Research

The purpose of the current study is to explore the informal social structure and communication channels that exist within a stratified social system that is a large university. The social structure will be viewed and considered as to how an idea would be diffused through it.

Specifically it is hypothesized, as a result of the investigation of the complaints during the FSM at Berkeley and the CSR at Michigan State University that:

(1) Students are not integrated into the academic community.

  (a) students are socially separated from faculty members in comparison with faculty members and administrators.

  (b) students are socially separated from the administrators in comparison with faculty members and administrators.

  (c) students are socially separated from other students.

The measure of a student's integration into the academic community or its inverse, the student's separation from other segments of the academic community, will be measured by determining the length of the informal communication channels linking students to other students, faculty members, and administrators. These hypotheses will be further clarified in the following section in terms of the technique used to test the hypotheses and previous research performed with the technique.

It is further hypothesized that administrators will have shorter communication channels to other segments of the academic community than do either the students or the faculty. Leavitt (1951) studied four different patterns of communications in five-man groups that had been given a common problem to solve. The problem was for each group to determine what symbol was held in common by its membership from a variety of symbols held by individuals in the group.

The communication pattern, i.e., the arrangement of open communication channels with which one group member may communicate to another member (not all communication channels were open) during the period in which a solution was sought were fixed by Leavitt. The groups were given several trials in which to establish a problem solving procedure in order to clarify the role each member was to play in reaching the solution. Leavitt found that the most "central" individual in the pattern, i.e., the individual with shorter communication channels to other group members, generally made the decisions for his group. He also found that the individual who was most central was recognized as the leader most often by the other members of the group. Thus as individual administrators have broader decision making responsibilities than do other segments of the academic community. It is expected that they will have shorter communication channels to the other segments of the academic community.

CHAPTER II

METHOD

The Technique

The investigating technique used in this study was originated and first used by Milgram (1967, 1969). He called it the "'Small World' Technique," a phrase which according to Milgram (1969) has long been a common expression of speech, but was first utilized in the social sciences by Ithiel Pool. The following illustrations should help explain the question the Small World Technique attempts to answer and yield some insight about the method.

The population in a given social unit such as the United States may be viewed as approximately 200,000,000 points; each point representing one individual from the 200,000,000 individuals residing in the United States. These people, represented as points, are not isolated, they have acquaintances.[1] Each acquaintanceship between any two

[1] In fact the average individual has approximately 500 acquaintances according to Gurevitch (1961). Gurevitch asked a variety of individuals to keep a record of the people they came in contact with during a 100 day period. Surprisingly, the average person came in contact with roughly 500 persons during this period.

individuals of this population can be represented by a line linking the two individuals that are acquaintances. If each acquaintanceship was linked by these lines, the resulting diagram would appear to be a very complex network of acquaintances. If this was diagrammed, one would readily observe that no individual is directly connected to every other individual via an acquaintanceship. However the vast majority of individuals can be indirectly connected, i.e., connected through an acquaintance, to a vast number of people they do not know personally. For example, Albert is directly acquainted with John as they spend Saturdays together at the town dump shooting rats. John is directly acquainted with Richard as on Tuesday nights Richard and John go bowling together. Albert and Richard have never met. Thus they are not directly acquainted. However, one may say they are indirectly acquainted as Albert knows Richard through John. If Albert had to deliver a message to Richard and was restricted so that he could only hand the message to someone he personally knew, he could hand the message to John who could hand it to Richard. Thus it may be said that Albert is indirectly acquainted to Richard through John. This is the principle on which the Small World Technique is based.

In the Small World Technique an individual, who Milgram calls the "Starter Person," is given a packet of instructions which includes the name of a second individual who Milgram calls the "Target Person." The Starter Person

is asked to transmit the packet of instructions to the Target Person. However, the Starter Person is restricted so that he can only hand the booklet to an individual he knows according to a certain criterion; e.g., he must know the person to whom he will give the packet of instructions on a first name basis. Failing to meet the criterion so as to pass the packet of instructions to the Target Person directly, the Starter Person is requested to select an individual from his pool of acquaintances, that he does know according to the criterion who would have a better chance of knowing the Target Person. He is asked to pass the instructional packet along to this individual. The second person in this chain, providing that he is not the Target Person, is asked to follow the same procedure as are all the other people involved in the chain. This process lasts until a person is found who can pass the instructional packet directly to the Target Person according to the criterion or the booklet is discarded or lost. The Target Person is requested to hold the instructional packet for the experimenter. To summarize then, if the instructional packet reaches the Target Person it can be stated that the Starter Person is indirectly acquainted with the Target Person through the group of intermediaries that transmitted the instructional packet from the Starter Person to the Target Person.

Thus through this technique it is possible to trace a chain of people that link the Starter Person to the

Target Person. Both the number of and characteristics of the intermediaries that link the Starter Person to the Target Person are the major dependent variables of interest. To obtain these data each individual who takes part in a study using this technique is asked to fill out and return a postage paid business reply card.

Several studies have been carried out by Milgram and his colleagues using the Small World Technique. In all these studies Milgram and his associates asked the Ss to follow the same criterion:

> "IF YOU KNOW THE TARGET PERSON ON A PERSONAL BASIS, MAIL THIS FOLDER DIRECTLY TO HIM (HER). Do this only if you have previously met the target person and know each other on a first name basis.
> "IF YOU DO NOT KNOW THE TARGET PERSON ON A PERSONAL BASIS DO NOT TRY TO CONTACT HIM DIRECTLY. INSTEAD, MAIL THIS FOLDER (POST CARDS AND ALL) TO A PERSONAL ACQUAINTANCE WHO IS MORE LIKELY THAN YOU TO KNOW THE TARGET PERSON. You may send the folder on to a friend, relative or acquaintance, but it must be someone you know on a first name basis."[2]

They placed in the instructional packet the Target Person's name and information pertaining to him such as his address, occupation, organizational membership and his business address.

Travers and Milgram (1970) utilized a stock broker residing in Sharon, Massachusetts and working in Boston as the Target Person. Three different "Starter" populations

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[2] Quoted from Milgram (1969)
One form of the instrument is reproduced on pp. 110-111 of this source.

were used. One Starter population was randomly selected from the Boston area; i.e., proximal to the "Target's" home. The second and third populations came from the state of Nebraska (distal to the Target's home); the second population was randomly selected while the third population was "systematically chosen" for ownership of blue-chip stocks. Through this design Travers and Milgram hoped to assess the relative effects of the Target Person's occupational contacts and the geographical distance between the Starter Person and the Target Person. The authors found that 29% of the instructional packets that were started reached the Target Person taking a mean of 5.2 intermediaries to complete the chain. When the completed chains were separated by their approach to the "Target," i.e., either through the Target's business contacts or through his residence, it was found that the business contacts provided a shorter route than did the residence approach (a mean of 4.6 intermediates compared to 6.1 intermediaries). The authors also found a significant difference between the locations of the "Starters." Boston Starters had relatively shorter numbers of intermediaries than did the Nebraska Starters that were randomly selected (4.4 intermediaries compared to 5.7 intermediaries). There was no significant difference between the Nebraska Starters that were randomly selected and the Nebraska Starters with stock brokerage connections. Travers and Milgram found that as the chains converged on a target they tend to pass through

common channels, i.e., the chains share intermediaries. Travers and Milgram report that the 64 instructional packets that reached the target were sent by a total of 26 people. In fact, 25% of these instructional packets reached the target through just one neighbor. The authors also report that they could find no differences between the Ss that co-operated by participating in the study and those that did not. Thus the authors tentatively concluded that the refusal to cooperate with the study is a random event. This point will be of interest in later sections.

Korte and Milgram (in press) had white Starter Persons in Los Angeles attempt to 'reach' one population of white and a second population of Negro Target Persons residing in New York. The objectives of the study, according to the authors, "was to see what happens to acquaintanceship chains as they are impinged upon by social structure." Korte and Milgram found no significant difference between the mean number of intermediaries needed to complete "white-target" chains (5.5) in comparison to "Negro-target" chains (5.9). They did find, however, that Negro-target chains were less successful in reaching their target (13%) in comparison to white-target chains (33%). When the chains were viewed without reference to the race of the Target Person the results were comparable to previous studies. The mean number of intermediaries between the Starter Person and the Target Person was approximately 5 to 6 with 22% of the instructional booklets reaching their designated

targets. Korte and Milgram report that 72% of the Negro participants cooperated in unsuccessful Negro-target chains compared to 82% cooperation for whites in these same chains. This raises some doubts about the previous conclusion that the refusal to cooperate with the study is a random event.

Thus, in general, it would appear that Milgram (1967) has additional support for the conclusions made from his pilot study. The "Small World Method" is workable and on the average only about five intermediaries are needed to link any two individuals chosen at random in the United States.

In terms of the objectives of the present study, then, if the mean number of intermediaries between any two groups (students, faculty and administrators) approaches five the two groups will be considered socially distant from each other and the academic community not well integrated.

The Instrument

The instrument used in the present study is similar in design to the one used by Korte and Milgram. It consisted of a passport style, plastic covered, 3 3/8" x 6 1/4" booklet. The name of the Target Person was placed within each booklet in addition to the status of the individual (Sophomore, Associate Professor, Assistant Dean, etc.), his area of interest (his major if he is a student,

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his department if he is a faculty member, or his college or office if he is an administrator), his campus mailing address, and his residential address (if he is a faculty member or administrator) or his home town (if he is a student). Each individual taking part was asked to take the following steps:

(1) to add his name to the booklet roster. This step allows each participant to see who has previously taken part, and to prevent the recycling of the booklet through previous participants.

(2) to detach, fill out and return a business reply card. This step enables the experimenter to keep track of the booklet as it approaches the Target Person and to gather information about each participant. On each business reply card was printed the booklet number from which the card originated and a sequence number so as to easily 'place' a link in the chain.

(3) to send the booklet to the Target Person if he was known to the individual on the basis stated in the criterion. If he did not know the Target Person as suggested by the criterion, he was asked to hand the booklet to an individual he did know according to the criterion who was more likely to know the Target Person according to the criterion.

The criterion used in the present study is a variant of the one utilized by Milgram and his associates. Milgram and his associates, as previously stated, asked their Ss to only pass the booklet to people they knew on a "personal basis." The Ss were given a relatively 'hard' criterion from which to judge whether or not they knew a prospective recipient of the booklet on a personal basis. This criterion was, are you on a first name basis with the individual selected to receive the booklet? If the answer was

yes, the individual could pass the booklet to that person and was judged to know that person on a personal basis. If this criterion of knowing the individual on a first name basis was utilized in an academic community, it is reasonable to assume that few, if any, undergraduates would be able to pass the booklet along to a faculty member or administrator. Social convention at a university dictates that an undergraduate, even if he knows a faculty member, still addresses him as Doctor or Professor. Thus what was needed was a criterion that was comparable in meaning to the one used by Milgram and his associates but did not utilize the first name basis criterion. What was needed was a criterion that implied a more intimate form of contact than the contact provided solely by a relationship of complimentary roles, e.g., student and teacher.

The criterion selected was having previously had an informal conversation with the recipient of the booklet. It was felt that if a person was acquainted with another on a first name basis he has had informal conversations with the person. The criterion as written in the booklet appears below.

> If you do not know the target person on an informal basis, i.e., if you have never previously entered into an informal conversation with the target person, then do not try to contact the target person directly. Rather pass this booklet to an individual you know on an informal basis who has a better chance of passing the booklet to the target person.

Three rules that should be followed in the selection of the next individual to receive this booklet are:

(1) THE PERSON YOU PASS THIS BOOKLET TO MUST KNOW YOU AS A "PERSON" NOT JUST AS A STUDENT, FACULTY MEMBER, OR ADMINISTRATOR.

(2) DO NOT PASS THIS BOOKLET TO AN INDIVIDUAL WHERE YOUR CONVERSATIONS ONLY CONCERN "SMALL TALK" (E.G., HOW ARE YOU TODAY?).

(3) PASS THIS BOOKLET TO AN INDIVIDUAL WITH WHOM YOU HAVE DISCUSSED PERSONAL PROBLEMS, YOUR SOCIAL LIFE, FOOTBALL OR ANYTHING ELSE OF MUTUAL INTEREST TO THE TWO OF YOU. SELECT AN INDIVIDUAL WITH WHOM YOU ARE ABLE TO DISCUSS MOST ANY TOPIC RELATING TO THE UNIVERSITY OR TO INDIVIDUALS WITH WHOM YOU CAN CARRY ON AN HONEST EXCHANGE OF VIEWS.

Some examples of legal and illegal passes are: You should NOT pass it to a faculty member if all your contact concerned tests, grades, course material for the course he teaches himself. You MAY pass this booklet to an individual if your conversations with him have concerned grading procedures, or similar general topics. Likewise, an administrator should not pass the booklet to a faculty member if all their previous communications were concerned exclusively with budgets, course material, etc.

The entire instrument booklet is reproduced in Appendix A.

The informal communication network was chosen as the structure of study for several reasons. One, the informal network is the only way some types of communications are disseminated. For example, how well a faculty member conducts his class is a type of communication that is only disseminated both to students and faculty on an informal basis. Two, student complaints that most interested the author were those concerning the informal social structure

of the university. Three, Coleman, et. al., found the informal communication networks to be important in the dissemination of a new idea. Four, Rogers reports that informal communication is very important at the evaluation stage of the adoption process. Five, using informal communication patterns parameters obtained from the present study could be compared to those obtained by Milgram and his colleagues.

Subjects

Ss were chosen from the three major segments of the university; i.e., the faculty, students and administrators.

Two hundred students were randomly selected from a list of full time undergraduates enrolled at Michigan State University during the fall quarter of 1968. They were chosen without regard to class level, sex, grade point average, etc. Half of the 200 students were randomly designated potential Starter Persons with the second half designated as potential Target Persons. Letters were then mailed to the potential Starter Persons and Target Persons explaining the functions of the project, the roles they were being asked to play, and soliciting

their cooperation. When more than 110 students volunteered (55 Starter Persons and 55 Target Persons) students were randomly eliminated from the samples to achieve this number.

Two hundred faculty members were randomly selected from a list of faculty members that were currently employed at Michigan State University during the academic year of 1968-1969. They were chosen without regard to rank (Instructors to Full Professors were selected) or departmental assignments. Half of the 200 faculty members were randomly designated potential Starter Persons with the second half designated as potential Target Persons. Letters were then mailed to the potential Starter Persons and Target Persons explaining the functions of the project, the roles they were being asked to play, and soliciting their cooperation. When more than 110 faculty members volunteered (55 Starter Persons and 55 Target Persons) faculty members were randomly eliminated from the samples to achieve this number.

The Administration, as used in this study, consisted of the 'Officers of the University' (the President, the Provost, the Vice President for Student Affairs, etc.), the Deans (from Assistant Dean to full Dean), the Chairmen of academic departments, and the Directors of On-Campus Housing, the Placement Bureau and the Union.

The Administrators were not samples as they are relatively small in number. Rather, half of the approximately 300 administrators were randomly designated potential Starter Persons with the second half designated as potential Target Persons. Letters were then mailed to the potential Starter Persons and Target Persons explaining the functions of the project, the roles they were being asked to play, and soliciting their cooperation. When more than 110 administrators volunteered (55 Starter Persons and 55 Target Persons) administrators were randomly eliminated from the samples to achieve this number.

The Design

If a university population is viewed as a composition of individuals playing three separate but interrelated roles, then there are nine different Starter Person - Target Person combinations of these roles. They are:

	Starter Person	Target Person
(1)	Faculty members	Faculty members
(2)	Faculty members	Students
(3)	Faculty members	Administrators
(4)	Students	Faculty members
(5)	Students	Students
(6)	Students	Administrators
(7)	Administrators	Faculty members
(8)	Administrators	Students
(9)	Administrators	Administrators

All nine Starter Person - Target Person combinations are used in the present study. Each Starter Person is asked to start six instructional booklets toward their targets. Each set of six booklets will contain two randomly chosen booklets with student targets, two booklets with randomly chosen faculty targets, and two booklets with randomly chosen administrative targets. Each Target Person was told to expect to receive a maximum of six instructional booklets; two from student starters, two from administrative starters, and two from faculty starters. Thus a total of 990 instruction booklets were used in the present study. Figure 2 illustrates this design.

The Setting

The study was performed at Michigan State University during the last two weeks of November and the month of December 1967.

Michigan State University is a Morrill Act Land Grant institution and a state supported school. During the 1960's the university's student body, faculty and

FIGURE 2. The Experimental Design

STARTERS \ TARGETS	Faculty	Students	Administrators	
Faculty	55 Faculty send 2 booklets 55 Faculty receive 2 booklets 110 Booklets	55 Faculty send 2 booklets 55 Students receive 2 booklets 110 Booklets	55 Faculty send 2 booklets 55 Adms. receive 2 booklets 110 Booklets	55 Faculty send 6 booklets for a total of 330 Booklets
Students	55 Students send 2 booklets 55 Faculty receive 2 booklets 110 Booklets	55 Students send 2 booklets 55 Students receive 2 booklets 110 Booklets	55 Students send 2 booklets 55 Adms. receive 2 booklets 110 Booklets	55 Students send 6 booklets for a total of 330 Booklets
Administrators	55 Adms. send 2 booklets 55 Faculty receive 2 booklets 110 Booklets	55 Adms. send 2 booklets 55 Students receive 2 booklets 110 Booklets	55 Adms. send 2 booklets 55 Adms. receive 2 booklets 110 Booklets	55 Adms. send 6 booklets for a total of 330 Booklets
	55 Faculty receive 6 Booklets for a total of 330 Booklets	55 Students receive 6 Booklets for a total of 330 Booklets	55 Adms. receive 6 Booklets for a total of 330 Booklets	

physical facilities grew at a tremendous rate. During the school year 1967-1968 there were approximately 300 administrators, 2,300 faculty members (instructors to full professors), 32,300 undergraduate students and 7,700 graduate students.

CHAPTER III

THE RESULTS[1]

The level of S cooperation was excellent. From the 990 instructional booklets used in the present study some 69% reached their assigned target. This completion rate is approximately twice the level obtained by Milgram and his associates. Table 1 shows the proportion of the instructional booklets started, the proportion that were completed, and the proportion started that were completed for all nine starter-target combinations.

Approximately 94% of the individuals who were handed the instructional booklet cooperated by passing it along to another person. This compares to the best rate of 82% reported by Korte and Milgram. Table 2 shows the proportion of the Ss that cooperated by passing the instructional booklets to another individual.

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[1]Many tables of conditional probabilities will be presented within the result section. These tables are only segments of larger tables to be found in Appendix B. The complete tables will not be presented in the text for several reasons: (1) Because of space limitations, (2) rarely will all of a single table be needed to make a point, and (3) to keep the conditional probabilities pertinent to the discussion proximal to the area of the text where they are being discussed.

TABLE 1. The proportion of the instructional booklets started, the proportion that were completed, and the proportion started that were completed for all nine starter-target combinations

	The Proportion Started	The Proportion Completed	The Number Completed / The Number Started
Faculty-Faculty	.955	.891	.933
Student-Faculty	.809	.527	.652
Administrator-Faculty	.982	.927	.944
Faculty-Student	.946	.518	.548
Student-Student	.773	.373	.482
Administrator-Student	.982	.591	.602
Faculty-Administrator	.982	.855	.870
Student-Administrator	.764	.527	.691
Administrator-Administrator	.982	.955	.972
TOTAL	.908	.685	.754

Cooperation, or its inverse a failure to cooperate is not a random event. Table 2 indicates that undergraduates do not cooperate as often (.914) as do the faculty (.961) ($Z=4.80$, $p < .001$) or administrators (.965) ($Z=5.10$, $p < .001$).

The Validity of the Small World Method

Before exploring the results in detail it would be wise to first examine the validity of the Small World Method and as a consequence the validity of the findings to be reported in subsequent sections.

TABLE 2. The proportion of a given status group that cooperated with the study

	The Proportion	Total N on Which the Proportion is based
Freshman	.916	308
Sophomores	.914	429
Juniors	.917	364
Seniors	.920	386
Graduate Students	.922	244
Instructors	.949	98
Assistant Professors	.954	280
Associate Professors	.954	197
Full Professors	.971	419
Administrators	.965	818
TOTAL	.939	3543

(from Appendix B, Table 13)

The concept of validity will be separated into two forms for the purposes of this discussion. The first form of validity, the 'traditional' form, refers to the ability of the instrument to measure along a certain specified dimension the variable or set of variables it was designed to measure. The second form of validity refers to the generalizability of the results of specific studies to other situations or populations. This form of validity is referred to as 'external validity' by Campbell and Stanley (1963).

A measure of 'concurrent validity' (Cronbach and Meehl, 1955) was obtained to test the first form of validity described above. An independent criterion was selected and

was compared with the results from the Small World Method. The independent criterion used in this validation was the selection of roommates by undergraduates. This was compared to the undergraduates selection of the next individual to receive the instructional booklet on its road to the Target Person (using the Small World Method).

For the purposes of the criterion both male and female wings of a campus dormitory in addition to an off-campus apartment complex were randomly chosen for interviews. A total of 88 living units were asked for interviews with 100% of those living units cooperating. The students that answered the door were asked the following questions:

(1) Are you a Freshman, Sophomore, Junior or Senior?

(2) Is your roommate (or roommates) a Freshman, Sophomore, Junior or Senior?

(3) Did you select your roommate or was he assigned to the same living unit through the university or did you find each other through a newspaper advertisement?

From the total of 88 living units 61 units housed roommates that had selected each other to live with. It is these 61 units that are of interest. Table 3 represents the frequency of undergraduates residing with a peer across class levels, i.e., a Freshman living with another Freshman, a Sophomore with another Sophomore, etc.

From viewing Table 3 it is quite clear that students generally select their peers to live with. A X^2 was computed to test the null hypothesis that these results had

TABLE 3. The frequency of residing with a peer across undergraduate class levels

	Peer	Non-Peer
Freshman	11	0
Sophomore	17	4
Junior	13	3
Senior	8	5

occurred by chance. A $X^2 = 103.82$ was obtained yielding a p value less than .001 (3 d.f.). Thus the null hypothesis was rejected.

To compare the results from the Small World Method to the criterion presented above a problem must first be solved. In selecting a roommate a student can choose any individual he desires to live with. The Small World Method does not allow the participants this range of choices. Rather, the participant is asked to find an individual from his pool of acquaintances that has the best chance of sending the instructional booklet on to the Target Person (if he knows the Target Person he is further restricted as he is instructed to pass the booklet to the Target Person). This places a "teleological strain," a strain that is target directed, on the choice being made. To counterbalance this strain no single one of the nine starter-target combinations (e.g., a faculty starter to a student target) was used as this creates maximum strain toward one target type. Rather, a table of conditional probabilities was computed from all nine starter-target combinations

so as to balance the strain by maximizing it for all targets. Thus there is no greater strain toward one target type than for either of the other two target types.

The results using the Small World Method, as Table 4 illustrates, shows that undergraduates selected their peers more often than other groups to receive the instructional booklet.

TABLE 4. The conditional probabilities that an undergraduate from a particular class or status will send the instructional booklet to another undergraduate of a particular class or status across all nine starter-target combinations

		Receivers				
		Freshmen	Sophomores	Juniors	Seniors	N
Senders	Freshmen	.464	.192	.140	.049	308
	Sophomores	.100	.422	.182	.084	429
	Juniors	.099	.170	.319	.170	364
	Seniors	.018	.109	.200	.389	386

(from Appendix B Table 13)

Freshmen passed the instructional booklets to other freshmen with a greater probability than to sophomores ($Z = 7.56$, $p < .001$), juniors or seniors.[2] Sophomores passed the instructional booklets to other sophomores with a greater probability than to juniors ($Z = 8.00$, $p < .001$), freshmen

[2]The standard error of the estimate is largest when a probability is at .50 and decreases as the probability deviates from .50. The two probabilities closest to each other were tested. These probabilities were closest to .50. Thus the numerator (the difference between the probabilities) of the Z test was at its minimum and the denominator (the standard error of the estimate) was at its maximum. Any subsequent test of a peer selecting another peer versus a non-peer has to produce a bigger Z than the one reported.

or seniors. Likewise juniors passed the instructional booklets to other juniors with a greater probability than to either sophomores or seniors ($Z = 4.81$, $p<.001$), or freshmen. Again, with seniors it is found that seniors passed the instructional booklets to other seniors with a greater probability than to juniors ($Z = 5.91$, $p<.001$), sophomores and freshmen. Table 4 also indicates that the tendency for students to select a peer as a roommate is stronger for freshmen than for seniors. Likewise the tendency to select a peer to receive the instructional booklet in the small world situation is weaker for freshmen than for seniors ($Z = 2.03$, $p<.05$). Thus as the results in the criterion situation yield similar relationships to the results from the Small World Method the Small World Method may be said to be valid.

The results of the present study also appear to be externally valid or generalizable to other student populations on other campuses. Lundberg and Beagley (1943) studied student social structures at a small eastern women's college using a standard sociometric device; they asked: "If it were possible for you to keep in touch with only three students after you leave college, which three would you choose?" They discovered that all students, regardless of class level, selected their peers to members of other classes. Lundberg, Hertzler and Dickson (1944) reported similar attraction patterns among the residents of four women's dormitories at a 'large university.' Smucker (1946)

reported similar results on yet another campus as did Priest and Sawyer (1967).

As a sample of the results from the present study are in agreement with a validation criterion and also in agreement with the results of several other studies performed with different student populations, the Small World Method appears to be a valid technique.

The Social Distance Between Faculty, Students and Administrators

The Small World Method yields two possible dependent measures that reflect the structure of a social system. The first measure is the number of intermediaries required to link the starter person to the target person. The second measure is the probability that a member of a given social status will pass the instructional booklet to members of the same social status or to members of different statuses. The first dependent measure described above is the operational definition of social distance as defined in this study and will now be discussed.

Table 5 illustrates the mean number of intermediaries required to link the Starter and Target for each of the nine starter-target combinations. As one can readily observe from Table 5, the hypotheses were confirmed.

Students are isolated from all segments of the academic community including their fellow students. In fact, the mean number of intermediaries required to link students

TABLE 5. The means and standard deviations of the number of intermediaries required to link the starter to the target for each of the nine starter-target combinations

STARTER TYPE	TARGET TYPE		
	Administrators	Faculty	Students
Administrators	$\bar{X}$=0.93 S_1=0.67 N=55	$\bar{X}$=1.31 S_1=0.69 N=55	$\bar{X}$=4.26 S_1=2.70 N=45
Faculty	$\bar{X}$=1.64 S_1=0.87 N=54	$\bar{X}$=2.23 S_1=1.34 N=53	$\bar{X}$=5.55 S_1=3.72 N=40
Students	$\bar{X}$=3.69 S_1=2.04 N=46	$\bar{X}$=4.26 S_1=2.36 N=40	$\bar{X}$=4.11 S_1=2.62 N=33

as starters or targets to all three segments of the university is 4.4 with the lowest number of intermediaries (3.7) occurring with student starters to administrator targets and the largest number of intermediaries (5.6) occurring with faculty starters to student targets. The mean number of intermediaries needed to link students, either as a starter or target to the three segments of the academic community appears to approach the number of intermediaries found by Milgram and his associates to be required to link any two members of the U. S. taken at random (approximately 5.0 intermediaries). However, differences in the patterns of the non-completed chains within the studies performed by Milgram and his associates and the present study may change the results of this comparison. This will be discussed in the following section.

It was also hypothesized that students were not only separated from faculty members, administrators, and their fellow students on an absolute basis (as shown above) but also require more intermediaries to complete their chains with faculty members or administrators than do the other two groups. As hypotheses were made, t-tests for matched samples were used as a planned comparison method. Individual α was set at $p < .01$ to minimize the level of overall α.

The hypothesis was confirmed. Student starters required more intermediaries to reach either a faculty target or administrator target than did administrator starters or faculty starters. Student starters required 4.26 intermediaries to reach a faculty target while administrator starters required 1.31 intermediaries ($t=7.30$, $df-39$, $p < .001$) and faculty starters required 2.22 intermediaries ($t=4.72$, $df=39$, $p < .001$). Student starters required 3.69 intermediaries to reach an administrator target while faculty starters required 1.63 intermediaries ($t=9.30$, $df=45$, $p < .001$) and administrator starters required .92 intermediaries ($t=9.12$, $df=44$, $p < .001$).

Student targets required more intermediaries than did faculty targets or administrator targets to be reached by both faculty starters and administrator starters. Faculty starters required 5.56 intermediaries to reach a student target in comparison to 2.22 intermediaries ($t=5.49$, $df=38$, $p < .001$) to reach a faculty target or 1.63 intermediaries ($t=6.83$, $df=38$, $p < .001$) to reach an administrator target.

Likewise, administrator starters required 4.26 intermediaries to reach a student target in comparison to 1.31 intermediaries ($t=6.93$, $df=44$, $p < .001$) to reach a faculty target or .92 intermediaries to reach an administrator target ($t=8.01$, $df=44$, $p < .001$). In conclusion, the results indicate that it requires more intermediaries to link student starters and targets to both the faculty and administrators than to link either faculty starters and targets or administrator starters and targets. Given this evidence and the absolute size of the chains involving students, it would appear that students are isolated from the rest of the academic community.

From Leavitt's experimentation with five-man groups, it was hypothesized that administrators would have shorter communication channels (a smaller number of intermediaries) to faculty, students, and administrators than do either the faculty or students. This hypothesis was confirmed in part. Administrator starters required 4.26 intermediaries to reach student targets compared to 4.11 intermediaries for student starters and 5.55 intermediaries for faculty starters. Thus the administrator starters did not have statistically significant shorter communication channels to student targets in comparison to faculty and student starters. Administrator starters did, however, reach faculty targets and administrator targets requiring fewer intermediaries than did faculty or student starters. Administrator starters required 1.31 intermediaries and .92 intermediaries

respectively to reach faculty targets and administrator targets while faculty starters required 2.22 intermediaries and 1.64 intermediaries ($t=4.23$, $df=52$, $p < .001$), ($t=4.83$, $df=42$, $p < .001$). Administrator starters also required fewer intermediaries than student starters to reach administrator targets or faculty targets (these comparisons were made previously).

Administrator targets also required fewer intermediaries than do faculty and student targets to be reached by administrator and faculty starters. An administrator starter requires .92 intermediaries to reach an administrator target, 1.31 intermediaries to reach a faculty target ($t=2.93$, $df=53$, $p < .005$) and 4.26 intermediaries to reach a student target ($t=8.01$, $df=44$, $p < .001$). Likewise, faculty starters required 1.64 intermediaries to reach an administrator target in comparison to 2.22 intermediaries to reach a faculty target ($t=2.56$, $df=51$, $p < .01$) or 5.55 intermediaries to reach a student target ($t=6.84$, $df-38$, $p < .001$). Student starters did not reach administrator targets with less intermediaries than faculty or student targets.

When the length of administrator communication channels are compared to the communication channels of faculty and students, it would appear that administrators have shorter communication channels to the faculty and other administrators. Administrators do not have shorter communication channels to students in comparison to faculty and students.

Leavitt (1958) suggests that communication is extremely important to the functioning of an organization:

> From management's perspective, we can think of ... (an organization) ... as an elaborate set of interconnected communication channels designed to collect and collate, analyze, and sort out information; also as a system for making decisions, acting them out, getting feedback information and correcting itself.[3]

If Leavitt (1958) and others (Dorsey, 1957; Thayer, 1967) are correct as to the importance of communications in organizations, it is interesting to ask if the lack of short informal communication channels to students mirrors a fault in the organizational structure of the university.

The Relative Size of the Groups and Its Effect on Chain Lengths

One question that may be posed is whether the differences in the chain lengths reflect relative differences in the sizes of the three groups or possibly some normative prohibition of contact between students, the faculty and administration.

If the relative size of the groups is a major factor, it would be expected that the target type drawn from the largest population would show the longest chain; i.e., it is harder to find a needle in a large haystack than in a small one. Thus it would be expected that student targets would require the longest chains followed by faculty targets with administrator targets showing the shortest chains. Looking at Table 5, it would appear that this is generally

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[3]H. Leavitt, Managerial Psychology (Chicago: 1964), p. 300.

the case. However, viewing the starter-target combinations in which students play the role of either a starter person or target person it becomes obvious that students are approximately equidistant from other students, faculty and administrators. This appears to be true regardless of whether the student is playing a starter or a target role. This would tend to disconfirm 'size' as an important variable as a student starter should have an easier time reaching a faculty target than vice versa (a faculty target is a needle in a smaller 'haystack' than a student target). Thus to test the effect of the relative size of the groups, comparisons should be made between the number of intermediaries required to complete a student to faculty chain versus a faculty to student chain, an administrator to student chain versus a student to administrator chain and finally a faculty to administrator chain versus an administrator to faculty chain. If size is a major variable, chains that have the largest group acting as a target should require more intermediaries to complete the chain to that target. This hypothesis was rejected as the administrator starter to student target chain did not require significantly more intermediaries to complete than did the student starter to administrator target chain ($t=1.12$, $df=43$). The faculty starter to student target chain did not require significantly more intermediaries to reach the target than did the student starter to faculty target chain ($t=1.83$, $df=38$). Administrator starters required significantly <u>fewer</u>

intermediaries to reach faculty targets, the larger target type, than did the faculty starters to administrator targets ($t=2.18$, $df=52$, $p < .05$) thus disconfirming the hypothesis.

It would seem that the relative size of the groups is not the major determiner of the length of the chains as judged from the observed chains.

The Actual Chain Lengths, An Estimate of the Parameters

One problem that should be considered is that the size of the observed chain lengths reported previously are shorter than their true or actual size. Observed chain lengths shorter than their actual size should be expected as a long chain is less likely to reach its target than a shorter chain. For example, if the probability that an individual will cooperate by passing on the instructional booklet is .90, the probability is .90 that a given booklet will not be lost with the first pass, with two passes the probability than an instructional booklet is not lost is $(.90)^2$ or .81, with three passes the probability that the booklet is not lost is $(.90)^3$ or .73, etc. A target person that is one intermediary distant from a starter person will be more likely to receive the booklet than a target person two intermediaries away. Thus the observed chain lengths are biased toward shorter chains.

White (1966) designed a three-state probabilistic model to handle this problem. White assumed that if an intermediary knows the target person he will send it to the target person with a fixed probability of 1.00. If the intermediary does not know the target person he has two choices. He can send the booklet on with a fixed probability of α or he may discard the booklet with a probability of $1-\alpha$. White defines four terms for use in the model.

Q_i = the probability that an intermediary reached at the i^{th} step of the chain knows the target person.[4]

T_i = the total number of booklets received at the i^{th} step of the chain.

C_i = the number of booklets received by the target at the i^{th} step of the chain.

$$N_i = T_i - C_i$$

Thus the parameter α can be estimated for each value of i or step in the chain by:

$$\hat{\alpha} = \frac{N_i + 1}{N_i - C_i + 1}$$

An estimate of the parameter Q_i is obtained by:

$$\hat{Q}_i = \frac{C_i + 1}{N_i}$$

White stated that the two parameters behaved as expected when the Travers and Milgram, and Korte and Milgram

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[4]The i^{th} step equals the starter person plus the number of intermediaries required to reach the i^{th} position. For example, step 4 equals the starter person plus 3 intermediaries.

data were viewed. Q_i remains at a negligible level through step 2 and then arose to a plateau by step 6. The parameter α did not vary as a function of the step in the chain. Thus it appears reasonable to assume that the model would predict chain lengths. To calculate the predicted chain lengths as if all chains reached their assigned targets, White set: P_i = to the probability that the Target Person is reached at step i. Then,

$$P_{i+1} = Q_i \prod_{j=0}^{i-1}(1 - Q_j), \text{ for } i > 0, + P_i = Q_0$$ [5]

Travers and Milgram used White's model to control for the now-completed chain problem. The found that the median chain length shifted upward from an observed five intermediaries to a predicted seven. However, they concluded that no substantial revision of conclusions drawn from the raw data was required other than the estimate of the chain length parameter.

White's model, while meeting the needs of Travers and Milgram, do not meet the requirements of the present study for two reasons. First, it does not consider differences between subject sub-populations. The model has two absorbing states, target and lost, and only one transitory state, that of being moved toward the target through an undifferentiated population. If Ss belong to

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[5] P_i (t_i) = the number of booklets completed at the i^{th} step. To obtain an average chain length (number of intermediaries), multiply the product of P_i (t_i) by the step number and divide by the total number of booklets started. Then subtract one.

different sub-populations, the lumping together of these Ss is based on an unwarranted assumption, i.e., that the S population is homogeneous. Secondly, the model does not allow for differences in the cooperation rate (White's α) as a function of the subject sub-population.

In order to control for the effects of missing data in the present study, a first order Markov model was utilized.[6] One way to conceptualize the Markov model is to compare it to White's model. Like the previous model, the Markov model has two absorbing states, lost and target. However, instead of treating the population as homogeneous with one transitory state, the Markov model takes into account the individual's university status (Freshman, Assistant Professor, Administrator, etc.) with 11 transitory states. As was demonstrated previously, students did not cooperate as readily (91%) as the faculty (96%) or the administration (97%). The Markov model allows the rate of cooperation to vary as a function of the status group to which the individual belongs instead of using an average cooperation rate.

The basic assumption on which the Markov model is based is that the conditional probability of selecting a given type of individual to receive the instructional booklet is independent of a prior pass. For example, if

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. Kemeny & J. Snell, Finite Markov Chains, (Princeton, ew Jersey, 1960).

the target is a faculty member and a freshman has the instructional booklet the probability that the freshman will pass the booklet to another freshman, sophomore, Associate Professor, etc., is invariant regardless of from whom the sender obtained the booklet. A corollary of this assumption is that the probability of absorbing a chain into the lost state, i.e., the rate of cooperation or its inverse non-cooperation is invariant across the steps of the chain.

One method of testing the independence assumption of a first order Markov model is to square the one-step conditional probability matrices and compare them to the two step conditional probability matrices. If the corresponding squared one step and the two step matrices are comparable the assumption of independence is supported by the data. The two step matrices indicate the probabilities that a booklet will reach a particular status in two steps given the status of the individual that presently holds the booklet.[7]

Given the selection of an individual to receive the booklet is independent of prior selections it would then be expected that the squared one step matrix is equal to the two step matrix for the following reason. The joint

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[7]For example, the probabilities in the two step matrix can answer the following question. If a freshman currently holds the booklet, what is the probability that another freshman holds the booklet two steps later. A freshman can hold the booklet two steps later in a number of ways. A freshman can pass the booklet to another freshman who passes the booklet to another freshman. Or a freshman can pass the booklet to a sophomore who passes the booklet to a freshman, etc.

The joint probability for two independent events is found by multiplying the probability for the first event by the second. The mechanics of squaring the matrix provides the correct combinations of multiplications and additions to yield the two step matrix providing the independence assumption of the Markov model holds. For example, in squaring a matrix in the present study the two step probability of a freshman passing the booklet to another freshman is computed, in part, by adding the product of the probability of a freshman passing the booklet to a sophomore multiplied by the probability of a sophomore passing the booklet back to a freshman plus the probability of a freshman passing the booklet to a junior multiplied by the probability of a junior passing the booklet back to a freshman, etc.

The two step matrices correspond almost exactly to the squared one step matrices indicating that the data meet the assumption of the model. The largest deviation between any pair of corresponding cells within corresponding matrices was .153 out of 507 comparisons. The mean deviation was .018.[8]

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[8]Looking at the mean chain lengths the data might appear to some readers to be Non-Markovian as the length of the chains started by students is much longer than those started by the faculty or administrators. Hence it might be argues that the student starter effected more than just the pass the starter was involved in. What should be remembered is that the data have to be Markovian in nature only within each of the nine starter-target combinations for the data to be Markovian.

Before applying the model to generate the expected chain lengths to compensate for the lost chains, the model can be tested in one other manner. The model can generate chain lengths without compensating for the lost chains and these expected chains can be compared to the observed chain lengths. The chain lengths obtained from the model without correcting for lost chains should approximate the observed chain lengths.

Let $E(CL_1)$ = the expected chain lengths without compensating for the lost chains

Let I = the identity matrix

Let A = the transition matrix, i.e., that part of the matrix representing the probabilities that a given status group will pass the booklets to members of their own or different statuses (no absorbing states)

Let B = the probabilities of each status group passing the booklets to target or lost states (the absorbing states)

Then

$$X = (I-A)^{-1} B$$

$$Y = (I-A)^{-2} B$$

And:

$$E(CL_1) = \frac{Yij}{Xij} - 1$$

The data again appear to fit the model as the $E(CL_1)$ approximates the observed chain length closely as Table 6 indicates.

The model's predicted chain lengths deviated from the observed chain lengths on the average of .34 intermediaries for 12.2% error. This is a reasonably good fit of the model to the data.

TABLE 6. The expected chain lengths [$E(CL_1)$] without compensating for missing chains in comparison to the observed chain lengths.

Starter-Target Types	$E(CL_1)$	Observed Chain Lengths	Per Cent of Error of $E(CL_1)$ $\frac{\text{Observed Chain Lengths} - E(CL_1)}{\text{Observed Chain Length}}$
Faculty-Faculty	1.72	2.22	22.5%
Student-Faculty	4.50	4.26	5.6%
Administrator-Faculty	1.57	1.30	20.7%
Faculty-Student	4.81	5.55	13.3%
Student-Student	3.82	4.11	7.1%
Administrator-Student	5.18	4.26	21.6%
Faculty-Administrator	1.58	1.63	3.1%
Student-Administrator	4.16	3.69	12.7%
Administrator-Administrator	0.89	0.92	3.3%

Thus to generate chain lengths to compensate for non-completed chains the probability of each status group not cooperating or losing the booklet is eliminated and the matrices are reconditionalized.

Let $E(CL_2)$ = the expected chain lengths if all chains reached their target

Let $E(CL_2)$ = the row sums of $(I-A)^{-1} - 1$

Table 7 shows the expected chain lengths if all chains had reached their target.

TABLE 7. The mean number of intermediaries required to link the starter to the target for each of the nine starter-target combinations assuming all chains reached their targets.

STARTER TYPE	TARGET TYPE Administrators	Faculty	Students
Administrators	1.00	1.79	8.56
Faculty	1.78	1.95	8.16
Students	4.88	5.36	6.96

The conclusions drawn from the non-adjusted chain lengths pertaining to the hypotheses do not have to be adjusted. It still appears that the student is isolated from all other segments of the university including other students. Administrators still appear to have the shortest communication channels to all segments of the university except for the students.

The relative sizes of the populations, however, do seem to play a role in determining chain lengths in which students are involved. When the non-corrected chains of student starters to faculty targets were compared to faculty starters to student targets no differences in chain lengths were found. Likewise when administrator starters to student targets were compared to student starters to administrator targets, and administrator starters to faculty targets were compared to faculty starters to administrator targets differences in the predicted direction were not found. Hence it was concluded that the relative sizes of

the groups did not play a role in determining chain length. Viewing the corrected chain lengths [$E(CL_2)$] this conclusion has to be adjusted. Student starters require fewer intermediaries to reach faculty targets (5.36) than do faculty starters to reach student targets (8.16). Student starters require fewer intermediaries to reach administrator targets (4.88) than do administrator starters to student targets (8.56). As it requires more intermediaries to find an individual in a large group than in a small one, the relative sizes of the group does appear to influence the lengths of the chains. The relative sizes of the administrator and faculty groups does not seem to determine the length of chains between these two groups as the same number of intermediaries are required to link a faculty starter to an administrator target (1.78) as is required to link an administrator starter to a faculty target (1.79).

The Permeability of Faculty, Student and Administrator Role Groups

One indication of the permeability of a role group designated as A by members of role groups designated as B and C is the degree to which members of role groups B and C are used as intermediaries when the starter and target persons both belong to role group A. For example, how often are undergraduates, graduate students, administrators and others (secretaries, faculty wives, etc.) used as intermediaries in a chain with a faculty starter to a faculty target?

One reason for not selecting an intermediary that is not a member of the starter-target group is that they are not known to the holder of the booklet. For example, within a faculty starter to a faculty target chain students might not be used as intermediaries because the faculty are not acquainted with students on a personal basis. A second reason is that intermediaries from role groups other than the starter's or target's might not be viewed as being efficient at forwarding the booklet to the target. For example, within an administrator starter to administrator target chain students might not be used as intermediaries because the holder of the booklet feels that handing the booklet to a student will extend rather than shorten the length of the chain. Both reasons lead to the interpretation that the role group is relatively impermeable with regard to out-group social contact. For example, if the faculty does not know students on a personal basis so that the faculty cannot pass the booklets to students, then a logical conclusion is that there is little social contact between faculty and students, and thus few communication channels between faculty and students. The faculty might not forward the booklet to a student because the faculty feels that students would reach the target less efficiently. This leads to the interpretation that the faculty role group is relatively impermeable to students as it was concluded that the student does not have sufficient social contact within the faculty role group to be an efficient next step.

The faculty role group appears to be the most permeable as faculty members passed the booklet to out-group members 24.5% of the time. Administrators were the second most permeable group with administrators passing the booklet to out-group members 14.6% of the time ($Z = 2.50$, $p < .01$). The student role group was significantly less permeable (4.7%) than either the administrator role group ($Z = 3.41$, $p < .01$) or the faculty role group ($Z = 6.39$, $p < .001$). Thus it would appear that the faculty has the greatest amount of social contact with out-groups followed by administrators and then students.

A Faculty Starter to a Faculty Target

The major target variable selected by the faculty to forward the booklet to a faculty target was departmental affiliation. It would appear that some faculty members view academic departments as being semi-isolated. The faculty selected administrators and students to forward the booklet to targets in other departments. Thus it would appear that some faculty members feel that administrators and students would be more efficient than the faculty at spanning the distances between departments. Administrators appeared to be very efficient at reaching faculty in the correct department while students did not appear to be. A faculty member may pass the booklet to a student knowing that the student takes classes in the target person's department. However, the student might not know any faculty

in the target's department and thus the student attempts to pass the booklet to another student that does. The chain may be passed on by several students before reaching the faculty again.

Faculty acquaintances with faculty appear to be determined by their status or academic rank. A $X^2 = 59.29$, $P<.001$ ($df = 9$) was obtained when the frequency of passing the instructional booklet by each academic rank to every other academic rank was compared to a random model based on the frequency of each academic rank in the population of faculty.[9] Table 8 illustrates the probability of each faculty status passing the instructional booklets to each faculty status.

Most of the differences represented by the X^2 value reported in Table 8 (over 73%, $X^2 = 43.46$) were found in the pattern of passes initiated by full Professors. It would appear that full Professors tend to pass the instructional booklet to Instructors and Assistant Professors less frequently and to full Professors more frequequently than would be expected by chance. Korte and Milgram found that there was a tendency for their booklets to be passed to high status individuals as they have "maximum surveillance"

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[9]To compensate for teleological strain the X^2 reported was performed on the data from the total summary table (Appendix B, Table 13). The same relationship was found to hold using the data obtained only from the faculty starter to faculty target starter-target combination ($X^2 = 41.36$, $df = 9$, $P < .001$).

TABLE 8. The conditional probabilities that a faculty member of a particular rank or status will send the instructional booklet to another faculty member of a particular rank or status

Senders	Receivers				
	Instructors	Assistant Professors	Associate Professors	Professors	N
Instructors	.122	.153	.061	.051	98
Assistant Professors	.065	.175	.115	.175	280
Associate Professors	.071	.137	.196	.188	197
Professors	.043	.091	.148	.274	419

of the domain. This does not appear to be the case in regard to full Professors as only full Professors pass more often to full Professors. Lower faculty ranks pass to full Professors either at a chance level or less frequently than chance.

There appears to be a relationship between the rank of faculty members and the initiation of contacts with administrators. Table 9 illustrates this relationship.

As Table 9 indicates, full Professors initiated more contacts with administrators than do Assistant Professors ($Z = 4.58$, $p < .001$) or Instructors ($Z = 6.39$, $p < .001$). Associate Professors initiated more contact with administrators than did Assistant Professors ($Z = 2.82$, $p < .004$) or Instructors ($Z = 4.51$, $p < .001$). Likewise, Assistant Professors initiated more contacts with Administrators than

TABLE 9. The relationship between faculty initiated contact with administrators and faculty rank

SENDERS	RECEIVERS Administrators	N
Instructors	.071	98
Assistant Professors	.147	280
Associate Professors	.253	197
Professors	.289	419
	See Appendix B, Table 13	

did Instructors ($Z = 2.27$, $p < .03$). There was no significant difference between the amount of contact that Professors and Associate Professors initiated with administrators.

A Student Starter to a Faculty Target

The major target variable selected by the student to forward the booklet to a faculty target was the target's departmental affiliation. The student starter usually attempted to forward the booklet to another student taking courses in the target's department. This was accomplished with relatively few steps. The student taking courses in the target's department typically was not acquainted with any faculty in that department. He would then pass it to a student majoring in the target's department. The booklet then is passed until a student is found who knows a faculty member affiliated with the same academic department as the target. Once the booklet reaches a faculty member of the

target person's department, it typically reaches the target in one step. Clearly, the bottleneck occurs at the point in the chain where students are attempting to find a student 'gatekeeper' that is acquainted with a faculty member in the target's department.

It would appear that seniors (.281) tend to be gatekeepers more often than do juniors (.119) ($Z = 2.32$, $p < .03$), sophomores (.091) ($Z = 2.98$, $p < .003$) or freshmen (.086) ($Z = 3.03$, $p < .003$). There appears to be no differences in the frequency with which freshmen, sophomores or juniors act as gatekeepers to the faculty. Surprisingly, graduate students (.415) did not act as gatekeepers significantly more often than did seniors. The lack of statistical significance in this case is due to the small N caused by the infrequent use of graduate students as intermediaries. The same relationships are observed from the total summary table. Graduate students contact the faculty a greater proportion of the time (.197) than do seniors (.101) ($Z = 3.21$, $p < .002$), juniors (.066) ($Z = 4.67$, $p < .001$), sophomores (.035) ($Z = 5.99$), $p < .001$), or freshmen (.036) ($Z = 5.86$, $p < .001$). Seniors contact the faculty more often than do sophomores ($Z = 3.71$, $p < .001$) or freshmen ($Z = 3.49$, $p < .002$). Other differences were not statistically significant. The relationship between student class level and the initiation of faculty contacts are shown in Table 10.

TABLE 10. Student class level and the initiation of contact with the faculty

	RECEIVERS	
SENDERS	Faculty	N
Freshman	.036	308
Sophomore	.035	429
Junior	.066	364
Senior	.101	386
Graduate Students	.197	244

See Appendix B, Table 13

Administrator Starter to a Faculty Target

The major target variable selected by the administrator to forward the booklet to a faculty target was the target's departmental affiliation. If the administrator starter did not know the target person personally, he passed the booklet to the chairman of the target person's department or the dean of the target person's college. From these positions the booklets were passed to the target in relatively few steps.

In a previous section it was shown that the initiation of contact with administrators by the faculty was related to faculty rank (see Table 9). It appears that this relationship is symmetrical; an important characteristic of a sociometric or informal communications trace device.

Administrator initiated contact with the faculty also appears to be related to faculty rank. Table 11 portrays this relationship.

TABLE 11. The relationship between administrator initiated contact with the faculty and faculty rank.

	RECEIVERS				
SENDERS	Instructor	Assistant Professor	Associate Professor	Professor	Administrator
Administration	.034	.059	.061	.146	.537
N	818	818	818	818	818

See Appendix B, Table 13

Administrators contact Professors more often (.146) than they do Associate Professors (.061) ($Z = 5.67$, $p < .001$), Assistant Professors (.059) ($Z = 5.80$, $p < .001$), or Instructors (.034) ($Z = 8.00$, $p < .001$). Administrators contact Associate Professors more often than they do Instructors ($Z = 2.46$, $p < .003$) but not significantly more often than they do Assistant Professors ($Z = .17$). Likewise, Administrators contact Assistant Professors more often than they do Instructors ($Z = 2.50$, $p < .003$). Not surprisingly, administrators contact administrators more often (.537) than Professors ($Z = 18.62$, $p < .001$), Associate Professors ($Z = 25.05$, $p < .001$), Assistant Professors ($Z = 25.16$, $p < .001$), and Instructors ($Z = 26.47$,

$p < .001$).[10]

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[10]The results reported were taken from the Total Summary Table (Appendix B, Table 13). The same results are obtained using the table representing only an administrator starter to faculty target (Appendix B, Table 3) with the following exception. Administrators did not pass the instructional booklet to other administrators significantly more often than to Professors. This could be a consequence of teleological strain as the target was a faculty member (1.31 intermediaries were required to link the starter to the target). Thus the Total Summary Table was used to counteract the strain. However, in this case even the use of the Total Summary Table has a flaw as only one status of administrator was designated in this study and one of the nine tables summarized was one representing the administrator to administrator starter-target combination. Thus the conditional probability of an administrator passing the booklet to an administrator in this case should approximate 1.00 and will be weighted in the Total Summary Table. Thus both the Faculty Target Summary Table (Appendix B, Table 10) and the Student Target Summary Table (Appendix B, Table 11) was viewed as these do not include the administrator to administrator starter-target combination pass. Both these tables show that administrators pass the instructional booklet to other administrators more often than to Professors. Caution is still recommended, however, for two reasons: (1) Most passes went across academic units and administrators have the broadest surveillance. For example, if the Dean of the College of Natural Science holds the booklet and the target is a faculty member in a department of Social Science, probably the best intermediary to pass the booklet to is either the target's department chairman or the Dean of Social Science. (2) Administrators are a heterogeneous group composed of central administrators (Provost, Registrar, President, etc.), department chairmen, etc. While it is reasonable to assume central administrators communicate mostly with each other, it would seem reasonable that department chairmen would communicate most often with their own faculty.

A Faculty Starter to a Student Target

There was no major target variable selected by the faculty to forward the booklet to a student target. Two different strategies seemed to predominate. One strategy involved passing the booklet to a faculty member in the student's major academic department. The theory being a faculty member that is involved in a student's education should be acquainted with the student. This strategy appeared to be more successful with students enrolled in colleges such as Engineering that have small classes. The second strategy used by the faculty was to pass the instructional booklet to a student immediately; reasoning that students are better acquainted with students in comparison with the faculty. If the second strategy was used after the booklet reached a student the chain was similar in character to a student starter to a student target combination. Of the chains started, 77.9% used one of the two strategies. The two strategies were not significantly different from each other in regard to completing the chain to the target. The chains that were started using the major strategy completed 61.7% while the student strategy completed 50.0%.

There appears to be a relationship between faculty rank and the frequency of faculty initiated contact with students. Table 12 displays this relationship.

TABLE 12. The relationship between faculty initiated contact with undergraduates and faculty rank.

SENDERS	RECEIVERS Undergraduates	N
Instructors	.306	98
Assistant Professors	.154	280
Associate Professors	.091	197
Professors	.050	419
	See Appendix B, Table 13	

Instructors have more contact with students (.306) than do Assistant Professors (.154) ($Z = 2.98$, $p < .003$), Associate Professors (.091) ($Z = 4.22$, $p < .001$), or Professors (.050) ($Z = 5.33$, $p < .001$). Assistant Professors have more contact with students than do Associate Professors ($Z = 2.10$, $p < .005$) or Full Professors ($Z = 4.33$, $p < .001$). Associate Professors did not have significantly more contact with students than Professors. Thus it is found that the high status faculty have the smallest amount of contact with students.[11]

Student Starter To a Student Target

As with the faculty starter to student target combination, there appeared to be no predominant target

[11] Similar results were obtained with the probabilities from only the faculty starter to student target combination (Appendix B, Table 5).

variable selected to forward the booklet to a student target. Two different strategies seemed to predominate. One strategy involved passing the booklet to a student who shares the same academic major as the target. The theory being a student who takes classes with the target has a high probability of being acquainted with the target.

The second strategy was to try to reach the target through his residence. The theory being a student should be acquainted with his neighbors. The two strategies (judged by the starter's strategy) accounted for 71.8% of the passes that were started. The "residence" strategy had completed 73.5% (N = 34) of the chains to the target, while the major strategy completed just 44.4% (N = 27) ($Z = 2.39$, $p < .005$). Thus it would appear that student acquaintances with other students are structured around their residence more so than their major.

Both strategies placed the booklet either with a student with the same academic major or the same dormitory residence as the target. Usually this was accomplished with the first pass, indicating that students are acquainted with other students across a wide range of academic majors residing in many different locations. At this point in the chain the residence strategy showed to be superior. The address in the dormitory gave the holder of the booklet finer distinctions to proceed by; i.e., which wing of the dormitory and which floor the target lived on. The academic major gives no further distinctions. The student

using this strategy must turn to other criterion such as year in school. Thus the booklet tends to wander from one student with the same major to another until it is either lost or finds the target. Of the booklets that reached the target using the academic major strategy usually either involved targets from a small pool of academic majors or involved a switching to the resident strategy.

The matrix of conditional probabilities representing the class levels of undergraduates passing the instructional booklet to other class levels of undergraduates shows the same relationship as was reported in Table 4 of the validity section. Students tend to pass the booklet to students of the same class level (peers) (see Appendix B, Table 5). There is one exception to this correspondence with Table 4. The tendency to pass the instructional booklet to peers instead of constantly decreasing as one rises from class level to class level decreases until the senior year in which case it rises to approximately the freshman level again.

Milgram (1967 and 1969) discovered a tendency to pass the booklet to a member of the same sex. This same tendency was found within a student starter to student target chain as Table 13 illustrates.

Males preferred to pass the booklet to other males (.621) rather than to females (.214) ($Z = 9.92$, $p < .001$). Likewise, females preferred to pass the booklet to females (.651) rather than males (.192) ($Z = 12.41$, $p < .001$).

TABLE 13. The conditional probabilities of passing the instructional booklet to a member of the same sex

SENDERS	RECEIVERS Male	Female	N
Male	.621	.214	243
Female	.192	.651	281

There was no difference in the tendency of within sex transmission of the booklet between males and females (Z = .714) (males to males vs. females to females).

Administrator Starter to Student Target

Two different strategies were used in forwarding 80.6% of the chains originating with an administrator and terminating with a student target. Administrators either attempted to reach the student through faculty affiliated with his academic major or attempted to reach the student through his residence. The residence strategy again appeared to be more effective than the academic major strategy as 82.6% of the booklets forwarded by residence were completed while just 57.8% of the booklets forwarded by major were completed ($Z = 2.48$, $p < .005$). The academic major strategy was approximately three times more widely used than the residence strategy.

The residence strategy as used by the administrators was a variant on the one used by the students as the administrators used their informal acquaintances within the

formal structure. For example, an administrator using the residence strategy might pass the booklet to the head of the dormitory system who would then hand the booklet to the administrator in charge of the particular dormitory in which the target resided. The administrator in charge of the dormitory would then pass the booklet to the student acting as the Resident Assistant on the floor the target resided.[12] The Resident Assistant would then pass the booklet to the target. Students, as one would expect, did not use the formal structure in the same manner as did the administrators as few students would be acquainted with high level dormitory administrators. However, students occasionally did make use of elements of the formal structure as they tended to use the Resident Assistant structure in the dormitory. A student might pass the booklet to his own Resident Assistant who would forward the booklet to the Resident Assistant on the target's floor and hence to the target.

The academic major strategy was similar to those previously used with the exception that some administrators would pull the target's academic records in order to determine what classes the target was currently taking. The

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[12]A Resident Assistant is an undergraduate who lives within a certain segment of rooms in the dormitory. He is given room and board without cost in exchange for acting as a friend to other residents of his segment in addition to serving as a liaison between the administration of the dormitory and the students residing in his segment.

administrator then made an effort to pass the booklet to a member of the faculty he was acquainted with who was teaching a class the target was enrolled in.

Freshmen appear to be gatekeepers to the students for the administration less often than upperclassmen. Administrators initiate less contact with freshmen than with sophomores, juniors ($Z = 3.40$, $p < .001$) and seniors ($Z = 4.60$, $p < .001$) as Table 14 illustrates.[13]

TABLE 14. The relationship between student class level and administrator initiated contact

SENDERS	RECEIVERS Freshmen	Sophomores	Juniors	Seniors	N
Administrators	.003	.020	.020	.026	818

See Appendix B, Table 13

Faculty Starter to Administrator Target

The strategy taken by the faculty to reach an administrator target is to pass the booklet upward in rank, i.e., to an administrator they are acquainted with. The hypothesis being that administrators are acquainted with other administrators. A variant of this strategy was to

[13] The same relationships appear within just the administrator starter to student target passes. This relationship may be indigenous to Michigan State University as Resident Assistants are composed of sophomores and more heavily of juniors and seniors. Also officials in the office of Off Campus Housing have contacts restricted to upperclassmen as university policy requires students to be 21 years old in order to reside off campus.

pass the booklet to a faculty member who should be acquainted with the administrator; e.g., to a professor of history to reach the chairman of the department of history.

As reported previously from the total summary table, it would appear that tenured faculty (Professors and Associate Professors) initiate more contact with administrators than did the non-tenured faculty (Assistant Professors and Instructors). Analyzing only the data within the faculty starter to administrator target passes (Appendix B, Table 7), there is a non-significant trend in the above stated direction.

Student Starter to an Administrator Target

The strategy taken by the student to reach an administrator target was to pass the booklet to a relevant student, i.e., to a student who is majoring in the academic unit (department or college) the administrator target directs. This student passed the booklet to a faculty member the student was acquainted with. The faculty member then tried to reach the administrator target. Another relevant student was the Resident Assistant who was used both to forward the booklet to a target within the dormitory management system or to central administrators (the Provost, Registrar, etc.).

In a previous section it was reported that administrators initiated fewer contacts with freshmen than with upperclassmen (sophomores, juniors and seniors). Again,

this relationship appears to be symmetrical as freshmen initiate fewer contacts with administrators (.016) in comparison to upperclassmen (.036) ($Z = 2.25$, $p < .005$).[14] Possibly the most important point to appreciate from administrator student communications are the extremely small conditional probabilities indicating little direct contact between these two groups.

Administrator Starter to an Administrator Target

No strategy appeared to be used or necessary in these chains. The starters either knew the subject directly (the starter passed the booklet directly to the target in 33% of the cases) or knew who was acquainted with the target if they were not.

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[14] The data used in the relationship reported above were derived from the Total Summary Table. The data taken from only the student starter to administrator target shows a non-significant trend in the same direction. Freshmen initiate fewer contacts with administrators (.055) than do upperclassmen (.119) ($Z = 1.83$, $p < .07$).

CHAPTER IV

DISCUSSION

A Partial Summary of the Results

The complaints of activist students concerning the social structure of a large university have been substantiated. The activists complained that there was no academic community. They complained that students are socially separated from the faculty, administration, and other students. The present study adds substance to these complaints. Given that the criterion used in the present study is roughly equivalent to the criterion used by Milgram and his associates, it would appear that students are separated from elements of the academic community by as many intermediaries as separate two people chosen at random from the population of the United States.

The activists complained that:

> He (the student) loses contact with his professors as they turn more to research and publishing and away from teaching. His professors lose contact with one another as they serve a discipline and turn away from dialogue.

This complaint also was substantiated. The results of the present study show that the tenured faculty (Associate

Professors and Professors) initiated less contact with students than did the non-tenured faculty. In fact, the amount of contact initiated by a faculty member with students is inversely related to their academic rank. The faculty used out-group (administrators and students) intermediaries to reach faculty targets more often than did either students attempting to reach student targets or administrators attempting to reach administrator targets. This indicates that the faculty feel that administrators and students may have more contacts across academic departments than the faculty themselves have; i.e., there is limited faculty contact across academic disciplines. It also indicates that the faculty have more contacts with out-group members than do either the students or administrators.

While the tenured faculty seem to have less contacts with students than do the non-tenured faculty, the tenured faculty appear to have more administrator contacts. Thus it would seem that the faculty ranks endowed with the most power have the greatest amount of contacts with administrators (or at least uses them most often). With caution it might also be stated that administrators communicate with other administrators more frequently than with other role groups or statuses.

It also appears that administrators are the most "central" role group in that they have shorter communication channels to other administrators and faculty than

does any other role group. Administrators did not have appreciably shorter communication channels to students. In fact, administrators had very little direct contact with students, with freshmen having the least contact. Student initiated contact with faculty was directly related to the student's class level.

What do the Chain Lengths Indicate?

Previously, it was stated that chains involving students as either starters or targets were approximately equal in magnitude to a chain linking any two individuals selected at random in the United States. Milgram and his associates observed a mean value of five intermediaries and seven intermediaries adjusting for incomplete chains to link any two persons selected at random from the population of the United States. In the present study mean values approaching those found by Milgram and his associates were discovered in chains involving students as starters or targets.

One question that may be posed is whether a parameter estimate of five or seven intermediaries has the same meaning within a population in excess of 200,000,000 persons as it does in a population less than 50,000 persons? The answer is that the estimate of the social distance parameter is the same in both cases but the implications for the social structure may be quite different.

When a starter person in Nebraska attempts to reach a target person in Massachusetts he searches through his set of acquaintances for the individual with the best opportunity of knowing the target. This individual has the widest set of acquaintances that possibly could be relevant to the task. He has a broader selection of useful criterion to be used to pass the booklet and hence the largest set of relevant acquaintances. For example, the starter can select a friend that resides in the target's home community. The starter's friend residing in the target's community no longer considers residing in the target's home town as a relevant criterion but rather as a limiting factor. It no longer is profitable just to pass the booklet to anyone in the town as the booklet is present in the town and further selections on this basis amount to little more than random passing within the community. Residing in the target's community is now a limiting factor as the search for the next intermediary within a set of acquaintances will be limited to those residing within the community, i.e., an intermediary is unlikely to select an acquaintance residing outside the community and automatically eliminates them from consideration. Travers and Milgram give some qualitative support for this position:

> Chains which converge on the target principally by using geographic information reach his home town or the surrounding area readily, but once there often circulate before entering the target's circle of acquaintances.[1]

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[1] J. Travers and S. Milgram, "An Experimental Study of The Small World Problem." Sociometry, 1969, 32, p. 432.

The university chains are started in an analogous position to the residence chains of Traver's and Milgram's after they have first entered Sharon, Massachusetts. The situations are analogous in that the university chains are started within the community the target person holds membership and are generally not sent beyond the confines of the community by a starter or intermediary.

Given that the two situations are approximately analogous: (1) why should faculty starters require 5.55 intermediaries to reach a student target and (2) why should the length of corrected chains that involve students as starters or targets approach or surpass Traver's and Milgram's across country corrected chain length (seven intermediaries)?

The approximate equivalence of the chain lengths reported by Milgram and his associates and the university chain lengths (involving students) is not as surprising as one might first think. Travers and Milgram reported a mean of 6.1 intermediaries for chains that approached the target through his home town. Travers and Milgram also reported that chains reach the home town area readily, but once there circulate before reaching the target. Assuming "readily" means between one and two intermediaries, it would appear that if the booklet was started in the target's home town the chain lengths required to link the starter to the target approximates the observed university chain lengths involving students. Hence it is not extremely

surprising that the two sets of chain lengths can be comparable. This, however, is not the entire answer for several reasons. One, the observed chain lengths were compared. Thus when adjustments are made for lost chains the results might change. Second, the faculty starter to student target chains (observed) cannot be explained in this manner as the chain is too long. Three, the faculty starter to student target and the administrator starter to student target chains are both longer than those reported by Travers and Milgram after both sets of chains are adjusted for the lost chains.

One reason for long chain lengths within the university community may be a greater amount of inbreeding of acquaintanceship networks in comparison to other communities; i.e., individuals within a university community may have more mutual acquaintances. The greater the inbreeding of acquaintances the longer the chains. For example, assume that every person within the university has only five acquaintances. Hence the starter has five acquaintances which we will assume does not include the target. The starter passes the booklet to A_1, one of the starter's acquaintances. If the starter and A_1 share four of the same acquaintances (counting themselves), A_1 has only one acquaintance left that could be the target as it was determined previously that the starter was not acquainted with the target. If A_1 has two acquaintances not known to the starter, A_1 has twice the chance of knowing the target and thus terminating the chain by passing the booklet to the target. Hence the

more inbreeding of acquaintances the longer one would expect the chains to be.

Another reason for long chain lengths involving students as either starters or targets is the extremely rapid turnover of the undergraduate population. The academic plan for the Bachelor's degree calls for approximately a 25% turnover of undergraduates per year due to graduation and new admissions. Hence within four years time there should be approximately a 100% turnover of undergraduates. There is additional student turnovers due to withdrawals and transfers. The faculty also is mobile with new faculty arriving and others leaving for different jobs. It has been shown that upper classmen have the most contact with faculty and administrators. Thus the students who are most integrated into the academic community are the ones that leave. These turnovers cause disruption of communication and acquaintanceship networks and hence longer chains.[2]

As the student role group was shown to be relatively impermeable to contact by faculty and administrators and the chains started by these groups to students were relatively long, a more efficient strategy to use to reach students may be an indirect approach.[3] Hence a direct

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[2] As shown previously, the relative size of groups is one determinant of chain lengths. It is not discussed in this context as the question being answered is how can chain lengths be approximately equivalent within a population of 200,000,000 and one of less than 50,000.

[3] It should be remembered that the term impermeable refers to a lack of efficient contacts by one role group within a second role group. One role group may still be impermeable to another while having contacts with the second role group. An anology of this situation is that water can come in contact with skin but still does not penetrate the skin.

confrontation with the barrier separating students from other groups is avoided. For example, in one of the shortest faculty starter to student target chains, the starter sent the booklet to a friend in the target's home town. The town was an extremely small farming community. The first intermediary passed the chain to the target's mother who then sent the chain to the target. Hence this indirect approach used few intermediaries. Possibly the most relevant criterion to be used when one is faced with a choice of variables to forward the booklet is the size of the membership group. The smaller the group the more efficient the chain.

Of course another possible reason exists for the equivalence of the university chain lengths and those chain lengths obtained by Milgram and his colleagues. It is possible that the criterion used by Milgram and his colleagues is not equivalent to the one used in this study as the author has assumed. Hence the comparison would not be valid. It should be remembered that this comparison is not necessary to the forthcoming discussion in the section entitled the "Centrality and the Degree of Contentment With the Social Structure."

The Social Structure and the Diffusion of an Idea

Coleman, et. al., found that the simple spreading of information about a certain idea was not itself sufficient

to cause the adoption of the idea. What was also needed were discussions about the pros and cons of the idea.

Within the result section it was shown that some statuses and roles communicate with certain other statuses and roles more so than with others. When communications between one role or status and a second role group occurs less frequently than between the second role group and a third role group, it should be expected that an idea will spread less quickly from the first role or status to the third. For example, an idea should spread to undergraduates more quickly from non-tenured faculty than from tenured faculty as non-tenured faculty have more contacts with undergraduates. The summary section of the discussion is a summary of these results. Assuming that each status group is equally susceptible to the idea, predictions can be made by this method concerning how an idea would spread through the university. Appendix B, Table 13 is the best description of how an idea would spread through the university. As these predictions follow directly from the conditional probabilities already presented it will not be repeated. To make meaningful predictions, however, the results of this study should be weighted with the susceptibility levels of each status group.

It has been noted by the author that it appears to be the non-tenured faculty rather than the tenured faculty who are most sympathetic to student activists. It is not suggested that the greater amount of contact with

undergraduates by non-tenured faculty made them more sympathetic. Variables such as the shorter interval between the present and their own years of schooling and their proximity in age to students in comparison to the tenured faculty are more powerful explanations. However, it seems reasonable that the greater amount of contact with undergraduates by the sympathetic non-tenured faculty might be reinforcing for both those sympathetic faculty members and activist students. It is also interesting to ask if the tenured faculty and administrators' greater amount of contact might also reinforce a particular set of their ideas.

Centrality and the Degree of Contentment With the Social Structure

As hypothesized, administrators were shown to have the shortest communication channels to other administrators and the faculty. Administrators did not, however, have the shortest communication channels to students. Students, on the other hand, had the longest communication channels to the faculty and administrators but not to other students (based on the corrected chains). Hence, the administrators may be said to hold the most central position within the university, the students the most peripheral position and the faculty somewhere in between the administrators and students.

Leavitt (1951), experimenting with five-man groups, found some indication that the pattern with the most central

position was the most efficient. Efficiency in this case was measured by the single fastest solution of a problem. Leavitt also found, however, that his Ss holding the most peripheral positions enjoyed their job much less than did Ss holding the most central position who stated that they enjoyed their job (see Bavelas, 1950). Leavitt suggests that centrality affects behavior by the "limits that centrality imposes upon independent behavior." Thus it is not surprising that a segment of the student population is dissatisfied with the university.

Obviously, not all students are activists. The question then might be asked, why are those activist students activist students? One answer is that these students have a different self image of themselves in comparison to non-activists. The activists have been raised to both act and see themselves as independent beings. Flacks (1967) investigated the child rearing practices of both the parents of activists and non-activists. He found that activists rate their parents as "milder," "more lenient," and "less severe" than do non-activists. Flacks also asked the parents of activists and non-activists how they would respond in a hypothetical situation. For example, the parents were asked "what they would do if their son (daughter) decided to drop out of school and doesn't know what he really wants to do." Or the parents were asked what would you do if your "child was living with a member of the opposite sex?" The parents' answers to these questions were then rated on a

parental intervention continuum. The fathers of activists were reported to be much less interventionist than fathers of non-activists.[4] Thus the parents of activists train their children to be independent and do not generally intervene in the decisions of their children. The activists then enters the university where the administration might intervene by setting living group regulations, etc.

Thus activism on the part of students is seen as being caused by an interaction of the social structure of the university and the personality of the activist student.

Modifications of the Social Structure to Produce Shorter Chain Lengths

One question that may be asked is, how can the social distance between students and the remainder of the academic community be reduced? In other words, how can the chain lengths be made shorter than they are currently?

Possibly the most practical variable to manipulate is that of propinquity. Newcomb (1956) states that the

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[4]Flacks also reports that activists and their parents have different values than do non-activists and their parents. Flacks reports that activists are higher on "romanticism," "intellectualism" and "humanitarianism" than non-activists. For those readers interested in pursuing the differences between activists and non-activists, see: E. Sampson, "Stirring Out of Apathy: Student Activism and the Decade of Protest," The Journal of Social Issues, 1967, 23, 3, pp. 1-137.

shorter the physical distance between two individuals, the more probable the two individuals will interact and the more likely they will be attracted to each other. As stated perviously, the greater the probability that two people will interact or are acquainted with each other, the shorter the chain lengths.

One possible solution to increase propinquity is to reduce the size of all segments of the university. With fewer students, faculty and administrators housed on less acreage it would be more probable that individuals within the university would know each other. Another similar possibility is small self-sufficient colleges within the university.[5] Each college could have its own student body, faculty and administration. Thus it is possible for all three role groups to have a substantial amount of contact with each other as a result of small role group sizes. The greater the contacts across role groups and the smaller the size of the role groups, the smaller the possibility of inbreeding of acquaintances and the shorter the chains across groups and within groups.

Another possible solution is to build recreational centers and organize activities that will be engaged in by all segments of the academic community. Instead of building student unions and faculty club houses a common building where students, faculty and administrators either engage

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[5]Michigan State University has established three experimental colleges similar in nature to the brief description presented here.

in activities together or proximate to each other should produce more contacts between individuals across role groups. Instead of building student dormitories and faculty and administrative offices, buildings housing all units in common buildings will increase contacts across role groups. The more contacts an individual has across role groups, the less inbreeding of acquaintance networks and thus the shorter the chains.

Summary

Within the literature produced by several student movements some very specific complaints pertaining to the social structure of the university appear. Two student movements on two different campuses were viewed with regard to complaints about the social structure of the university. The activist students complained that they were socially separated from the faculty, from the administrators and from other students.

It was hypothesized that students would be connected to other students, faculty members and administrators by the longest informal communication channels. On the basis of Leavitt's (1958) study, it was also hypothesized that administrators would have the shortest informal communication channels to other administrators, faculty and students.

The technique used in the present study to measure the length of informal communication channels was first

used by Milgram (1967). Milgram called the technique the "Small World Method." Using the Small World Method, two sets of individuals are selected. One set of individuals is designated the starter persons, a second set of individuals is designated the target persons. A starter person is asked to try to pass an instructional booklet to the target person by only passing the booklet to people they know according to a certain criterion (e.g., knowing the person on a first name basis, etc.). If the starter person does not know the target person according to the criterion the starter person is then instructed to pass the booklet to an acquaintance he does know according to the criterion, who has a better chance of being acquainted with the target person. The number and characteristics of the intermediary persons between the starter and target serve as the dependent variables.

Student, faculty and administrators were randomly selected to serve as starter and target persons from the population of a large university. Each starter person was asked to start two booklets to student targets, two booklets to faculty targets and two booklets to administrator targets. Each target person was asked to receive a possible two booklets from student starters, two booklets from faculty starters and two booklets from administrator starters. The starter and target persons were randomly paired.

The results confirmed the hypotheses. Students had the longest informal communication channels while the administrators had the shortest communication channels. Thus, in Leavitt's terminology administrators may be said to be the most central group while the students are the most peripheral group within the university. The results were discussed in terms of the peripherality of the students and their contentment with the social structure of the university. Suggestions were made for the modification of the social structure of the university.

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A P P E N D I X A

THE INSTRUMENT

COMMUNICATIONS PROJECT
LEARNING SERVICE
MICHIGAN STATE UNIVERSITY
EAST LANSING, MICHIGAN

A FRIEND

has sent this passbook to you. He hopes that you will aid this University study by forwarding the booklet by the criterion stated below. The name of the person who sent you this booklet and his academic role is listed in the Roster below.

ROSTER

NAME	(Check One) Faculty	Administrator	Student
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

THE COMMUNICATIONS PROJECT

We need your help in an unusual communication study designed to investigate the nature of social contact on the East Lansing campus. If the name of a member of the academic community were picked out of a hat, could you get to know that person using only your network of friends and acquaintances? Just how open or closed is our academic community? To answer these questions, which are important to our research, we ask for your help.

You will notice that this passbook has come to you from an acquaintance. His name appears in the Roster on page 1. He has aided this study by passing this booklet on to you. He hopes that you will aid the study by forwarding this booklet to someone else.

On the next page you will find the name, address and role (student, faculty member, or administrator) of a member of the academic community who has agreed to serve as the target person in this study. The idea of the study is to transmit this passbook to the target person by following the guideline written on page 4.

TARGET PERSON

Please look at page 4 to take part in study.

If you do not know the target person on an informal basis, i.e., if you have never previously entered into an informal conversation with the target person, then do not try to contact the target person directly. Rather pass this booklet to an individual you know on an informal basis who has a better chance of passing the booklet to the target person.

Three rules that should be followed in the selection of the next individual to receive this booklet are:

(1) THE PERSON YOU PASS THIS BOOKLET TO MUST KNOW YOU AS A "PERSON" NOT JUST AS A STUDENT, FACULTY MEMBER, OR ADMINISTRATOR.

(2) DO NOT PASS THIS BOOKLET TO AN INDIVIDUAL WHERE YOUR CONVERSATIONS ONLY CONCERN "S M A L L TALK" (EG. HOW ARE YOU TODAY?)

(3) PASS THIS BOOKLET TO AN INDIVIDUAL WITH WHOM YOU HAVE DISCUSSED PERSONAL PROBLEMS, YOUR SOCIAL LIFE, FOOTBALL OR ANYTHING ELSE OF MUTUAL INTEREST TO THE TWO OF YOU SELECT AN INDIVIDUAL WITH WHOM YOU ARE ABLE TO DISCUSS MOST ANY TOPIC RELATING TO THE UNIVERSITY OR TO INDIVIDUALS WITH WHOM YOU CAN CARRY ON AN HONEST EXCHANGE OF VIEWS.

Some examples of legal and illegal passes are You should **not** pass it to a faculty member if all your contact concerned tests, grades, course material for the course he teaches himself. You **may** pass this booklet to an individual if your conversations with him have concerned grading procedures, or similar general topics Likewise, an administrator should not pass the booklet to a faculty member if all their previous communications were concerned exclusively with budgets, course material, etc

HOW TO TAKE PART IN THIS STUDY

1

ADD YOUR NAME TO THE ROSTER ON PAGE 1, so that the next person who receives this passbook will know who it came from.

2

DETACH ONE POSTCARD FROM THE BACK OF THIS BOOKLET. FILL IT OUT AND RETURN IT TO THE LEARNING SERVICE. No stamp is needed. The postcard is very important. It allows us to keep track of the progress of the booklet as it moves toward the target person.

3

IF YOU KNOW THE TARGET PERSON ON A PERSONAL BASIS, (AS STATED IN THE GUIDELINE) HAND THIS PASSBOOK DIRECTLY TO HIM (HER). Do this only if you have previously met the target person and know each other as suggested in the guidelines.

4

IF YOU DO NOT KNOW THE TARGET PERSON ON A PERSONAL BASIS, (AS SUGGESTED BY THE GUIDELINES) DO NOT TRY TO CONTACT HIM DIRECTLY. INSTEAD HAND THIS PASSBOOK TO A PERSON YOU KNOW, ACCORDING TO THE GUIDELINES, WHO IS MORE LIKELY THAN YOU TO KNOW THE TARGET PERSON.

Remember, the aim is to move this passbook toward the target person using only a chain of friends and acquaintances. On first thought you may feel you do not know anyone who is acquainted with the target person. This is natural, but at least you can start it moving in the right direction. The real challenge is to identify among your friends and acquaintances a person who can advance the booklet toward the target person. For example, who among your acquaintances might conceivably move in the same social circles as the target person? It may take several steps beyond your friend to get to the target person, but what counts most is to start the passbook on its way. The person who receives this passbook will then repeat the process until the passbook is received by the target person.

May we ask you to begin.

Every person who participates in this study and returns the post card to us will receive a report of the final results of the study.

Please transmit this passbook within 24 hours. Your help is greatly appreciated.

Yours sincerely,

R. Lance Shotland

Robert L. Shotland
Learning Service

YOU MAY USE THE CAMPUS MESSENGER SERVICE (CAMPUS MAIL) TO TRANSMIT THIS PASSBOOK ANYWHERE ON CAMPUS

№ 1101 2

First Class
Permit
No. 188
East Lansing
Michigan

BUSINESS REPLY CARD

No Postage Stamp Necessary if Mailed in the United States

Postage will be paid by

COMMUNICATIONS PROJECT
Learning Service
17 Morrill Hall
Michigan State University
East Lansing, Michigan 48823

My Name:_____

My Address: (Campus)_____

My Role is: (Circle One)

Fresh Soph Jr. Sr. Grad.

Instructor Asst. Inst. Asst. Prof.

Assoc. Prof. Professor Administrator

Other? please state_____

What would be your best guess as to the number of persons this booklet must go through to reach the target person after it leaves your possession?

Please fill in the following information about the person to whom you are sending the folder.

His (Her) Name _____

His (Her) Address _____

_____

His Role: (Check One) Student Non-Academic

Why did you think [illegible]?

_____

_____

_____

A P P E N D I X B

THE CONDITIONAL PROBABILITY TABLES REPRESENTING THE NINE DIFFERENT STARTER-TARGET COMBINATIONS

APPENDIX B

Appendix B contains thirteen conditional probability tables. The first nine tables represent and correspond to the nine starter-target combinations used in the present study. The last four tables are summary tables. Table numbers 10, 11, and 12 were computed by collapsing the three tables with the same target role group. Table 13 represents all nine starter-target combinations collapsed into one table.

Key

Numbers

1. Freshmen
2. Sophomores
3. Juniors
4. Seniors
5. Graduate Students
6. Instructors
7. Assistant Professors
8. Associate Professors
9. Professors
10. Administrators
11. Others (secretaries, wives, etc.)
12. Lost
13. Target

TABLE 1. The faculty starter to a faculty target starter-target combination.

Send-ers	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.000	.000	1.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1
2	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000	.000	2
3	.000	.125	.250	.125	.125	.000	.000	.000	.000	.000	.125	.000	.250	8
4	.000	.000	.333	.444	.000	.111	.111	.000	.000	.000	.000	.000	.000	9
5	.000	.000	.033	.033	.500	.000	.000	.133	.067	.000	.000	.067	.167	30
6	.000	.071	.000	.143	.000	.214	.143	.143	.000	.000	.071	.071	.143	14
7	.000	.000	.018	.000	.088	.035	.193	.140	.228	.088	.053	.018	.140	57
8	.022	.000	.000	.000	.022	.022	.043	.109	.261	.217	.000	.022	.261	46
9	.000	.000	.000	.000	.037	.019	.028	.102	.259	.157	.028	.019	.352	108
10	.000	.000	.000	.000	.019	.000	.038	.019	.151	.283	.019	.019	.434	53
11	.000	.000	.000	.000	.000	.000	.000	.091	.182	.000	.182	.000	.545	11
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	8
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	

TABLE 2. The student starter to faculty target starter-target combination

Send-ers	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.444	.185	.086	.062	.037	.000	.049	.012	.025	.000	.025	.062	.012	81
2	.080	.341	.205	.068	.080	.023	.034	.011	.011	.034	.034	.068	.011	88
3	.051	.102	.271	.254	.034	.000	.034	.034	.000	.034	.034	.102	.050	59
4	.047	.047	.125	.234	.125	.063	.047	.078	.078	.000	.047	.094	.016	64
5	.000	.024	.049	.049	.439	.049	.049	.049	.024	.024	.000	.000	.244	41
6	.000	.000	.100	.000	.100	.100	.000	.200	.000	.000	.100	.000	.400	10
7	.000	.000	.000	.000	.043	.043	.087	.087	.043	.087	.000	.087	.522	23
8	.000	.000	.067	.000	.000	.000	.200	.000	.133	.067	.067	.133	.333	15
9	.000	.000	.000	.000	.063	.000	.063	.000	.188	.000	.000	.000	.688	16
10	.000	.000	.000	.077	.000	.000	.077	.000	.077	.231	.000	.154	.385	13
11	.000	.000	.000	.143	.000	.000	.143	.000	.000	.071	.143	.214	.286	14
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	32
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	

TABLE 3. The administrator starter to faculty target starter-target combination.

Send-ers	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	00
2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	00
3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	00
4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1
5	.000	.000	.000	.250	.250	.000	.000	.250	.000	.250	.000	.000	.000	4
6	.000	.000	.000	.000	.000	.000	.200	.000	.000	.000	.000	.000	.800	5
7	.000	.000	.000	.000	.000	.100	.100	.000	.000	.100	.000	.100	.600	10
8	.000	.000	.000	.000	.143	.000	.000	.000	.071	.071	.143	.000	.571	14
9	.000	.000	.000	.000	.000	.000	.040	.100	.140	.080	.000	.000	.640	50
10	.000	.000	.000	.000	.006	.025	.037	.043	.216	.309	.025	.025	.315	162
11	.000	.000	.000	.000	.000	.000	.000	.167	.500	.167	.000	.167	.000	16
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.100	6
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	

TABLE 4. The faculty starter to student target starter-target combination

Send-ers	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.333	.238	.238	.000	.000	.000	.000	.000	.000	.000	.000	.048	.143	21
2	.036	.411	.161	.107	.000	.000	.000	.000	.000	.018	.000	.161	.107	56
3	.045	.146	.303	.157	.011	.000	.022	.000	.000	.034	.011	.045	.225	89
4	.014	.114	.300	.271	.043	.000	.043	.000	.000	.000	.000	.114	.100	70
5	.016	.031	.141	.156	.281	.016	.031	.047	.000	.063	.047	.141	.031	64
6	.034	.000	.172	.069	.207	.103	.034	.034	.034	.069	.034	.034	.172	29
7	.013	.025	.100	.112	.175	.050	.188	.037	.138	.075	.000	.063	.025	80
8	.028	.000	.028	.028	.000	.167	.194	.167	.083	.111	.056	.056	.083	36
9	.023	.011	.011	.034	.114	.034	.091	.091	.284	.170	.057	.034	.045	88
10	.019	.019	.038	.075	.170	.113	.057	.038	.057	.245	.000	.057	.113	53
11	.000	.059	.059	.118	.118	.000	.118	.059	.059	.059	.235	.118	.000	17
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	47
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	

TABLE 5. The student starter to student target starter-target combination

Senders	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.486	.193	.101	.073	.000	.000	.009	.000	.000	.009	.000	.092	.037	109
2	.117	.445	.182	.066	.015	.000	.000	.015	.000	.015	.007	.073	.066	137
3	.071	.131	.323	.111	.020	.010	.010	.010	.000	.000	.000	.182	.131	99
4	.011	.116	.221	.463	.021	.000	.011	.011	.000	.011	.000	.053	.084	95
5	.000	.077	.154	.154	.385	.000	.000	.000	.000	.000	.077	.000	.154	13
6	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.500	2
7	.000	.000	.000	.143	.000	.143	.000	.286	.000	.286	.000	.000	.143	7
8	.000	.167	.000	.000	.167	.000	.500	.000	.000	.000	.000	.000	.167	6
9	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	0
10	.000	.000	.077	.077	.077	.000	.000	.000	.000	.462	.000	.154	.154	13
11	.250	.000	.250	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	4
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	54
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.100	.000	1.000	

TABLE 6. The administrator starter to student target starter-target combination

Send-ers	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.238	.238	.190	.048	.000	.000	.000	.000	.000	.000	.000	.095	.190	21
2	.077	.327	.135	.058	.019	.000	.000	.000	.000	.000	.000	.135	.250	52
3	.107	.125	.286	.089	.036	.036	.054	.000	.000	.036	.000	.054	.179	56
4	.013	.105	.118	.421	.026	.013	.039	.013	.013	.013	.000	.105	.118	76
5	.042	.063	.104	.167	.375	.000	.021	.021	.021	.021	.021	.083	.063	48
6	.034	.172	.069	.069	.207	.138	.103	.000	.034	.069	.000	.069	.034	29
7	.024	.024	.098	.098	.073	.146	.171	.098	.000	.049	.000	.073	.146	41
8	.031	.000	.000	.094	.063	.094	.156	.063	.125	.125	.094	.063	.094	32
9	.000	.000	.000	.045	.045	.045	.091	.182	.136	.159	.091	.068	.136	44
10	.000	.032	.036	.059	.036	.050	.068	.054	.126	.432	.036	.027	.045	222
11	.000	.000	.000	.136	.182	.000	.000	.000	.000	.273	.273	.000	.136	22
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	42
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	

TABLE 7. The faculty starter to administrator target starter-target combination

Send-ers	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.000	.000	1.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1
2	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000	.000	.000	.000	1
3	.000	.000	.000	.000	.333	.000	.000	.000	.333	.333	.000	.000	.000	3
4	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	2
5	.000	.000	.000	.000	.333	.000	.000	.190	.095	.143	.048	.048	.143	21
6	.000	.000	.000	.125	.125	.125	.000	.000	.125	.375	.000	.125	.000	8
7	.000	.000	.038	.000	.058	.000	.115	.058	.250	.250	.115	.019	.096	52
8	.000	.000	.000	.000	.032	.032	.032	.097	.161	.290	.032	.065	.258	31
9	.012	.000	.000	.012	.036	.000	.048	.072	.145	.361	.000	.048	.265	83
10	.000	.000	.000	.000	.012	.000	.012	.012	.037	.222	.025	.037	.642	81
11	.000	.000	.000	.000	.091	.000	.000	.091	.091	.091	.091	.182	.364	11
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	15
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	

TABLE 8. The student starter to the administrator target starter-target combination

Send-ers	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.459	.135	.176	.014	.014	.000	.014	.000	.027	.041	.000	.108	.014	74
2	.075	.398	.151	.086	.054	.011	.022	.011	.011	.097	.022	.054	.011	93
3	.082	.184	.143	.286	.041	.000	.000	.082	.000	.102	.020	.061	.000	49
4	.014	.072	.101	.377	.087	.000	.014	.043	.043	.058	.043	.058	.087	69
5	.000	.053	.000	.000	.211	.000	.000	.053	.105	.105	.000	.158	.316	19
6	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000	.000	1
7	.000	.000	.000	.000	.000	.000	.000	.167	.333	.167	.000	.000	.333	6
8	.000	.083	.000	.083	.000	.000	.000	.000	.000	.167	.000	.000	.667	12
9	.000	.000	.000	.000	.000	.000	.071	.071	.071	.214	.000	.000	.571	14
10	.000	.000	.000	.022	.022	.000	.000	.000	.044	.289	.022	.067	.533	45
11	.000	.000	.000	.000	.000	.000	.000	.125	.125	.375	.125	.000	.250	8
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	27
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	

TABLE 9. The administrator starter to the administrator target starter-target combination

Senders	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.100	.000	00
2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	00
3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	01
4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	00
5	.000	.000	.000	.000	.500	.000	.250	.000	.250	.000	.000	.000	.000	04
6	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	00
7	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.500	04
8	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	05
9	.000	.000	.063	.000	.000	.000	.000	.000	.125	.250	.000	.000	.563	16
10	.000	.000	.000	.000	.011	.000	.017	.023	.057	.358	.034	.028	.472	176
11	.000	.000	.000	.000	.000	.000	.000	.000	.167	.333	.000	.000	.500	6
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	5
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	

TABLE 10. The faculty, student and administrator starters to a faculty target

Senders	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.439	.183	.098	.061	.037	.000	.049	.012	.024	.000	.024	.061	.012	82
2	.078	.333	.200	.078	.089	.022	.033	.011	.011	.033	.033	.067	.011	90
3	.045	.104	.269	.239	.045	.000	.030	.030	.000	.030	.045	.090	.075	67
4	.041	.041	.149	.257	.108	.068	.054	.068	.068	.000	.041	.081	.027	74
5	.000	.013	.040	.053	.453	.027	.027	.093	.040	.027	.000	.027	.200	75
6	.000	.034	.034	.069	.034	.138	.103	.138	.000	.000	.069	.034	.345	29
7	.000	.000	.011	.000	.067	.044	.156	.111	.156	.089	.033	.044	.289	90
8	.013	.000	.013	.000	.040	.013	.067	.067	.200	.160	.040	.040	.333	75
9	.000	.000	.000	.000	.029	.011	.034	.092	.218	.121	.017	.011	.466	174
10	.000	.000	.000	.004	.009	.018	.039	.035	.193	.298	.022	.031	.346	228
11	.000	.000	.000	.065	.000	.000	.065	.065	.161	.065	.129	.129	.323	31
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	46
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	

TABLE 11. The faculty, student and administrator starters to a student target

Send-ers	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.430	.205	.132	.060	.000	.000	.007	.000	.000	.007	.000	.086	.073	151
2	.090	.412	.167	.073	.012	.000	.000	.008	.000	.012	.004	.106	.114	245
3	.070	.135	.307	.123	.020	.012	.025	.004	.000	.020	.004	.102	.176	244
4	.012	.112	.212	.394	.029	.004	.029	.008	.004	.008	.000	.087	.100	241
5	.024	.048	.128	.160	.328	.008	.024	.032	.008	.040	.040	.104	.056	125
6	.033	.083	.117	.067	.200	.117	.067	.017	.033	.067	.033	.050	.117	60
7	.016	.023	.094	.109	.133	.086	.172	.070	.086	.078	.000	.063	.070	128
8	.027	.014	.014	.054	.041	.122	.203	.108	.095	.108	.068	.054	.095	74
9	.015	.008	.008	.038	.091	.038	.091	.121	.235	.167	.068	.045	.076	132
10	.003	.028	.038	.063	.063	.059	.063	.049	.108	.399	.028	.038	.062	288
11	.023	.023	.047	.116	.140	.000	.047	.023	.023	.186	.256	.047	.070	43
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	143
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	

TABLE 12. The faculty, student and administrator starter to an administrator target

Send-ers	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.453	.133	.187	.013	.013	.000	.013	.000	.027	.040	.000	.107	.013	75
2	.074	.394	.149	.085	.064	.011	.021	.011	.011	.096	.021	.053	.011	94
3	.075	.170	.132	.264	.057	.000	.000	.075	.019	.113	.019	.057	.019	53
4	.014	.085	.099	.366	.099	.000	.014	.042	.042	.056	.042	.056	.085	71
5	.000	.023	.000	.000	.295	.000	.023	.114	.114	.114	.023	.091	.205	44
6	.000	.000	.000	.111	.111	.111	.111	.000	.111	.333	.000	.111	.000	9
7	.000	.000	.032	.000	.048	.000	.097	.081	.242	.242	.097	.016	.145	62
8	.000	.021	.000	.021	.021	.021	.021	.063	.104	.229	.021	.042	.437	48
9	.009	.000	.009	.009	.027	.000	.044	.062	.133	.327	.000	.035	.345	113
10	.000	.000	.000	.003	.013	.000	.013	.017	.050	.311	.030	.036	.526	302
11	.000	.000	.000	.000	.040	.000	.000	.080	.120	.240	.080	.080	.360	25
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	47
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	

TABLE 13. Summary table of all nine starter-target combinations

Send-ers	RECEIVERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	N
1	.438	.182	.136	.049	.013	.000	.019	.003	.013	.013	.006	.084	.042	308
2	.084	.392	.170	.077	.040	.007	.012	.009	.005	.035	.014	.086	.070	429
3	.066	.135	.275	.165	.030	.008	.022	.019	.003	.036	.014	.093	.135	364
4	.018	.093	.179	.363	.057	.016	.031	.026	.023	.016	.016	.080	.083	386
5	.012	.033	.078	.098	.361	.012	.025	.066	.037	.049	.025	.078	.127	244
6	.020	.061	.082	.071	.143	.122	.082	.051	.031	.071	.041	.051	.173	98
7	.007	.011	.054	.050	.093	.054	.150	.086	.143	.118	.032	.046	.157	280
8	.015	.010	.010	.025	.036	.056	.107	.081	.137	.157	.046	.046	.269	197
9	.007	.002	.005	.014	.048	.017	.055	.093	.200	.191	.029	.029	.310	419
10	.001	.010	.013	.024	.029	.026	.038	.033	.110	.339	.027	.035	.313	818
11	.010	.010	.020	.071	.071	.000	.040	.051	.091	.162	.172	.081	.222	99
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	236
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	