To the Graduate Council:

I am submitting herewith a dissertation written by Dallas D. Owens, Jr. entitled "Relationship Maintenance in Ride Sharing Groups." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Sociology.

Thomas C. Hood, Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted for the Council:

Vice Chancellor
Graduate Studies and Research

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RELATIONSHIP MAINTENANCE IN RIDESHARING GROUPS

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Dallas D. Owens, Jr.

December 1977

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ABSTRACT

The objective of this study was to determine why some ridesharing members continue their group participation while others do not. The dependent variable, relationship maintenance, is one of great concern and familiarity to sociologists. Though the variable is familiar, the group context is not. In the latter sense, this study is of an exploratory nature. In three other ways it is somewhat exceptional. The measurement of relationship maintenance is behavioral even though taken from the cohesion literature. Equity theory is used to extract three of the independent variables. The design deals with naturally occurring groups rather than experimental groups.

The data were collected from interviews with sixty subjects. Thirty were participating carpool and vanpool members. The other half were dropouts from one of the two pooling types. Ninety percent of the purposive sample worked for two large employers located in the Knoxville, Tennessee standard metropolitan statistical area. The remaining 10 percent were employed by two small companies in the same area.

Four categories of independent variables were introduced. These categories were: (1) traditional, (2) cohesion, (3) TOD constraints, and (4) equity theory. The first two categories have a history of sociological investigation but the latter two do not. Eleven variables, derived from a review of past research in the four categories, were hypothesized to distinguish between participants and dropouts.

Multiple Discriminant Analysis (MDA) was used to evaluate the hypotheses. Of the eleven variables, five were chosen by MDA as having an optimal amount of discriminating power. The five were (1) group satisfaction, (2) TOD constraints, (3) number of agreements, (4) group heterogeneity, and (5) equity norms. After considering the relationship direction, four hypotheses were judged to be supported. The hypothesis involving heterogeneity was rejected because the relationship direction was inappropriate. Six others were judged unsupported when the independent variables were rejected by MDA. Of the supported hypotheses, none were traditional group structure or demographic variables, one was a cohesion variable, one was a TOD contraint variable and two were equity theory variables. Equity theory, TOD constraints and cohesion variables explain relationship maintenance for this sample. Group structure and demographic variables proved to be of little value. The results call for further research since the sample was limited. The strength of relationships found testifies to the potential explanatory power of the equity theory perspective in naturally occurring groups.

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CHAPTER I

STATEMENT OF THE PROBLEM

The Problem

The object of this work is to explore possible answers to the question, why do some members of the ridesharing group continue participation in that group while others do not?

The eventual dependent variable, relationship maintenance, is a variable which has a long history of interest to sociologists. Referred to as group success, group maintenance, and group cohesion, to name only the most frequently used terms, "relationship maintenance" is probably the most suitable term for the purposes of this study. "Group success," in the sense that a goal is reached or a task is performed, is often the dependent variable in laboratory work groups. The continuation of a group in some structural sense, independent of and beyond participation of a few individual members concerns some investigators. Neither group success nor structural continuity concerns us. Rather, the interest is in explaining the continuation of interaction between a small number of individuals, over time, in a particular group setting. The interaction studied involves both spatial proximity and, at minimum, enough interaction to coordinate the group activity of ridesharing.

The interest expressed above differs from some categories developed to clarify definitions of group cohesion. Chapter II discusses both

theoretical and operational aspects of "continued interaction" and "cohesion." For now it is enough to point out that there is considerable overlap between the concept of relationship maintenance as used here and some definitions of cohesion.

A "ridesharing" group is two or more people riding together regularly in a privately owned or leased vehicle to reach a common destination. Furthermore, this group has been initiated and is maintained by one or more of the members. This definition excludes accidental or casual gatherings of individuals. For example, the study excludes persons who share a taxi ride from the airport to a hotel and any gathering arranged by or mediated by some transportation agency, such as the riders who share a bus on a tour or to work every day. In other words, ridesharing group membership cannot change without involving other members in negotiation. At the operational level, ridesharing groups include "carpools" and "vanpools." This limitation restricts the groups of interest to a size of between two and sixteen persons.

A combination of old concepts and a recently formalized theoretical orientation are used to guide the study. The goal here is to integrate those concepts having a demonstrated value into an equity theory framework to produce a parsimonious explanation of an unexplored group context. Equity theory proponents claim their's is a "general theory," which successfully integrates a number of less general "middle range" theories. The generality should reduce the difficulty in achieving this assigned task. The resulting explanation should serve to support equity theory, expand the theory's power, reiterate the usefulness of the chosen concepts and explain behavior in the ridesharing group context.

The explanation includes concepts applicable at both individual and group levels of analysis. The former includes the variables of leadership style and perceived equity; the latter includes group size, group homogeneity, equity norm agreement and norm enforcement rigor. Chapter II includes a definition of concepts, a sketch of equity theory, and an examination of the literature which justifies the hypothesized relationships.

Limits of the Study

The data used in this study have been collected as a part of two larger projects sponsored by the U. S. Department of Transportation in the Knoxville area.* The selections of data collection techniques used are in part due to the aims of the larger project. Most of the data come from personal, in-depth interviews. Other data collected by self-administered questionnaires and telephone interviews help to describe or act as supportive evidence. Cost limited the number of in-depth interviews which could be collected. Questionnaire and telephone interview samples were larger and more representative of the area.

Data collection was restricted to the Knoxville, Tennessee Standard Metropolitan Statistical Area. Little effort was exerted to insure that the sample was demographically representative of all Knoxville employees who rideshare. Care was taken to represent different ride-sharing modes, carpools and different size vanpools, and different

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*Title projects: City of Knoxville Van Pool Brokerage Service and The Implementation of a Car/Bus Pool System in Knoxville, Tennessee.

types of initiation, private, public or industry. Sample bias is examined in more detail below and specification of the sample frame and sampling technique is given in detail. The results of the research do not appear to be greatly affected by the bias.

As stated above, the subject matter has both familiar and novel aspects. Consequently, research in the area has a dual purpose. Reliance on previous "small groups" and "equity" literature creates expectations of explanatory results and, indeed, hypothesis testing is done. Since studies of ridesharing groups are uncommon, some descriptive results are presented also.

Significance of the Problem

Studying the ridesharing group is certainly a timely topic. For assurance of this point one need only to observe different media sources which are regularly encouraging ridesharing activity. The sponsors of radio, television and various printed media advertisements vary from governmental agencies (U.S. Department of Transportation, 1975) to oil companies (Smith of Shell Oil, 1974) to private companies (Chrysler Corporation, 1974). In addition, the Federal Department of Transportation has distributed large amounts of money in support of local, usually computer based, carpool matching programs (U.S.D.O.T., 1975, 67-77). Many of these programs are described in numerous newspaper accounts. In the first six months of 1974 nearly 150 articles about ridesharing from 52 cities were listed in Update: The Urban News File or Newsbank Urban Affairs Library. Both of these microfiche clipping

services recorded a sufficient increase in the number of articles about carpooling to create new subtopics in the "Automobiles" and the "Transportation" sections of their summary index.

All the efforts to promote ridesharing appear to be a product of the realization that energy resources are becoming less available and more expensive. Authors have pointed to traffic congestion reduction (Kendall, 1974), reduced pollution and reduced parking demand (U.S.D.O.T., 1975, 91-92, 36-37) as positive benefits of ridesharing. Thus the problem is a practical one for many segments of the population. Indeed, the problem of resource scarcity and expense will continue to be experienced for a long while, even on an international level. The only claim here is that the entire population of the United States could benefit from knowledge obtained about ridesharing as a source for reducing energy consumption and saving money (Hirst, 1974, 42-46; U.S.D.O.T., 1975, 91-92). The information now released to the public is more of a technical nature than social. Information about the amount of money that can be saved, the computer resources, and the agency contacts is readily available (U.S. Department of Transportation, 1975). But very little, beyond speculation and testimonials, can be said about the ridesharing group as a social entity.

At a more academic level, research is virtually absent about this small group which has a history of existence in America at least since the gasoline rationing during World War II. From data collected in the Knoxville area it is evident that many individuals have been involved in car pools for more than twenty years. Ridesharing, as we

define it, is very likely to be as old as the automobile and other forms may have preceded the automobile's invention.

Furthermore, the few early studies (Shapiro and Aldrich, 1972; Aldrich, 1972; Krejci, 1973) of the ridesharing group were not even grossly adequate in a sociological sense. They produced little more than a theoretical demographic description of carpool members and are of little value for explaining the group's formation and maintenance processes. More recent studies by Horowitz and Sheth (1976) and Blankenship (1975) are a positive step toward what must be done. They utilize social psychological theories as bases for their analyses.

Only recently have social scientists begun to show interest in this little studied social group. Evidence of this interest can be inferred by introduction of a section in the American Psychological Association's 1976 Annual Meetings in Washington, D. C. entitled "Why is Carpooling not More Common? How to Promote It." Although sociologists have been interested in transportation and small groups, few papers and publications have appeared. A round table discussion on Transportation, which included the topic of carpooling appeared in the community section at the 1976 meetings of the American Sociological Association.

This research also responds to a theoretical gap in sociological literature. Although sociologists are aware that equity theory exists, they have adopted it much less slowly than have the psychologists. But failure to adopt is not in itself condemning. The failure to attempt to support or refute the theory is a glaring omission among

sociologists. In either discipline the vast majority of research done to support or refute the theory has been with ad hoc groups in the laboratory rather than with naturally occurring groups. Many authors believe that findings from examination of experimental laboratory groups of rather unique character (in terms of setting, duration, and commitment) may not apply in other settings (Borgatta & Bohrnstedt, 1974). This is not to say that such research is of no value, only that it needs to be, at least, compared to studies of natural groups. A contention of this sort is not in contradistinction to the retort given by Wuebeen, Straits and Schulman (1974, 15-19) to "traditional objections to experimentation."

The ridesharing group, as studied here, is a "naturally occurring" group rather than one established in a laboratory by some social scientist. It is certainly not an original thought to suggest that the study of "naturally occurring" groups is now needed to determine more exactly the "developmental process" of groups (Altman & Taylor, 1973, 189; Borgatta & Bohrnstedt, 1974). Findings from studies, such as this one, can do much to further support, modify, or contradict equity theory. Whatever the consequences for equity theory, the study will help sociologists become aware of the ridesharing group and be a first step toward understanding the behavior within it.

CHAPTER II

REVIEW OF LITERATURE

Relationship Maintenance

"Relationship maintenance," the dependent variable, is a concept that is of central concern to sociologists. Its centrality is indirectly recognized by Hare (1962, 8) when he points out the concern of sociologists to be "behavior: interaction of individuals in small groups" as a "compromise between the inputs from man's biological nature and personality, on the one hand, and role, culture, and environment, on the other." By definition (Hare, 1962, 10; Abrahamson, 1966, 78-79; Gibb, 1969, 207) individual group members must be interacting over some period of time to establish goals, norms, roles and relationship networks, key terms in the sociological analysis of groups. Additionally, the three major foci of sociologists, group process, change, and structure, are only meaningful when interaction within a group context is considered; the former two are measured over some period of time while the latter is a description at one point in time.

The "essence" of a group is found in the study of interaction among its members. Interaction cannot occur unless the group members are in contact with one another, either in person or mediated by some technology. The continuation of a relationship is synonymous to interaction between group members. Hence, the definition of

relationship maintenance, given in Chapter I, reads ". . . the continuation of interaction . . . ."

Relationship maintenance is a concern in several theoretical orientations, since interaction must exist before the above mentioned "key terms" and "major foci" exist. All orientations deal with one or more of these concerns. Most sociologists would probably admit that "continued interaction," symbolic or physical, is an essential precondition for or a defining characteristic of a group.

Writings on group cohesion form a familiar and large part of small groups literature (Raven, 1969). Cohesion is closely related to relationship maintenance. Some definitional categories of cohesion include relationship maintenance. A thorough examination of the cohesion literature clarifies the point.

Cohesion has been used with nearly equal frequency as both a dependent and independent variable (Cartwright, 1968, 91). Occasionally, the cohesion variable has been used as an untested intervening variable to explain unexpected statistical relationships (Walker & Heyns, 1962, 40). This discussion seeks to show the relationship between cohesion and relationship maintenance. This literature review emphasizes the cohesion as a dependent variable, when such a distinction has value.

Schachter (1951, 229) notes that cohesion has been used in one of two broad ways: (1) morale, efficiency, or spirit of the group or (2) attractiveness of the group for its members. Festinger, Schachter, and Back (1950) attempted to "sum-up" the previous uses as "the average resultant force acting on members with direction toward the

group." This definition was later modified by Schachter (1951) to read "the total field of forces acting on members to remain in the group." Though attacked by Gross and Martin (1952a; 1952b) and defended by Schachter (1952), this theoretical definition is often cited and apparently widely accepted (Olmsted, 1959, 112; Cartwright, 1968, 91). The wide acceptance may be attributed to its broad and nonprohibitive nature which leaves the concept open to varied operationalizations.

Cartwright (1968, 91-109) attempts to make sense of the different cohesion measurement techniques by placing them into theoretical categories. The resulting categories are: (1) interpersonal attraction among members, (2) evaluation of a group as a whole, (3) closeness or identification with a group, (4) expressed desire to remain a member of a group, and (5) composite indexes, combinations of types one through four. Notably absent from this scheme is any behavioral measurement; those included are unanimously attitudinal. The term attitude is used in its broadest sense.

In his book The Small Group, Golembiewski (1962) addresses the problem much as Cartwright did. His categories include: (1) the attraction of a group for its members, (2) the coordination of the member's efforts, and (3) the level of motivation of group members to do a task with zeal and efficiency. Of the three categories the second one appears to be behavioral while the first and third are attitudinal, though the third could conceivably have behavioral measures, if "motivation" is deemphasized.

Lastly, a cross-classification scheme developed by Akers (1970, 74-75) includes the four combinations resulting from considering orientational and relational mental components with social (interactional) and cultural (ideational) artifacts. The results, as Akers admits, need further development before having empirical value.

In addition to classification schemes a number of "dictionary" or theoretical definitions are given in passing by Hoult (1969, 67), Turner and Killian (1957, 20), and Gross and Martin (1952a, 553). The list is by no means all inclusive but their content illustrates that clarification of the classification schemes examined earlier is not offered by casual definitions.

As might be expected, numerous operational definitions have developed, each proclaiming to be measure cohesion. Only limited attempts have been made to measure the "relative" validity of these various measures. Eisman (1959) examined the interrelations between five measures, only two of which had ever actually been used. Gross and Martin (1942a) correlated three sociometric measures. Finally, Ramus-Nienhuis and Van Bergan (1960) essentially replicated Eisman's work. These few works do not tell us much about cohesion measurement.

To make any sense of the cohesion measurements, an attempt to classify them must be made. One scheme would reflect what is being measured and from what level of analysis. To keep the "what is being measured" at a simple dichotomous level the "attitude" and "behavior" categories can be used. For equal simplicity the "level of analysis" categories can include the "individual" and the "group." These four

categories are widely used in various contexts and generally accepted as legitimate by sociologists. If the four are placed into a two-by-two table it is possible for an operationalization to fall in one of the four resulting categories. The scheme will only be a simple tool for categorizing cohesion measurements, but these measurements were developed by their authors to reflect theoretical orientations that should be identifiable as sociological and/or psychological. The scheme corresponds to that of Cartwright (1968), Golembiewski (1962) or Akers (1970) but with more clearly specified criteria for its justification and emphasis on actual measures instead of theoretical meaning. The four categories are used to classify some relevant "classical" studies in Chart II.1.

Chart II.1: Categories of the Group Cohesion Literature

1. Attitudes about individual group members
   (a) Sociometric indexes: "friendship index" used by Dimock (1941), Festinger et al. (1950), Bovard (1951), Newcomb (1956, 1961), Schachter (1951), Emerson (1954), Berkowitz & Howard (1959), Lott & Lott (1965), Dittes (1959), Aronson & Mills (1959), Hendrich et al. (1971).
   (b) Sociometric index: "social distance scale" used by Stein et al. (1965), Triandis & Davis (1965), and Triandis et al. (1971).
   (c) Sociometric index: "interpersonal judgment scale" used by Byrne (1962, 1971), Byrne & Rhaney (1965), Byrne & Griffett (1966, 1969), Byrne & Clore (1966, 1968), Lindsey & Byrne (1968).
   (d) Sociometric index: "preference scale" used by Byrne (1961), Jones & Daugherty (1959(, Worchel & McCormic (1963), and Newcomb (1945, 1961).
   (e) Sociometric index: "physical attractiveness rating" used by Byrne, Ervin & Lamberth (1970).
2. Behavior of an individual group member
   (a) Personal involvement measure (Sagi et al., 1955).
   (b) Behavior compliance pattern (Baron, 1970).
   (c) Approval-cue indicator (Aronson & Worchel, 1966).

3. Attitude about the group as a whole
   (a) Direct question technique (Seashore, 1954; Mann & Baungarter, 1952).
   (b) Resistance to leave the group (Nash, 1969-1970).
   (c) Multi-demential evaluation of the group (Jackson, 1959).
   (d) Choice to remain in the group (Libo, 1953).
4. Behavior of the group as a whole
   (a) Intergroup competition measure (Julian et al., 1966; Meyers, 1962).
   (b) Group Hostility against verbal abuse (Pepitone & Reichling, 1955).
   (c) Visual Interaction (Efran, 1969).
   (d) Proximity (Byrne et al., 1970).
   (e) Personal space (Sommer, 1959).

Since Cartwright's (1968) theoretical scheme is widely cited it will be compared to the one developed above. Cartwright's theoretical categories should correspond to the empirical categories represented. Chart II.2 compares the two schemes.

Chart II.2: Comparison Between Cartwright and the Empirical Scheme

Cartwright's theoretical scheme	Empirical scheme
(1) Interpersonal attraction among members	(1) Attitudes about individual group members
(2) Evaluation of a group as a whole	(3) Attitude about the group as a whole
(3) Closeness or identification with a group	(3) Attitude about the group as a whole
(4) Expressed desire to remain a member of the group	(3) Attitude about the group as a whole

Clearly Cartwright's scheme shows cohesion as an "attitudinal" or verbal measure of attraction to other group members or to the group as a whole. Other authors, represented in categories two and four of Chart II.1, obviously disagree with Cartwright. Most cohesion theorists agree with Cartwright. An attitudinal measure of attraction is only appropriate when it is a more or less adequate predictor of a behavioral consequence. Researchers should not be concerned about

individual "attraction systems" for their own sake. Rather, the concern should be with some aspect of interaction within the group which has consequences for something broadly classified as "group success." Success can be in terms of goal attainment or group continuation.

The authors cited in categories two and four have attempted to bypass the "attitudinal" stage of analysis and deal with subsequent behavior. But these authors, especially those in category two, only advanced to stage two, the interaction patterns. They still fail to deal with the more important behavioral consequences which can be hypothesized from the behaviors they examine. This work examines one important consequence, the discontinuation of interaction.

The purpose of this discussion has been to demonstrate the relationship between cohesion and relationship maintenance. Before the comparison could be made the cohesion literature had to be classified into manageable theoretical and empirical categories. Frequent reference to the scheme serves as a basis for defining this study's dependent variable.

The question might be asked, "Why was the cohesion literature chosen over other types to represent relationship maintenance?" The "primary" purpose of all cohesion research is to explain the maintenance of groups. Only half of the cohesion definitional categories are used here but that is a result of our definitional restriction, not because the other categories do not concern relationship maintenance. Much literature is grouped around "leadership" or "communication" or other similar concerns, perhaps with unavoidable but seldom examined reference to maintenance of relationships. Within the forthcoming "traditional explanations"

section the overlap between the types of literature is examined selectively.

Traditional Explanations

In the Handbook of Small Group Research (1962), Hare tells us that there are "six major variables" which have "effects . . . on the interaction process" (169). The definition of the dependent variable in this study includes the terms "continuation of interaction between a small number of individuals . . . ." It seems plausible to consider some of Hare's variables. Two of these variables, "group size" and "leadership," are especially suited for examination in this study. The two obviously vary within the "group setting" of interest. A number of the "social characteristics" are easily measured and are also suitable for investigation. Those other variables dealt with by Hare are (1) personality, (2) task, and (3) communication network. None of these last three variables will be dealt with in this study. The three variables of interest in this study are examined in more detail below.

Group size has a long history of interest to sociologists. Georg Simmel (1950, 141) emphasized group size as an important determinant of group characteristics, including interaction form and content. It is the consequences of change in interaction form and content that makes group size an important "summary" variable. No attempt will be made to examine the variables subsumed under group size. The only concern is with the consequences of total changes for relationship maintenance.

In the 1950's several researchers attempted to establish the "free-forming" size of groups for a number of social activities (James, 1951; 1953). Slater (1958) and Ziller (1957) tried to find the "optimal group size" for achieving selected goals. More relevant to the study at hand, Thomas and Fink (1963, 534), Egerbladh (1976) and Knowles et al. (1976) found that group size has significant effects on aspects of individual and group task performance, on the nature of interaction and distribution of member participation. Olsen (1971, 34-36, 46-48) confirms these findings and elaborates on what the effects are. The interest in group size was further demonstrated by Coleman and James (1961) and White (1962) in their respective, though contradictory, mathematical models.

The above studies conclude that group size determines some aspects of interaction. Interaction is a central concept in the definition of relationship maintenance. The consequence of changing group size for relationship maintenance is not obvious. The "optimal size" literature suggests that the effect is activity or goal specific. The ridesharing activity has yet to be investigated. If the goal of ridesharing is to travel to work in the most efficient, pleasant and trouble-free manner, it would appear that the smaller numbers of persons would be more easily coordinated. This is not to say that the rate of increased coordination difficulty is uniform or that all individuals would perceive the increase uniformly. In the ridesharing groups there are very important time constraints placed on the group activity. It can be assumed that coordination is at a premium. As the group increases in size, the amount

of "spare" time that can be spent for coordination efforts decrease. For example, a person driving to work alone has zero amount of time spent on coordination. When that person picks up other "A," even when not leaving the original route, some minutes must be allowed to give other "A" time for loading. In most cases some "slack" time must be added in case other "A" is not completely ready to load.

When others "B" through "F" are included in the ride to work group, the situation becomes more complex. Ideally it would seem that the amount of "spare" time allowed for other "A" must now be multiplied by six. The five minutes coordination time become thirty when rider-ship increases from one to six. There must be some point when the additional "costs" of increased coordination time is greater than the "rewards" from financial savings. Such would probably be the case if the driver picked up fifteen riders each at a different location, causing a 75 minute increase in trip time. Before adding fifteen riders, the driver could sleep till 7:00 a.m. and still be at work by 8:00 a.m. Now wake-up time is 5:45 a.m., costly to most people.

Most drivers would decrease the potential costs in a number of ways. One way is to have central pick-up points. If the fifteen riders are picked up at only three points the coordination time is reduced from 75 to 15 minutes. Another method is to assume that each rider will not "use" his or her entire allotment of spare time. By assuming that 12 of the 15 riders will only use two minutes each, the time is cut to 39 minutes, even when the other three use all their time.

The preceding discussion is to demonstrate that increasing the number of persons in a ride to work situation "always" involves some time costs. Financial and social gains, coupled with compensatory tactics, makes it difficult to specify the degree individuals perceive the increased costs. To further complicate the situation, the first few of the 15 riders picked up are very likely to experience more "costs" than the last riders. They experience more of the "spare" time allowed for riders other than themselves.

In sum, coordination efforts are easier and less costly and interpersonal rewards are greater in smaller groups. The hypothesis is the larger the group the less likely the relationship will be maintained.

The hypothesis is supported by James (1951, 1953) who found that most "naturally forming" groups are small, ranging from two to seven with a mean of about three. This holds especially for groups forming from face-to-face contact. Homans (1950) adds his support by pointing to the increased durability of small groups. The second assumption made by Coleman and James (1961) also supports the hypothesis. They assumed that since individuals have a constant probability of leaving a group, the rate of departure depends on the number in the group. Hence, referring to our defintion, group maintenance decreases as group size increases. Olsen (1971, 48) offers a theoretical explanation for the phenomena which goes beyond the mathematical cause formulated by Coleman and James.

Another variable which may be important for explaining the interaction process is <u>leadership</u>. The concept of leadership has

received attention from sociologists as part of three traditions. According to Stogdill (1974, 16) much of the leadership literature is of little theoretical value when beginning with definitions designed to identify leadership as a "focus of group process and movement" or consider leadership as the "art of inducing compliance." More productive are definitions that conceive the concept in "terms of power differentials, role differentiation, and initiation of structure." The latter definition is more prevalent in the recent literature. Gibb (1969, 205) and Janda (1960, 345) concur that first came the "trait" or "personality" studies, followed by the "interaction" or "situational" literature. Gibb concludes that more recently there has developed ". . . a more sophisticated psychology of leadership . . . (considering) the personal, environmental, and social situation variables . . . ."

Definitions of leadership and limitations on research problems are closely related to one or more "theories" of leadership. Gibb (1969) and Stogdill (1974) offer two very different lists of leadership theories. Gibb (264) names the three theories (1) unitary trait, (2) constellation-of-traits, and (3) interaction. The latter one is proposed by Gibb to be the most viable and is the only one he greatly elaborates. Interaction theory includes consideration of the (a) leaders' personality, (b) followers' characteristics, and (c) group characteristics (268).

Stogdill's (1974, 17) scheme is more complex, including the theories: (1) great man, (2) environmental, (3) personal-situational, (4) interaction-expectation, (5) humanistic, and (6) exchange.

Stogdill's more closely coincides with traditional general sociological theories of the type presented by Wallace (1969) or Martindale (1960). Gibb's scheme is not less valuable solely because the terminology is less familiar or receives less consensus from sociologists. Both undoubtedly have problems categorizing particular works. Stogdill's is more acceptable because his elaborations are more extensive and his criteria for classification clearer. He goes so far as to classify a great number of works, which Gibb fails to do. Stogdill uses familiar terminology, placing leadership literature back into the mainstream of sociological research; i.e., it "fits" into general sociological theory. Fit is emphasized more than uniqueness. If sociological theory is to ever have real predictive or explanatory power, "special" theories must be combined. Fit must be demonstrated between "leadership" theory, "small-groups" theory, and the "general" theories.

Both Gibb (212, 214) and Stogdill (10, 12) recognize the concept of "influence" as central to the definition of leadership. Both authors consider influence to be directed toward initiating and continuing "structure," as part of a "role," designed to achieve a "goal" (Gibb, 214-215; Stogdill, 16). Their definition has unavoidable ramifications for identifying the leader in a ridesharing situation. The most obvious example is the vanpool driver who sets rules, recruits riders and collects fees to acheive the group goal of getting to work. That role is essential to the group's formation and continuation. The influence may go beyond formation, to the determination of whether or not the group continues or dissolves. The leader's influence, or power, is not

to be underestimated in a vanpooling situation. The situation is very similar in a carpool which has only one driver. The role may be radically different in carpools having multiple drivers. In the latter instance the leader may not be well defined and may exert differential amounts of influence. There is no inherent degree of influence connected with the role.

Gibb and Stogdill have both demonstrated the need for considering leadership when trying to explain why relationships are maintained. The concepts are inseparable since leadership is defined in terms of a role in the interaction process, leading to strengthening, weakening, or dissolution of the group. A great deal of literature is devoted to showing the functions of leadership for the group's maintenance and development.

Stogdill (1974, 30) lists the leadership functions attributed to behavioral theorists. The functions are taken from the works of Gross (1961), Selznick (1957), Katz and Kahn (1966), Benne and Sheats (1948), Stogdill (1959), Bowers and Seashore (1967), and Cattell (1957). The list supports the contention that the two concepts, leadership and group maintenance (interaction), belong in the same theoretical scheme.

The literature shows that the leader may be a person or subgroup. The leader's chief role is to influence group members in achieving a goal by developing and maintaining a group structure. Some form of this definition is implicitly or explicitly expressed in most recent leadership studies. After identifying leaders, sociologists use their information in different ways. Gibb (258) and Stogdill (27-28)

state that most works are designed to create a typology of leadership or explain the effects of different types on group behavior. The typologies have reflected a "style" or "function" criterion for classification.

In this study the style criterion is of more interest. The functions of leaders in ridesharing groups appear unspecialized. The ridesharing leader might perform all those functions listed by Stogdill (30) instead of specializing in just one or two. The difficulty encountered when trying to use the "abstract" and "incomplete" list of functions is widely acknowledged (Stogdill, 31) and will not be used. The most often used style criteria are autocratic and democratic, although sometimes called by other names (Gibb, 258; Stogdill, 27). The original names will be retained here, for lack of a compelling reason to change them. The important consideration is to make clear the definitions of each concept. The definitions first offered by Lippitt (1940) supplied the impetus for voluminous research. The autocratic leader determines the group's policy and dictates the methods for goal attainment. The democratic leader encourages a group to determine their own policies and methods for goal attainment. The measurement of these types will be discussed in Chapter III.

Leadership style is related to relationship maintenance through two channels. A number of authors (Anderson, 1959; Foa, 1947; Harnquist, 1956; Mullen, 1965, 1966; Muller, 1966; Shaw, 1955; Snadowski, 1969) have found that democratic styles are positively related to group member satisfaction. Enough inconsistency in findings have occurred to prompt

Stogdill (370) to conclude:

> . . . member satisfaction is associated with a democratic style of supervision . . . (but) satisfaction . . . tends to be highest in small, interaction-oriented groups. Members are better satisfied with autocratic leadership in large, task-oriented groups.

The second connection with group maintenance is through the work of Lippitt (1940), White and Lippitt (1960), Ley (1966), and Gibb (1969). These authors found the democratic style to be associated with group cohesiveness while the autocratic style destroyed cohesiveness. Though research on leadership styles' relationship to cohesiveness is sparse, it has produced few inconsistent findings. Participative/directive styles are definitionally equivalent to democratic/autocratic styles. Fox (1954, 1957), French et al. (1955), Kahn and Tannenbaum (1957, Mann et al. (1953), Pennington et al. (1958), and Tannenbaum and Smith (1964) have demonstrated that participative leadership, the near-equal to democratic, is correlated with group cohesiveness.

It only remains to demonstrate how "member satisfaction" and "cohesion" are related to relationship maintenance before formulating a hypothesis to explain relationship maintenance. The latter concept offers no problem since the first of this chapter was dedicated to explaining how relationship maintenance is a concept easily subsumed under cohesion. Group satisfaction is related by virtue of being only another word for type three of cohesion "empirical" literature, i.e., "attitude about the group as a whole." The value of type three research as a predictor of relationship maintenance, behaviorally defined, has already been discussed. Leadership style determines relationship

maintenance in as much as one accepts that member satisfaction determines relationship maintenance. Member satisfaction is an intervening variable between leadership style and relationship maintenance.

A hypothesis follows, justified by the empirical research examined. The more democratic the style of leadership the more likely the relationship will be maintained.

The third and final category of variables is taken from Hare's discussion of social characteristics. The variables examined here include sex, age, occupation, and group homogeneity. Each has a long tradition of use by sociologists but justification for their use will be given below.

There have been a number of studies concluding that a person's sex determines the interaction pattern in a group context. Beloff (1958), Costanzo and Shaw (1966), Reitan and Shaw (1964) and Tuddenham (1958) contend that women are more likely to conform to group norms than men. Sistrunk and McDavid (1971) add the modification that the relationship between sex differences and conformity depends on the group's task. The Berg and Bass (1961) conclusion that men are more task-oriented while women are more interaction-oriented partially supports Sistrunk and McDavid.

If the sex/interaction-style relationship is situational-specific, more information is necessary about sex differences in ridesharing groups before a hypothesis can be formed. If the ridesharing group is voluntary, there are some relevant studies. Rosnow and Rosenthal (1966) conclude

that males are more likely to volunteer for "nonstandard" types of research but females are just as likely to volunteer for "traditional" types.

Payne et al. (1972) show that men more often acquire membership in all voluntary associations but for specific associations women have equal or greater membership. Hausknecht (1962) offers an explanation for these findings; males and females join the associations that are culturally determined to be appropriate. The conclusion is reasonable but no one has determined whether the ridesharing group is culturally appropriate for men or wormen. The empirical studies of ridesharing groups should give some indication of that.

The ridesharing literature is as inconsistent as the preceding. Krejci (1973) states that males are more likely to rideshare while Shapiro and Aldrich (1972) feel that females are the more likely. Transportation Center (1975) studies show an insignificant degree of association between sex and ridesharing for 4,000 Knoxville employees, though males have a slightly higher rate of ridesharing. At the same time, for 2,000 employees of a large company males are 8 percent more likely to express a desire to be in the carpool matching program and 12 percent more likely to be willing to participate in a follow-up study (Owens et al., 1974).

In the face of very inconsistent and indirect findings the resulting hypothesis cannot be made with much confidence. This mixed evidence slightly supports the conclusion that females are more likely to maintain the ridesharing relationship than males. The literature on conformity

is more important for relationship maintenance than that dealing with voluntary associations. This study seeks to explain which sex is more likely to continue as a member, not which one is more likely to join. Conformity as a member is more important than the predisposition to join.

The variable of age has a research tradition nearly as inconsistent as that of sex. Shaw (1976, 163) points out that, "age is an important determinant of the kinds of behaviors an individual group member will display in the group." He reviews several studies but none of them include age categories above age twenty-one and conformity and leadership are the only dependent variables examined. These limitations make it difficult to generalize the author's conclusions to the ridesharing group.

Rosenthal and Rosnow (1969) feel that the evidence, though inconsistent, supports the belief that younger individuals are more likely to volunteer for research. Payne et al. (1972) summarize a number of studies clearly concluding that middle-age people are more often members in voluntary associations than younger or older people. Owens et al. (1974) found younger respondents more willing to participate in a carpool matching program while middle-age respondents were more willing to participate in a follow-up study. Shapiro and Aldrich (1972) found older persons more likely to carpool but Krejci (1973) found the opposite to be true. In Transportation Center studies (n = 4,000) there was no significant relationship between age and carpooling, though younger subjects are slightly more likely to pool.

Again, the hypothesis must be offered with very little confidence, especially since relying on predisposition literature rather than that concerning interaction. Considering the weakness of the Shapiro and Aldrich study and Transportation Center findings, it can be expected that younger subjects are more likely to maintain the relationship than older subjects.

The importance of the occupation variable is grounded in its indication of ". . . status as a cue to appropriate interaction . . ." (Shaw, 1976, 246). Shaw goes on to say that ". . . of course it is the perceived status that influences behavior . . . (since it) is necessary for defining the social situation . . . ." Usually the persons of higher status are more conforming than those of lower status (Harms, 1961). One can accrue "idiosyncrasy credit" from past contribution which allows for nonconforming behavior (Hollander, 1958). The degree of conformity depends to some degree upon the nature of the group context (Gergen & Taylor, 1969).

Much of the evidence cited to support the initial statement by Shaw involves differences in status within the group. The concern is being limited to subjects' occupational status, existing independent of the group. The above literature is somewhat relevant since the more "general" status is transferable across group contexts. To clearly indicate the impact of occupational status on interaction patterns within small groups another type of literature must be examined.

A variety of status indicators are used by sociologists and the controversy over which is the most appropriate is in no danger of

immediate resolution. The use of occupational status in no way denies the complexity of the "class-culture" question discussed at length by Grey (1969) and others. Pearlin and Kohn (1976, 177-479) point out that occupational category is a "critical dimension of class" and is "most important" for explaining "many aspects of behavior." Agreement is indicated by Blau and Duncan (1967, vii), Reiss (1961, 83-84) and Kerckhoff (1972, 5-6).

The literature suggests that occupational status is important. It must now be determined how occupational status affects interaction patterns within small groups. Evidence has been offered to support the contention that "class" differences affect interaction patterns in the family group (see the critical reviews by Erlanger, 1974, 68-85 and Kerckhoff, 1972, 39-59). Such evidence has only minor, mixed and indirect implication for ridesharing groups. Hall (1969, 175-203) summarizes the white-collar work, working conditions and interaction patterns in the working context. He (204-254) does the same for all other work categories, collectively called blue-collar, but fails to give descriptions of interaction patterns outside the work context.

Most closely related to the ridesharing group is the category of literature classified as "Class and Personality." Findings in this area are very controversial but have some fairly consistent themes. These themes are well summarized by Miller and Riessman (1961) who characterize the working class as striving for nearly unattainable stability and security, being very traditional, selective in demonstrating emotional intensity, person centered, pragmatic, anti-intellectual, and

excitement seeking. The sum of the authors' themes is that the working class individuals show less stability in their interaction patterns than middle-class individuals. Gans (1962, 242-246) comes to similar conclusions but concentrates on the family structure. Kerckhoff (1972, 57-58) explains the instability from the socialization perspective:

> . . . social sensitivity is closely related to the self-image, and . . . by . . . (it) is simply meant the ability and tendency to take the role of the other in social interaction . . . involves a view not only of the other but of one's own relation to the other . . . class-related practices . . . vary in their effectiveness in encouraging cognitive development and thus role-taking and role-playing ability . . . . (Kerckhoff, 1972, 57)

In essence, Kerckhoff concludes that white-collar (middle-class) persons have more "social sensitivity" than do blue-collar (working- and lower-class) persons.

From yet another perspective, the joining behavior of ridesharing groups is inconsistently related to occupational status. Shapiro and Aldrich (1972) show lower income subjects less likely to pool but Davis et al. (1974) show blue-collar "industry categories" to have higher pooling rates. Horowitz and Sheth (1976) were unable to find a connection between income and pooling.

For purposes of hypothesis formation reliance must again be on the status-conformity and status-stability literature rather than on the status-joining type. The emphasis is on continuation of interaction rather than the establishment of interaction. Even though the evidence is mixed, it appears that the higher the occupational status the more likely the relationship will be maintained.

For Hare homogeneity does not warrant a special subheading but is listed under the consideration of race, sex and age. Group homogeneity has long been recognized by sociologists and anthropologists as an important determinant of group interaction content, both at the societal and small group level.

At the societal level, Davis and Moore (1945) point out that no groups are "classless" or "unstratified." There are only certain differences in the degree of homogeneity. Rose (1967, 289) states that "industrial society is, by its very nature, multi-group(ed)." Redfield (1947) describes the ideal type "folk" society in terms of a high degree of homogeneity. The same themes have appeared and reappeared for years in the sociological literature most often at the societal level.

At the small group level, Shaw (1976, 219) points out that:

> . . . many theorists believe that the homogeneous-heterogeneous dimension is . . . important . . . . The general assumption is that most group activities require variety of skills and knowledges; hence, the more likely the necessary abilities and information will be available and the more effective the group is likely to be.

Shaw (220) points out that caution must be used when interpreting findings about group homogeneity since, ". . . groups are homogeneous or heterogeneous with respect to specific characteristics, not all of which are relevant to the group's activities."

The conclusions offered by Shaw and supported by Hoffman (1959) and Hoffman and Maier (1961) are based on findings involving task-oriented groups. The characteristics examined are directly relevant to the task's achievement. The characteristics to be examined in

ridesharing groups are all social in consequence. They have little to do with skills or abilities needed to do physical tasks. The assumption behind the group homogeneity hypothesis is that individuals find it "costly" to be in close proximity to individuals different from themselves. These differences must be perceived and believed significant to be important. In our culture differences in race, sex, and to a lesser extent, age, are often considered significant. Close association with individuals having different characteristics may prove uncomfortable (costly) because interaction patterns and social expectations are different, lending an unpredictability to the situation.

Shaw (1976, 227) states that the racial composition of a given group:

> . . . clearly influences the feelings and behaviors of group members, particularly of the black group members. In some cases, these behavioral differences interfere with group performance, but this is not invariably true.

Some authors agree with Shaw that feelings are affected, but they do not necessarily believe that group's productivity is changed. The preponderance of evidence supports the contention that groups' productivity suffers when races are mixed. Katz et al. (1958), Eitzen (1973), Fenelon and Megaree (1971) and Entwisle and Webster (1974) conclude that race homogeneity increases the likelihood of goal attainment and group effectiveness. Decreased efficiency in mixed-race groups is due to tension created by interaction with individuals of a different race.

Mixed findings for sex homogeneity mostly support the contention that same-sex groups are more effective in achieving tasks. South (1927),

Hoffman and Maier (1961), Clement and Schiereck (1973) and Lefébvre (1973) found same-sex groups to operate more efficiently than mixed-sex groups. The conclusions are complicated by findings that behavior conformity increases for both males and females with mixed-sex groups (Shaw, 1976, 225). Same-sex groups engage in more individualistic and competitive behavior (Wyer & Malinowski, 1972) and same-sex groups are more action-oriented, original and optimistic (Kent & McGarth, 1969). The latter studies imply that certain groups, especially where no specific task is evident, lack competitive, action-oriented and nonconforming behavior that is conducive to groups continuation.

Age homogeneity has been less studied than the other characteristics. Ziller and Exline (1958) discovered that group's age composition, while controlling for sex, affected the amount of verbal participation. The earlier assumption that individuals find it "costly" to be in close proximity to different others applies to age difference too. The research lends very weak support to the same conclusion offered about the other characteristics. That is, age heterogeneity creates disruption, costs or inefficiency in goal-oriented groups.

The cumulative evidence, though not entirely consistent, lends itself to supporting a hypothesis. The greater the group homogeneity the more likely the relationship will be maintained. Group homogeneity has three dimensions, race, sex, and age.

Equity Theory Explanations

The basic equity theory propositions are given by Walster, Berscheid, and Walster (1973, 1976) and Walster and Walster (1976). These

propositions are claimed to accurately represent and extend the formulations of Adams (1963, 1965). Adams acknowledges the propositions' validity in his later writing (Adams & Freedman, 1976). The propositions are:

> Proposition I: Individuals will try to maximize their outcomes (where outcomes equal rewards minus costs).
> Proposition IIA: Groups can maximize collective reward by evolving accepted systems for equitably apportioning resources among members. Thus, groups will evolve such systems of equity, and will attempt to induce members to accept and adhere to these systems.
> Proposition IIB: Groups will generally reward members who treat others equitably, and generally punish (increase the costs of) members who treat others inequitably.
> Proposition III: When individuals find themselves participating in inequitable relationships, they will become distressed. The more inequitable the relationship, the more distress individuals will feel.
> Proposition IV: Individuals who discover they are in an inequitable relationship will attempt to eliminate their distress by restoring equity. The greater the inequity that exists, the more distress they will feel, and the harder they will try to restore equity. (Walster & Walster, 1976, 290; Walster et al., 1976, 2 & 6)

The sole purpose of this study is not to examine equity theory. The formulas and discussion designed to clarify the propositions are omitted except where relevant to the study. Elaboration is presented in the same publication with the propositions. The equity theory literature is also reviewed in the 165 item annotated bibliography presented by Adams and Freedman (1976). The propositions have not gone unchallenged, though they are usually supported by equity theorists. Harris (1976, 197) calls the propositions and formulas "merely a pseudonym for each researcher's intuitions about equity." He proposes an examination of definitions "against a comprehensive set of criteria, rather than simply those which 'inspired' the definition."

Abrams and Freedman (1976, 44 & 52) give the belief and ambition expressed of equity theorists:

> . . . equity theory may, indeed, eventually result in a comprehensive theory of social relationships. The theory in its present form (Walster et al., 1973) strikes us as having a well articulated structure, being parsimoniously elegant, and having an increased predictive range . . . as equity theory matures and its relevance extends to the domains of exploitative, intimate, and helping social relationships (see Walster et al., 1973, Miller, 1977; Bloom & Clark, 1976), and legal justice (see Legant, 1973; Macaulay & Walster, 1971), more precise measurement of variables and parametric investigations appear desirable (see Austin et al., 1973; Lerner et al., 1976; DeJong et al., 1976).

Walster, Berscheid, and Walster (1976, 38) offer further support:

> ". . . Given the relevance of many social psychological findings to equity theory, the next step in equity research should be to integrate these social psychological findings into equity theory in a formal way, in the hope of further increasing the breadth of the equity theory predictions.

There are many who would disagree with the equity theorists' favorable evaluation of their efforts. Homans (1976, 240-241) points out that "behavioral psychology," which equity theorists claim to subsume, is actually the more general of the two theories. Burgess and Nielsen (1974) contend that equity considerations are actually "only one kind" of exchange relationship, making equity theory a special case of exchange theory.

Equity theory propositions explain variation of interaction in groups. The type interactions explained are group activity designed to maximize outcomes (individual), maximize collective reward and distribute rewards and punishments to maintain the social system. If distress develops from failure to obtain "deserved" rewards, action is

taken to change the situation. Equity theory states that during group activity one tries to obtain personal benefit while insuring continuation of the needed group by helping the whole group obtain rewards and punishing those who fail to do their fair share. Personal reward is assured through individual efforts to achieve "common" goals.

The activity can easily be put into a ridesharing context. The rider/driver wishes to benefit by getting to work cheaply. To continue doing so he or she must guarantee the continuation of the ridesharing group by insuring that other members are benefiting too. If one member ceases doing his or her share, paying or driving their turn, the whole group is jeopardized and must share in the reduced benefit. Hence, corrective action must be taken against the delinquent member in an attempt to return the entire group to a "fair" arrangement.

The majority of empirical research offering evidence on equity theory involves economic relationships and is experimental. Typically, the subjects are paid differentially to do some task and informed that other subjects are more or less qualified than themselves but are being paid the same or differently. To measure the effect of perceived payment inequity the productivity and work quality is evaluated. (See Adams, 1963; Adams et al., 1964, 1962; Goodman et al., 1968, 1969; Kessler & Wiener, 1972; Lawler, 1968; Weick et al., 1968; Moore & Baron, 1973.) Rivera and Tedeschi (1976) have introduced additional variables to elaborate on this basic relationship.

Others, of more relevance to this study, have examined consequences of an inequitable circumstance, such as job dissatisfaction or reduced

attraction for the job (Pritchard et al., 1972; Yuchtman, 1972) and dropping from the relationship (Telley et al., 1971; Valenzi, 1971).

The latter studies serve as a basis for a hypothesized relationship: the greater the perceived equity the more likely the relationship will be maintained. Ambiguity of findings in the "over-reward" inequity literature, summarized well by Cook (1975), limits the concern in this paper to under reward inequity.

At least two other variables must be introduced before "perceived equity" can be explained. Proposition IIA (Walster & Walster, 1976, 290; Walster et al., 1972, 2) introduces the notion of "evolving accepted systems." In traditional sociology this is no more than establishing a norm. This particular norm involves equitable distribution of rewards. Homans (1976, 232) endorses the likelihood that such a norm develops but doubts agreement exists about:

> . . . what kinds of rewards and contributions are to be legitimately taken into account in applying the rule (and) . . . the assessment of the amounts of these contributions each makes and the amounts of these rewards each receives . . . .

Experiments by Brickman and Bryan (1976), Reis (1976) and Greenberg and Leventhal (1976), respectively, partially support, modify, and deny the relationship.

Propositions IIB, especially, and IV involve the sociological equivalence of norm enforcement or sanctions. From these propositions it follows that the greater the group agreement on equitable arrangements (equity norms) the more likely the relationship will be maintained. Furthermore, the more rigorously the equity norm is enforced the more

likely the relationship will be maintained. Support for Proposition IIB is often found to be accompanied by a stipulation reflecting "groupness" between subjects and observed persons whose conditions are being manipulated (Miller et al., 1976; Bleda et al., 1976). These studies' conclusions support the expectation that the propositions will most likely hold true for small well-defined groups, such as the ridesharing group.

TOD Constraints

The final variable to be considered does not fit neatly into either the "traditional" or "equity" category. It is nearly a "traditional" variable since it involves environmental constraint factors related to mobility and occupation. The "time-origin-destination" phrase has its roots in the transportation literature. Matching TODs for potential ridesharers is considered a prerequisite for forming a car or van pool (Smith, 1974; Davis, 1975).

It is very unlikely that individuals will rideshare if they actually have differences in any of the three TOD elements. They are important to consider in any explanation of why an individual is not participating in such a group.

In reality few individuals have unmatchable TODs. When they perceive themselves as unmatchable with a "reasonable" target group it affects their participation in a ridesharing group. That perception is likely to increase as the number of factors are increased. A person is more likely to perceive they are unmatchable if they believe they

have different work times and different work locations than if only the locations are different. Based on the foregoing comments, the perceived differences are additive in their effect.

The additivity concept is largely untested. TOD constraint factors do warrant a hypothesis. The greater the degree of perceived TOD constraints the more likely an individual will not maintain the relationship. No attempt will be made to determine the relative value of TOD components.

Summary

The objective of this study is to explain relationship maintenance within a ridesharing context. To achieve this goal a review of literature was undertaken that considered three variable categories: (1) traditional, (2) equity, and (3) TOD constraint. From the review the following hypotheses have been created:

1. The larger the group the less likely the relationship will be maintained.
2. The more democratic the style of leadership the more likely the relationship will be maintained.
3. Females are more likely to maintain the relationship than males.
4. Younger subjects are more likely to maintain the relationship than older subjects.
5. White-collar subjects are more likely to maintain the relationship than blue-collar subjects.
6. The greater the group homogeneity the more the likelihood of relationship maintenance.

7. The greater the degree of group agreement the more likely relationship maintenance.
8. The greater the norm enforcement rigor the more likely the relationship will be maintained.
9. The greater the perception of equity the more likely the relationship will be maintained.
10. The less the TOD constraints the more likely the relationship will be maintained.
11. The greater the degree of group satisfaction the greater the likelihood of group maintenance.

The relationships between independent variables are not directly examined. This is not to say that each bivariate relationship is examined independently. Each of the hypothesized relationships are evaluated only in the context of the other eight being considered. The relative importance of each independent variable for explaining variation in the dependent variable is evaluated. The nature of the statistical analysis and its implication for conclusions is examined closely in Chapter III.

CHAPTER III

METHODOLOGY

Setting

The setting for this study is the Knoxville, Tennessee Standard Metropolitan Statistical Area, consisting of Knox, Anderson, and Blount Counties. Respondents both work and live within the SMSA, an area with 400,337 inhabitants (1970 census). Of these inhabitants 197,587 (43.6 percent) live in the Knoxville central city area and 15,915 (4.0 percent) are from the Knoxville urban fringe. A total of 251,225 (62.8 percent) are residents of urban areas and 149,112 (37.2 percent) are from rural areas.

There are 130,792 individuals who both live and work in the Knoxville SMSA. Of that number 62.0 percent are male, 93.7 percent are white, and 88.2 percent drive or ride in private automobiles to work. Only 20,000 either live in the SMSA but work outside or live outside the SMSA while working inside.

The setting can also be described in terms of the sample's work situation. Most of the sample (90 percent) is taken from two companies, each employing more than two thousand. These large companies employ predominantly male white-collar workers. The remaining 10 percent of the sample was taken from two medium size companies, employing from 1,000 to 2,000. The workers from the small companies are predominantly blue collar, one employing mostly males and the other mostly females.

Sixty-six percent of the sample is drawn from a company located in the Central Business District (CBD) of Knoxville. The remainder is taken from companies that are located in urban settings, but not in the CBD. All four companies have workers distributed over a wide area. None have worker concentrations near the plant location. The two larger companies have distinctive worker distributions but they do not overlap. The company located in the Knoxville CBD has a disproportionate number of employees living in West Knoxville. The other large company employs many residents in the nearby middle-sized city of Oak Ridge, Tennessee.

Data Source

The population consists of individuals who have participated in ridesharing groups within the Knoxville SMSA. Because of little variation among subjects, a case cannot be made for generalizing results to a population of all United States Urban ridesharing participants. It is not a principal concern here to argue how representative Knoxville is of a larger population. The ridesharing group has not previously been studied effectively in any setting. This study should serve as a starting point for similar research in more diverse settings.

The sampling technique is nonprobability and mostly purposive. It is difficult to precisely identify the population, even though Knoxville has been more effective than most cities in identifying ridesharers. No systematic technique for identifying all ridesharing members of a community has been developed at this point.

Efforts to identify the commuting mode for Knoxville area workers began with surveys being distributed to nineteen companies, employing from fifty to 3,882 individuals. In the latter half of 1974 nearly 10,000 completed questionnaires were returned. This number represented almost 50 percent of all questionnaires distributed. The excellent response can be attributed to the "fuel crisis" impact, excellent cooperation from employers and, the respondents' lack of obligation to act beyond filling out the questionnaire. Nearly 8 percent of the known commuting population in the Knoxville SMSA returned surveys. The percentage of ridesharers identified in the survey is probably the same as the percentage for all commuters in the Knoxville area. The respondents have the full range of scheduling problems and represent many different employers. The sample fails to adequately represent the small employers, those having less than 1,000 workers.

From the resulting sample of ridesharers a list of 200 individuals working for one large company located in the Knoxville CBD and ridesharing for more than two years was developed. Most ridesharers were carpool members rather than van riders. Twenty of the subjects were interviewed, in great depth and individually, with open-ended questions. The questions were designed to encourage the interviewee to explain as much as possible about the carpooling arrangement. More than one member of the same carpool was often interviewed to validate reports but only one individual in each pool is used in the analysis.

In 1976 and 1977 the Transportation Center received funds to establish the "City of Knoxville Van Pool Brokerage Service."

Individuals were matched by computer, much like what was done in the 1974-1975 project. The center also leased vans and, consequently, stayed in much closer contact with van members than it had with carpoolers. Some sixty-nine vans were established. By February of 1977, the number of vans operating was forty-five. Twenty-four others had been established but folded. One member from each of ten "successful" vans was interviewed. The interviews were in-depth and had much the same emphasis as those given to carpoolers. Van drivers were not interviewed because of their leadership position.

Only interviews with participating vanpool and carpool members have been described. Just as much valuable information might be obtained from those who dropped from ridesharing groups. For vanpoolers the more valuable information would be expected to come from individual dropouts rather than from members of folded vans. The individual dropout precipitates his or her break with the group. Members of "folding" vans may be only passive drop-outs, victims of a driver's discontent or other circumstances beyond the rider's control. The van may fold in its formation stage simply because the organizing driver, over estimated the number of interested parties. There is little interest in dropouts from a near-group which never really formed.

A list of vanpool dropouts was obtained from Transportation Center files, believed to contain nearly all "project" van dropouts. The completeness was insured by requiring each driver to submit the names of all ridership changes each month. An interview was conducted with ten former vanpoolers chosen from the list. The subjects were interviewed

in as much depth as possible under the circumstances. These respondents were slightly less cooperative than those still in a ridesharing situation.

Dropout information was also obtained from carpoolers. Some people on the list from the large CBD company had dropped from their pool since it was formed. Telephone calls were made to determine which of the individuals were dropouts. The first twenty found, using most of the list, were interviewed. The same interview format used for participants was also used for dropouts.

In summary, the sample consists of twenty carpoolers, twenty carpool dropouts, ten project van poolers and ten project vanpool dropouts. The total number of individuals interviewed was sixty. The sample can be summarized demographically: More of the subjects are white collar (86.7 percent) than blue collar; they are more male (86.7 percent) than female; and they are more white (95 percent) than of other races. The lack of balance is to some degree a consequence of inadequate sampling refinement. Some of the inbalance represents the labor force and ridesharing distributions. For instance, the census shows males (63 percent) constituting a majority of those working in the Knoxville SMSA. Krejci (1973) contends that males are more likely to rideshare than females.

Although the male-female ratio in the Knoxville work force may not be unusual, the contention of Krejci is in doubt. Shapiro and Aldrich (1972) conclude that females are more likely to rideshare than males, though their conclusions are based on an inadequate data

base. In a survey conducted by the Transportation Center (Davis et al., 1975) nearly 4,000 employees from two Knoxville companies show a very small degree of association (R = 0.078) and (R = 0.087) between sex and the number of individuals in commuting vehicles.

The only criterion available to judge the sample is its comparison with the known commuting population rather than the suspected ridesharing population. The comparison is made despite there being no claim of the sample's representativeness of the commuting population.

Whites are slightly overrepresented. Ninety-five percent of the sample is white but only 93.7 percent of all commuters are white. Females are greatly underrepresented. Thirteen percent of the sample is female but 37 percent of the commuting population is female. The sample contains 87 percent white-collar workers but only 64 percent of all commuters are white collar.

Data Collection

The data collection technique is influenced by the previous lack of investigations of ridesharing phenomena. Little previous ridesharing group literature exists, making it desirable to collect the "richest" possible data. Rich data is usable for a variety of descriptive and verificational purposes. Selltiz et al. (1976, 94-95) use the preceding justification for using an "experience survey," the type used in this study. Individuals who have had ridesharing experience are interviewed. Open-ended orienting questions call for reconstruction of the ridesharing group-formation processes. Information about on-going

interpersonal processes are obtained in the same manner. Observational techniques might be more desirable in some respects. But observation of ridesharing groups is prohibitively expensive and cannot be done unobtrusively. Self-report measures are used as the best alternative.

The author's methodological orientation probably has more influence upon choice of measurement technique than practical considerations. Though the ridesharing group context is relatively unexplored, the ultimate concern, group formation and maintenance, is as old as sociology. In this broader perspective there is a vast amount of literature to rely upon for methodological direction. As Webb (1966, 3-5) and Lewis (1975, 123-125) point out, there are a number of research alternatives, all having their own specific problems with reliability and validity. Each researcher must decide on a strategy unless a great deal of money and time are available for multi-strategy approaches. Even with multi-strategy approaches choices must be made. It is not practical to use all possible techniques.

Within the small groups literature the (1) experimental design, (2) survey, (3) naturalistic, and unobtrusive strategies are each used. This list (Lewis, 1975, 124) fails to be mutually exclusive and is certainly not agreed to by authors of other research methods books. The illustrative list is less important than the central point; there are different strategies to choose from and the criterion for making that choice is often a nonscientific one. A justification for the strategy chosen in this study follows.

Use of an interview technique rather than a popular competing method, the experiment, stems from agreement with Goffman (1961, 10) that in "laboratory and ad hoc gatherings, (only) a pale and limited version of the attributes of little groups may be uncovered." Altman and Taylor (1973, 189) are supportive with, ". . . it is possible to examine certain features of developmental events in the laboratory, but our feeling is that we can only go so far and then only on certain issues." In the language of experimentalists, there is doubt about the "generalizability" (Vidmar, 1971) or "external validity" (Borgatta and Bohrnstedt, 1974) of findings from experimental small group studies. Morse (1976) offers one example of problems in the equity literature resulting from heavy reliance on the experimental technique. Generally speaking, sociologists have not widely adopted experimentalism as a methodology, largely because of belief in the preceding points. There are, however, sufficient numbers of experimental sociologist-social psychologists to keep the debate over the merits of experimentalism alive and unresolved.

The rejection of naturalistic techniques, participant and non-participant observation, is largely due to practicality rather than aversion. These techniques are expensive, time consuming, and placement of an observer in a small confined group would have a significant impact on the interactions being studied. Further difficulty is encountered when the observer affects the "formation process" and the "termination" of a group member.

Unobtrusive measures are unavailable for this study. There are few official documents involved and diaries would be difficult to obtain or systematically examine. Erosion or accretion measures have little meaning.

Finally, the "survey analysis" category has its different strategies, only one of which is the interview. The depth, richness in detail or variety of information cannot be obtained by mail, telephone, or distributed survey. Case studies and life histories have the opposite problem; they obtain much more information than is needed. Of the surveys listed by Lewis (1975), the loose, but somewhat focused, seems most desirable. The greatest amount of information can be obtained by focusing on events leading up to, during, and, when applicable, after the ridesharing situation. A "life history" of the group develops from such information. Individuals, individuals in a specific group, or groups can be the units of analysis. The possibilities for analysis of such data are many.

Coding difficulties are encountered in any work using content analysis. Intra-coder reliability is discussed below. Measures were taken to determine the degree of error experienced during the coding stage of data collection. All coding was originally done by one person, the author, from written sources. The taped interviews were transcribed to increase reliability. A second individual, with social psychological training, independently recoded one-fourth of the interviews with only what is written in the section on indicators below and the code sheet for instructions. Each of the four subject categories

are represented in the recoding, in the same proportion they exist in the sample.

The total scores from the original coding and the recoding were correlated. All but one variable had coding reliability scores, correlation coefficients, greater than .90. The heterogeneity variable had only a .87 coefficient. The rather high coefficients indicate acceptable coding reliability for a design employing content analysis. No attempt was made to correlate the number of statements for any sub-category of an index. Nor were specific statements matched to see if they were coded the same way.

Indicators

The indicators are largely a consequence of the data collection technique. A content analysis is applied to the data, a technique that Holsti (1969, 16, 23) recognizes as appropriate and increasingly popular for "verbal data produced by subjects at the behest of the investigator." Objections are less likely to be for the use of content analysis than for its misuse. Allegations of misuse will most often surround the question of how data are coded since "coding rules are . . . a central part of the research design" (Holsti, 1969, 94). Holsti states the major "decisions" faced by an analyst to be (1) How is the research problem defined in terms of categories?, (2) What unit of content is to be classified?, and (3) What system of enumeration will be used? The remainder of this section is designed to explain how these decisions were made.

First, decisions about the appropriate categories for each variable must be made. The categories, units, and enumeration are stated and briefly justified in the order each variable was introduced in Chapter II. Since there are no "standard" categories for most of the variables, justification reflects the definitions cited earlier. When "standard" categories can be used, they are adopted with less supportive arguments. The appropriate "units of analysis" are discussed for each variable as part of the categories' explanation.

The dependent variable, relationship maintenance, was defined as ". . . the continuation of interaction . . . over time." The definition identifies the termination of group membership as the most important item to measure. The measure falls into the "Behavior of an individual group member" category given in Chapter II. The measure is not like those used by Sagi et al. (1955) or Baron (1970) but is the logical extension of each. Ceasing group participation is the ultimate lack of "personal involvement" and "compliance pattern." The participating/nonparticipating dichotomy is roughly equivalent to involvement/non-involvement and, to a lesser extent, compliance/noncompliance categories of respectively, Sagi et al. and Baron.

Reasons for using the participating/nonparticipating dichotomy rather than a traditional "degree of participation" or "intensity of interaction" measure deserves elaboration. First, the ridesharing group is clearly involved in multi-goal directed behavior. None of the goals are possible without first achieving physical proximity. There can be some inference about "contribution to the group goals" from member

activities after assembly. The most important consideration is the getting-together activity. If assembly fails to occur, the group goals are not reached or only reached at the more costly individual levels.

Once gathered, the most obvious group activities consist of verbal interactions. Simple volume of verbal interaction does not indicate member involvement since such activities are not very "costly." Most costs are incurred in the proximity achievement activity. Once gathered, the verbal interaction is unlikely to directly prevent goal achievement, though it may be so obvious that members discontinue participation. If verbal volume or intensity were used to measure participation, it would be possible to find groups that became so involved they "involve" some members out of the group. For example, a group may have extremely high rates of verbalization but some members want a quiet ride to work. Another group may have a high rate but the interaction is confrontive and antagonistic. In either case there is likely to be a high dropout rate. Such an interpretation of involvement seems to violate the concept's spirit and will not be used here.

The discussion demonstrates that the most important type of "less involvement" is to no longer achieve proximity, i.e., to drop out. The purpose is much like that of the cohesion literature that precedes it, to determine the factors causing a group to dissolve. The assumption is that the same factors causing an entire group to cease interaction are those which would cause single members to drop out. After a certain proportion of a group's membership drops from participation the group ceases to be functional. After all the members drop out the group ceases to exist, at least in a behavioral sense.

To measure whether an individual is a participating member is easy to determine by simply asking. Since all subjects have been or are in ridesharing groups they can be classified as ridesharers or dropouts. Only those who participate in a car or van pool on a regular basis, greater than 50 percent of the work days, will be classified as ridesharers. All others will be dropouts, from their most recent ridesharing situation.

Of the independent variables the individual's demographic characteristics are relatively easy to measure. The sex is easy to determine since contact with subjects is physical rather than mediated by mechanical devices.

Job type is not usually difficult to determine since interviews are conducted personally. Vanpool riders using project vans often have the information appearing on their application sheets. The forty employees from the large Knoxville company have job titles specified on the interview face sheet or at the interview's beginning. Remaining subjects indicate their job in the interview's body. The job title is given on each code sheet but for the purpose of analysis Rice's "Blue-White Collar" scale is employed. Rice's index uses fewer categories, only five, than most conventional scales, such as those developed by Duncan (Reiss et al., 1961) or the Bureau of Census. Refined categories are not needed due to the small sample size, relative sample homogeneity and statistical analysis technique. Specific job titles and their correspondence to Rice's index is found in Robinson et al. (1969, 344-356).

Respondent's age is not always easily determined. Many times the subject volunteers the information. Project van pooler's age can sometimes be determined from application forms. To allow for estimation error, the ten-year interval census categories are used. The categories have a long history of use by sociologists.

Group satisfaction is measured by liking (positive) and the disliking (negative) statements. Volunteered information, beyond specific requests for it, is often used. Recording units are phrases, counted in multiple when key words are compound or repeated. The phrases must contain defining words or be in response to an appropriate direct question. Appropriate question includes the key words defining the phrase. Defining positive words include like, good, enjoy, pleasing, etc. Negative words are their antonyms. Key words fall into one of two categories, liking or disliking. Their context must be the group "as a whole" or the group activity and not the individual or subgroup. Examples of liking or positive statements include: (1) items about other group members such as, I like them, they are nice, congenial, good, enjoyable, fun, friends, close, pleasant, etc. and (2) items about the ridesharing situation such as, it is fun, comfortable or any of the adjectives used about group members. The same phrase categories with antonyms for key words constitute disliking or negative item.

The "satisfaction score" is the number of positive statements minus the negative statements within an interview. Statements are used because an increase in the number of times stated, to include repeats, indicates the "strength" of liking. Repeats are not counted if they

are intended to clarify a preceding item. An ordinal measure results which may range from one to nineteen. Positive numbers are insured by adding ten to each sum, making analysis less difficult.

There are dangers from relying on statement counting for measures. Participants may be more willing than dropouts to talk about their group, therefore, overrepresent positive statements. The danger may apply to any counting measures. To insure that such a problem does not exist satisfaction and dissatisfaction statements were counted. Participants and dropouts averaged 7.0 statements per person. The count indicates that both groups contain individuals of equal verbal inclination. Only satisfaction statements were counted but the same results are expected for other categories. Satisfaction statements are at least as threatening for respondents as any other type.

Group size is one of the easiest independent variables to measure. Most respondents are asked about membership and how it has changed. There is no problem getting sizes, only in deciding which number to use when the group has fluctuated. When the group size is preceded by a statement indicating the "usual circumstance," that number will be used. These statements include anything like "usually there are . . . most of the time there . . . ." When there have been long periods of stable membership the most recent "usual" number is used, if that most recent period has been for one month or more. When the present number has existed for less than one month, a prior time period is used, assuming the present number is a temporary fluctuation. If the group constantly fluctuates, an average number is used, considering membership figures for one month prior to the interview.

Leadership style measurement is more complicated. Leadership style is likely to be indicated by subjects in response to questions about pooling agreements. The recording unit is the phrase having agreements or rules as its subject. Repeated agreements are not counted since the number of agreements from each source is desired rather than the strength of knowledge about certain agreements. Autocratic style statements include any indicating agreements like, ". . . the leader decided . . . the leader told us . . . ." The word leader is interchangeable with "driver" when there is only one driver in the group. When everyone drives it will not be assumed that the words are synonyms. Democratic style statements are more like, ". . . we agreed that . . . we voted on . . . we had a meeting and . . . ." An autocratic index is created by subtracting the number of democratic statements from the autocratic statements and adding ten to insure a positive number. The higher the number the more autocratic the leadership. The scores can range from one to nineteen but actually range from four to thirteen.

The same phrases are used to indicate leadership style and equity norms. Leadership style is concerned with the agreement's "source" rather than their number or content. It is unlikely that all agreements are either dictated by a leader or agreed to in a democratic fashion. It is more likely that some fall into each category. In many cases an agreement may be given but no source specified. The relative number of agreements in each category is reflected by this variable's measurement.

Group homogeneity is indicated by statements about sex, race and age group composition. There are certainly other dimensions of

homogeneity that can be studied but only these three are examined. These three are commonly used dimensions, widely recognized as important demographic considerations.

The composition becomes evident when respondents are asked about "who is involved" and about "rider characteristics." Responses reflect the group's minority composition sexually, racially and chronologically. A homogeneity score is created from the information. The assumption is made that heterogeneity is cumulative, i.e., a group with different ages, different sexes, and different races is more heterogeneous than one with only different sexes.

The assumption of cumulativeness is only an extension of an often used but seldom stated assumption underlying much of the homogeneity literature. That assumption is that interaction with "others" perceived to be different incurs social costs. If this assumption is correct, heterogeneity costs can be viewed ordinally. The relationship between the two concepts can be stated as, the greater the heterogeneity the greater the incurred costs and the less likely the continuation of voluntary interaction.

To consider homogeneity as an ordinal level variable a technique is provided to consider the additive qualities within and across dimensions. A point is given for each 10 percent of a "minority kind." Up to 50 percent, an equal mix, may exist in each category. For example, if a group has 20 percent males, 18 percent blacks, and 30 percent elders, the group receives two, two, and three points for its respective minority content. A score of seven is the heterogeneity index.

Zero, complete homogeneity for the three categories, means a group is made up of the same sex, race, and age grouping. A score of fifteen is achieved when a group has 45 percent to 54 percent minority, an even mix, in all three categories.

The age category is the most difficult of the three to measure. Verbalizations represent the subject's perception of older and younger, gross categories with themselves as reference point. There is no absolute criterion for subjects to use. Consequences of heterogeneity result from its perception and not from some absolute criterion, even in the case of race and sex. There is less of a "measurement problem" than recognition that there is little intrasubject reliability. Most small groups would agree about the number of its members who are black or male. There would be much less agreement about the number who are "old, young or middle aged." Perception reliability poses less problems when the units of analysis are individuals rather than groups. No intrasubject reliability problems are created since the index reflects perceived rather than "real" homogeneity.

Concern with perceived homogeneity permits a way to consider the relative weights of each category. For two or more individuals the relative importance of each category is likely to be different. Since interview questions are nondirective it is assumed that relative importance is given by the respondent. For example, if the respondent does not think age differences are important, he or she is less likely to mention them. If race differences are important, the respondent is very likely to make note of it.

Finding the degree an equity norm's existence is perceived is made more difficult by depending solely on unprompted responses. Individuals do not usually describe their activities in equity theory terms. A tact other than analysis of equity term frequencies must be used. Nearly all groups establish norms and a ridesharing group is no different. Agreements made by the group about their activity involves evaluation by group members. Considerations used by each member are difficult to determine. Assumptions of equity proposition I (Walster & Walster, 1976, 290; Walster et al., 1976, 2), reflecting behavioristic thinking, states that "benefit-cost" calculations will be made. Each group member believes their "fair share" of rewards are insured by the agreement. When agreements result from benefit-cost considerations they are equity norms. All agreements, or norms, established by the group members and involving group activity are considered "equity norms." Therefore, the number of statements made about different agreements constitute an equity norm index.

The appropriate phrase, the recording unit, can take a number of forms. Such phrases include ". . . we agreed not to play the radio . . . we could only sit in assigned seats . . . it was understood that no one would smoke . . . ." The key words include: we agreed, we decided, it was understood, everyone knew, we only did, we can only do, etc. Unlike the "leadership style" variable, the source of agreements is unimportant. The index number is the total of all such agreements, even if only one key word precedes many areas of agreement.

The phrases are only counted when stated in the context of the ridesharing group activity. They frequently result from questions about work trip activities or rules of the pool. Rules or agreements about activities designed to achieve proximity, activities during the ride to work and unloading procedures are considered parts of the ridesharing group activity.

This measurement technique is different from any found in the equity literature. Most research has been experimental, with a contrived task-oriented situation that the experimenter assumes to be inequitable. Differential productivity or rewarding behavior is measured. When differences are significant it is concluded that an equity norm exists for participants. The experiment is used to infer that subjects subscribe to an equity norm from behavior that investigators logically deduce to be a consequence of accepting such a norm. Some of these more recent experiments are exemplified by Benton (1972), Callahna and Messé (1973), Garrett and Libby (1973), Kahn (1972), Leventhal and Lane (1970), Leventhal et al. (1973a, 1973b), Long and Lerner (1974), Moore and Baron (1973), Long and Lerner (1974), Moore and Baron (1973), Messé et al. (1973), Schmitt and Marwell (1972), Pritchard et al. (1972), Rosen and Jerdee (1974), Rose et al. (1971), Walster and Austin (1974), Wicke and Bushweiler (1970), Wyer and Malinowski (1972). This list is not exhaustive. It only offers a small percentage of the huge volume of works using experiments to infer the presence of an equity norm. Many of the studies have additional goals but the existence of an equity norm is an essential part of their conclusions.

Not all the equity norm research has been experimental. A relatively small number of studies have used questionnaires (Yuchtman, 1972; Zedeck and Smith, 1968) and role projection (Andrews and Valenzi, 1970). All but the last of the three examples used members from existing groups rather than creating their own. Even in these three studies, the existence of an equity norm is inferred, respectively, by job satisfaction, personal feelings of fairness and "projection" into a hypothetical situation. In each case, the "norm" being inferred is somehow "general" and nongroup specific.

Attempts are made to avoid some pitfalls experienced in the equity norm literature. The norm is measured as a group specific phenomenon, as most sociologists agree it must. Consideration of whether the norm exists, a nominal level of measurement, is abandoned in favor of determining its degree of existence, an ordinal level measurement. The existence of such agreements are not assumed from consequential behavior believed associated with norm agreement. Rather, a direct measure of agreements made when the group was forming is used.

Finally, as a consequence of this study, an attempt is being made to verify equity theory's proposition IIA (Walster & Walster, 1976, 290), that groups will evolve systems, later called a set of rules (291), of equity. After fifteen years of testing propositions IIB, III and IV, it is time for the theory's more basic foundation to be directly tested.

Such direct measures may disturb equity theory proponents since they may not produce appropriate verbalizations. If the appropriate

verbalizations are not produced it will be a weak rejection of equity theory. Most people are not expected to be aware of norms or express them in the language of social science. On the other hand, if the verbalizations are produced it will be a very strong support for the existence of equity norms. The concern is somewhat reduced by recognizing the more common terms, agreement, understanding and usual-thing, as acceptable substitutes for the term norm. By using a fairly large number of synonyms to increase response frequency the measure's validity is more questionable. The synonyms approximate the concept of norm closely enough to not reduce validity.

Sanction rigor distributions to violators of equity norm agreements is indicated by statements about negative reactions. One or more group members may react negatively to individuals who break the equity agreements described in the preceding section. An indication of an agreement, its violation and a negative reaction must be present before a sanction rigor score is given. One is assigned to the sanction category, an instance involving all three items. A minus one is assigned to the nonsanction category, when only the first two are present. The recording unit is the theme, unlike previous units, since the unit boundary is difficult to define. The three necessary statements for a positive score or the two for a negative score may be in separate sentences or paragraphs. The boundary problem creates more work for coding but is unavoidable.

Scoring is done for each "act" described by respondents, whether there are multiple acts for one person or multiple members involved.

An example of an act with all three elements might read, "Mr. J. was often more than the five minutes late coming from his house, the amount of time we had agreed was fair to wait. When this happens we leave him." A two element act could be, "Mr. J. is often more than five minutes late, the time we agreed to wait, but we never leave him, as we should." The three parts are not usually so well defined or in proximity. Negative scores are subtracted from positive scores to create a norm enforcement index. Ten is added to the sum to prevent negative numbers. The higher the index the more rigorous the norm enforcement.

The acts often appear in the "problems and pleasures" section of responses, especially when compared within the agreements section. The first element's negative or positive perception may only be indicated by whether it appears in the "problems" or "pleasures" section.

The measurement technique is, again, very different from those used in the equity research literature. The concept is exactly what many experimentalists are claiming to measure. The difference is that naturally occurring groups have more dramatic consequences. They are formed to achieve a goal the subjects believe to be important, rather than brought together for a short period to do tasks having little or no consequence for the subjects. Sanction's variety and severity are often greater in "naturally occurring" groups than in experimental groups. The variety provides much "richer" data for analysis.

The potential problem resulting from depending on unprompted statements was discussed in the equity norms section. The same

discussion applies here, with one exception. The technique used to measure sanction rigor depends less on vocabulary similarities between the populations and social scientists. Therefore, the problem is less with response validity and more with whether their frequency of occurrence is adequate. Appendix D shows the resulting index scores range from eight to thirteen, with a fairly normal distribution. The range is certainly adequate for analysis.

The final variable, perceived equity, is measured using the phrase as a recording unit. There are two phrase categories, equity and inequity. The key phrase, indicating equity, notes the arrangement's fairness or how the situation (ridesharing) works out equally for all members. Inequity items note the situation's unfairness or how ride-sharing works out unequally for members. Examples of equity items include, "It (the arrangement) is fair . . . it all works out even . . . we try to make it the same for everyone . . . it's about the same for all of us . . . we figure we are usually paid back . . . we'll ask the same from them later (so it all works out) . . . didn't want to (didn't) make money off them . . . or charge for services they don't get . . . no one skips their turn or fails to pay back their days . . . we wouldn't do what wasn't fair." Inequity examples are the same type statements but with antonyms for key words.

Using group member's statements to determine group's equitability is not an original idea. Though equity theory proponents fail to use the technique in their verificational efforts, it is proposed as the appropriate technique by some of the theory's most influential authors (Walster et al., 1978, 11).

A minus one is assigned to each "inequity" statement and a plus one to each equity statement. Minus and plus statements are added and ten added to that sum. The final sum is a perceived equity index, with higher scores representing greater degrees of perceived equity.

Though this measure is just as "direct" as that used for equity norm, it is not as problematic in one sense. Evaluation of relationships in terms of fairness, an acceptable substitute for equity, is common for most populations. Consequently, more frequent verbalizations can be expected and equity theory proponents are more likely to accept the measure. The analysis is either more supportive or more condemning of equity theory than analysis of the other two variables.

The measure remains notably different from those used by equity theorists, especially the experimentalists. Experimentalists assume perceived inequity affects behavior in reaction to contrived inequitable situation. The assumption is made because experimentalists trust their own inferences about subjects' "motives" more than the subjects' self-reports of motives. No attempt is made to deal with the philosophical controversy over reasons versus real reasons. It may be that "subject's" reasons for behavior coincide with "the real" reasons (Peters, 1969, 8-9) attributed by social scientists. Coincidence between the two reasons is assumed in this study. Equity theorists give subjects credit for desiring equity, rationally moving toward equity by forming a normative system, punishing violators of the system and avoiding inequitable situations. Yet, no credit is given to subjects for knowing why they do this rather complex activity. Experimentalists

seem to be saying that man is rational, evaluating alternatives to achieve a goal, but unaware of the evaluation process or alternative goals; a rather naive way to view subjects.

Finally, TOD constraints are measured by counting "time-origin-destination" (TOD) restrictions cited by subjects. Other environmental items can be restrictive but TOD events are directly tied to the group's goal. TOD items include different working hours, irregular overtime requirements, change in jobs, change in shifts and change in home location. Phrases with these key concerns are given for not ridesharing. The same issues may disrupt existing ridesharing situations. In either context, the number of constraint statements are added to create a constraint index. Statements are counted in multiple when presented in a compound sentence but not when repeated.

It should now be clear how each variable is measured. The next section demonstrates how the resulting data are statistically analyzed.

An example of a coded questionnaire and corresponding code sheet is in Appendix A and B. Note that the numbers in brackets correspond to appropriate columns on the code sheet. These numbers represent the code assigned to the statement made in the interview body preceding the number. The relevant statement is underlined.

Data Analysis

In Chapter II the dependent variable was theoretically defined as the continuation of interaction. Earlier in this chapter that definition was operationalized as a dichotomous response, participation

or nonparticipation. Two groups of subjects are being examined, those currently ridesharing and those who have dropped from ridesharing groups. The goal is to distinguish between the two groups by selecting a set of "discriminating variables." In Chapter II eleven variables were hypothesized to discriminate between the two groups. The nature (direction) of discrimination was also hypothesized.

The objective is to evaluate the relative discriminatory power of each variable and combine them to explain the optimal differences between the two groups. To achieve the goal Multiple Discriminant Analysis (MDA) is used. MDA is a statistical analysis technique that can be used for either analysis or classification. MDA can analyze the differences between ridesharers and ridesharer dropouts or classify an individual, knowing the relevant characteristics, as likely to continue or discontinue their pooling arrangement. This study is only concerned with the former purpose but characteristics are specified for the second.

Multiple Discriminant Analysis has been used by social scientists for many years. Social science examples are provided by Nie et al. (1975, 434-443) and Zaltman and Burger (1975, 467-473). The technique is more appropriate for research where the discriminators are unknown, i.e., where the research is exploratory. This work is certainly exploratory since ridesharing group research has concentrated on predispositions for joining rather than reasons for maintaining the relationship. Complaints of inadequacy can easily be made about most group contexts. The potential use for classification certainly has ramification for ridesharing marketing techniques.

Eleven variables are too many for accurate application of MDA since there are only sixty subjects in the sample. The number of variables should be no more than six. For this reason MDA is applied to the data in two stages. The first application is designed to reduce the number of variables. The second should give a more accurate representation of the final variables' discriminatory power. A correlation matrix is introduced to check choices made by MDA and further clarify the relationship between the independent variables.

Analysis is performed using the Statistical Package for the Social Sciences (#6), explained by Nie et al. (1975, 434-467). Only one discriminant function is possible since the number of groups analyzed is two; the number of discriminant functions equals the number of groups minus one. The program presents statistics useful for evaluating the hypothesized relationships between the two groups. The statistics are examined in more detail below.

A stepwise procedure is used to order the independent variables and optimize discriminatory power. Differences are explained between the two groups and the relative discriminating value of each variable, while considering all others, is evaluated. Nie et al. (1975, 447) summarizes the procedure:

> The process begins by choosing the single variable which has the highest value on the selection criterion. This initial variable is then paired with each of the other available variables, one at a time, and the selection criterion is computed. The new variable which in conjunction with the initial variable produces the best criterion value is selected as the second variable to "enter the equation." These two are then combined with each of the remaining variables, one at a time, to form triplets which

> are evaluated on the criterion. The triplet with the best criterion value determines the third variable to be selected. This procedure of locating the next variable that would yield the best criterion score, given the variables already selected, continues until all variables are selected or no additional variables provide a minimum level of improvement.

To account for the variables' interaction effects the following is considered.

> As variables are selected for inclusion, some variables previously selected may lose their discriminating power. This occurs because the information that they contain about group differences is now available in some combination of the other included variables. Such variables are redundant and should be eliminated. Thus, at the beginning of each step, each of the previously selected variables is tested to determine if it still makes a sufficient contribution to discrimination. If any are eligible for removal, the least useful is eliminated. A variable which has been removed at one step may re-enter at a later step if it satisfies the selection criterion at that time. (Nie et al., 1975, 447)

"Selection criterion" for the stepwise process is METHOD=WILKS. This criterion use the overall multivariate F ratio for testing differences between group centroids. Wilks' lambda is a measure of group discrimination, taking into consideration the difference between the centroids and the cohesion (homogeneity) within the two groups (Nie et al., 1975, 447). The larger the lambda coefficient, the less discriminating information remains to be found in the other variables being analyzed. Wilks' lambda also serves as the basis for a significance of contribution test using chi square.

Rao's V coefficient and coefficient changes are given by MDA. Rao's V is a generalized distance measure giving another indication of the independent variable's discriminatory power. The larger the change

in Rao's V the more the two groups are being "pushed" apart from their position determined by variables previously introduced (Nie et al., 1975, 448). There is a significance of change test reflecting a chi-square distribution, DF = 1. The significance test is most accurate when the number of cases is relatively large.

Differences between Wilks' lambda and Rao's V reflect how previously introduced variables relate to the computation of respective coefficients. Wilks' lambda is computed without consideration of the other variables' introduction. The coefficient reflects only the relative discriminatory power of one variable. Since they are not cumulative they decrease in magnitude as discriminatory power becomes less. The Rao's V coefficient change does reflect the variable or variable set previously introduced by MDA. The discriminatory power reflects additional discriminatory value of a given variable. The two coefficients may not correspond for a given set of variables. The amount of "independent" discriminatory power may not correspond to the amount of "additional" discriminatory power.

Pearson's R is introduced as an additional measure of each independent variable's association with relationship maintenance. Giving too much credibility to the correlation coefficient is dangerous since the correlated variables are usually ordinal/nominal combinations. Labovitz (1967, 1970, 1971) contends that changes in measurement level have little effect on correlation coefficients. Boyle (1970), Ableson and Turkey (1959) and Borgatta (1968) lend support to the same contention. Readers may judge the issue but here it is assumed that coefficients have sufficient worth to be presented.

MDA generates "standardized discriminant coefficients." They represent the relative contribution of their associated variable toward explaining differences between the two groups. Only their magnitude is considered in their interpretation. The sign merely reflects direction of relationship and not their magnitude. Interpretation is analogous to beta weight interpretation in multiple regression (Nie et al., 1975, 443).

The program produces three statistics for evaluating the discriminatory power of a function. Two, eigenvalue and Wilks' lambda, are most useful when comparing the utility of two or more functions. Wilks' lambda will loosely reflect the variance remaining to be explained by introducing additional functions or variables. These two statistics' usefulness is certainly limited when only one function is being examined. Of more use is the canonical correlation. It, too, has comparative value, but, more importantly, specifies the variance explained by the set of variables chosen by MDA. Squaring the canonical correlation coefficient reveals the total variance explained.

In summary, Multiple Discriminant Analysis (MDA) is used to analyze the difference between subjects who continue ridesharing and those who discontinue. MDA is applied in two step because a large number of independent variables are being examined. Eleven independent variables are evaluated for their relative discriminating value, using a stepwise procedure with METHOD=WILKS criterion. Standardized discriminant function coefficients, Wilks' lambda, Rao's V and Pearson's R reflect the relative and absolute discriminating power of each variable.

Discriminating value of the variable set chosen by MDA is evaluated by the canonical correlation and its squared coefficient and, to a less extent, by the total Wilks' lambda.

CHAPTER IV

RESULTS

Reducing the Number of Independent Variables

The first step in the analysis is to reduce the number of variables to the six or less most important. Two methods are used to achieve this goal. First, MDA is used to choose the optimal independent variables from the eleven. Secondly, a correlation matrix is generated for the selected independent variables. The matrix is used to eliminate variables chosen by MDA when some are highly intercorrelated. The SPSS program (Nie et al., 1975) is designed to eliminate "overlapping" influences. When two highly correlated variables are identified as having discriminatory power, the program "kicks out" the one with less value. Newly introduced variables are always evaluated after considering the effect of previously admitted variables.

Since eleven variables are too many to use with only sixty subjects, the results of MDA may not be very accurate. The results can, however, indicate variables deserving further investigation. Five variables were chosen by the MDA to provide the optimal amount of discrimination between participants and dropouts. Table 1 represents each predictor variable's mean, mean difference, and F score. The F scores are "zero step," those computed before any variables are withdrawn by MDA. As variables are withdrawn the F scores are recomputed to reflect "removing

Table 1

Predictor Variables' Mean, Mean Difference and Zero Step F Score

Predictor Variable	Mean Values of Predictor Variables: Ridesharer Participants	Ridesharer Drop-outs	Difference	F
Sex	1.1167	1.1000	0.0667	2.45881
Age	4.1333	4.1333	0.0000	0.03993
Job Category	1.5333	1.1667	0.3666	1.69583
Group Satisfaction**	12.8333	9.0667	3.7666	23.46495*
Group Size	5.9333	5.9667	0.0334	0.03608
Heterogeneity**	2.0667	1.5000	0.5667	2.01735
TOD Constraints**	0.2000	1.0000	0.8000	17.40100*
Equity Index**	10.4333	10.0333	0.4000	4.04252*
Autocratic Index	8.8333	9.5667	0.7334	0.12175
Agreement Items**	5.6000	3.5333	2.0667	10.02172*
Sanctions Index	10.2000	10.2000	0.0000	0.34356

*F of 4.0000 with 1 and 60 degrees of freedom, significant beyond .05 level.

**Variables chosen by MDA as contributing significantly to discrimination.

the variance of the 'out' variables which is due to covariance with the 'in' variables" (Zaltman & Burger, 1975, 493).

Table 1, page 73, shows significant (.05 level) F scores for four variables. All four variables were chosen by MDA for their significant discriminatory power. Additionally, MDA selected heterogeneity, even though one rejected variable has a higher zero step F score. Explanation for the apparent discrepancy is that the heterogeneity F score increased to 4.14995 by the fifth and final step. The other variable's score decreased to below 1.0000. Excepting heterogeneity the zero-step significant F scores reflect the standardized discriminant function coefficients' ordering at step five.

Table 1, page 73, indicates the five variables chosen by MDA. In the order of their utility, they include: (1) satisfaction index, (2) TOD constraints, (3) number of agreement items, (4) heterogeneity index, and (5) equity index. MDA gives a variety of other information, but there is little value in discussing it further because of the possible distortion already discussed.

There are no correlations above ± .300 between any combination of the five independent variables chosen by MDA. Only one variable is significant at the .05 level and it has a very low (0.225) degree of association. Accordingly, there is no justification for eliminating other variables from a second MDA. For the reader's benefit, Table 2 presents the correlation matrix for the five variables. A correlation matrix for all variables in the analysis is in Appendix C.

Table 2

Correlation Matrix for Five Variables Chosen by MDA*

Variable	Satisfaction	TOD	Agreements	Heterogeneity	Equity
Satisfaction	--	-0.157	0.225**	-0.039	0.183
TOD	--	--	-0.202	-0.059	-0.108
Agreements	--	--	--	-0.204	0.144
Heterogeneity	--	--	--	--	0.037
Equity	--	--	--	--	--

*N = 60 for all relationships in matrix.

**Significant at the .05 level.

The Final Analysis

The second application of MDA, using the five independent variables specified in the last section, has multiple utility. From the results it is possible to (1) evaluate the relative value of each variable and its absolute contribution to discriminating between the two groups; (2) determine the support for hypotheses derived in Chapter II; and (3) evaluate the total value of the optimal number of variables for the function. Table 3 serves as the basis for conclusions in each of these areas.

The relative value of the independent variables for discriminating between ridesharing participants and dropouts is determined from the column in Table 3 titled "Standardized Discriminant Function Coefficients." After discarding the sign, the relative values are indicated by the remaining coefficients. The variable with the greatest relative discriminating value is satisfaction index. The other variables, in order of value, are TOD constraints, number of agreements, heterogeneity index, and equity index. The same ordering is reflected in the Wilks' lambda coefficient, though all five have coefficients that are significant at the .001 level. Rao's V coefficients very nearly reflect the same ordering but the satisfaction index and TOD constraints exchange rankings. The correlation coefficients are equally close to having the same order but with heterogeneity index and equity index transposed.

The absolute value of each variable's contribution to discriminating between the two groups is also evaluated. The satisfaction index has a

Table 3

MDA for Ridesharer's Disposition

Variable	Standardized Discriminant Function Coefficients	F to Enter or Remove	Wilks' Lambda	Sig. of Lambda	Rao's V	Change in Rao's V	Sig. of Change	Pearson's R
Satisfaction Index	-0.51995	23.46495	0.71196	0.000	23.4649	23.4649	0.000	-.537
TOD Constraints	0.44333	17.40100	0.54545	0.000	48.3345	24.8696	0.000	.488
Number of Agreements	-0.39004	7.89688	0.47804	0.000	63.3294	14.9949	0.000	-.439
Heterogeneity Index	-0.24276	4.45875	0.44219	0.000	73.1654	9.8359	0.002	-.135
Equity Index	-0.20108	2.85969	0.41995	0.000	80.1071	6.9418	0.008	-.312

Discriminant Function = 1

Eigenvalue = 1.38116

Canonical Correlation = 0.762

Wilks' Lambda = 0.4200

Chi-Square = 48.151

DF = 5; Sig. = 0.000

significant (at the .001 level) lambda coefficient. The coefficient of 0.71196 is significant and high enough to indicate that the remaining variables do not have a great deal of variance left to explain. The satisfaction index shows a Rao's V change nearly twice the size necessary to be significant at the .001 level, though slightly less in magnitude than that produced by TOD constraints. The Pearson's R of -.537 is significant at the .001 level and is classified by Davis (1971, 49) as "a substantial negative association." Using any of the statistical tests the satisfaction index is a very effective discriminator. In all criteria but the Rao's V change it is easily the most powerful discriminating variable of those examined.

TOD constraints and number of agreements must be described in much the same terms as satisfaction index. They both have Wilks' lambda coefficients and Rao's V changes significant at the .001 level. Their correlation coefficients, .488 and -.439 respectively, are "moderate associations" (Davis, 1971, 49). These two variables contribute much to discrimination between the ridesharing groups. Of the two, TOD constraints has the most to contribute.

The heterogeneity index and equity index variables are different from the others in several respects. Their Wilks' lambda coefficients are significant (at the .001 level) but their change in Rao's V is slightly less significant, .002 and .008 respectively. Their correlation coefficients require further examination. Heterogeneity index has a much lower and insignificant R, even though its other coefficients are higher. This discrepancy may be explained by the near reversal of F

scores between the two variables from step zero to step five. In Table 1, page 73, the heterogeneity F is 2.01735 while the equity F is 4.04252. By step five (Table 3, page 77) the F scores are 4.45875 and 2.85969 respectively. Reversal indicates that some of equity's discriminatory power is better explained by the variables already introduced. With heterogeneity the case is different. After the first three variables were chosen by MDA there remained variance in the dependent variable which is better explained by heterogeneity than other remaining variables. The discriminatory power was "masked" in earlier steps because heterogeneity is significantly related (.01 level) to four other unchosen independent variables (see Appendix C). Equity was unmasked since it is not significantly related to any of the other independent variables.

Another variable deserves some discussion, even though it was rejected by MDA. Sanctions index barely missed being included by MDA in the list of "optimal" variables. It is much closer to meeting the entry criterion than any other rejected variable. To come this close to inclusion the F score had to increase from 0.34356 at step zero to 0.89133 at step five. The correlation coefficient of .164 fails to approach being significant.

The hypotheses are evaluated using information obtained from MDA and the correlation matrix. A hypothesis is considered "supported" if Wilks' lambda is significant at the .001 level and the direction of the relationship, indicated by the sign on Standardized Discriminant Function and correlation coefficients, is appropriate. Using this criterion, the following are those hypotheses accepted:

1. The greater the degree of group satisfaction the greater the likelihood of relationship maintenance.
2. The less the TOD constraints the more likely the relationship will be maintained.
3. The greater the degree of group agreement the more likely relationship maintenance.
4. The greater the perception of equity the more likely the relationship will be maintained.

One variable, heterogeneity index, was accepted by MDA but the hypothesized relationship was in the opposite direction of the sign. That hypothesis and the others listed below are not supported:

1. The larger the group the less likely the relationship will be maintained.
2. The more democratic the style of leadership the more likely the relationship will be maintained.
3. Females are more likely to maintain relationships than males.
4. Younger subjects are more likely to maintain the relationship than older subjects.
5. White-collar subjects are more likely to maintain the relationship than blue-collar subjects.
6. The greater the norm enforcement rigor the more likely the relationship will be maintained.
7. The greater the group homogeneity the more the likelihood of relationship maintenance.

Finally, the power of the five variables, in their "optimal" combination, for discriminating between the ridesharing participants

and dropouts is examined. The total Wilks' lambda (.420) is significant, at the .001 level, but not particularly impressive. There is a great deal more information to be gained from additional functions or additional variables. The canonical correlation of .762 is relatively high and indicates that the five variables explain about 58 percent of the variance in the dependent variable. Eighty-five percent of the sample's members were correctly classified by MDA using the five discriminating variables. Fifty percent would be expected to be correctly classified since the two groups are of equal size. The test is weak since the same cases classified were used to identify the variables. In summary, the five independent variables explain an impressive amount of variance in the dependent variables but the measure of discrimination between the two centroids needs improvement.

Implication of the Findings

The findings have implications for the variable categories introduced in Chapter II. Support or nonsupport of the hypotheses also has some implication for the categories. The following is an elaboration on the implication for the four variable categories: (1) traditional variables, (2) equity variables, (3) TOD constraint variable and (4) cohesion variable. Only the second category is clearly recognized as a theoretical orientation.

The traditional variables are group size, leadership type, group heterogeneity, sex, age and occupation. Though these variables are not from a single theoretical orientation they have a long history of use

by sociologists from several orientations. They can be termed "group structure" variables and, for the latter three, demographic variables. Only this variable grouping failed to have a single hypothesis supported. Reasons for the variables' failure are discussed below.

Demographic variables failure to have discriminating value can be largely attributed to the study's sampling technique. Subjects are simply too homogeneous, probably because most subjects are employed by the same company. Homogeneity is especially problematic since the hypotheses were based on inconsistent evidence. Despite shortcomings both sex and occupation had sufficient discriminatory power, F scores greater than 1.00000, to be selected by MDA at step zero. Their F scores decreased greatly by step five. The decrease indicates that the small amount of variance explained by demographics is better explained by other variables.

Little can be said about the group size and leadership style variables other than that they proved to have no value as discriminators. Group size was recognized earlier as an "umbrella" variable which might have less value than the interaction pattern it implies. The F values stayed very low throughout the MDA process, implying that group size has little value either directly or indirectly. The case might be different if dealing with larger or more evenly distributed group sizes. Seventy percent of the subjects were from groups having from two to five members (see Appendix D). Leadership style had no value at any MDA step either. It failed to be correlated ($r = -.22$) significantly (at the .01 level) with group satisfaction, the basis for hypothesizing

a relationship with relationship maintenance. Failure of the leadership style variable may be due to its intercorrelation with other variables, produced in part by the measurement technique. It is significantly related (to the .01 level) with five other independent variables. Two of these variables were selected by MDA.

The final traditional variable, group heterogeneity, was accepted by MDA as contributing to the discrimination between ridesharing participants and dropouts, but in the opposite direction hypothesized. The degree of association with the dependent variable is extremely low ($r = -.140$). Its association with group satisfaction, the link between heterogeneity and relationship maintenance justifying the hypothesis, is also insignificant ($r = -.04$). Inconsistent and nonsupportive evidence might be a consequence of sample homogeneity. Additional problems are created by a narrow definition of homogeneity, using only three components. The race component proved useless since no subjects indicated membership in mixed race groups.

In sum, the variables designated traditional proved to be of little value. Demographics and group structure variables proved to have an insignificant degree of discriminating power for relationship maintenance. Only heterogeneity had value and it proved to have a relationship of opposite direction from the one hypothesized. Heterogeneity had a low degree of association with the dependent variable despite being chosen by MDA.

The cohesion variable of group satisfaction comes more from a grouping of literature than from a single theoretical orientation. It is,

unlike the traditional variables, an attitudinal variable with a long tradition of use. It is the attitudinal equivalent of the behavioral measure called relationship maintenance, the dependent variable. The hypothesized relationship assumed correlation between attitude about the group and behavior within the group. The correlation exists (.537) and group satisfaction was chosen by MDA as the variable with greatest discriminatory power for relationship maintenance.

The analysis gives no indication of the relationship's sequence. The conclusion cannot be safely made that group satisfaction causes relationship maintenance. Cognitive dissonance theory would contend the opposite ordering exists. The problem of sequence and its solution will be discussed further in Chapter V.

Confirmation of the relationship has more consequence for those studying group cohesion than for any theoretical orientation. There is a longer tradition and wider current use of attitudinal measures than behavioral measures of group cohesion. Findings indicate that the two measures correspond closely and both are legitimate for certain uses. Those using attitudinal data to approximate a behavioral equivalent are somewhat supported. Where the investigator has a choice of measures it would seem advantageous to use the one indicating the behavioral consequence. Though the attitude contains a high degree of discriminatory power there are four other variables contributing additional information. The additional information would be lost if attitude and behavior were considered equivalent. On the other hand, it appears that any explanation of relationship maintenance needs an attitudinal component.

The TOD constraints variable is taken directly from transportation literature. The concept translates into sociology as an environmental or extra-group structural variable, long recognized as valuable by sociologists of many orientations. There are social psychological elements imposed since "perception" of TOD constraints are being measured. This sociological modification of the concept may have implication for computer based rideshare matching programs based on "actual" TOD constraints.

The data support the hypothesis derived in Chapter II from previous research using the TOD constraints variable. The support lends credibility to the contention that extra-group (environmental) factors or perception of such factors affect group maintenance. Findings indicate these factors are less important than those within the group but of sufficient importance to include in any explanation of relationship maintenance. Because of their demonstrated importance the rideshare matching programs might consider perceived TOD constraints to be nearly as important as "actual" constraints. The degree to which actual and perceived constraints correspond is not indicated but needs investigation.

The last variable category, extracted from equity theory, more clearly than any other category represents a clearly defined theoretical orientation. Unlike in earlier discussions, the evaluation can be in terms of support for a theory. Three equity variables, extracted from three of the five propositions presented in Chapter II, were examined. Of the three hypotheses, two were clearly supported and one came close to being supported.

The supported hypothesis is probably the most necessary of the three to the theory's credibility. Unless the perception of equity has some discriminatory power for relationship maintenance the entire theory is in doubt. It is the perception of equity, and its consequence, to which all other propositions lead.

The second supported hypothesis is based on the first part of Proposition IIA. "Equity norm" measures assume that all agreements made by a group concerning its activities are designed to assure equity. Without the norms there exists no basis for members to evaluate relationship equity. Support of this hypothesis lends credibility to equity theorist's seldom tested assumption that systems of equity are created. Support for the assumption is impressive since sociologists recognize that group members are generally unaware of most norms and informal agreements.

The unsupported equity hypothesis is based on the sanction enforcement variable. The sanctions variable is important because it indicates the group's involvement in activity designed to insure equitable relationships are created (Propositions IIA and IIB) and maintained (Propositions IIB and IV). The variable came closer than any other unsupported variable to being accepted by MDA.

In sum, equity theory is sufficiently supported to warrant further consideration by sociologists. Support comes despite using respondents' own vocabulary of motives, not necessarily expected to match those used by social scientists. Support comes despite depending on potentially low frequency response rates caused by relying on unprompted responses.

The relatively high degree of support for the equity category, while failing to support more traditional social structure and demographic variables, should give some sociologists cause for position reevaluation of their theories' applicability to intragroup phenomena.

Theoretical reevaluation can take more than one form. Equity theory may be accepted as stated and alternative explanations rejected. Equity theory may be rejected and supported hypotheses explained by another theoretical orientation. If the first tact is taken, only issues concerning operationalizations need be raised. If the second is taken, alternative explanations need examining and research developed which make possible comparisons between competing explanations. This latter tact is examined in greater detail in Chapter V.

Pooler Profile

From the findings it is possible to construct a profile of what is most likely to be a successful pooler. The "ideal" successful pooler necessarily defines its polar opposite, the unsuccessful pooler or dropout. Any real individual can be placed on a continuum somewhere between the two ideals by evaluating the five characteristics used to create the ideals. The major problem in an attempt to categorize real persons is how to weight the characteristics. Weights are suggested by characteristics' (variables) relative discriminatory power. The goal is not to become involved with the weighting problem, only to describe the successful pooler.

The successful pooler can best be characterized as one who is satisfied with his or her arrangement. Satisfaction can involve numerous aspects of the group activity but most likely centers around the arrangement's convenience and liking for other group members. Satisfaction is most often relative to that which is expected from alternative modes having the same financial benefits. This is especially the case when convenience is the issue. Liking for other group members is more likely to be expressed in absolute terms.

A pooler is likely to perceive no TOD constraints. Feelings are most strong about origins and destinations being the same or requiring very little deviation from the ideal route to and from work. Very often the same company is a desired common destination. Few are willing to "go out of their way" more than a mile to pick up riders. Usually there are small allowances for time differences but few people are willing to leave early or wait more than 15 minutes for others. Though these specific limits on constraints are the most often cited, they can vary greatly. The important consequence for individual's continued participation is whether the constraints are perceived. The successful pooler does not perceive them to exist.

The pooler is likely to perceive a relatively large number of agreements with other members about group activities. Agreements may be either formal or informal but individuals most often perceive them to be only informal "understandings." Very few call them "rules." Many who say their group has understandings are adamant in their objections to the existence of rules in their pool. Agreements are

almost always made about pick-up points and times. Very often they involve a schedule of driver rotation, payment for riding or parking, a procedure for trading-off driving responsibility, and means for notifying others when not riding. Less frequently, they include seating arrangements, smoking, radio playing, procedures for getting the pool to stop for errands, and recruitment procedures.

Successful poolers are more likely to be members of groups having heterogeneous age and sex compositions. Age heterogeneity is the more likely of the two types. Members of both successful and unsuccessful groups are unlikely to express negative feelings about mixed groups. Both groups make more negative statements about mixed sex groups than about mixed age groups. Despite similarity of verbal expressions, members of heterogeneous groups, within this relatively homogeneous population, are more likely to continue participation. Finally, poolers who feel their arrangement is equitable are more likely to continue participation. Feelings of equity are most often expressed in statements about the arrangement's fairness or fairness of treatment by other members. Arrangement fairness is likely to reflect feelings of equal time and energy investment by all members. Treatment fairness very often involves the specific issue of trading driving days and may be expressed in terms of expectations rather than occurrences.

In sum, the ridesharing group member who continues participation is described as being satisfied with the arrangement and liking other group members. They are unlikely to perceive work time, origin or destination constraints on their pooling activities. The person is

probably a member of a group having different age groups and, to a lesser extent, having both sexes. The member is likely to perceive the ridesharing arrangement and their treatment by other members as fair.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The objective of this study was to determine why some ridesharing members continue their group participation while others do not. The dependent variable, relationship maintenance, is one of great concern and familiarity to sociologists. Though the variable is familiar, the group context is not. In the latter sense, this study is of an exploratory nature. In three other ways it is somewhat exceptional. The measurement of relationship maintenance is behavioral, even though taken from the cohesion literature. Equity theory is the source of three independent variables. The group being studied is naturally occurring rather than an ad hoc laboratory group.

Four categories of independent variables were introduced. These categories were: (1) traditional, (2) cohesion, (3) TOD constraints, and (4) equity theory. The first two categories have a history of sociological investigation, but the latter two do not. Eleven variables, derived from a review of past research in the four categories, were hypothesized to distinguish between participants and dropouts.

Multiple Discriminant Analysis (MDA) was used to evaluate the hypotheses. Of the eleven variables, five were chosen by MDA as having an optimal amount of discriminating power. The five were: (1) group satisfaction, (2) TOD constraints, (3) number of agreements, (4) group

heterogeneity, and (5) equity norms. After considering the relationship direction, four hypotheses were judged to be supported. The hypothesis involving heterogeneity was rejected because the relationship direction was inappropriate. Six others were judged unsupported when the independent variables were rejected by MDA. Of the supported hypotheses, none were traditional group structure or demographic, one was a cohesion variable, one was a TOD constraint, and two were equity theory variables. Equity theory, TOD constraints, and cohesion variables explain relationship maintenance for this sample. Group structure and demographic variables proved to be of little value.

Strengths of the Study

The strengths of the study are in its uniqueness. The ridesharers' participate in naturally occurring groups rather than ad hoc laboratory groups. Sociology's eventual worth as a social science may be determined by its ability to explain and predict phenomena in naturally occurring settings. Experimentalists would probably not argue this point, but they would add that findings from experimental settings can be generalizable enough to be useful. The measure of the dependent variable is especially unusual. A behavioral measure of relationship maintenance is compatible with what sociology wants to explain, namely the actual behavior in a group. Paper and pencil behavior and verbal behavior about behaviors of dramatic consequence to the group are only weak substitutes or, at best, useful predictors of the "real thing." Written or verbal behaviors have limited value as measures for relationship maintenance, however useful they may be in studying mental phenomena.

The variety of independent variables, from four different categories, is certainly a strength. The goal was not to examine a single explanation for a phenomena but, rather, to compare several explanations. These comparisons help to evaluate the worth of competing explanations. Of course, weaknesses in the design detract from the value of the comparison.

A final strength is that the study is interdisciplinary. It evaluates explanations used by sociology, psychology and transportation. The phenomenon being explained has elements of interest for all three disciplines. There is a long over-due realization by many sociologists that very few phenomena can be adequately explained by any single social science, especially when having a combination of social and nonsocial elements.

Limitations of the Study

First, the sample is purposive and does not represent the varied character of the commuting population. The resulting sample is too homogeneous to adequately evaluate the hypotheses based on demographics. The homogeneity may have affected other results too. For example, the sample is overwhelmingly white collar. White collar workers are more articulate than blue collar workers and have a vocabulary of motives more nearly like that of social scientists. Since content analysis was applied to the open ended interviews it might be expected that interviews with white collar workers would produce more information and more supportive information than interviews with blue collar workers. If the

sample were more representative the relationships might be weaker or totally wash out.

The small sample size creates analysis problems. With 60 subjects only the analysis half of MDA can be used. There is not a sufficient number of subjects to withhold half for the classification procedure. Normal distribution of subjects within each variable is an assumption of MDA, though Morrison (1974, 451) notes that MDA is "not very sensitive to the normality of data." Normality cannot be expected with such a small sample. The lack of normality may have limited the effectiveness of the analysis.

Some of the sampling problems are unavoidable because there is no way to accurately identify the total commuting population. Even the most ambitious attempts would underrepresent the lower blue collar workers since they are most often missed by the census too. Given resources for an areawide survey, the sample could be made more representative. Resources for such a study were not available.

A second weakness of the study is the data collection technique. The open-ended interview is recognized as legitimate for exploratory studies of the nature represented here. Nevertheless, this data collection technique has certain inherent faults. One is that the number of interviews is limited even when more resources are available than were to this study. A small number of interviews increases the chance of introducing systematic error. This problem is linked to the representativeness problem already discussed. Another problem comes with the coding technique. The coding unit must arbitrarily be chosen. Coding instructions must be more detailed and require more coder

decisions. Reliability may be a problem, both in coding and in interviewing. Weighting of statements can be hazardous but failure to weight may cause loss of information. As indicated in Chapter III, measures were taken to assure the reliability and validity of the data.

No easy solutions to the problems caused by data collection technique inadequacies exist. All techniques have some problems and should eventually be used in multiple to check for technique specific errors. Even though the technique used in this study was probably the best in its exploratory context, other techniques need to be used in its replication. Especially appropriate might be a questionnaire, thereby eliminating some of the cost, reliability, coding, and articulation difference problems.

Implications for Ridesharing Programs

This study has several implications for rideshare matching programs. Assume that individuals use the same criteria to decide whether or not to join a pool as they do to decide whether or not to stay in one. The majority of the rideshare matching programs use computer matching techniques. Actual TOD constraint variables are the usual criterion for making a "match." Some programs accidentally control, to a degree, the heterogeneity variables by using only company data bases. From the evidence of this study the choice to join a ridesharing group would depend less on the "perceived" TOD constraints than on the other social variables. Again, the relationship between "actual" and "perceived" TOD constraints is unknown, though it seems likely that most often the constraints are merely perceived. It is seldom the case that absolutely

no one in a person's area, or on the route to work, has nearly the same work times and work location.

Perceived TOD constraints are important enough to warrant more attention by those forming ridesharing groups. When marketing a ridesharing program, special advertising can be used to convince more of the target population that they are matchable. Part of such a campaign may include efforts to convince individuals to be matched with those who work for different employers. Only when using more than company data bases can many individuals working for small employers be made matchable or be convinced that they are matchable. If, for example, a subject works with only five others, he or she may correctly perceive that they are unmatchable with their work group. If they are on a company data base system or are afraid to be matched with people outside their company, they may perceive themselves as absolutely unmatchable. Only by expanding the data base and reducing the fear will the individual feel matchable. Those who feel matchable are more likely to desire participation in the ridesharing program.

Other benefits are gained from convincing individuals of their matchability. Use of the informal matching system is likely to increase. Many existing pools would never have formed if dependent upon a grid matching program alone. Matches along routes are often missed by the computer but individuals can discover riders through informal networks. These networks also serve as updating systems, often more efficient than the computer and certainly less expensive. As long as individuals are not faced with some evidence of their matchability they have one more excuse to not join a pool. If convinced of their matchability and the

importance of informal networks, many pools could be formed without the computer or could complement computer based efforts.

The homogeneity partially insured by the matching procedure is a "same company" or "same type job" type. This is in contradiction to the multiple component kind used in this study. The only possible overlap might be with the component of sex. Many large companies employ predominantly males or females. In such companies the data base would encourage sex homogeneous pools. But in this study homogeneity, half the component being sex, was inversely related to group maintenance. It may be that the matching programs with mono-sex company data bases are actually discouraging individuals from continuing in their pools or creating matches with a less than optimal chance of success. The evidence is weak for such a contention though since sex is only one component of the heterogeneity variable.

The variables definitely not considered by the matching programs are group satisfaction, agreement items, and perceived equity. For these variables to be considered the programs would have to be changed dramatically. A great deal of propaganda would have to be designed to convince potential poolers that much satisfaction could be derived from pooling. The satisfaction items would include friendship, convenience and enjoyments from being around "other" considerate and cogenial individuals.

"Cookbook" guides to forming the pool and personalized attention at early group development stages might be necessary. One means for insuring the personalized attention is to have field persons to help in the formation of each group. These persons could be assigned the task

of helping all members form agreements, if only informally, about the group-related activities. By having the entire group participate in forming agreements, the likelihood is increased that individual group members will perceive the arrangement as fair (equitable). The agreements formed would include procedures to deal with violators of activity agreements. The importance of their consistent application (sanctions), to insure fairness, must also be stressed.

These sketchily enumerated steps call for rather ambitious changes in the procedures used by existing rideshare matching programs. However, groups of people are being created. Specific suggestions, offered above, attempt to recognize that the resulting product, if successfully matched, is a group, not a collection. When forming human groups, programs should consult those social scientists who have at least some knowledge of the principles involved with group formation and maintenance. In fact the best application of these principles may require consultation with applied social scientists having marketing or counseling skills.

Implication for Further Research

There is need for further research in three areas. First, the weaknesses of this study need to be corrected and the variables re-examined in a variety of group contexts. If the relationships supported in this study continue to be supported, two other needs arise. Research should be conducted which would allow determination of the developmental relationship between group satisfaction and relationship maintenance. Finally, research is needed to compare the adequacy of equity theory

with that of other orientations for explaining relationship maintenance. All three needs are examined in more detail below.

First, there is a need for replication of this study with other data collection techniques and a more adequate sample. Such a replication would remove many of the weaknesses of the study while retaining most of its unique aspects. If there is a change to a questionnaire technique, care must be taken to preserve the spirit of the operationalizations in this study. No replicative claims could be made otherwise. There are certain advantages to changing to a questionnaire. Many of the weaknesses of this study, examined earlier in this chapter, could be avoided with less cost to the researcher. The sample size could be increased and be made more representative. Reliability problems could be reduced greatly.

If the design's value is confirmed through replication, it can be applied to a variety of group contexts where it is deemed desirable to explain why some members continue participation while others dropped out. Some of the independent variables would need changing to fit a new context, but the four categories, with the exception of TOD constraints, would fit most contexts. Even TOD constraints would probably only be changed to some other environmental constraint, since all groups are subject to such constraints to some degree.

Another need is to apply the classification technique of MDA. In this study there were just too few cases to hold some out for the purpose. If a questionnaire technique is used, enough cases to run both parts of MDA could be obtained with less cost. If interviews are again used, perhaps only the classification part should be used.

A second need is for research to establish whether group satisfaction precedes relationship maintenance or vice versa. The question of whether attitude precedes behavior or behavior precedes attitude has long been contested. Cognitive dissonance proponents support the contention that behavior occurs first and attitudes become consonant.

For the ridesharing group context, a design can be formulated to settle the question. What is needed is a longitudinal study rather than the after-the-fact design used here. Measures of group satisfaction need to be taken periodically in established ridesharing groups. If satisfaction with the group decreases before the individual drops out, the support is for the attitude preceding behavior. If the decrease comes after dropping out, the support is for the other direction.

The basic idea for the design is simple enough. Its application is far more difficult. The expense of constantly monitoring and frequently testing individuals in a large number of groups would be great, particularly over a long period of time. There would be problems with trying to test the group satisfaction frequently while avoiding making the subjects sensitive to the measurement technique. Sensitivity would be an almost certain consequence if a questionnaire or very specific interviews were used. Some type of unobtrusive measure would be most desirable. Participant observation would seem a likely second choice but requires a large number of trained persons to be effective. The design details are problematic but the question needs to be answered.

Finally, equity theory should be compared to other "general" theories. This task is made difficult by equity theorists' claim that their theory is a "summary" type with similarities to those it encompasses. Because of the similarities evidence often supports equity without offering evidence to reject competing explanations. No attempt will be made here to offer designs for examining all alternative explanations. Only a suggestion to compare equity theory and behavioral psychology. Behavioral psychology is chosen because proponents of both theories recognize the closeness of their two orientations. Equity theorists recognize their debt to behavioral psychology in Proposition I (Walster & Walster, 1976, 290). Homans (1976, 240-241) offers the behavioral psychologists' view when he states that they actually subsume equity theory.

In research designed to compare the two orientations the variables of perceived equity and perceived reward could be examined. If the degree of reward is more valuable for explaining relationship maintenance than perceived equity, the behaviorists would be supported. If perceived equity demonstrated more value, equity theory becomes more important. If both have value or prove to be of little value, the issue remains unresolved. Any findings would be contested by one group or the other. Equity theorists could claim that reward is a component of the concept of equity and is therefore inherently a less powerful concept. Behaviorists can claim that only short-term rewards are being measured and that they are able to account for equity through the concept of long-term rewards or protracted contingency evaluation.

A more critical evaluation may be obtained by examining the sanctions variable. Equity theory predicts that the rigorous enforcement of agreements decreases the number of dropouts since fairness is insured. As long as rules were agreed to by all members, there is no reason why the dropout rate would be greater for individuals receiving negative sanctions than for other group members. Behaviorism predicts that group members being punished would avoid the source of punishment, i.e., the other group members. They would therefore predict that dropout rates would be higher for those being punished than for other group members. Research could be designed to determine whether dropouts received sanctions more frequently or more severely than participants. The results would clearly support one theory or the other.

Research of the latter type would need to be designed to avoid some potential problems. Longitudinal studies using more than one group member would be most desirable. They would provide checks on the distribution of sanctions and insure that the perception of that distribution is not affected by adjustments to account for a dropout's behavior. This type of longitudinal study has all the economic pitfalls discussed in the design described to determine relationship direction. Despite its problems, it would be valuable for answering an important question about the ultimate value of equity theory.

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APPENDIXES

APPENDIX A

Sample Interview

Subject #56 [1-3] (6-6-77) (S.B.) Carpool Dropout [32, 33]
Male [4]

S.B. I just want to ask you a few questions about carpooling—your feelings about it and getting out of a carpool. And I'd like to just start by getting some information about you—your age.

Subject. 55 [5]

Q. And your occupation?

A. Medical Engineer. [6]

Q. And the general area of residence.

A. West Knoxville.

Q. How long ago was it that you carpooled?

A. Well, I'd been with TVA about 30 years now, and I guess for almost all those years I've been in a carpool.

Q. When did you leave your last carpool?

A. In the first carpool, I lived South and the carpool there was as long as I lived South. But I lived where I am now for 20 years, and as soon as I moved there I got into a carpool with 4 or 5 and continued with about 4, usually 4, sometimes 5, up until—I guess it was last fall. [11-12]

Q. You said that there were about 4 or 5 people in the carpool. Did the membership change very frequently?

A. No. It was pretty stable.

Q. Who were the people that were in the carpool with you?

A. Well, I had—the last carpool had Zuber . . .

Q. Well, what relationship were they to you?

A. The only relationship they were within about—most of them were in a few blocks. The farthest away was maybe a mile and a half, and

they were all here—there's none that worked in this branch. They're throughout TVA.

Q. They work in these towers though?

A. No. Two of them were in the Building.

Q. So how long were you in the carpool with those people?

A. Some of them I guess for nearly 17-18 years, off and on. One I know that was in for a while and then he got out. You know, it's just that I've always been in a carpool, and they have been some. There was one fellow that was in a carpool that went to Chattanooga. Sometimes you try to get a replacement, and—but we always maintained 3 or 4 anyway. There were other carpools in the area at the time, picking people up on the same streets.

Q. Did you ever switch members with other carpools?

A. No, I don't think so. There was discussion about it at times when people would say we've got a vacancy, do you know of anybody? But I don't think we ever had anybody that just transferred from one to another. [14]

Q. When you were in that carpool, what kinds of driving arrangements did you make? Like how frequently would you drive?

A. Well, we usually tried to set a date, especially when we had 5 people, and I think even when we had 4, each was responsible for a day—because you get it mixed up if you don't. And the other day, somebody would try to, every so often they would take 2 that week. It was that most of those that were in the carpools were able to drive most any day. It wasn't a one-car family. They had 2. The last group that I was in, it was difficult for—one fellow's wife worked and so she did not work on Wednesdays, so that was his day. If there was any problem, we could always, somebody couldn't drive or they weren't going in, or on vacation, no problem finding someone else to fill in. [14, 23]

Q. What happened if for instance, you weren't going to go to work? Would you call the person?

A. If we didn't know til the next morning, we just called someone and asked if they could drive for us. It was usually no problem. I mean, you knew who had 2 cars and the other one sitting at home. [23]

Q. Did you ever have any problems with carpools with people you felt didn't take their fair share of the driving?

A. No. I know that for the last few years I was in, I know one of the members did keep some kind of a record, and I don't know that whoever used it for anything. He made some comments about it a few times, but it was pretty well balanced, the number of times that each drove. [28]

Q. What kinds of arrangements did you have for getting together in the morning?

A. Just drive around and pick them up at the door. [23]

Q. Would you just honk for people at their house?

A. They usually knew to be out at the street, and you came by at a particular time. Always try to get by about the same time, you knew to be out or watching for you. So there was very little lost time there in getting them into the car.

Q. What about if someone were late? How long would you wait, or did you have any rules?

A. Well, yes. We would have rules. Of course, if they were late coming out of the house, you'd usually go to the door and make sure that they didn't forget to tell you they'd been on vacation, but we usually set 5:00 here, because we, at least the last pool and some of the others didn't park close—we'd park several blocks away, so it would take 5 or 10 minutes to walk. So we'd usually if you don't get there by 5 then we may be gone. Because sometimes people would go home and forget to tell you. You just said 5:00 is the limit. We're not responsible for you getting home, not after 5. [23, 14, 23]

Q. So everybody would just walk to the car and meet there?

A. Just walk to the car and meet at the car.

Q. What about the financial arrangements? How did you pay for the gas and parking?

A. Each just paid his own. There was no—in parking, we would just pay for the parking by the month, by the 6 months or whatever, and you just paid up.

Q. Was anybody in charge of collecting the money?

A. Well the last time, seemed like I've been in charge part of the time. Most recent was that we were parking over at the church, which I took care of. I mean, I'd pay it and they'd pay me. [23]

Q. Did you have any kinds of arrangements about for instance smoking in the car?

A. No.

Q. Did anyone smoke?

A. We've had smokers in the car. I don't recall if there was ever any problem. I guess most recently I don't believe any of them smoked after people became more concerned about being in cars with smokers, then we didn't have any smokers. I think maybe one fellow did smoke a cigar, but he didn't smoke it in the car.

Q. What about the radio? Did you have any kind of problems with playing the radio?

A. No, no problems. We didn't fight over which station we wanted. Often it was on, coming in, listened to news or something.

Q. In this last carpool that you were in, how did you get involved in it to begin with?

A. Oh, I don't know. It started—it just, I've always been in a carpool and when someone would drop out, we'd pick up somebody else. It hasn't been, I probably couldn't name more than 8 or 9 people that dropped out in this area because they all have been working with TVA a long time. Zuber is one that has been working maybe 5 years, and I think it wasn't long after he started that he lived across the street from another fellow.

Q. Right. Well, when you were carpooling with these people, would you consider yourself to be friends with them, socialize with them?

A. Not because of the carpool. There's only, I guess, of the people I guess there were only 2 that I can think of within the last 10 years that were in the pool that I socialize with.

Q. How frequent?

A. It didn't come about because of the carpool. It was other than that.

Q. So were your families friends?

A. Family friends.

Q. What kinds of activities did you do together?

A. Whatever families do. We met in each other's homes—parties.

Q. Did you ever socialize with any of the other people?

A. No.

Q. Now that you're out of the carpool, do you ever see the people that you were in it with socially?

A. Not socially—one of them I guess, there's only one now.

Q. So you don't keep up with the other people in the pool?

A. One of them stops by here about once a month. He sits down and we talk. Of course, I see another one who's in this building, and I did notice on the street this morning that one of the other fellows that was in the pool up until last fall—just recognized him. He was at a distance, but we say hello when we see each other on the street. But other than that—except for one that I do.

Q. What kinds of things did you talk about in the carpools in the morning? Was there a lot of conversation?

A. Just everything. We didn't polarize I guess to—it was not too bothersome I guess to those who weren't wide awake in the morning to be in the carpool. In other words, <u>everything flowed pretty smoothly</u>. Everybody didn't feel obligated to talk, just get in the car and discuss whatever you want to. I mean, there was no problem. [7]

Q. About how long would it take you to get in?

A. About 15 minutes.

Q. Did you ever feel that there were any kinds of problems associated with the carpool? For instance, did you feel that anybody in the pool was a bad driver?

A. I think that there were, it comes to mind that one of them I was a little concerned with about his driving, and I think maybe others. He was one of these that when he gets behind the wheel, he changes personalities a little bit, and he becomes a little aggressive and doesn't—frequently blowing his horn or commenting about other drivers, which kept your attention.

Q. Did you ever run errands for people when you were pooling, for instance, in the afternoon when you were going home? Did you ever stop for people to run errands or did you have any rules about that?

A. No. I don't think we had any errands. There were times when someone would say I need to not go home. I need to be dropped off where I left my car, that sort of thing, and we'd maybe go out of the way, drive a few extra blocks, something. But it was what you'd expect, people got along all right or they wouldn't be riding in the carpool for that long. [23]

Q. What kinds of advantages do you see in carpooling?

A. I suppose one advantage is it doesn't cost as much to get in, because of the parking, because it's not wear and tear on the car, and the other thing is that I suppose you're not riding alone, which is—most of us like to not be alone.

Q. What kinds of problems or disadvantages do you see in carpooling? [28, 28, 7]

A. The, if you think of carpooling over driving individually, you do have to leave a few minutes early, and when you're driving, and get home a few minutes later because you've had to go by and pick people up. Of course, I said we'd park quite a ways in the morning, I said we'd go to the car and meet at the car in the mornings we would drive by in the vicinity of the buildings and rather than have everyone walk all the way from the parking lot, we'd drop off and then let everyone meet down there. [8, 8, 8, 23]

Q. Are there any other kinds of things that you see as disadvantages to carpooling?

A. Well, it could be it ties you down—if you decide, you know, you're at work and you need to stay extra time, which often you've been around here as long as I have, sometimes it is required. You don't either work as fast or you got more to do, at least it doesn't get done. So there have been times when I would have liked to stayed I suppose, I know there have. I felt like I ought to be here another half hour, but I'm in the carpool and that's the only way I've got to get home, so I know that I probably have to take work home to do, rather than stay on here and do it where I had it, which it was not that I needed a lot of reference material for the type of thing that I might be doing, it was just catching up on paperwork and so I could package it up and carry it home. [8]

Q. How did you get out of the carpool? When did you leave?

A. I'm not sure of the day. Sometime it was last fall. The buses, the express buses had started, and there were 2, there were 4 in the pool at the time, and they lived, they were the 2 that lived across the street from each other, and one decided he'd try the bus to see how it goes. He had to walk, I think he could walk to the bus, which was probably 5 or 6 blocks away. He could—it was

within walking distance, and so he decided he'd try it for a couple of weeks, and then the other one that lived across the street from him decided he's try the bus, and it turned out that after a while of trying it, that left only 2 of us in the pool, and they'd discuss with them about whether or not they thought they'd stay on with it, and they were happy with the bus I think, and so then the other 2 of us just decided we'd try it also. So that's what, actually I, of course I've been riding the bus, the other person has a boy over at U.T., and I think he may ride in with him. They ride together, or he may drive. I don't know how much of the time. He may ride the bus part time.

Q. How do you feel about riding the bus?

A. Most of the time that I've ridden it through the winter, it was good, because we had a pretty bad winter, and there were a lot of days I wouldn't want to drive in. Of course, I do have to drive to the bus. In fact, I'm in a riding pool to the bus.

Q. How many?

A. Two of us that drive over. Just like this morning, I decided that I had something to do tonight at 6:00 and go out on the north end of town, so rather than have to drive back on the bus, go out home, pick up the car to come back and go north, I just drove in. And the other will go back and call his wife and tell her to come pick him up. It's not far—a mile away, so she picks him up at the bus.

Q. So when you drive in he just drives to the bus himself and then . . .

A. Well, in this case, I drove in and brought him. I just dropped him off here, so he had a free ride into town and didn't have to pay the bus fare, but he's got to call his wife and get him home.

Q. About how far is it from—how far do you drive to catch the bus?

A. Probably a mile and a half.

Q. Do you prefer the bus over carpooling?

A. At times I think. Like I say, when the weather's real bad and it's raining or something, it's nice to be able to walk out the door and get on the bus. But if you have 4 or 5 people in the car, it's really not that much difference. If you've got a good group you like to be with, because there are some disadvantages as I see it to have to get out of the building and maybe sit down there in the bus for several minutes before it takes off, and the buses are not air conditioned. The car on hot days might be, and

it's not a lot of difference between. You do have to walk depending where you park; our arrangement is to walk several blocks but that was no problem, and if it was a downpour, real bad weather situation, we sometimes would call around and say stay where you are, I'll come by and pick you up. Rather than get everybody wet, since we had to walk so far, but if they could stay dry with an umbrella, we'd still meet at the car.

Q. What about the finances of the bus? Do you think that they're comparable, cost a comparable amount of money?

A. Well, I think that you probably, if you had 4 or 5 in the carpool, probably it'd be less expensive to go for the carpool, because at the present rate it costs even with TVA's support it costs 80¢ a day, and if you have 5 people, that's $4.00 a day, and I think we can drive a car in and park it where we're parking, which is very nominal cost several blocks away. Now if you park close, it's going to cost you $1.50 maybe, but that still leaves $2.50 to pay for a couple of gallons of gas, so I think it probably would be more expensive for 4 or 5 people to ride the bus than it would be to ride a carpool. [28]

Q. Were you affected at all by the bus strike?

A. Well, since there were 2 of us that were already carpooling to the bus, we just carpooled to work.

Q. And then when the buses went back in operation, you just . . .

A. Just went back on the bus.

Q. Have either of you ever talked about tryi ng to get a carpool started again?

A. No.

Q. Why?

A. I don't think we're interested, since so many I think in the past when people didn't have the express bus, I think people were looking for some other way, and maybe they didn't want to try to maintain two cars, when you got rid of the family with kids and all, but now there's not that incentive to get into a carpool, so I'm just not out trying to. As I say, the people that were in the carpool all are fairly well satisfied with the busing.

Q. So no one has approached you since the fall about getting into a carpool?

A. No.

Q. And you haven't approached anyone about that? If you had your choice, which would you—which would you rather be doing—carpooling or coming on the bus?

A. I don't see much difference. In either case, you have to leave home at about the same time, and usually with carpooling, we probably play it a lot closer to the time. We get here at 1 minute to 8, but the bus we get here at 10 minutes to 8, and the getting home time is not much difference either, it's more than 5 minutes difference in the time, and it's not significant.

Q. So they're just about comparable in terms of convenience, cost and time.

A. I would think so. I think the advantages of one and the other—each has its advantages which are not really too much either one over the other. I think there's a considerable advantage over a bus than riding individually.

Q. If the carpool had continued though, you probably would have stayed.

A. I probably would have not been the one to pull out, that is I was not looking for an out. Maybe the others were more so than I.

Q. Do you think that there was any conflict or any problems created by the other 2 pulling out—any hard feelings?

A. No. I don't think there were any hard feelings. I'm not sure that—there may have been if we had had other people in the carpool. Sometimes after you've been with the same group for so long, someone might tend to get on your nerves occasionally, and I think in this case it was a little bit of that. I'm just tired of listening to something. So that may have had something to do with it—the inclination to try something else.

Q. So it might have stayed together if you'd had just a slight turnover?

A. It could have been, not that there was any—I say no conflict. But there was—one person that seems to—others got tired of hearing certain comments—at least to the point that it was discussed when he wasn't in the carpool, we'd refer to something he might say under these conditions and I think it got to where they were not entirely happy with him being in the pool, though it was not in any open conflicts or arguments or things like that, but it was just the kind of a guy that some people you could stand to be around some of the time but maybe this just got to be a little bit much every morning and every afternoon. [8]

Q. Okay, well is there anything about carpooling or busing that I haven't asked you that you want to say?

A. No, I don't think so.

APPENDIX B

Sample Code Sheet

1. 0 Name: _____ I.D. # 0 5 6
2. 5
3. 6 Sex: Male X 1. Age: 5 Categories: 1. 1-19
Female 2. 2. 20-29
3. 30-39
4. 1 4. 40-49
5. 5 Occupation: job title-Medical Engineer 5. 50-59
6. 1 Categories: 1. Upper White Collar 6. 60-98
2. Lower White Collar
3. Upper Blue Collar
4. Lower Blue Collar
5. Farm Related

---

7. 2 Group Satisfaction
8. 5 A. # of liking or advantage statements (2)
9. 0 B. # of disliking or disadvantage statements (6)
10. 7 C. Liking index (A - B + 10) ___ ___

11. 0 Group size: 0 4
12. 4

13. 0 Leadership style:
14. 3 A. # of autocratic Items
15. 0 B. # of democratic Items (3)
16. 7 C. Autocratic index (A - B + 10) ___ ___

17. 0 Group Homogeneity:
18. 0 A. # of points for sex differences ___
19. 0 B. # of points for race differences ___
20. 0 C. # of points for age differences ___
21. 0 D. Heterogeneity index (A + B + C) ___ ___

22. 0 T.O.D. constraints index:
Items about time, origin, or destination restrictions

Note: for single col., 9 = u/k or n/a, 8 = 8 or more. For 2 col., 99 = u/k or n/a

"Statements" mean repeats are counted
"Items" mean repeats are not counted

23. 8 Equity norm:
# of agreement Items (8)

24. 0 Sanctions:
25. 0 A. # of sanctions for rule breaking ___
26. 1 B. # of nonsanctions for rule breaking ___
27. 0 C. Sanctions enforcement index (A - B + 10) ___ ___

28. 1 Perceived equity:
29. 0 A. # of fairness Items (3)
30. 1 B. # of unfairness Items
31. 1 C. Equity index (A - B + 10) ___ ___

---

32. 2 Summary dependent variable (relationship maintenance):
Respondent is: 1. Participating ___
2. Dropped out X

33. 6 Respondent is:

1. driver only ___	4. driver drop-out ___
2. rider only ___	5. rider drop-out ___
3. driver & rider ___	6. driver & rider drop-out X

APPENDIX C

Table C-1

Complete Correlation Matrix

Predictor Variables	Variables											
	Sex	Age	Job	Satisfaction	Size	Autocratic	Heterogeneity	TOD	Agreements	Sanctions	Equity	Disposition
Sex	--	-.26*	.12	-.13	.02	.13	.39**	-.11	.05	-.09	-.07	-.13
Age	--	--	-.09	.04	-.19	-.36**	-.14	-.06	.08	.25*	.11	.00
Job	--	--	--	.11	.60**	.41**	.28**	-.06	.04	.05	.09	-.20
Satisfaction	--	--	--	--	-.05	-.22*	-.04	-.16	.23*	.01	.18	-.54**
Group Size	--	--	--	--	--	.53**	.44 *	.03	-.14	.02	-.08	.01
Autocratic	--	--	--	--	--	--	.34**	.13	-.34**	-.01	-.14	.15
Heterogeneity	--	--	--	--	--	--	--	-.06	-.20	-.19	.04	-.13
TOD	--	--	--	--	--	--	--	--	-.20	-.02	-.11	.49**
Agreements	--	--	--	--	--	--	--	--	--	-.02	.14	-.44**
Sanctions	--	--	--	--	--	--	--	--	--	--	-.18	.16
Equity	--	--	--	--	--	--	--	--	--	--	--	-.31**
Disposition	--	--	--	--	--	--	--	--	--	--	--	--

*Significant at the .05 level.

**Significant at the .01 level.

APPENDIX D

Frequency Distribution for Independent Variables

	Response	n Respondents	Percentage	Category (when appropriate)
Sex:				
	1	52	86.7%	male
	2	8	13.3%	female
Age:				
	2	4	6.7%	20-29
	3	11	18.3%	30-39
	4	19	31.7%	40-49
	5	25	41.7%	50-59
	6	1	1.7%	60-
Job:				
	1	52	86.7%	upper white-collar
	3	3	5.0%	upper blue-collar
	4	4	8.3%	lower blue-collar
Group Satisfaction:				
	3	1	1.7%	
	4	2	3.3%	
	5	1	1.7%	
	6	2	3.3%	
	7	3	5.0%	
	8	6	10.0%	
	9	5	8.3%	
	10	6	10.0%	
	11*	9	15.0%	
	12	4	6.7%	
	13*	9	15.0%	
	14	3	5.0%	
	15	3	5.0%	
	16	2	3.3%	
	17	1	1.7%	
	18	2	3.3%	
	19	1	1.7%	
Group Size:				
	2	9	15.0%	
	3	9	15.0%	
	4	11	18.3%	

Group Size (continued)

Response	n Respondents	Percentage	Category (when appropriate)
5*	13	21.7%	
6	1	1.7%	
8	1	1.7%	
10	6	10.0%	
12	4	6.7%	
13	4	6.7%	
14	1	1.7%	
15	1	1.7%	
Autocratic Index:			
4	4	6.7%	
5	2	3.3%	
6	2	3.3%	
7	6	10.0%	
8	6	10.0%	
9	9	15.0%	
10*	11	18.3%	
11	10	16.7%	
12	7	11.7%	
13	3	5.0%	
Heterogeneity Index:			
0*	30	50.0%	
1	2	3.3%	
2	9	15.0%	
3	4	6.7%	
4	4	6.7%	
5	7	11.7%	
6	4	6.7%	
TOD Constraints:			
0*	34	56.7%	
1	18	30.0%	
2	7	11.7%	
4	1	1.7%	
Agreement Items:			
1	5	8.3%	
2	8	13.3%	
3	11	18.3%	
4*	10	16.7%	
5	4	6.7%	
6	7	11.7%	
7	5	8.3%	
8	7	11.7%	
9	3	5.0%	

Response	n Respondents	Percentage	Category (when appropriate)
Sanctions Index:			
8	2	3.3%	
9	9	15.0%	
10*	31	51.7%	
11	14	23.3%	
12	3	5.0%	
13	1	1.7%	
Equity Index:			
8	1	1.7%	
9	3	5.0%	
10*	38	63.3%	
11	17	28.3%	
12	1	1.7%	

*Mode for ordinal level variables.

VITA

Dallas D. Owens, Jr. was born in Marion, North Carolina on February 12, 1947. He graduated from Glenwood Elementary and High School in May 1965. The following March he began serving a three-year tour of duty with the United States Army.

After being discharged from the Army, he entered the University of North Carolina at Charlotte. He received his Bachelor of Science degree in Sociology in June 1972. The next month he entered Utah State University, where he received his Master's degree in Sociology. This degree was awarded in August 1973.

In September 1973 the author entered the University of Tennessee, Knoxville graduate school. He received the Doctor of Philosophy degree with a major in Sociology in December 1977.

The author is a member of Phi Kappa Phi, Southern Sociological Association, Transportation Research Board, Sierra Club, National Geographic Society, and the Association of Voluntary Action Scholars. Mr. Owens will be employed by Clemson University after graduation.

He is married to the former Patricia Williams of Marion, North Carolina.