COMMUNICATION AND INTERORGANIZATIONAL RELATIONSHIPS AMONG COMPLEX ORGANIZATIONS IN SOCIAL SERVICE SETTINGS

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ABSTRACT

COMMUNICATION AND INTERORGANIZATIONAL RELATIONSHIPS AMONG COMPLEX ORGANIZATIONS IN SOCIAL SERVICE SETTINGS

By

Rolf T. Wigand

Interorganizational communication relationships are explored in a systemic fashion and are viewed in the light of social service settings. Within an interorganizational system four interorganizational class variables are identified: communication, the environmental conditions, interdependence, and goal attainment. The first two variables are understood as exogenous to and the last two variables are viewed as endogenous to the interorganizational system, respectively. These variables' interdependencies are expressed in the form of propositions.

Based on this discussion, a preliminary path-analytic model is tested in a study of the interrelationships of sixty-nine social service agencies in the Lansing, Michigan, area. The endogenous variable goal attainment is the main dependent variable. The resulting analysis renders unsatisfactory results largely based on the low values for explained variance. This model suggests, however, several expansion possibilities for the basic path model.

The expanded model incorporates such variables as goal attainment, communication, centralization, organizational position, satisfaction, age, education, interdependence, cooperative-competitive environment, need for additional services, source variability of agency funds, budget, and others. Most path coefficients are statistically significant and the path-analytic model represents the best possible analysis of the data set. From this static analysis--since dynamic characteristics were not available via the data set at hand--a cybernetic model is developed that exemplified numerous dynamic relationships of interorganizational systems. This model demonstrates that it permits the extraction of implications that are not easily, if at all, obtained otherwise.

In conclusion, the results of the study suggest that further research should not be recommended. This study provides policymakers with information for directed distribution of social service funds as well as for the restructuring and organization of communication and coordination among social service agencies. Consolidation and application of current technology as well as relaxation, not in the service area but in the communication barriers dividing person from person, group from group, are recommended.

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A DISSERTATION

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CHAPTER I

INTRODUCTION

Overview of Problem Area

The importance of organizations which are autonomous and competing for viable democratic operating processes is emphasized by scholars in sociology, economics, political science, and other fields. Models resulting from the theoretical positions in these fields assume that the processes of exchange, competition, cooperation, coordination and communication are inherent in social reality. This thesis argues that the study of interorganizational relationships can appropriately incorporate these social processes, and can provide an important analytical tool for explicating them.

If researchers are to gain a comprehensive insight into organizational behavior, there is a need to consider interorganizational communication (e.g., Etzioni, 1960). Once the environment surrounding organizations is no longer assumed to be constant, ceteris paribus, then processes that result in organizations effecting change in their environments come to be seen as important subjects for examination. Similarly, organizational processes involving adaptation to external constraints and contingencies are also worthy of investigation.

Most organizational communication research is concerned with individuals within the organization, and not with the total

organization per se. Most organizational studies do not consider organizations in terms of their effect on other organizations and units in society, nor as having to adapt to external constraints and uncertainties. Whatever type of organization, the researcher will gain greater insights into organizational processes, typically, by understanding the environment within which the organization operates. By understanding the pressures acting on a focal organization and on its individual decision makers, the researcher can isolate sets of objectives, goals and criteria relevant to the organization.

Considerable attention to organizational change is found among researchers in such areas as organizational development, group dynamics, etc. Most stress the importance of the concept of change. Researchers in the past became aware of a need for organizational change because performance measures, disturbances or breakdowns in communication, etc. suggested it. It should be noted, however, that these symptoms are all internal assessments of the organization's immediate "task environment."

Few studies, unfortunately, attempt to identify and measure a set of external or environmental variables that are causative of change and/or whose recognition necessitates a specific, desired change. In short, while organization scholars speak of organizations as interacting with their environment in theory, most empirical studies, by virtue of their design, ignore the process by which this interaction occurs. This is the case from both the standpoint of the focal organization and that of other organizations

in its environment. In the present study, this author attempts to conceptually and empirically differentiate between external (exogenous) and internal (endogenous) variables that may affect a change in the behavior of organizations.

First, the types of variables that are largely instrumental in determining communication behavior among organizations will be identified. There are two main, broad categories of variables that are discussed in this context: (a) the exogenous environmental conditions that exert influence on the focal organization as well as on a set of organizations; (b) the endogenous information processing activities of the organization, i.e. the flow of and the behavior of certain communication acts occurring within the organization.

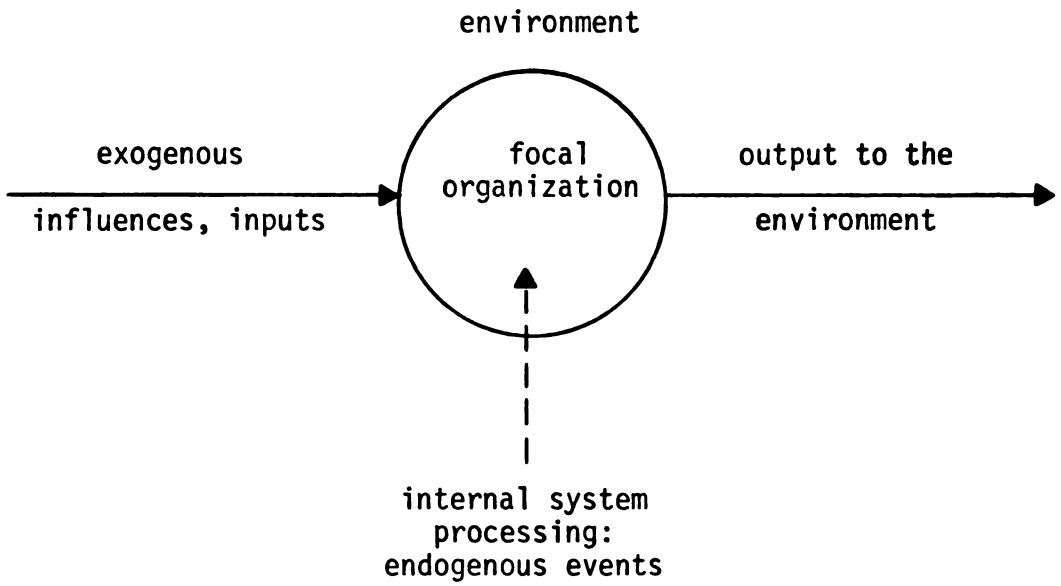


Figure 1.--The organization viewed as the focus of analysis in an environmental context.

This thesis specifically focuses on these two categories of exogenous and endogenous variables. Furthermore, related phenomena that reflect the individual within the organization, the organization per se, as well as the immediate organizational environment are considered. The primary purpose of the proposed research is to test proposed and modeled relationships through the interorganizational behavior of social service agencies as expressed in a causal model exemplifying this behavior.

Interorganizational Communication Relationships

Organizations are social systems, i.e. systematic ensembles of interdependent, interhuman activities attempting to achieve joint objectives by coordinating joint efforts of a group of people, following a predetermined program of conduct (Cf., together with Ackoff, 1960). A complex of roles is formed in such a social system, and is constituted by individuals and groups linked together by their mutual recognition and realization of certain values and norms. In this process, organizations are evolutionary formations, which emerge, exist and change for the realization of basic human goals. When a set of organizations operates in a common environment, they are to some degree interdependent and may be viewed as a system. An interorganizational relationship is defined as the interaction between two or more organizations for the realization of their respective goals which is affected by the nature of the interaction pattern and the condition under which such interactions occur.

Most organization scholars, as noted above, are concerned with intraorganizational phenomena while only a few have studied interorganizational phenomena. For example, it is known that the nature of communication networks affects the quality and role of communication, as well as the behavior of the network participants (Leavitt, 1951; Festinger & Thibaut, 1951; Cartwright & Zander, 1960; and Shaw, 1954). In this context, only a small number of studies have looked critically at certain formations in natural, complex organizations while considering the influence of the environment.

The concept of the environment, including its components and relevant dimensions, is not thoroughly explicated and specified in the literature (Jirasek, 1968; Lawrence & Lorsch, 1967b; Perrow, 1967; Emery & Trist, 1965; and Dill, 1958). Emery and Trist (1965) emphasize the processes occurring in various subsets of the organization and the environment in which it operates. The scheme of these authors still seems to emphasize system-internal and intrasystem processes, although it allows for "processes through which parts of the environment become related to each other--i.e., its causal texture--the area of interdependencies that belong within the environment itself."

It is this latter environmental sphere, described as the "causal texture of the environment," that is the primary area of discussion for the purposes of this thesis. In part, the actors in this area have been further described by Evan (1965) as the "organization set." In Evan's conceptualization--developed from

Merton's role-set--the unit of analysis is an individual organization or a class of organizations and its interactions that are mapped with the relevant network of organizations in this environment.

All such interorganizational relationships occur in some sort of communicative form: they may be formal, social, using various channels for the transmission of messages (telephones, letters, etc.). They may exist between and among organizations, groups, individuals and combinations thereof. A number of writers are concerned with such variables as the size of the organization, propinquity, interdependency, informal interactions, etc. (Cf., McCullough, 1963; Barth, 1963; and Morris, 1962). A sizeable number of studies have emphasized the importance of interorganizational relationships in the light of rehabilitation and mental health (Black & Kase, 1963), delinquency prevention and control (Reid, 1964; Miller, 1958), politics (Perrucci & Pilisuk, 1970), education (Keller, 1974; Clark, 1965), economic networks (Farace & Wigand, 1975; Anderson, 1974; 1965), medical care (Levine, White & Paul, 1963), services for the elderly (Morris & Randall, 1965), community action (Warren, 1967), urban structure (Turk, 1973, 1969) and community disaster situations (Farace & Wigand, 1974; Form & Nosow, 1958).

The nature of organizational environments was explored with regard to the idea of turbulence (Terreberry, 1968; Emery & Trist, 1965). A few studies focused on the impact of the environment on organization-internal processes. Thompson and McEwen (1958)

and Dill (1958) demonstrated that the condition of the organizational environment may alter the goal setting behavior of organizations. Yuchtman and Seashore (1967) specified organizational effectiveness in terms of the organization's success in obtaining resources from the environment. Terreberry (1968) hypothesized that organizational change is largely influenced by environmental factors. Thompson (1962) and Lawrence and Lorsch (1967a, 1967b) also suggested certain ways in which environmental forces affect organizations. Simpson and Gulley (1962) studied voluntary organizations with diffuse environmental pressures. Variations in cultural values and norms were found to affect the internal structure of organizations (Crozier, 1964).

The idea of exchange and transactional interdependencies has been investigated by a large number of researchers (Reid, 1967, 1964; Guetzkow, 1966; Levine, White & Paul, 1963; Dill, 1962; Litwak & Hylton, 1962; Thompson, 1962; Homans, 1958). Levine and White (1961) propose an exchange model of interorganizational relationships in which organizations that share domain consensus are able to unilaterally, reciprocally, or jointly allocate scarce resources of clients, labor services, and other resources. Analogous to such an exchange model, Homans' (1961) model envisages human behavior as a function of its payoff: in amount and kind, an organization's responses depend on the amount and quality of reward and punishment that its actions elicit. Reid (1967, 1964) proposes a thesis of relations among autonomous organizations and suggests that there are three basic modes of

behavior in interorganizational relationships: independence, interdependence, and conflict.

Additional difficulties are encountered in measuring and describing the condition of the environment through which interorganizational communication flows and is influenced. The environmental condition may be ascertained by describing the characteristics of the larger social and industrial units in which the organization is located--community, industry, region, etc. Weick (1969) emphasizes the enacted environment, which identifies the information space outside the organization and is understood as a composite of the various viewpoints of the organization's members. Emery and Trist (1965) identify four main types of environments, each of which is based on a significantly different conception of the information space of a given organization:

(a) the placid, randomized environment is a state in which the organizational goals and the pertinent noxiants are considered to be relatively stable and are distributed randomly;

(b) the placid, clustered environment describes a condition in which the goals of the organization and the noxiants are nonrandomly distributed, i.e. they have developed a pattern and are clustered;

(c) the disturbed, reactive environment is characterized by the fact that there are a number of similar organizations operating competitively in the same general environment; and

(d) the turbulent environment is recognized by the organization because of the unstable, unpredictive, complex condition that is generally difficult to cope with.

Each of these four descriptive states of the environment may significantly influence the communication behavior and the inter-organizational relationships of organizations. These relationships are viewed as they are reflected in the nature, perception and flow of interactions between and among organizations.

This author suggests that a minimum set of variables can be identified that are characteristic of the most salient aspects of interorganizational relationships. The variables may be viewed as the state variables whose values and variances define the communication characteristics existing within a given set of organizations. These characteristics are reflected in various communication networks and in the relationships detected within such a network. The entire process--modified by the environmental conditions--that influences the communication patterns of a focal organization can be represented in the form of a graphic model (Cf., Figure 2).

Social Service Settings: A Testing Ground For Interorganizational Relationships

Interorganizational behavior can be observed in many facets of life. For example, it would be possible to study the inter-organizational activities of firms operating in the same environment. Settings in which such a study might reveal a variety of exciting findings are easy to conceive (i.e., firms in the various energy industries with their current environment of high uncertainty and mutual dependence on foreign resources). In less direct-profit oriented settings, activities of industry-wide trade associations

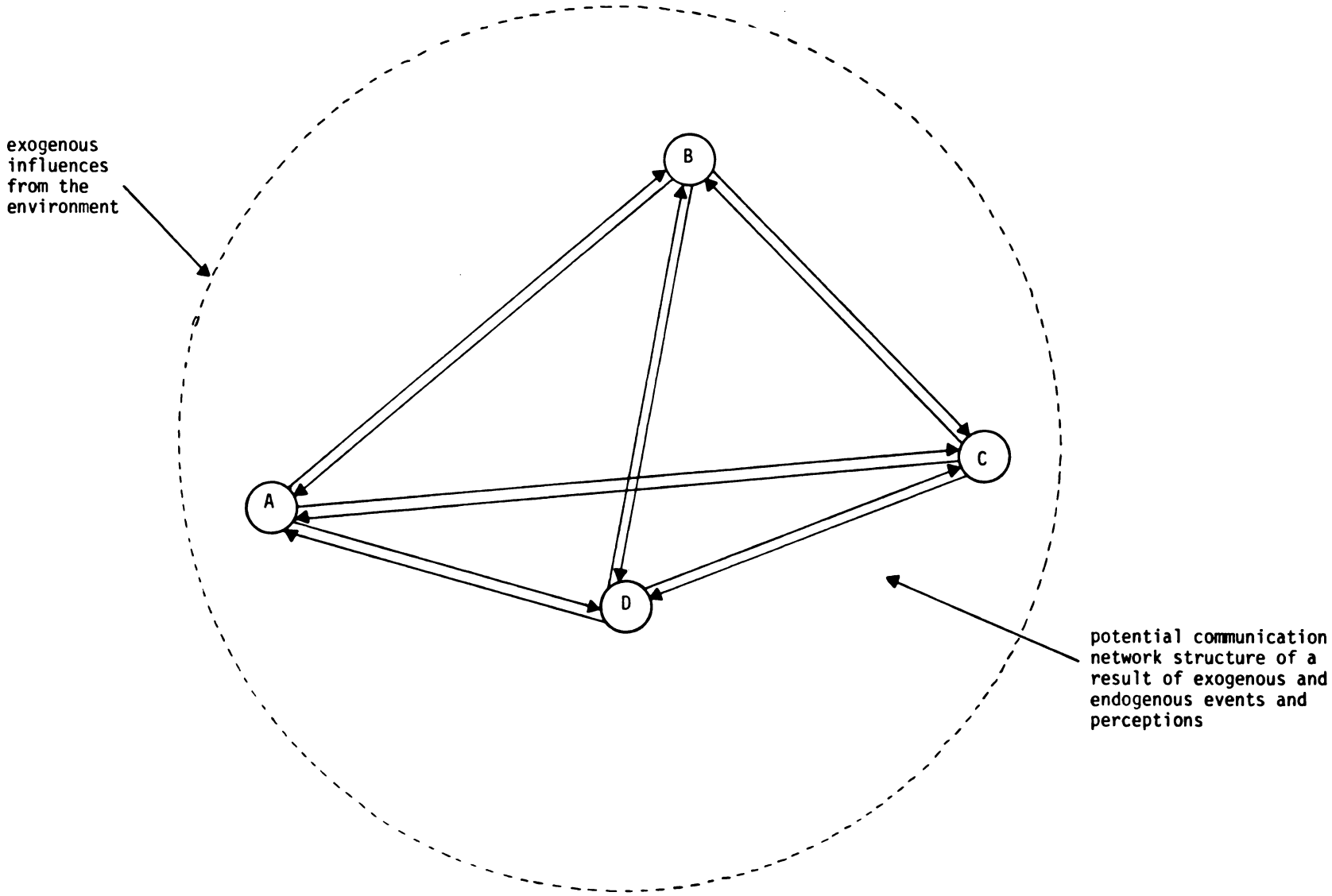


Figure 2.-- A graphic representation of inksosganizational communication. [Note: Organizations A, B, C and D are members of the organization - self operating in the same environment.]

and coalitions for lobbying or in search of other means to reduce uncertainties inherent in market mechanisms, remain largely unexplored.

One domain of organizations that is to a large extent more amenable for such a study are public organizations such as social service agencies. It can be argued that these organizations operate in the same environment, compete in many ways for the same or highly similar financial resources, clients, employees and activities. Many times, these activities overlap, compete, are completely missing, are duplicated or demand coordination.

In this context, and particularly in conjunction with the concept introduced earlier of "interdependence," a number of additional terms will be used that require clarification. These are: merger, interdependence (in the more specific sense it will be used in the empirical portion of this dissertation), coordination, cooperation and competition with respect to the activities of social service agencies:

Agency Merger: the union of two or more agencies into

(a) a larger existing agency, or

(b) an agency with a new identity;

Agency Interdependence: a set of agencies, whose mutual state of being is determined, influenced or controlled by one or more other agencies, that could not function or exist satisfactorily without the aid or cooperation of each interdependent agency;

Agency Coordination: the act or effort between two or more agencies to work jointly and harmoniously;

Agency Cooperation: an association of two or more agencies for mutual benefit; and

Agency Competition: the rivalry between two or more agencies striving for

(a) the same client, and/or

(b) the same funding resources.

Before a study is explored that explicitly tests inter-organizational relationships, the importance of such studies is emphasized and the relevant literature is reviewed in the present context.

Importance of Interorganizational Research in Social Service Settings

Particularly within this country's cities the accelerating complexity of modern life has led to an upsurge of organizational bureaucracies. The social welfare field, as much as any other, has adopted this intra-organizational structure, characterized by an attempt to rationalize the world, to exercise control based on specialized knowledge. As Weber (1952) pointed out, the advantages that accrue to a bureaucracy include focus of expertise, standardization of values, maximization of coordination, accumulation of extensive knowledge and experience, and calculability of results.

This sophistication of intra-organizational structure unfortunately has not been evidenced in the inter-organizational realm, a social arena where partial conflict over values and

resources is common and where no formal authority structure exists to mediate and coordinate interactions. This absence of inter-organizational coordination has had especially deleterious effects upon the effective and efficient delivery of human social services. In general, agencies in this field have been characterized by inadequate budgets, limited manpower, vast numbers of multi-problem clients, and the inefficiency of disjointed client referrals. Numerous observers have documented the problems arising from an unmet need for comprehensive coordination of service delivery. Rice (1973) assumed a universal need for coordination of services, arguing that "the assumption that the individual practitioner is the basic unit of service delivery . . . has been outmoded by changes in both practice and agency administration." A descriptive study of child-serving agencies in one community, reported by Dinerman (1972), noted that a worker must create de novo a set of services for each client. Without an effective coordinating structure, referrals prove time consuming and often ineffective. Although much discussion centers around the high cost of delivering needed services, Winer (1972) cited services for victims of family breakdown as those most deficient in coordination, with a correspondingly high social cost associated with lack of service.

Examination of the limited amount of data available supports a similar discouraging conclusion: the present social welfare system has limited ability to deal effectively with many client problems. One recent report (Lansing Planning Department, 1973)

showed that 60% of all clients seeking social services are turned away without service. The probability of receiving even one service is 0.4. Furthermore, the probability is 0.17 of a referral being effective for a client who actually reaches the place he is referred to and receives treatment. Implications for the multi-problem client are obvious, and 86% of all clients require more than one service input. Given the above probabilities, the likelihood of a client receiving all needed services is relatively close to zero.

Other studies (Michigan Department of Management and Budget, 1974) indicate that the probability of effective referral ranges from a low of 0.07 to a high of 0.22. Another disquieting result of inadequate coordination is that single services provided independently of one another do not result in changes in clients' dependency status or life chances. Frequently, the failure to actually receive referred services prevents clients from benefitting from a service already available.

Despite widespread recognition of the severe problems resulting from inadequate coordination among social service agencies such as duplications, gaps, or contradictions in services, a significant lack in social science research involves the examination of military, industrial, educational, governmental, or social welfare agencies as <u>subjects</u> in an analysis of any behavior. The problem of inter-agency cooperation and coordination has been approached from several different theoretical perspectives. A number of writers have cited the frequency and facility of

communication between memberships of different organizations as a basis for coordination. Whether arising from propinquity (McCullough, 1959), from similarities in staff training and orientation (Barth, 1963), or from informal interactions among key decision makers (Morris, 1962), communication among members of different organizations may increase awareness of possible cross-matches between goals and resources and thereby expand the process of exchange.

An early effort to examine organizations as interacting elements in a social system was undertaken by Levine and White (1961) who proposed an "exchange model" of interorganization relationships. They suggested that agencies which share domain consensus are able to unilaterally, reciprocally, or jointly allocate scarce resources of clients, labor, and other resources (funds, equipment, information) in order to most effectively meet community needs.

In a later expansion (Levine, White, and Paul, 1969) a further distinction is drawn between corporate agencies, those which are local affiliates of national fund-raising bodies, e.g. American Cancer Society, and federated agencies, those which raise and spend more of their funds on the local level. They posit that interaction between agencies is a function of domain consensus, goals, and access to resources. Many local organizations have traditionally been concerned with obtaining support from parent bodies or policy-making groups outside the community, from local governing boards, and from the general community, in that order. Such an orientation may be acceptable for corporate

agencies, but is disastrous for federated, direct service agencies which would benefit from fuller integration into the community system from which their support derives.

Conditions under which "coordinating agencies" emerge--formal organizations whose major purpose is to order behavior between two or more independent organizations--were hypothesized by Litwak & Hylton (1962). Their thesis of interorganizational analysis argued that coordinating agencies will develop and continue in existence if formal organizations are partly interdependent (coordination is necessary to accomplish separate goals), agencies are aware of this interdependence (overt recognition is given in public policy), and it can be defined in standardized units of action (behavior is reliably ascertained and repetitive in character).

Interorganizational coordination is characterized by the need to maintain both cooperation and conflict (i.e. autonomy). Over the long run, competition and conflict among agencies tends to promote an on-going re-analysis of community needs. Such a situation aids in maintaining a high degree of specialization of skill and interest in the problem area and guards against development of an inflexible monolithic network resistant to change. Some of the short and long term consequences of interagency conflict are presented by Barth (1963). Conflict is likely to arise when there are autonomous agencies working in the same activity sphere, organized on a bureaucratic model, with differential philosophies and goals, in competition for financial and public support.

Negative short-term consequences include alienation of public support, waste of staff energies, and absence of adequate division of labor. Positive consequences may also result such as intra-agency integration and cohesiveness, and increased staff motivation and sensitivity to the community.

An alternative framework for analysis of linkages among autonomous agencies has been advanced by Reid (1965, 1969). Building upon the theoretical approaches cited above, Reid suggested that three basic modes of behavior--independence, interdependence, and conflict--characterize interorganizational relations. Given the goal of better coordinated social service delivery, interdependence must be increased by a coordinating agency. Strategies of (1) facilitation of interdependence, via information exchange or goal reformulation/resource reallocation, or (2) inducement of interdependence, by withholding resources or manipulating power indirectly, are available to such an agency, though as Reid demurred, ". . . coordination by such devices may still be quite circumscribed and subject to collapse once they are withdrawn."

A wide variety of applied models to achieve the desired level of interagency cooperation and coorientation of services have been advanced by social science researchers and practitioners. For example, Long (1973) suggests that information and referral may simply be a transitional service in the development of a centralized intake, assessment, and referral agency whose overt function would be to oversee inter-agency coordination.

Konopka (1959) was an early advocate of inter-agency "practitioner committees" as a means of delinquency prevention. These committees would assure continuity of client care and a better appreciation of the various kinds of staff needed to deal with juvenile delinquency, a total community problem in child rearing. The strongest argument for such practitioner committees is the flexibility they would bring to this facet of social service delivery, with a resultant increase in cooperation and coordination in existing resources.

A centralized consulting service for community agencies was described by Allison (1973) as a means of increasing communication among agencies around specific needs of clients that are not being met. Vanderbilt University law students were used as consultants to drug centers, family services agencies, a youth training facility, and a penitentiary, all of which have clients with legal as well as social problems. After initial research on legal questions surrounding insurance matters, status of children, agency liability, etc., the Student Legal Aid Society instituted weekly meetings with all agencies for provision of legal services.

The outright merger of agencies is a more drastic means of insuring coordination and improvement of social services. This approach was proposed by Fellin (1972) who noted a number of crucial elements in a successful merger: the role of goals and values to be achieved, the role of information about policies and procedures, and the role of relevant groups such as agency staff, United Fund boards, planning councils, clients and

non-involved community agencies. Especially when dealing with a sensitive and potentially threatening issue like a merger, the support generated by participative decision making of all groups can greatly reduce chances of failure. Pfeffer (1972) examined business merger activity, though his conclusions seem equally applicable to non-industrial organizations. He presented evidence that organizations attempt to manage their dependence on the environment; one strategy to deal with organizational interdependence is merger, designed to (1) reduce symbiotic interdependence (vertical mergers) or (2) reduce competitive interdependence (horizontal mergers), or (3) diversify previous interdependencies (growth and expansion mergers). Social welfare agencies may engage in similar behaviors, although their results are not often documented on a profit and loss statement.

The joint venture is another vehicle for achieving interorganizational coordination. Aiken and Hage (1968) studied the use of joint ventures among community agencies and postulated that the joint venture serves the objective of providing additional resources for program development while simultaneously maintaining the autonomy of the parent organization.

A widely implemented model for coordinating the activities of a variety of social service agencies is exemplified by the Community Chest or United Ways board. Faced with the problem of increasing competition for limited amounts of funds and the consequent duplication and waste in fund-raising expenses, agencies consolidated their fund-raising under an "umbrella" agency

responsible for collection and disbursement. The responsibility for disbursement quickly brought the Community Chest board to a prominent coordinating role as it was forced to establish priorities as well as to consider issues of service duplication, contradiction, and omission.

Finally, the advent of a widespread and relatively economical computer capability has resulted in the application of computer technology to many problems of management and coordination. Computers have found application in the medical field (Garfield, 1970) as well as in other areas. In general, the rate of adoption of computer technology by social service agencies has lagged behind acceptance in other facets of the society. In most instances, computers have been used to simplify and centralize the record-keeping functions that occupy much practitioner time and which are duplicated by many agencies. One of the more successful examples of computer utilization is the Chattanooga (Tenn.) Human Services Systems. Built around the city's IBM 360/30 computer and linked to three neighborhood Human Service Centers via cathode ray and hard copy terminals, this system basically handles client demographic data common to all users. A Plan of Service listing future contacts with other agencies is stored for all multi-problem clients, and the primary worker is notified when a scheduled intervention does not take place. Intake procedure costs for the 90 participating service providers were drastically lowered when the number of intake forms was reduced from 90 to 4.

Similar savings in time and effort were multiplied many times over on the client level.

As noted earlier, there is a marked paucity of field research investigating the paradigm of interorganizational relationships and the phenomena associated with practical applications. Research spans only about the last five years and most has been heuristic in nature. Krueckeberg (1971) examined 109 metropolitan planning agencies and found four output types: budget oriented, service oriented, economic development and comprehensive planning orientation, and consistently low output. Kane (1972) reported an investigation of formal and informal factors in interorganizational exchange and continuity of care between community mental health centers and family service agencies. He found no formal structures for exchanges among agency directors, and also that level of interorganizational exchange is correlated with strength of executives' political values.

Research conducted by Gummer (1973) measured the rate and purposes of interorganizational exchanges by a county board of assistance. In social welfare areas with firm division of labor, the focal organization adopted a competitive posture; more cooperative strategies prevailed in areas without clear consensus about allocation of function. The most intensive exchanges were with other public sector agencies, although there were extensive, superficial contacts with a wide variety of agencies.

Nelson and Burgess (1973), using an open adoptive systems model, followed the growing linkage pattern of a crisis call center.

By focusing on patient referral, client consultation, and patient/client information exchange over a two year period they documented the inclusion of more and also more different types of social service providers in the crisis call center's linkage network, and the growth in its role as an unofficial organizer of community resources.

Social service agencies, their staff, and clients can be conceptualized as elements in an interactive system, and general as well as cybernetic systems theory has come into increased acceptance as a means for analyzing inter-agency relationships (Hage, 1974; Wigand, 1976a; Hutcheson & Krause, 1969). Systems theory can deal with both inter- and intraorganizational events (Nelson & Johnson, 1974); Nelson & Lockert (1970) have used an information flow analysis to focus on client pathway flows through a service network. This technique can be used not only to chart client movement but also to provide measures of overall service delivery capabilities, and of individual case fiscal accounting as well as to ascertain treatment effectiveness (Burgess, Nelson & Wallhaus, 1974).

Rather than to focus on patient flow, the proposed research adopted an alternative approach that places emphasis upon the characteristics, functions, and operations of the agencies themselves. By viewing social services agencies as individual, but interrelated entities, it is possible to explore the implications of communication and information flow for the development of effective mechanisms to coordinate the delivery of social services.

Operationalizing "interdependence" among agencies in a meaningful and feasible way within existing constraints poses some difficulties. Interdependence may be reflected in various coordination activities. Specifically, no coordination could take place without the pre-existence or concurrence of communication.

From a larger perspective, organizations themselves can be approached as sets of members of a system with recurring patterns of interactions resembling networks (Wigand, 1974a & b). These communication networks may be assessed on the basis of frequency of contact, perceived importance, content area, and/or mode of transfer. Furthermore, members may be delineated according to their roles that they hold within the network: group member, liaison, bridge, dyad, isolate and so on.

In this light, the research discussed on the following pages can serve as a vehicle to further explore the implication of communication information flow for the development of effective mechanisms to coordinate the delivery of social services.

Interorganizational System Variables

During the construction of any system, it is important to identify the essential and characteristic set of state variables that describe and suggest the critical properties of the system (Ashby, 1956). In regard to these critical properties, the appropriate literature was reviewed, and the author compiled a list of what he considered to be relevant variables. This section, then, reports on the selection and identification of important variables which describe the interorganizational relationships.

For this purpose, a list of "promising" variables was compiled from the reviewed literature. They were then grouped into classes based on their commonality. Next, the causal nature of their relationships was explored. From the compilation of variables, they appear to fall into three basic classes of endogenous variables and one exogenous class variable.

For the purposes of this study, the following endogenous class variables are selected:

(a) an interorganizational communication variable;

(b) a perceived organization-set interdependence variable; and

(c) a goal attainment variable.

To this list of variables, a fourth, exogenous class variable is considered that reflects the influences and conditions of the environment:

(d) an environment variable.

The interorganizational communication variable is a measure of the communication exchange among a set of organizations operating in the same relevant environment. Organizations may be viewed as a set of roles which are linked or related to one another by channels of communication, both face-to-face and mediated. A map of such communication links illustrates the communication network. The goal of network analysis is to determine the particular pathways through which information moves in a given setting and to recognize certain patterns among these communication links.

Communication networks arise in a social system when recurring patterns of interactions take place among the system's members. In addition to the identification of group members, intergroup linkers or liaisons allow for information to move between groups, and isolates that do not participate in the network may be delineated.

In all organizations, the occupants of some positions perform a liaison function with other organizations. Liaisons may form, for example, official, professional, social and political organizational linkages or ties. The divergence from the prescribed structure as suggested with an organization chart representing the organizational linkage systems is the key reflection of the specific dynamics of the interorganizational system as well as the focal area for potential disintegrative tendencies. With regard to the situational context, communication may be measured in terms of frequency, amount, importance, intensity, or content. Subsequent to the generation of this descriptive, empirically based classificatory map of information flow, it is germane to focus on the various indices and metrics of network properties that are amenable to any theoretic discussion. As suggested earlier, communication is essential for interorganizational activities. In this proposed research, communication is considered to be an influence on the interdependence variable.

The <u>interdependence</u> variable is a measure of the degree to which a member of an organization perceives his organization to be interdependent or independent in regard to other organizations.

This perception, for example, may be reflected in the members' need to behave in unison as a member of its relevant organization-set. This need is a measure of the perceived forces impelling the organization to coordinate, cooperate, merge, compete with or act independently of elements of its organization-set. Although the need for interdependence is assumed to be aggregated within each organization individually, the organization-set's contextually defined state of need is considered as the result of forces that are exogenous to any focal organization. Some other measures of the interdependence variable may be the degree of adherence to collective goals, joint profit maximization, through oligopolization, etc. In this study, however, interdependence is viewed how an individual perceives his organization to be interdependent with or independent of other organizations.

The goal attainment variable describes a long-term state of affairs (Ackoff, 1960) and, typically, is a measure of an index of performance. Goal attainment of organizations is understood to be one preferred and observable state (or, several substates), which is not identical with the sum of the states of the organizational elements. Other terms for goal attainment are achievement, effectiveness, performance, profit realization, coordination efforts toward a joint goal, etc. Some of these goals may be unobtainable, but nevertheless they exist as the ultimate goals toward which the organization is proceeding and against which certain actions can be measured. Obviously the goal

attainment variable is, in part, dependent upon the operating conditions existing within the environment of the organization-set.

As previously suggested, these endogenous class variables (communication, interdependence and goal attainment) have to be seen in the light of the prevailing conditions of the environment that may influence the behavior of the organization-set. The distinction between the world as perceived and the world as acted upon defines the basic condition of survival of organizations (Cf., Simon, 1962; Simon & Newell, 1962). Environmental pressures acting upon organizations may function as constraints on the performance of the system and are reflected as constraints in the model. The compelling conditions and influences of the environment are therefore added as a fourth, exogenous variable to the list of class variables that comprise the interorganizational activities.

Relations Among the System Variables: Three Propositions

In the proposed model, the relationships among the class variables are stated as propositions:

(1) the interorganizational communication variable has a direct positive relationship with the interdependence variable;

(2) the interdependence variable varies directly and positively with the goal attainment variable;

(3) the goal attainment variable is directly and positively related to the interdependence variable and the environment variable.

ad loc. (1): Although there is some variation in the findings, the relationship expressed in the first proposition between communication and interdependence has been widely supported in the literature. In the area of small group research, it is a well-established fact that groups exert pressures on their members resulting in desired uniformity, one form in which interdependence can be recognized (Glanzer & Glaser, 1961; Cartwright & Zander, 1960; Festinger & Thibaut, 1951; Leavitt, 1951; Festinger, Schachter & Back, 1950; Homans, 1950). Other studies have attempted to designate transactional interdependencies among organization-sets (Reid, 1964; Levine, White & Paul, 1963; Dill, 1962; Litwak & Hylton, 1962; Thompson, 1962; Levine & White, 1961; Guetzkow, 1966).

The concept of interdependence allows the researcher to focus on the problem of interorganizational exchanges and thus interdependence becomes a critical tool for the analysis of this process. The majority of studies concerned with interdependence views the organization as an entity requiring inputs and outputs for its functioning, thus linking together a number of organizations via the process of exchanges and transactions.

Aiken and Hage (1968) studied organizational interdependence for certain social service organizations by operationalizing organizational interdependence as a measure of the joint programs that a focal organization has with other organizations. Similarly with Guetzkow (1966), these authors found that the greater the number of joint programs, the more organizational decision-making

is constrained through obligations, commitments, or contracts with other organizations, and the greater the degree of organizational interdependence. The fact that communication enhances interdependence has been reported also in studies by Barnard (1962), March and Simon (1958), Thompson (1961), and Terreberry (1968).

ad loc. (2): Proposition (2), namely that interdependence varies directly and positively with the goal attainment variable, states that a high level of goal attainment may result in an increasing relationship with the degree of organizational interdependence.

This relationship has generally been discussed by Thompson and McEwen (1958). Economists have studied the relationship between interdependence or adherence and goal attainment or levels of achievement of firms in the industry more rigorously. Goal attainment typically may take on such forms as joint profit maximization, and the willingness of firms to place such a long-run collective goal ahead of short-run and organization-specific goals constitutes a measure of the strength of interdependence (Cf., Lange, 1944; Williamson, 1965).

ad loc. (3): The third relationship among the model's state variables states that goal attainment is directly related to interdependence and the environmental variable. In the field of economics one can observe that the level of collective goal attainment existing among members of the organization-set increases as the members adhere to a group goal such as joint profit maximization, market dominance, attempts to create an oligopolistic

market or to form cartels. Furthermore, the improvement of environmental operating conditions produces an increase in the level of goal attainment (e.g., the effects of the well-publicized energy shortage of 1973/74 on the oil and related industries). Phillips (1960) developed a theory of interfirm behavior positing that firms are members of groups and that the explanation of group behavior requires assumptions beyond those relating to the motivation of the individuals in the group. He states that assumptions with respect to individual motives are necessary but not at all sufficient to explain the group behavior of firms. This theory of interfirm organization is based on the premise that it is incorrect to assume that individual firms attempt unilaterally to maximize anything at all, whether it is profits, sales or even a "general-preference function" if all the dimensions of the function are variables internal to the firm (Phillips, 1960).

A number of researchers have viewed "goal attainment" in the light of the existing conditions in the organization-relevant environment. Tolman and Brunswik (1935), Emery and Trist (1965) analyzed the causal texture of organizational environments arguing that the main problem in studying organizational change is that the environmental contexts in which organizations operate are themselves changing. Thus, changes occurring in the environment are said to have such an impact that they demand consideration for their own sake when viewing one focal organization, several organizations or the entire organization-set.

The postulate that behavior is a function of the interaction of an organism with the environment is widely accepted and the theoretical as well as practical implications are investigated (Forehand & Gilmer, 1964; Barton, 1961; Cronbach, 1957; Brunswik, 1956; Murray, 1938). Furthermore, Thompson and McEwen (1958) state that the setting of goals is essentially a desired relationship between an organization and its environment. Change in the organization or in the environment requires review and maybe the alteration of goals. These authors and others (Galbraith, 1958; Boulding, 1953) suggest also that the setting of goals is not to be viewed as a static but as a dynamic element.

The following chapter will describe the background, methods and procedures of the present study.

CHAPTER II

METHODS AND PROCEDURES

Overview

The background of the study is described, followed by an account of the development of the instruments, the procedures for agency contact and questionnaire administration. Lastly, the operationalization of the independent and dependent variables are presented. 310 Subjects completed a structured questionnaire, once for the creation of interorganizational communication networks and once for the various attitudes and perceptions of interagency and agency-specific activities.

Study Design and Data Gathering

Background of this Study

During the summer of 1974, a research grant was received from the National Science Foundation (NSF) by a group of students to study the communication flow as well as service delivery among social service agencies in the Lansing area. NSF requirements for this study were such that students from several areas of the social sciences were to work on this project interdisciplinarily. The author of this proposal was responsible for the section on network analysis and communication flow of the original proposal that was submitted to NSF before the reception of the grant.

During the 1974 summer months, this group of students (from sociology, psychology, social science, social work, computer science and communication) met to start with the design leading toward this study. During this stage, it was this writer's responsibility to design the communication flow sector, the network analytic as well as several organization-theoretic questions of the questionnaire. Several presentations were made to this study group by this writer on the rationale behind network analysis, general and specific features of the computerized network analysis program were discussed in detail and former studies using network analysis were presented and the results were interpreted. Furthermore, this writer was earlier involved in and conducted himself several other studies that dealt with various issues of communication and communication flow with respect to measures of satisfaction, integration, organizational climate, etc. that were also presented, discussed and reviewed in the context of the present NSF study.

Goals of the Study

The present research effort was undertaken with several foci in mind. One goal was simply to compile a description of the types and extent of interactions among a representative cross-sample of social service agencies in Lansing, Michigan. This data base would be useful to agency administrators and urban planners in many mid-sized, urban-industrial cities of which the city under study is characteristic. Systematic presentation of

the interorganizational communication patterns should enable the parties involved to identify referral sources which are over- or under-utilized as well as provide a baseline for comparison with other agencies.

A second goal is to identify organizational and individual correlates of the observed communication patterns. Detailed examination of the data should suggest causal antecedents of interorganizational behavior. Aside from the heuristic aspects of this research, the primary goal is to investigate the validity of several major theoretical perspectives on the problem of inter-organizational behavior.

Subjects

In a study of this nature, there are two ways of viewing subjects. One may view the individual agency as a unit of analysis or the individual employee within each agency. Data were collected about subjects at both levels, although all individual responses were transformed into aggregate agency responses.

Due to time constraints, it was impossible to interview as many agencies as desired. Therefore, a sample stratified by agency size as well as problem area was selected. Although this procedure did not produce a random sample, every attempt was made to make it as representative as possible.

The organizations selected fell into the following seven, broadly defined categories:

Mental Health
Family and Child Services

Alcohol and Drug Abuse
Aid to the Handicapped
Employment
Legal and Police Assistance
Physical Health

A comprehensive list of over 200 helping organizations falling under these headings was compiled from The Answer Book (1973), a compendium of social service agencies in the Lansing metropolitan area. A problem occurred when no information source could be located to specify the size of each agency. An outside panel of experts, comprised of social science faculty members at Michigan State University familiar with the social service situation in Lansing, then rated the agencies on the basis of size. Small, medium and large organizations were thus identified for the agency selection process.

In an effort to scale the sample size down to a more manageable, yet meaningful, number, several social workers with field experience in social service agencies then selected the three to five most representative small, medium and large agencies in each of the above problem categories. Criteria for "representativeness" included agencies' jurisdiction and sources of funding (i.e. public, private and/or voluntary), types of programs and services offered (i.e. direct treatment, information and referral services, planning and/or evaluation programs were all included), and target populations served (i.e. children, adults, senior citizens, denominational or ethnic groups, etc.). Each person, with the exception of two, was a salaried employee of some social service agency. It was felt that different hierarchical

positions could reflect different aspects of an agency. In each case, therefore, a "slice" of the organization was assessed by reaching the agency's director or his designate, a middle level supervisory person, several general caseworkers, and one or two clerical personnel. Ultimately, 310 individuals were interviewed, representing sixty-nine different social service agencies. In this study then, all responses for each agency were transformed into a mean agency response. This aggregate agency response became the basic unit of analysis, thus making interorganizational comparison possible.

Instrument Development

From the outset it was felt that several types of data were necessary in attempting to understand inter-agency communication. It was necessary to characterize both the agency and the individual respondent. In addition, some characterization of the total social service environment in the metropolitan Lansing area was desired.

A questionnaire was designed, pretested, and with this preliminary feedback, the individual items were again refined. In addition, it was decided to submit all agency-demographic questions to the agency directors only, as there would be little or no variance in response to such standard items obtained by agency employees. Copies of all questionnaires are in Appendix I.

In order to generate the communication networks, it was necessary to collect data on communication relationships among these agencies. Information had to be ascertained about how often

these agencies communicate with each other, how important this communication was perceived to be and on what topic they typically communicate about. For the network analysis purpose, the same list of sixty-nine contactees was used and three network topic areas were chosen:

(1) direct treatment/service delivery,

(2) planning/innovation, and

(3) interpersonal relations.

These topic areas, while perhaps not exhaustive, were thought to cover most communicative acts for most agencies. Most importantly, they were thought to reflect three representative communicative functions (Cf., similarly with Barnard, 1962) characteristic of most agencies. A copy of the network questionnaire is in Appendix I.

Agency Contact and Questionnaire Administration

A letter of introduction and encouragement to participate was written and mailed out to the designated agencies. This letter was followed by another letter explaining more of the proposed study and alerting the selected agencies to an initial telephone contact. When a telephone contact was made, the researcher answered any further questions, explained possible benefits of the study, and scheduled an interview. Agencies were assured of the confidentiality of their responses and given the choice of completing the questionnaire privately or in the presence of the researcher. All interviewers received some basic training in interviewing techniques and shared the interviewing activities equally. Only one agency refused to participate in the study.

Those variables that are included in the earlier model of interorganizational communication are discussed in the next section.

Operationalizations and Measures of Data for Preliminary Model

The previously suggested model of interorganizational communication can be partially tested with the data set generated from the interorganizational activities of the social service agencies in Lansing. The structural relationships of the model are expressed in Figure 3 below. One will recall that the model incorporates four main classes of variables: communication, interdependence, goal attainment and the environmental influences. It should be noted that for the correct representation of this model (Figure 3), and contrary to the earlier discussed model, the communication variable has to be represented as a variable that is exogenous to this model.

The structural equations of this model are as follows:

$$(1)\ X_2 = p_{x_2x_3} X_3 + p_{x_2v} V$$

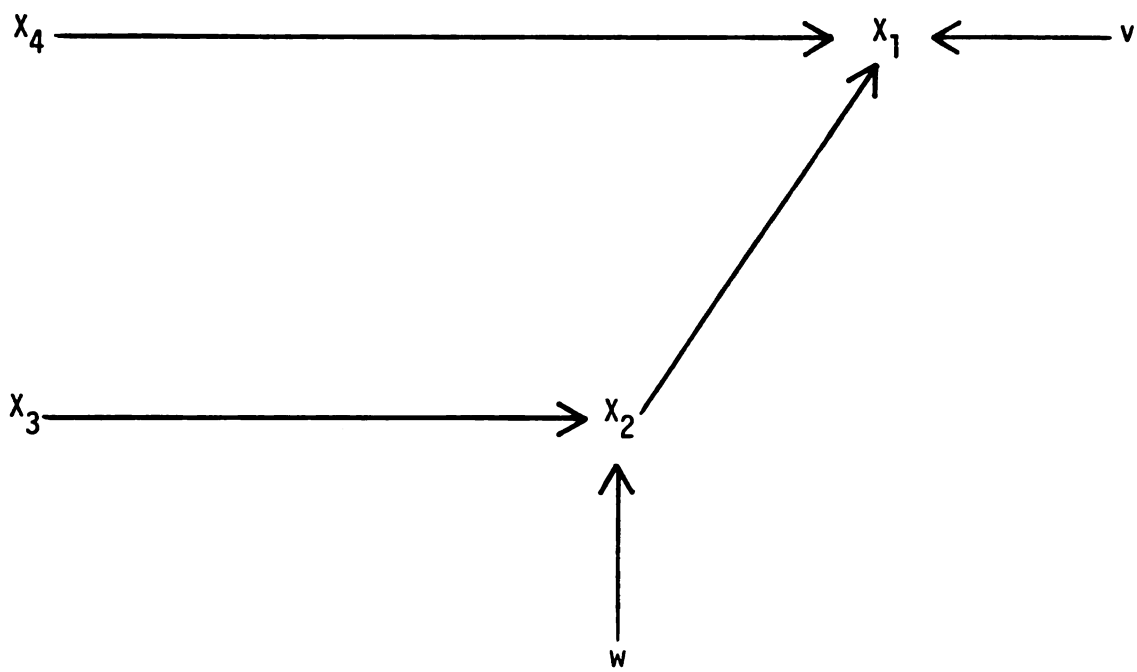
$$(2)\ X_1 = p_{x_1x_4} X_4 + p_{x_1x_2} X_2 + p_{x_1w} W$$

It is readily apparent that this causal model is just identified.[1]

Following is a brief presentation of the operationalization for each variable considered in the model:

---

[1] Two external pieces of information "explain" two internal pieces of information about the above system. There must be at least as many external pieces of information as there are internal ones before a model can be said to be "just identified" (Cf. Duncan, 1975, 70; Heise, 1969, 52-57; Johnston, 1963, 240-243, 250-252).



X_1 = Goal Attainment
X_2 = Interdependence
X_3 = Communication
X_4 = Environmental Condition

$\left.\begin{matrix} v \\ w \end{matrix}\right\}$ = Disturbances*

*Other terms are: residuals, errors in prediction, and unobservable sampling error.

Figure 3.--Causal model in conjunction with the developed system of interorganizational communication.

(1) Communication.--This communication variable was generated through the various network questions associated with the communication network questionnaire. Four network topics were generated: (a) direct treatment/service delivery, (b) planning/innovation, (c) interpersonal relations, and (d) referrals.

The first network, direct treatment/service delivery, is thought of to be probably the major activity of any social service

agency and somewhat comparable to the production function of an industrial firm. The planning/innovation network was thought to reflect the activities related to the innovation function as expressed by Barnard (1962). The third network, interpersonal relations, is understood as a measure of informal communication and thus reflecting some sort of a maintenance function for the employees of an agency. The last network, communication with regard to referrals, is a measure of the frequency with which agency representatives referred clients to other social service agencies.

All networks are specified by (a) the frequency of communication and (b) the perceived importance of that communication (except for the referral network that was only specified by [a] frequency).

(a) Frequency of communication.--Each respondent was presented with the following question: "With which organization do you communicate about . . . [network topic to be inserted]?" The response categories with their weighting scales are:

4 = once a day or more often

3 = once or twice a week

2 = once or twice a month

1 = once or twice every three months

Respondents to questions with regard to referral communications used the following scale:

3 = often

2 = sometimes

1 = rarely

0 = never

(b) Perceived importance of communication.--Each respondent was asked to rate each communication frequency--as specified in (a)--to another agency with regard to how important he perceived this communication to be. The respondent was provided with the following question and corresponding scale:

"How important is this communication?"

1	2	3	4	5
low				high

Communication as a variable could be studied in four different ways:

(1) One could merely utilize the frequency of communication for each network.

(2) One could weight the communication frequency by the perceived importance measure in order to bring in some qualitative aspect for the communication variable.

(3) One could lump together all three networks into one aggregate communication frequency measure.

(4) One could lump together all three networks into one aggregate communication measure; whereby this measure would consist of the product composed of the communication frequency measure and the weighted perceived importance measure for each network, respectively.

The fourth operationalization was chosen to be used for further analysis since on conceptual grounds it is perceived to be the most "complete" and representative measure of communication. This measure is from now on referred to as the communication variable.

The various descriptive statistics are presented in Table 1.

TABLE 1.--Descriptive Statistics for Variable Communication.[a]

Mean	101.12
S.D.	222.28
Range	992.00

[a]N = 69 for each variable.

(2) Perceived Interdependence.--Perceived interdependence is measured by the following question:

> In general, social service agencies in the Lansing area seem to be:
>
> ____ highly interdependent
> ____ somewhat interdependent
> ____ neither interdependent nor independent
> ____ somewhat independent
> ____ highly independent

The position "highly independent" vs. "highly independent" are understood as bi-polar opposites measuring the dependency dimension among social service agencies. The response "highly interdependent" was coded as 1; the response "highly independent" was coded as 5.

The perceived interdependence variable is referred to from here on as the interdependence variable.

Descriptive statistics for the interdependence variable are in Table 2.

TABLE 2.--Descriptive Statistics for Variable Interdependence.[a]

Mean	2.75
S.D.	.70
Range	3.00

[a]N = 68 for each variable.

(3) Goal Attainment.--Organizational goals are frequently analyzed while studying various forms of organization. Most studies view the goals of an organization as a constant and do not seem to express much concern about the dynamic aspects of goals, i.e. studies usually end at that point when the degree of attainment of a goal has been empirically studied. The measurement of organizational goals is commonly utilized as a standard for appraising organizational performance (Ackoff, 1960).

Goals can be studied at two levels: (a) at an organization-internal level, and (b) at the boundary of the organization, i.e. goals here are subject to the specification of a desired relationship between an organization and its environment (e.g., group goals). In this study, goal attainment is measured at the organization-internal level, mainly because no data were at hand to study joint goals of the organization set.

The third variable in the proposed model, resource goal attainment, is measured by the following questions:

To what extent does your agency need more of the following resources?

The resources provided here are: clients, staff, funds, equipment, expertise in treatment "techniques." The response categories are: 1 - no need at all, 2 - some need, and 3 - great need. One can argue that this variable measures the need for various resources, but at the same time it can be argued that this measure represents the degree to which certain goals for resources have been attained. Any organization can be conceived of having infinitely many goals; some of which may even not be attainable. This question is then understood to measure one important segment of the set of goals that social service agencies may attempt to achieve. Agency resources, specifically, clients, staff, funds, equipment, expertise in treatment "techniques" are five important prerequisites for a social service agency to function and serve its clientele. It can be argued that the degree to which an agency has no need for these resources means that the agency has attained its goal with regard to the acquisition of these resources. The descriptive statistics for each of the five questions with regard to clients, staff, funds, equipment, and expertise in treatment "techniques" are presented in Appendix II, Table 3A. The descriptive statistics for the index resource goal attainment and the intercorrelations among the components of the index are presented below in Tables 3 and 4, respectively.

TABLE 3.--Descriptive Statistics for the Goal Attainment Index.[a]

Mean	10.88
S.D.	5.04
Range	43.00

[a]N = 69 for each variable.

TABLE 4.--Intercorrelations Among the Components of the Goal Attainment Index.

Variables	(1)	(2)	(3)	(4)	(5)
Need for Clients (1)	1.00[a]				
Need for Staff (2)	-.00[a]	1.00[b]			
Need for Funds (3)	.07[a]	.23[*,c]	1.00[b]		
Need for Equipment (4)	.09[a]	.14[b]	.53[***,b]	1.00[b]	
Need for Treatment Expertise (5)	.32[**,a]	.18[b]	.34[**,b]	.32[**,b]	1.00[b]

[a]N = 67

[b]N = 68

*$p \leq .05$

**$p \leq .01$

***$p \leq .001$

Since the intercorrelations of the index Goal Attainment show highly variable coefficients and degrees of significance, all items were factor-analyzed. The resulting factor structure yielded a two-dimensional solution after varimax rotation (Cf., Table 5).

TABLE 5.--Factor-analytic Results for the Components of the Goal Attainment Index.

Variables	Factor 1	Factor 2
Need for Clients (1)	-.12	.90
Need for Staff (2)	.56	-.12
Need for Funds (3)	.82	.15
Need for Equipment (4)	.75	.21
Need for Treatment Expertise (5)	.43	.66

As can be seen from Table 5, Factor 1 loaded on the needs for more Staff, Funds and Equipment. Factor 2 loaded on the need for more Clients and Treatment Expertise.

Before additional usage of the Goal Attainment Index is made, it would be desirable to know whether or not there is a systematic relationship between factor 1 and 2. Rao's Canonical Factor Analysis (1955) provides such a test of statistical significance between factors. The principle of canonical factoring is to find a factor solution in which the correlation between a set of hypothesized factors and a set of data variables is maximized.

Canonical factoring is analogous to the classical factor model in the sense that the hypothesized factors are assumed to be determined by the linear combination of the joint variance portion of the observed variables. Thus the estimation of communality or unique variance becomes the central issue.

Furthermore, Rao's canonical factoring questions the amount of factors required such that the fit between the data and the hypothesized factors does not deviate significantly on a pre-specified level from chance expectation.

The resultant canonical factor structure for the Goal Attainment Index is presented in Table 6 below.

TABLE 6.--Canonical Factor-analytic Results for the Components of the Goal Attainment Index.

Variables	Factor 1	Factor 2
Need for Clients (1)	.22	.53
Need for Staff (2)	.28	-.05
Need for Funds (3)	.76	-.20
Need for Equipment (4)	.65	-.11
Need for Treatment Expertise (5)	.55	.36

The resultant Chi-square statistic below factor 1 and 2 is .810 with one degree of freedom. The comparison of this figure in a distribution table of chi-square values indicates that the value of .810 lies between a probability of .5 and .3. It may be concluded

that there is no statistically significant difference between Factor 1 and 2 at the .05 or a higher level. The variable Goal Attainment is then viewed as a two-dimensional construct. Based on this information, the variable resource goal attainment is composed of the linear addition of each of the responses for each of the five questions. This variable is from now on referred to as the goal attainment variable.

(4) Environmental Condition.--A concept such as the "environmental condition" is rather complex and all-encompassing. It appears to be a most difficult attempt to design a set of questions that would even be approximately adequate to measure this concept. Furthermore, such a set of questions would be rather situation-specific with regard to the research setting.

In the light of social service settings and especially with regard to the helping and cooperative nature of social service activities, it seems appropriate to measure the degree to which the environmental operating conditions for a given agency are perceived to be competitive vs. cooperative. In order to measure this perceived competitive-cooperative dimension, the following question was presented to respondents:

> In general, social service agencies in the Lansing area seem to be:
>
> ____ highly competitive
> ____ somewhat competitive
> ____ neither competitive nor cooperative
> ____ somewhat cooperative
> ____ highly cooperative

The response "highly competitive" was coded as 1; the response "highly cooperative" was coded as 5. The descriptive statistics for this question are presented in Table 7, below.

TABLE 7.--Descriptive Statistics for the Variable Environmental Condition.[a]

Mean	3.27
S.D.	.80
Range	3.50

[a]N = 69 for each variable.

For simplicity's sake, this variable is from now on referred to as the environmental condition variable.

CHAPTER III

RESULTS OF THE PRELIMINARY MODEL

Overview

The results are presented in this chapter in terms of the preliminary causal model. First, the intercorrelations among the variables comprising the preliminary model are presented and discussed. Secondly, a multiple regression procedure is described for the partial analysis of the preliminary model cast into a path-analytic format. Certain shortcomings of the model are pointed out.

Intercorrelations Among Preliminary Model Variables

The zero-order correlations among all endogenous and exogenous variables of the preliminary model are presented in Table 8. The examination of Table 8 does not support the proposition that there is a positive correlation between communication and interdependence. The correlation coefficient is .07. The prediction that the environmental conditions suggest an effect on the goal attainment variable is supported ($r = -.36$, $p \leq .001$). Similarly, it was proposed that the interdependence variable is positively related to the goal attainment variable which was not supported ($r = -.23$, $p \leq .05$). The corresponding r amounts to -.23, suggesting that there is a negative correlation.

TABLE 8.--Intercorrelations among Variables Comprising the Preliminary Path Model.

Variables	X_1	X_2	X_3	X_4
X_1 - Goal Attainment	1.00[a]			
X_2 - Interdependence	-.23[*,b]	1.00[b]		
X_3 - Communication	-.18[a]	.07[b]	1.00[a]	
X_4 - Environmental Conditions	-.36[***,a]	.35[**,b]	.02[a]	1.00[a]

[a] $N = 69$

[b] $N = 68$

$^{*}p \leq .05$

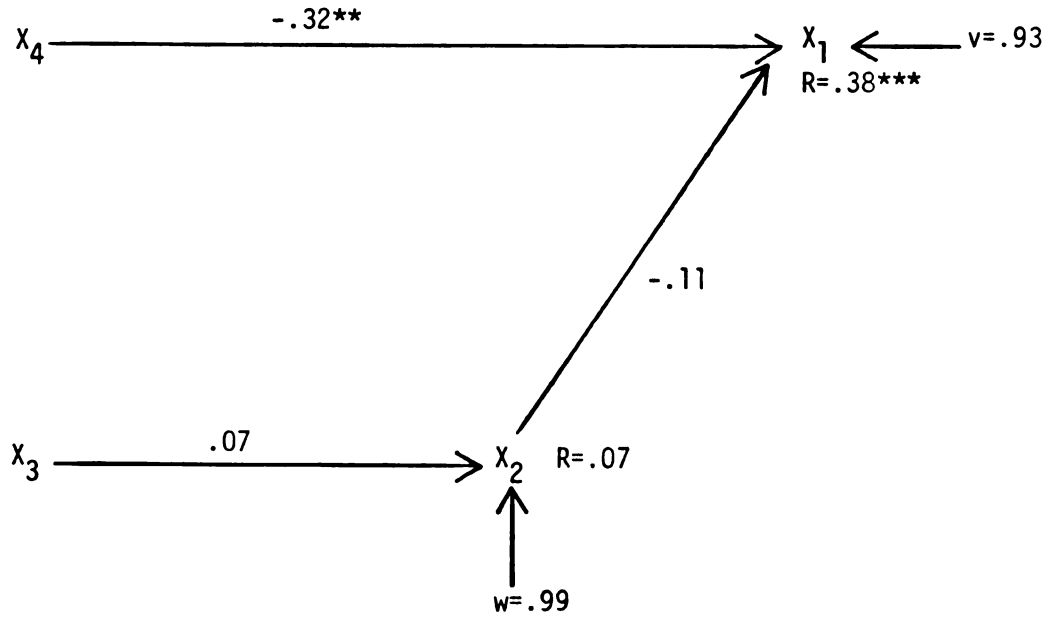
$^{**}p \leq .01$

$^{***}p \leq .001$

Multiple Regression Analysis of Preliminary Model

The proposed preliminary model (Cf., Figure 4) was divided into two sets of regression equations. One relates the communication variable (X_3) to the dependent variable interdependence (X_2). The second equation relates the exogenous variable, environmental conditions (X_4) and the endogenous variable, interdependence (X_2), to the dependent variable, goal attainment (X_1).

In order to present a more complete picture of this data set as a test of the model, the respective beta values and values for multiple Rs are presented in Figure 4. As can be expected in part from the matrix of intercorrelations, some of the respective



X_1 = Goal Attainment
X_2 = Interdependence
X_3 = Communication
X_4 = Environmental Conditions

$\left.\begin{matrix} v \\ w \end{matrix}\right\}$ = Disturbances

$^{**}p \leq .01$
$^{***}p \leq .001$

Figure 4.--Proposed preliminary model cast into path-analytic format.

betas and multiple Rs, the values for explained variance are correspondingly low. The explained variance for interdependence (X_2) amounts to merely .01; the disturbance[1] w is therefore very

[1]The disturbance values are calculated using the following expression: $\sqrt{1 - R^2}$.

high (.99). For the variable of goal attainment, the explained variance amounts to .14, also a relatively low value. The corresponding disturbance term v equals .93.

Considering the low values for explained variance and corresponding high disturbances, the fact that the path model is just identified and that some of the operationalizations of the variables comprising the model may not have been in correspondence to the concepts they are to portray, further analysis of the model is not meaningful. Especially in the case of the operationalization of the environmental conditions-variable criticism is appropriate. For example, it appears that a competitive-cooperative dimension alone is a weak operationalization of such a complex concept as "environmental conditions."

Based on this analysis, it was decided to expand the model. With the data set at hand, the model was then expanded on theoretical grounds with respect to endogenous variables, but also--most importantly--expanded with regard to the exogenous variables.

CHAPTER IV

REVISION AND EXPANSION OF THE MODEL

Overview

Based on the findings through the analysis of the preliminary model, the final proposed model will be modified according to the following two stipulations:

(a) the revised model is to reflect a more comprehensive and representative picture of reality, i.e. it will be expanded on theoretical grounds, and

(b) the revision of the model will occur within the realm of the available data set.

Lastly, the proposed determinants of various dependent variables are operationalized.

Theoretical Expansion of the Model

All variables comprising the preliminary model will be kept as variables in the final model. Goal Attainment thus remains the major dependent variable. Although Goal Attainment and Interdependence show a negative and statistically not significant relationship, this path is kept in the final model on theoretical grounds. The literature review demonstrated that the relationship between Goal Attainment and Interdependence is too well established than to be discarded based on the present findings. Furthermore,

it might very well be the case that this negative correlation is an artifact of this particular sample.

Given the above specified constraints one might ask oneself what potential determinants might contribute toward the variance of Goal Attainment, Interdependence and Communication.

Goal Attainment

Approximately one year after the initial data collection phase, twenty social service agencies in the Lansing area were randomly selected and the respective agency directors were interviewed by phone to determine what they perceived as crucial factors influencing the performance of the agency. Following is a list that identified the most frequently cited topic areas by those agency directors:

(1) the amount of the annual budget (cited by 83% of respondents),

(2) source variability of agency funds (cited by 53% of respondents), and

(3) the expected size of staff (cited by 46% of respondents).

Operationalizations for all three categories were available in the original data set and thus added as exogenous variables to the endogenous communication and interdependence variables as additional determinants of goal attainment. These three variables find support on logical grounds since it can correspondingly be argued that,

(1) the annual dispensable finances can greatly influence the degree of goal attainment for an agency;

(2) the source of funds can in part determine the realizable goal attainment level since most sources (state, municipal, etc.) typically have certain strings attached with respect to the disbursement of such funds; and

(3) the staff size of an agency in the social service field seems to be of particular importance to achieve certain goals due to the particular nature of this "helping"-profession.

This third argument can be carried further. One normally would assume that the size (staff) of an organization correlates highly with the organization's budget. This might not necessarily be so in the social services field, since a large proportion of certain agencies are volunteers. If size and budget would be highly correlated, then either variable or an index combined of both variables should be entered in a causal path model. Table 9 provides additional information about the staff composition.

TABLE 9.--N, Means and Standard Deviations for Staff Composition.

Variables	N	Mean	S.D.
Professional Staff	262	16.89	22.44
Paid Paraprofessional Staff	173	19.61	49.50
Clerical Staff	252	11.48	17.75
Volunteer Staff	108	19.37	38.47

The examination of Table 9 indicates that altogether in the present sample 28.76% of all agency employees are voluntary staff members.

Interdependence

From the preliminary model it is known that the beta value for the path from Communication to Interdependence is .07. This result, unfortunately, does not support strongly the findings in the literature. This particular path is kept in the model on theoretical grounds since the support for it in the literature is overwhelming.

One might also add the conditions to the model in which interdependence or the lack thereof occurs. Depending on the degree to which the environment is perceived to be competitive vs. cooperative might increase or decrease the degree of interdependence. A Cooperative-Competitive Environment variable is thus related to Interdependence as an exogenous variable in the model (This variable was previously the Environmental Condition Variable).

The importance of the influence of the communication variable on Interdependence has been pointed out. In addition, it is argued, the means with which this communication occurs can be taken as a determinant of interdependence. The chosen communication means--as a reflection of proximity and personal involvement of both partners in a communication situation--can be understood to influence the degree of perceived interdependence. Thus, a variable Face-to-Face Communication Means is added to the model as a third potential determinant of Interdependence.

Communication

Next, it is attempted to explore causal antecedents for Communication. There is some evidence that an individual with a high level of satisfaction behaves differently in communicative acts (e.g., frequency of communication, communication with role types) than at a low level of satisfaction (Wigand, 1974b). A Satisfaction measure is added to the final model as a potential determinant of Communication.

Based on intercorrelation coefficients and on preliminary tests for explained variance through linear regression analysis, each earlier specified operationalization of the communication variable was examined for its unique predictive power within the realm of the proposed model. These tests showed that the fourth network, communication with regard to referrals (a measure of the frequency with which agency representatives referred clients to other social service agencies), suggested itself as the best operationalization of communication. This operationalization was then chosen to be used for further analysis and is from now on labeled as the communication variable instead of the longer term referral communication variable.

Satisfaction

Job satisfaction has been viewed from three differing causal perspectives. The first one--dating back to the human relations movement--simply states and emphasizes the causal direction that the employee's satisfaction directly influences the quality and

quantity of individual and group output and thus also communication. This theoretical position has been emphasized in the work by Vroom (1964) and Likert (1967).

The second theoretical position with regard to job satisfaction points out that satisfaction and performance are mediated by a number of moderating variables; i.e., satisfaction and performance do not covary under all conditions (Cummings & Schwab, 1970). Some of these moderating variables have been studied in the past. Korman (1968, 1970) examined personality factors such as self-esteem and Carlson (1969) studied the moderating effects of ability factors.

The last theoretical approach is best described in the work by Porter and Lawler (1968) emphasizing that satisfaction is not to be understood as a causal condition determining performance, but that satisfaction is dependent upon performance. Variance in performance, then, is understood as a determinant of rewards and thus leading toward higher or lower satisfaction.

As potential determinants of a Satisfaction measure three variables were added: Centralization, Employee's Age and Educational Background.

Centralization as a measure of both participation in decision making and the hierarchy of authority has found some support in the literature to relate to satisfaction-related issues. Aiken and Hage (1968) found that health and welfare organizations with many joint programs tend to have more decentralized decision-making structures, tend to be more complex, more innovative and

have more active internal communication channels. Simpson and Gulley (1962) reported that voluntary organizations with diffuse pressures from the environment were more likely to have decentralized structures, high internal communication frequencies, and high membership involvement, while those having more restricted pressures from the environment had the opposite characteristics.

The variables Employee's Age and Educational Background were added as exogenous variables to the model as potential partial determinants of Satisfaction.

Centralization

The variable Employee's Position was added as the last path into the final model as a potential determinant of Centralization. It can be argued that an individual's relative position within the organization, i.e. his rank within the organizational hierarchy has a causal relationship with Centralization. The individual's position thus is a function of the degree to which he participates in decision-making and a function of the ease with which he moves within the hierarchy of authority.

The operationalizations of these newly introduced constructs are presented in the following sections. Previously used measures that were already described in the context of the preliminary model are not discussed.

Determinant of Centralization

The exogenous variable explaining the centralization index is thought to be the relative position held by an employee. The employee's position was operationalized by the following question:

> How would you best describe your position in your agency? (Check the one term that best describes your job)
>
> ____ administrator
> ____ supervisor
> ____ staff worker
> ____ clerical

In the "administrator" category, 21.94% of the 310 respondents checked this answer; 27.10% responded under the "supervisor" category; 39.03% were "staff workers" and 10.97% belonged to the category of "clerical" position. Three respondents or .97% decided not to answer this question at all.[1]

Additional descriptive statistics are presented in Table 10 for this question.

TABLE 10.--Descriptive Statistics for the Variable Employee's Position.[a]

Mean	2.66
S.D.	.50
Range	2.40

[a] N = 69.

[1] These percentage figures add to a total slightly above 100% due to rounding.

Centralization

A measure of centralization was utilized here as one determinant of the satisfaction index. This index was arrived at by the linear addition of the responses to the following four questions:

> "If I have a new idea I feel I will be heard." (Check the one response which best describes your opinion.)
>
> "If I have a good idea, it will generally be implemented." (Check the one response which best describes your opinion.)
>
> "If I have a legitimate complaint, I'm usually listened to." (Check the one response which best describes your opinion.)
>
> "I feel I have a fair share in the decision-making process in this agency." (Check the one response which best describes your opinion.)

These questions measure the ease with which an individual can express himself, can communicate with his superiors, etc. This is understood as a measure of the existing centralization of communication, authority, decision-making as well as employee-participation. Each of the above four questions had the following five response categories:

____ strongly agree
____ agree
____ no opinion
____ disagree
____ strongly disagree

"Strongly agree" was coded as 1; "strongly disagree" was coded as 5. Descriptive statistics for the Centralization index are presented in Table 11. Additional descriptive statistics can be found in Table 11A in Appendix II.

TABLE 11.--Descriptive Statistics for the Centralization Index.[a]

Mean	16.10
S.D.	1.64
Range	7.00

[a]N = 69 for each variable.

Table 12 below presents the intercorrelation coefficients among the variables comprising the index of centralization:

TABLE 12.--Intercorrelations among the Centralization Index Components.[a]

Variables	(1)	(2)	(3)	(4)
New Idea-Being Heard (1)	1.00			
Good Idea-Being Implemented (2)	.64***	1.00		
Complaint-Being Listened to (3)	.68***	.61***	1.00	
Fair Share in Decision-Making (4)	.55***	.49***	.59***	1.00

[a]N = 69 for each variable.

***$p \leq .001$

As is readily apparent, all variables comprising the centralization index show relatively high and positive correlations with statistical significance levels of $p \leq .001$ for all correlations. In addition, the responses were submitted to a factor analysis with varimax rotation and Kaiser-normalizations. The factor analysis yielded a one-factor solution by-passing rotation as follows:

	Factor 1
New Idea - Being Heard	.87
Good Idea - Being Implemented	.82
Complaint - Being Listened To	.87
Fair Share in Decision-Making	.78

The composition of the centralization index was thus kept and modified by the respective beta-weights for each variable. Here, a multiple regression analysis yielded these beta-values for each of the four components of the centralization index while controlling for two exogenous variables, the age and educational background of the employees:

	Beta-Weight[1]
New Idea - Being Heard	-.12
Good Idea - Being Implemented	.80
Complaint - Being Listened To	-.01
Fair Share in Decision-Making	-.56

Each raw datum for each variable was then multiplied by the corresponding beta-weight such that the best possible linear fit onto the satisfaction index could be ascertained. Obviously, the best possible linear fit is desirable for the maximal explanation in the construction of any path model.

Determinants of Satisfaction

The satisfaction index is composed of the linear addition of the responses to three questions:

---

[1]Note: Only two digits are presented here and in future presentations of beta-weights. For the actual calculations, the entire seven digit beta-value was used.

To what extent do you consider your job to be routine? (check one)

____ always routine
____ frequently routine
____ occasionally routine
____ rarely routine
____ never routine

To what extent do you consider your job to be prestigious? (check one)

____ extremely prestigious
____ quite prestigious
____ somewhat prestigious
____ slightly prestigious
____ not at all prestigious

In general, how well do you get along with your co-workers? (check one)

____ extremely well
____ rather well
____ neither well nor poor
____ rather poorly
____ extremely poorly

All three questions were coded with the number 1 through 5, i.e. the first category (e.g., "always routine") received the number 1, the second category (e.g., "frequently routine") received the number 2, etc. up to the fifth category (e.g., "never routine") which received a 5. The scales for the second and third question of the satisfaction index were for all computations reversely coded for obvious conceptual reasons. The corresponding descriptive statistics for this index are presented in Table 13 below.

TABLE 13.--Descriptive Statistics for the Satisfaction Index.[a]

Mean	12.15
S.D.	11.39
Range	10.00

[a]N = 69 for each variable.

Additional descriptive statistics for each of the components comprising the satisfaction index can be found in Appendix II, Table 13A.

The intercorrelation matrix for the components of the satisfaction index are presented below:

TABLE 14.--Intercorrelations among the Satisfaction Index Components.[a]

Variables	(1)	(2)	(3)
Routineness of Job (1)	1.00		
Prestigiousness of Job (2)	-.16	1.00	
Getting Along on Job (3)	-.10	-.30**	1.00

[a]N = 69 for each variable.

**$p \leq .01$

The examination of Table 14 does not provide sufficient information such that the coefficients could be utilized on the basis of face validity for the construction of the satisfaction index.

The responses to the three questions were therefore submitted to a factor analysis. After a varimax rotation with Kaiser normalizations a two-factor structure resulted as follows:

	Factor 1	Factor 2
Routineness of Job	-.00	.94
Prestigiousness of Job	-.78	-.36
Getting Along on Job	.83	-.28

The resulting two-dimensional solution shows a factor-loading of .94 for Routineness of Job for factor 2, and loadings for factor 1 of -.78 and .83 for Prestigiousness of Job and Getting Along on Job, respectively.

The question arises whether or not there is a distinct difference between these two generated factors, i.e. do the two factors deviate significantly from chance expectation. Rao's (1955) earlier utilized canonical factoring procedure provides a test of significance based on the Chi-square statistic. With only three variables comprising the factor structure, Rao's test unfortunately cannot be computed.

The index Satisfaction is then understood as a two-dimensional construct. One dimension is centrally related to job activities (routiness) whereas the other dimension represents the social aspects and social activities of the job (prestigiousness and getting along with others).

The index was kept as designed, but then underwent a beta-weighting procedure. To do so, a multiple regression with each of the three components of the satisfaction index as independent variables generated the respective beta-weights. Each raw datum

of the Routineness of Job, Prestigiousness of Job and Getting Along on the Job-variables, respectively, was weighted with the corresponding beta-value as follows:

	Beta-Weight
Routiness of Job	-.04
Prestigiousness of Job	-.08
Getting Along on Job	-.07

Through this procedure in the modification of the satisfaction index, the best possible linear additive fit for the satisfaction index onto the communication variable was made possible.

Employee's Age and Educational Background

The satisfaction index--aside from the centralization index--is also thought of to be determined by two other independent variables: the employee's age and educational background. The employee's age was operationalized by the question:

What is your age? _____years

The corresponding descriptive statistics are in Table 15.

TABLE 15.--Descriptive Statistics for the Variable Employee's Age.[a]

Mean	36.30
S.D.	8.63
Range	50.00

[a]N = 69 for each variable.

A total of 311 employees were asked to respond to this question. "Some high school" was checked as a response by .64% of the

respondents; 9.33% of the respondents marked that they had received a "high school diploma." "Some college" was attended by 25.08% and a "bachelor's degree" was received by 16.08%. 16.72% of the respondents claimed to have "some graduate study" and 31.19% responded to have an "advanced degree." Two respondents or .64% of the total of 311 did not complete this question.

The employee's educational background was determined by the following question:

> How much education have you had? (check the highest educational level you have completed)
>
> ____ some high school
> ____ high school diploma
> ____ some college
> ____ bachelor's degree (B.A., B.S.)
> ____ some graduate study
> ____ advanced degree (M.A., M.S.W., Ph.D., M.D.)

The descriptive statistics for this variable are presented in Table 16.

TABLE 16.--Descriptive Statistics for the Variable Educational Background.[a]

Mean	4.29
S.D.	.92
Range	4.00

[a]N = 69 for each variable.

Determinants of Interdependence

The interdependence variable was thought of to be determined by two independent and exogenous variables, the variable along a cooperative-competitive dimension and the frequency with which employees of an agency utilize face-to-face communication means with other agencies.

Cooperative-Competitive Environment

The cooperative-competitive environment was measured by the previously utilized "environmental condition"-variable reflecting the inter-agency operating conditions.

Communication Means

Communication Means were ascertained by the following question:

> In general, how much of your communication with other agencies is by each of the following means? (please indicate percentages)
>
> ____% by memo/letters
> ____% by face-to-face contacts
> ____% by telephone
> ____% by newsletters/bulletins
>
> 100% Total

Considering the responses from this question as well as the results of preliminary regression tests with the interdependence variable, only the responses for the face-to-face contacts category were used for the operationalization of this variable. The corresponding descriptive statistics for this question are presented in Table 17.

TABLE 17.--Descriptive Statistics for the Variable Face-to-Face Communication Means.[a]

Mean	20.84
S.D.	15.07
Range	75.00

[a]N = 69 for each variable.

Determinants of Goal Attainment

The variable reflecting a need for additional services was constituted by an index composed of the addition of seven questions:

> Since many clients bring multi-faceted problems to social agencies, what percentage of your clients require additional services in each of the following problem area: (please indicate percentages; the total need not equal 100%)
>
> ____% employment
> ____% drug and/or alcohol
> ____% family services
> ____% legal assistance
> ____% physical handicapped
> ____% mental health
> ____% physical health

Descriptive statistics for this question are presented in Table 18. Additional statistics for each component of this index are presented in Table 18A, Appendix II.

The inter-item correlations among the components of the Need for Additional Services Index were computed and are presented in Table 19.

TABLE 18.--Descriptive Statistics for the Need for Additional Services Index.[a]

Mean	173.69
S.D.	164.29
Range	693.00

[a]N = 69 for each variable.

TABLE 19.--Intercorrelations Among the Components Comprising the Need for Additional Services Index.[a]

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Need for Employment (1)	1.00						
Need for Drug/Alcohol (2)	.29**	1.00					
Need for Family Services (3)	.02	-.14	1.00				
Need for Legal Assistance (4)	.34**	.04	.30**	1.00			
Need for Physically Handicapped (5)	.03	-.25*	.25*	.00	1.00		
Need for Mental Health (6)	.06	-.05	.34**	.16	.22*	1.00	
Need for Physical Health (7)	-.10	-.03	.51***	.22*	.51***	.29**	1.00

[a]N = 66 for each variable.

*$p \leq .05$

**$p \leq .01$

***$p \leq .001$

The responses were factor-analyzed and after a Varimax rotation with Kaiser normalization a two-factor structure yielded:

	Factor 1	Factor 2
Need for Employment	.02	.80
Need for Drug/Alcohol	-.27	.62
Need for Family Services	.76	.09
Need for Legal Assistance	.39	.63
Need for Physically Handicapped	.66	-.26
Need for Mental Health	.58	.13
Need for Physical Health	.81	-.06

The two factors that were generated suggest for dimension one those types of agencies that provide services to their clients requiring high, personal direct-involvement by the case worker (Need for Family Services, Need for Physically Handicapped, Need for Mental Health, Need for Physical Health). The second dimension is composed of agency types that demand less personal direct-involvement by the case worker (Need for Employment, Need for Drug/Alcohol, Need for Legal Assistance).

On theoretical grounds, it seems warranted to treat a construct such as "need for additional services" as one index, although it is composed of two dimensions. This variable was then comprised of the linear addition of each of the responses to the seven categories.

Since this variable, need for additional services, was selected to contribute as a determinant to the goal attainment variable, it was important to find its best possible linear fit with the goal attainment variable. For this purpose, a regression analysis allowed for the explanation of variance of the goal attainment variable using each of the individual components of

the "need for additional services" index as independent variables and at the same time controlling for all other independent variables related to the dependent goal attainment variable. From this procedure the respective beta-weights for each component of the index was generated. In order to allow for the best possible linear fit of this variable onto the goal attainment variable, each raw datum was weighted by its respective beta-weight as follows:

	Beta-Weight
Need for Employment	-.06
Need for Drug-Alcohol	.47
Need for Family Services	-.01
Need for Legal Assistance	.09
Need for Physically Handicapped	-.04
Need for Mental Health	-.15
Need for Physical Health	.29

The refined index "need for additional services" was thus created to allow for its unique contribution to the best possible linear fit to explain a maximum of variance for the goal attainment variable.

The variable Source Variability of Agency Funds is an index consisting of the following question and components:

How much funding comes from each of the following sources? (please indicate percentages)

____% from local government
____% from state government
____% from federal government
____% from private fundraising
____% from parent organization
____% from community chest (e.g., United Way)
____% from other source (please specify)

100% Total

The descriptive statistics for this question are represented in Table 20 below:

TABLE 20.--Descriptive Statistics for the Source Variability of Agency Funds Index.[a]

Mean	84.51
S.D.	52.24
Range	208.00

[a]N = 69 for each variable.

This index is the linear addition of each of the responses for each category provided in the question. This item was not factor-analyzed since the origin of agency funds does not appear to be amenable for a possible attribution to two or more dimensionalities.

Detailed descriptive statistics for each of the categories comprising this index are presented in Appendix II, Table 20A. As previously mentioned, in order to generate the best possible index construction as an aid to predict goal attainment, a multiple regression was run with each component of the index for "agency funds variability" as an independent variable while controlling for all other independent variables (interdependence, need for additional services, the agency's budget). The resulting beta-weights are as follows:

	Beta-Weight
Local Government Funds	-.04
State Government Funds	-.06
Federal Government Funds	-.06
Private Fund Raising	-.01
Parent Organization Funds	.03
Community Chest Funds	-.02
Other Funds	-.01

Similarly as before, each raw datum was weighted with its respective beta-weight to ascertain the best possible linear contribution to the dependent variable, goal attainment.

The agency's budget was comprised of one variable: Amount of Annual Budget.[1] This independent variable was ascertained by the question:

What is your total annual operating budget? $_____

The descriptive statistics for this variable are presented in Table 21.

TABLE 21.--Descriptive Statistics for the Agency's Budget.[a]

Mean	595,519
S.D.	1,574,766
Range	9,996

[a]N = 54 for each variable.

[1]It should be noted that the data set was collected during the summer of 1974, thus the response to this variable reflects the average budget for the fiscal year of 1974.

The dependent variable, goal attainment, is thus explained by the linear unique contribution of each independent variable, communication, interdependence, need for additional services, variability of agency funds, and the annual budget.

CHAPTER V

RESULTS AND DISCUSSION OF THE FINAL MODEL

Overview

The intercorrelations among the model variables are discussed followed by a discussion of the multiple regression analyses and a path-analytic evaluation of the final model.

Figure 5 presents the correlation coefficients that express the degree of statistical association between the proposed exogenous and endogenous variables. It should be noted that the correlation coefficients are not to be interpreted as having a causal relationship. The coefficients were merely entered into the path-like format to facilitate the presentation.

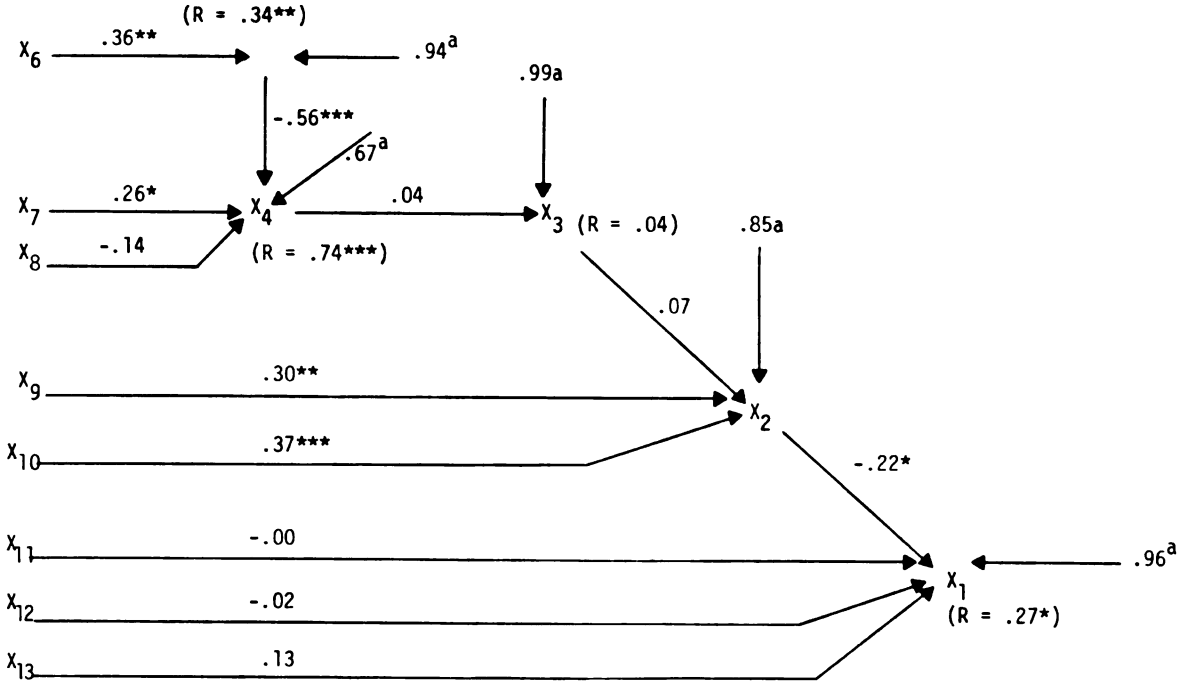
Table 22 presents the zero-order correlations among all variables of the proposed path model and Table 23 provides information about the zero-order correlations among the exogenous variables only.

Lastly, certain limitations of the static representation of the relationships among the variables are pointed out.

Intercorrelations Among Model Variables

Endogenous Variables

The endogenous variable Centralization has a high, negative correlation ($r = -.34$, $p<.01$) with the variable Employee's



Where:

X_1 = Goal Attainment
X_2 = Interdependence
X_3 = Communication
X_4 = Satisfaction
X_5 = Centralization
X_6 = Employee's Position
X_7 = Employee's Age
X_8 = Educational Background
X_9 = Cooperative-Competitive Environment
X_{10} = Face-to-Face Communication Means
X_{11} = Need for Additional Services
X_{12} = Agency's Budget
X_{13} = Source Variability of Agency Funds

* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$
a denotes disturbances

Figure 5.--Model indicating the pattern of zero-order correlations among variables.

TABLE 22.--Intercorrelations Among Variables of the Path-Model.[a]

Varibales	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}
X_1 -Goal Attainment	1.00												
X_2 -Interdependence	-.23*[b]	1.00											
X_3 -Communication	.11	.20*[b]	1.00										
X_4 -Satisfaction	.16	-.13[b]	.04	1.00									
X_5 -Centralization	-.14	.09[b]	-.14	-.68***	1.00								
X_6 -Employee's Position	.37***	-.29**[b]	-.11	.32**	-.34**	1.00							
X_7 -Employee's Age	.30**	-.12[b]	-.15	.49***	-.36***	.55***	1.00						
X_8 -Educational Background	.09	-.14[b]	-.06	-.31**	.22*	.17	-.19	1.00					
X_9 -Cooperative-Competitive Environment	-.36***	.35**[b]	.16	.13	-.03	-.28**	-.12	-.02	1.00				
X_{10}-Face-to-Face Communication Means	-.18	.42***[b]	.23*	-.16	-.05	-.02	-.19	-.06	.11	1.00			
X_{11}-Need for Additional Services	-.01	.13[b]	-.27*	-.03	-.10	.03	.02	-.00	-.12	-.04	1.00		
X_{12}-Agency's Budget	-.05[c]	-.01[d]	.11[c]	.08[c]	.07[c]	.08[c]	.11[c]	.25*[c]	-.08[c]	-.02[c]	-.07[c]	1.00	
X_{13}-Source Variability of Agency Funds	.15	-.09[b]	-.27*	.18	-.02	.04	.18	.03	.09	-.11	.16	-.26*[c]	1.00

[a] N = 69 for each variable, except where indicated by b,c,d.

[b] N = 68

[c] N = 54

[d] N = 53

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

TABLE 23.--Intercorrelations Among the Exogenous Variables of the Path Model.[a]

Variables	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}
X_6 -Employee's Position	1.00							
X_7 -Employee's Age	.55***	1.00						
X_8 -Educational Background	.17	-.19	1.00					
X_9 -Cooperative-Competitive Environment	-.28**	-.12	-.02	1.00				
X_{10}-Face-to-Face Communication Means	-.02	-.19	-.06	.11	1.00			
X_{11}-Need for Additional Services	.03	.02	-.00	-.12	-.04	1.00		
X_{12}-Agency's Budget	.08[b]	-.11[b]	.25*[b]	.09[b]	-.02[b]	-.07[b]	1.00[b]	
X_{13}-Source Variability of Agency Funds	.04	.18	.03	.09	-.11	.15	-.26*[b]	1.00

[a] N = 69 for each variable, except where indicated by b.

[b] N = 54.

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

Position. This does not support the earlier discussion with regard to this relationship.

The Satisfaction index is not related to the Centralization measure as proposed and a strong, negative correlation of -.68 ($p \leq .001$) can be reported. Satisfaction was also said to be related to the variables Employee's Age and Educational Background. The respective zero-order correlation coefficients are .49 ($p \leq .001$) and -.31 ($p \leq .01$).

Communication and Satisfaction are related to each other with a coefficient of $r = .04$, suggesting no support that Satisfaction influences Communication.

Communication and Interdependence are positively related with a coefficient of .20 ($p \leq .05$). Two other variables--according to the model--the Cooperative-Competitive Environment and Face-to-Face Communication Means, are both positively related to the Interdependence variable with coefficients of .35 ($p \leq .01$) and .41 ($p \leq .001$), respectively.

The Goal Attainment variable was already reported to have a negative, significant relationship with the Interdependence variable of -.23 ($p \leq .05$). Need for Additional Services correlates nearly not at all (-.01) with Goal Attainment. Agency's Budget, contrary as predicted, has a very low and not significant negative correlation with Goal Attainment ($r = -.05$). Lastly, Source Variability of Agency Funds has a low, positive correlation of .15 as proposed.

Exogenous Variables

The examination of the intercorrelations among the exogenous variables of the proposed model constitutes an important, partial test with regard to problems of multicollinearity (Aigner, 1971; Althauser, 1971; Farrar & Glauber, 1967; Blalock, 1963). Multicollinearity becomes a problem when all or some independent variables are highly intercorrelated.

Especially in regression analysis, multicollinearity can contribute to the misinterpretation of results when one of the independent variables is a perfect linear function of one or more independent variables in the equation, i.e. the respective coefficients cannot be uniquely determined (Johnson, 1963). Most obviously, in regression analysis the presence of multicollinearity would mean a paradoxical situation since this analysis as a tool allows for the unique contribution and relative importance of the independent variables. Farrar and Glauber (1967) pointed out that multicollinearity becomes a problem when the correlations are extremely high (>.85). Blalock (1963) and Gordon (1968), however, emphasized that lesser degrees of multicollinearity can post difficulties with lesser degrees of association.

Inspection of Table 23 shows that no independent variable within a potential regression equation shows a correlation coefficient of more than .55. This degree of statistical association is accepted as negligible.

Intercorrelations Among Exogenous Variables

Table 23 presents specifically the intercorrelations among all exogenous variables. The matrix shows one major area of concern that deserves discussion. The correlation between the variable Employee's Position and Employee's Age is significantly ($p \leq .001$) high with a coefficient of .55. This situation could be a potential problematic area contributing to the lack of explained variance for the Centralization and Satisfaction indices. As indicated earlier, the highest correlation coefficient among all the exogenous variables is .55 which is considered as negligible (Cf., with Farrar & Glauber [1967]).

Multiple Regression Analyses of the Final Model

The proposed model was divided into five sets of regression equations. Altogether five multiple regressions were calculated:

(1) Centralization (X_5) with[1] Employee's Position (X_6),

(2) Satisfaction (X_4) with Employee's Age (X_7), Educational Background (X_8) and Centralization (X_5),

(3) Communication (X_3) with Satisfaction (X_4),

(4) Interdependence (X_2) with Communication (X_3), Cooperative-Competitive Environment (X_9) and Face-to-Face Communication Means (X_{10}); and

---

[1]The term "with" denotes here that the independent variable (each time after "with")--in this case Employee's Position--is regressed on the dependent variable (immediately preceding "with")--in this case, Centralization.

(5) Goal Attainment (X_1) with Interdependence (X_2), Need for Additional Services (X_{11}), Agency's Budget (X_{12}) and Source Variability of Agency Funds (X_{13}).

Figure 6 portrays those relationships derived from multiple regression procedures. Analagous to the earlier discussion with regard to identification, it can be said that this path model is over-identified (eight pieces of external information vs. five pieces of model-internal information).

Determinant of Centralization

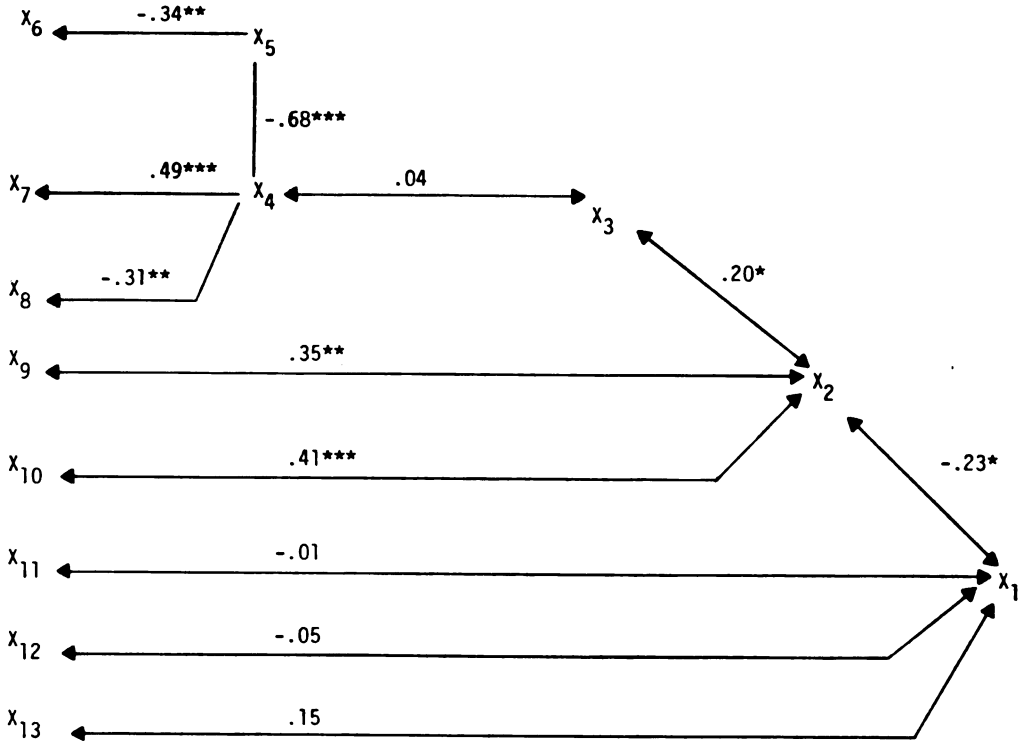
The proposed relationship between Centralization and Employee's Position is equal to the zero-order correlation coefficient, i.e. R equals also .34 ($p \leq .01$). The explained variance amounts to nearly 12% (11.56%).

Determinants of Satisfaction

The multiple regression procedure applied to Satisfaction showed that Centralization has the major impact with a beta-value of -.56 ($p<.001$). Educational background contributes to the explanation of Satisfaction with a beta of -.14. Employee's Age shows a beta-value of .26, and is statistically significant at the .05 level. The corresponding multiple R for Satisfaction is .74 ($p<.001$), accounting for almost 55% of the variance (54.76%).

Determinant of Communication

This finding was already reported in the discussion of the intercorrelations among the variables in the model. It should be



Where:

X_1 = Goal Attainment
X_2 = Interdependence
X_3 = Communication
X_4 = Satisfaction
X_5 = Centralization
X_6 = Employee's Position
X_7 = Employee's Age
X_8 = Educational Background
X_9 = Cooperative-Competitive Environment
X_{10} = Face-to-Face Communication Means
X_{11} = Need for Additional Services
X_{12} = Agency's Budget
X_{13} = Source Variability of Agency Funds

* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$

Figure 6.--Final model cast into path-analytic format.

stated that Communication in the model shows a R of .04 with Satisfaction.

Determinants of Interdependence

Multiple regression analysis of the variables entering the equation for Interdependence provides a multiple R of .52 ($p<.001$). The strongest contribution is made by the Face-to-Face Communication Means variable with a beta of .37 ($p<.001$), followed by Cooperative-Competitive Environment with a beta equal to .30 ($p\leq.01$). The third proposed determinant, Communication, entered the equation with a beta-value of .07, but did not approach statistical significance. The explained variance for this regression equation is 27.04%.

Determinants of Goal Attainment

The dependent variable Goal Attainment is determined by four independent variables. Interdependence loads into the regression equation oppositely as originally predicted. Interdependence shows a negative and statistically significant beta of -.22 ($p<.05$). Need for Additional Services makes nearly no contribution to the equation with a beta of -.00. Agency's Budget has a very low beta value (-.02) and is statistically not significant. The last determinant of Goal Attainment, Source Variability of Agency Funds, suggest that it may function as predicted with a beta of .13. The multiple R for Goal Attainment is .27 ($p\leq.05$). The explained variance amounts to merely 7.29%.

Generally, the results obtained through the multiple regression analysis of the variables comprising the final model show that for three out of five regression equations an appreciable amount of variance is explained. Some tentative explanation was advanced in the preceding discussion of zero-order relationships.

Path-Analytic Evaluation of the Final Model

Up to this point, the variables have been analyzed with regard to their agreement between the degree of statistical association and their proposed relationship, as well as through regression equations. A more powerful technique to shed light onto these relationships is path analysis. The essential idea of path analysis is the construction and testing of an oversimplified causal model of reality (Land, 1969). This implies that the model considers only a limited number of variables and relations out of the universe of social reality (Land, 1969; Duncan, 1966). More detailed discussions about path analysis can be found in Duncan (1975), Goldberger and Duncan (1973), Kerlinger and Pedhazur (1973) and Cohen (1968).

A complete application of path-analytic techniques to this data set was not possible, due to the unavailability of the appropriate computer software. Conventional regression analyses do not yield the correlations among the disturbance terms. A path-analytic evaluation of a causal model is not complete until the correlations among the disturbance terms have been examined.

A disturbance term can be expressed as the deviation of an observed Y score from an estimated Y' score. The average size of a disturbance term influences the explained variance and the standard error of estimate. These statistics aid in determining whether the fit of the regression equation is acceptable or not, and whether or not the explained variance is adequate.

Specifically, the examination of the disturbance terms provides information about:

(a) the potential lack of linearity,

(b) whether the assumptions about the disturbance terms are met, and suggests

(c) potential modifications toward the most appropriate fit within the model.

Lastly, it should be pointed out that in regression analysis, the disturbance terms are assumed to be (a) independent, (b) have a mean of zero, and (c) have the same variance throughout the range of Y values.

Software that allows for a visual pattern inspection of disturbances plotted against Y' values is available through the SPSS subroutine Regression. In this subroutine, all variables are placed in standard form during the regression procedure. Consequently, the residuals are also represented in standard form. It can be expected that the residuals of a distribution of cases ought to be located between the limits of -1.96 and 1.96. Specifically, one may assume that the residuals are normally distributed if they stay within these boundary limits.

Visual inspection of residual plots as obtained by the SPSS subprogram Regression suggests that the residuals for four of the five regressions is distributed normally. All cases for the regression for the goal attainment variable, as well as the interdependence variable fell within the boundary limits (rounded to -2.00 and 2.00) for each equation. The plot of standardized residuals for the regression of the centralization index showed one case that was located outside the negative (-2.0) boundary. This one case represents 1.45% (N=69) of all cases. Similarly, the regression for the satisfaction index showed one case where a residual was located outside the positive boundary, i.e. beyond the 2.0 limit. Again, this one case constitutes 1.45% of the total N. Lastly, the regression with communication as the dependent variable shows four cases where the residuals are located outside the 2.0 boundary limit. These four cases, however, constitute 5.80% of the N of 69. This percentage figure is no longer within the range of acceptable confidence, i.e. 95% or higher, and it must therefore be assumed that the residuals are no longer normally distributed. The results of the regression on communication and this equation's contribution to the model have therefore to be rejected.

The SPSS subprogram Regression produces also a scatter plot of standardized residuals. If the scatter plot resembles or displays a solid, straight band within the boundary limit of -2.0 and 2.0 (i.e., the band is not curved or does not flair out at either end), then it can be assumed that the disturbances have

a constant variance. Deviance from this assumption would invalidate the regression procedure. Visual inspection of the residuals was obtained and the residuals for each of the regressions for the model are of constant variance.

More advanced procedures and computer software for a comprehensive solution of the proposed model have been designed by Jöreskog et al. (Jöreskog, 1973, 1971, 1970a, 1970b, 1969). These software packages are available at Michigan State University, but have not been fully mounted yet.

The path-analytic relationships among the variables in the final causal model are presented in Figure 6. It is emphasized that this path analysis is incomplete in that no information is available with respect to the degree of statistical association among the disturbance terms. Any conclusions to be drawn from the findings must be viewed in the light of this shortcoming.

Generally, only six out of twelve paths reached statistical significance in the range of $p<.05$ to $p<.001$. The disturbance terms in the model, however, vary considerably. They range between .67 to .99. Without information about the correlations among the disturbance terms, the results suggest that the model as constructed fails to explain an appreciable amount of variance with its endogenous variables. This may suggest that as a model the system of interrelationships is not properly specified.

Limitations of Static Model

The preliminary as well as the final model discussed so far are static representations of a social reality that is assumed

to be dynamic. Frequently, in assessing the validity of a model, some variables of which are causally related to other variables, which later are found not to be fully taken into account or are assumed to be constant. The inferences that can be made from the analysis of a static model about its dynamic behavior are very limited or not warranted at all. The factor time as the most essential part of a dynamic representation has not entered the analysis.

Since the present data set at hand was collected at one point in time only, no direct inferences about the dynamic behavior of such a system can be made. In Chapter VI an alternative method is presented that overcomes, in part, this dilemma.

CHAPTER VI

DEVELOPMENT OF A DYNAMIC INTERORGANIZATIONAL MODEL

Overview

Up to this point, the discussion of the interorganizational model has focused on static aspects. The relationships that were extracted from the literature originated from studies that were static in nature and examined these relationships at one point in time. Also, the data at hand and the analysis presented here, plus the preliminary model as well as the final model of interorganizational relationships, are static in nature. The factor time is not under consideration, although it is only at a third point in time when one can begin to speak of certain dynamic aspects of observed phenomena.

Since such dynamic characteristics are not available via the data set at hand, an attempt is made to model the dynamic aspects of interorganizational relationships. First, a general model will be presented that reproduces the basic features of interorganizational behavior. Secondly, the model is then expanded to examine and express issues that range beyond the initial description. Thirdly, it should be noted that the model is dynamic and, specifically, cybernetic rather than static in nature. Although this third point complicates matters somewhat,

it permits nevertheless the extraction of implications that are not easily, if at all, obtained otherwise.

A large number of real world situations, current or hypothetical, do not accommodate investigation by strictly analytical techniques. Some reasons may be the fact that insufficient information about the relationships between variables is available; a lack of applicable deterministic techniques as well as random processes within the system. One approach to the study of such systems is model building. A model is an abstract approximation of a real world system and is created to facilitate the investigation of that system. Therefore, the results of the operation of a model are an approximation of real world events. The required closeness of fit between the simulation results and actual behavior of the real world system is dependent upon the particular application of the model.

Underlying Assumptions

In order to keep a dynamic system as suggested within reasonable limits, a certain set of assumptions and simplifications must be made. During the literature review and specifically in the section concerned with the interorganizational system variables, it was possible to extract four class variables: Communication, Interdependence, Goal Attainment and the Environmental Conditions. The system to be developed is based on these four class variables and their detected behavioral relationships through the literature review. These four class variables were grouped

into three endogenous variables (Communication, Interdependence, Goal Attainment) and one exogenous variable (Environmental Conditions). Within the realm of the dynamic model, the Environmental Conditions variable functions as the input variable, whereby Communication, Interdependence and Goal Attainment are state variables of the system. In turn, the Goal Attainment variable becomes an output variable and eventually provides again input into the model.

Before the overall connected framework of the model is presented, a number of assumptions about interorganizational processes must be stated. Some of these assumptions are new and some have been implicit in the previous part of the dissertation, for the development of a dynamic model, however, these ought to be specified.

(a) Organizations, each constituted by the aggregate of the members of an organization, perceive the pressure exerted by other organizations in various interorganizational activities. Pressure is here defined as the perception of continuous and constraining force by one organization on another to conform. Such perceptions and activities lead the organization to become more or less interdependent.

(b) Organizations operate toward common, broad goals which allows for the grouping of organizations into organization-sets.

(c) Organizations in organization-sets are sensitive toward exogenous forces and influences that require adjustments in their behavior.

(d) There is an optimal level of tolerable pressure exerted from either the organization-set itself (conceivably in the form of interdependence) and from the organization-set-external environment. This tolerance level of pressure is denoted by the constant μ. Further, μ is assumed to be sensed by the organization.

(aa) If the amount of pressure is above the level μ, then the organization is assumed to sense this fact.

(bb) If the amount of pressure is below this level μ, the organization is assumed to perceive this level as well.

(e) Pressures on other organizations can only be conveyed by acts of communication or sensed through perceptions of the environmental conditions.

In the following section, the system variables will be specified.

Specification of System Variables

It was stated that the proposed variables comprising the system are Communication, Interdependence, Goal Attainment and the Environmental Conditions. Variables describing the proposed system are denoted as follows:

Let,

C_n = the total amount of communication during the nth period given within the total system of organizations;

I_n = the pressure (as a whole) involved to perform certain activities which make the organizations within a system of organizations interdependent during the nth period;

G_n = the average perception within the system of organizations as a whole about common goals at the end of period n;

E = the influences (as a whole) from the outside for having common goals (e.g., such as pressures by the government on the system of organizations). These environmental influences, E, are understood as being constant for a particular period of time.[1]

μ = is the optimally tolerable level of pressure exerted internally by the system of organizations and/or from the external environmental of that system. One might argue that internal and external pressure differ; for simplicity's sake, these pressure levels are assumed to be identical. This situation could be conceived of slightly differently: if both internal and external pressure would differ such that a scale constant is thrown into the pressure values to account for this difference. This level μ is measured on a pressure scale.

After the basic conditions and variables have been identified, the relationships among these variables are restated in a

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[1]As an input variable and for purposes to develop the model, E has to be a constant. One can only model this situation if a particular environmental condition is a given. Obviously, E can take on any value desired and one then may examine the behavior of the model as an outcome to these conditions. E is analogous to the food supply variable of population models: when the food supply changes, i.e. no longer constant at a point in time, there can be drastic differences in the outcome of population growth or decline.

slightly modified form. This modification will make it possible to cast these relationships (a) into a potentially cybernetic format and (b) into a preliminary mathematical format.

A Cybernetic Model of an Interorganizational System

In the proposed cybernetic model, the relationships among the class variables are now expressed as follows:

(1) the interorganizational communication variable has a direct, positive relationship with the Interdependence variable and with itself;

(2) the interdependence variable varies directly and positively with the Goal Attainment variable and with itself;

(3) the goal attainment variable is directly and positively related to the Interdependence variable, the Environment variable and to itself.

It should be noted that each of the three basic relationships differs now from the earlier stated propositions with regard to the addition of "[and related] to itself." This addition makes it now possible to study the relationships over time and also in a cybernetic fashion. This becomes more obvious once these relationships are translated into a preliminary mathematical format. The following equations can be developed to correspond with the verbal propositions:

$$(1)\ C = f\ (I, C)$$

$$(2)\ I = f\ (G,\ I)$$

$$(3)\ G = f\ (I,\ E,\ G)$$

Earlier it was stated that the field of cybernetics is concerned with regulatory and control processes. Equations (1) through (3) representing our preliminary system demonstrate so far, however, merely a limited amount of control. Furthermore, this limited amount of control is only due to their system-internal relatedness, namely that equation (2) feeds conceptually into equation (1) and that equation (3) feeds into equation (2). The conditions under which such feedback should occur, are not yet specified. First, however, another aspect of control will be presented.

The optimally tolerable level of pressure, μ, plays an important part of such a control process. It was already stated that μ is related to I and E. Control aspects then enter the development of the model, when one considers the interplay between μ and I and μ and E. Depending on the perceived level of μ, certain consequences for I and E can be recognized. Specifically, this means that I and E at time period n can become > or < , or remain the same at time period n + 1. This regulatory interplay is then represented in the preliminary mathematical model as follows:

$$(1')\ C = f[(I - \mu)\ C]$$

$$(2')\ I = f\ [G,\ (\mu - I)]$$

$$(3')\ G = f\ [(\mu - I),\ (E - \mu),\ G]$$

The order of the constant μ with its corresponding state variable was chosen such that it represents the stated relationships suitably. Furthermore, equations (1'), (2') and (3') still express a very general functional relationship among the variables. In order to develop specific relationships, the following additional changes are made in these equations:

(a) The relationships among the variables within the system are arranged (through addition, subtraction and multiplication) such that they best represent the real world behavior. It should be noted, however, that through this rearranging the basic relationships are not altered, only the functional relationships are specified and emphasized.

(b) Seven parameters are introduced α, β, γ, ε, ζ, η and θ. These parameters are arbitrary symbolic constants that appear in front of the variables and mathematical expressions. The value of each parameter restricts or determines the specific form of the expression. All parameters are > 0.

(c) In order to examine the model with regard to changes over time, the subscript n is introduced with all variables. This addition now makes it possible to look at the behavior over time.

The model has now been fully expanded and can be expressed precisely through the following difference equations:

$$(1'') \quad \Delta C = \alpha(I_n - \mu) - \beta C_n$$

$$(2'') \quad \Delta I = \gamma G_n + \varepsilon (\mu - I_n)$$

$$(3'') \quad \Delta G = \zeta (\mu - I_n) + \eta (E - \mu) + \theta G_n$$

where the variables C, I, and G, the constants μ and E are ≥ 0, and the parameters α, β, γ, ε, ζ, η, and θ are > 0.

The system as expressed in equations (1''), (2'') and (3'') is essentially controlled by the various pressure influences as reflected in the interplay between μ, E and I. It can be readily seen in equation (1'') that the level of C is largely dependent on the interplay between I and μ. Assuming that C at the previous time period was equal to 0, the level for C at the current time period can only be positive if I is larger than μ. It is mathematically possible to have a value for C below 0. This, however, is theoretically impossible and the level for C in the system is thus set not to go below 0. Equation (1'') also shows that if I and μ are equal, then there is no need to communicate, assuming again that the previous level of C was 0. Each time the value for I_n is fed back into equation (1'')from equation (2'').

Equation (2'') represents the composition of the interdependence level which depends in the first part on the previous level of G which is fed into equation (2'') from equation (3''). To the value for G_n, $\varepsilon(\mu - I_n)$ is added. This latter part was constructed such that if I is larger than μ, the expression $\varepsilon (\mu - I_n)$ has a dampening effect on the value of I, i.e. it functions as a device that progressively diminishes the oscillations of I. I is always > 0.

In equation (3''), setting θG_n equal to 0, it can be seen that again the various pressure levels play an important part in the control of the system. In this case, Δ G is equal to 0, if I_n

equals E and the parameters ζ and η are equal to 1. Thus as long as $\mu < E > I$, Δ G will be a positive value. The pressure constant μ functions as a regulator within the model and operates such that goals are only attained when at least E equals μ, i.e. one condition is that environmental inputs must equal or exceed this pressure level to attain goals. G increases rapidly when the parameter θ is above 1.0 and when E is larger than μ. θ is thus to be understood as a critical parameter and exerts a decisive controlling effect on the model.

The system was written into a FORTRAN program, tested and revised for its behavior to correspond with the earlier discussion of interorganizational relationships. This program is presented in Appendix III. A sample output page can be found in Appendix IV.

A Self-Recovery Mechanism

So far the system develops no internal response to the situation when Interdependence and Goal Attainment are low. The reason I and G are low or possibly even equal to 0, is the fact that the only means of recovery is based on E, the environmental inputs. The following formulation of the model is heuristic in that it allows for the detection of basic dynamic characteristics built into the system; a more complete model, however would take into account the increased incentive to communicate. This is in part accomplished here but will also be reviewed again with regard to the discussion on stress. The self-recovery mechanism becomes operative for this model when the difference between the maximum

goal attainment level realizable and the average goal attainment level realized is great. Therefore, the communication difference equation (eq. [1'']) should be rewritten utilizing the following step mechanism:

$$(1''') \quad \Delta C = \tilde{\psi} \{\tilde{\omega} + \alpha (I_n - \mu) - \beta C_n\}$$

$$\text{where } \tilde{\omega} = \frac{\omega^* - \bar{\omega} + 1.0}{\omega^* + 1.0}$$

ω^* = maximum goal attainment level relizable,

$\bar{\omega}$ = average goal attainment level realized,

and $\tilde{\psi} > 0$.

C_{n+1} then feeds into the slightly revised integration difference equation (2'') when C_{n+1} has reached a prespecified level, $\lambda_{\tilde{\omega}}$:

$$(2''') \quad \Delta I = \gamma G_n + \varepsilon(\mu - I_n) + \Phi_{\tilde{\omega}} C_n$$

As long as the difference between the "maximum goal attainment level realizable," ω^*, and the "average goal attainment level realized," $\bar{\omega}$, is not great, I and G will remain at their present levels, assuming that I and G are both low or equal to 0. If the difference between ω^* and $\bar{\omega}$ becomes large, the communication recovery mechanism can be expected to become operative and will attempt to restore the system.

It appears to be reasonable to assume that only a partial recovery of the system will occur via the communication recovery

mechanism functioning as a system-internal response. Full recovery should only be expected with an increase of the environmental condition variable, E.

Communication and Stress

Further analysis of the cybernetic model provides additional insight into the relationships among the variables. As the constant E increases, C increases at an increasing rate. This relationship expresses an external increase with a system-internal increase and can be interpreted as external forces operating onto the system to conform with these forces. Such a set of external forces can be perceived by the organization as a form of stress.

Stress can be understood as some combination of E and μ in this situation. If one is to take seriously the point that various socialization and adjustment influences are important, explicit consideration for the communication process by which interorganizational activities are carried out may be essential. The perceived level of stress is modified by communication, i.e. communication, C, decreases stress. The computerized model was designed such that C no longer increases at a specified level, otherwise C would go to infinity. Stress (S) in the context of the cybernetic model is then defined as follows:

$$S = \Pi \left\{ \frac{K\,(E - \mu)}{C + 1.0} \right\}$$

where Π is a parameter and k is a constant, both > 0; and where the expression "C + 1.0" is a provision that C is

always > 0 and that no division by zero occurs when $C = 0$.

The only endogenous means by which stress is regulated is through communication. This formula must be used with caution: in the real world, if μ remains constant, but the values of all other variables and E go up considerably over some longer time period, it can no longer be assumed that the tolerance level μ will remain constant. Organizations, most obviously, are likely to adapt and develop a higher and appropriate tolerance level. Thus no provision for a gradual increase in μ over time is made.

CHAPTER VII

SUMMARY AND CONCLUSION

Overview

There are three basic parts to this chapter. First, the findings will be summarized. Second, a conclusion is presented and the chapter ends with suggestions and implications for future research.

Summary

This section is divided into sub-sections discussing and summarizing the three major types of analysis utilized: zero-order correlation, multiple regression and path analysis.

Analysis of Zero-Order Correlations

The inter-correlations among the model variables reveal that the endogenous variable Centralization has a strong positive correlation ($r = .34$, $p<.01$) with the variable Employee's Position. This finding is in support of the proposed relationship among these variables.

The Satisfaction index is related to the Centralization measure with a strong negative correlation ($-.68$, $p<.001$) as well as positively related to the variables Employee's Age ($r = .49$, $p<.001$) and negatively related to Educational Background ($r = -.31$, $p\leq.01$).

Furthermore, Satisfaction is slightly positively related to Communication (r = .04). Communication then is correlated to Interdependence with a coefficient of .20 ($p \leq .05$) and supports the proposed relationship among these variables. Two other variables, Face-to-Face Communication Means and the Cooperative-Competitive Environment are reported also to be highly and positively related with Interdependence (r = .41, $p < .001$ and .35, $p < .01$, respectively). Interdependence, however, is reported to have a negative relationship--differently than proposed--with the variable Goal Attainment (r = -.23, $p \leq .05$).

On the other hand, Goal Attainment correlates slightly negatively with the variables Need for Additional Services (r = -.01) and positively with Source Variability of Agency Funds (r = .15). Agency's Budget has a low and statistically not significant correlation (r = -.05) with Goal Attainment.

Multiple Regression Analysis

The proposed final model could be divided into five multiple regression equations:

(a) one equation linking Centralization with its proposed determinant (Employee's Position).

(b) one equation linking Satisfaction with its proposed determinants (Employee's Age, Educational Background, Centralization),

(c) one equation linking Communication with its proposed determinant (Satisfaction),

(d) one equation linking Interdependence with its proposed determinants (Communication, Cooperative-Competitive Environment, Face-to-Face Communication Means), and

(e) one equation linking Goal Attainment with its proposed determinants (Interdependence, Need for Additional Services, Agency's Budget, Source Variability of Agency Funds).

ad (a): Centralization was found to have a statistically significant relationship with Employee's Position ($r = R = .34$, $p<.01$).

ad (b): The multiple R for Satisfaction was a coefficient of .74 ($p<.001$). The variable Centralization entered the regression equation with a strong beta value of -.56 ($p<.001$), followed by Employee's Age with a beta of .26 ($p<.05$) and Educational Background with a statistically not significant beta of -.14.

ad (c): Communication showed a zero-order coefficient with Satisfaction of .04 which constitutes also R.

ad (d): The value for R with respect to Interdependence amounted to .52 ($p<.001$). The Cooperative-Competitive Environment variable entered the equation with a value for beta of .30 ($p\leq.05$), then Face-to-Face Communication Means entered with a strong beta of .37 ($p<.001$), followed by Communication with beta equalling .07 (no statistical significance).

ad (e): The multiple R for Goal Attainment amounts to .27 ($p\leq.05$). Interdependence showed the strongest beta of .22 ($p\leq.05$), Need for Additional Services as a contributor in the equation has a

beta of -.00, followed by Agency's Budget with a beta of -.02 and Source Variability of Agency Funds with a beta of .13.

Generally, the amount of explained variance for each of the regression equations is considered as relatively low although several contributions to the explained variance of dependent variables add only marginal support.

Path Analysis

Earlier it was pointed out that the application of path analysis to the data was incomplete due to the lack of available software. This is not to say, however, that the information provided through the path analysis is of little value. The path analytic method is useful in this form since it (a) suggests areas for future research where the model is conceptually incomplete and (b) it represents the best possible analysis of the data set.

Generally, it can be stated that six out of twelve path coefficients are statistically significant. The disturbance terms in the model vary considerably (range = .67 to .99), suggesting the model fails to explain a substantial part of the variance in its endogenous variables.

Conclusion

A study within the unified framework of interorganizational behavior leads the researcher to focus on aspects of organization that are overlooked many times when focusing solely on behavior within the organization. Comparing inter- and intraorganizational

behavior provides additional insight into the factors and constraints that shape organizational behavior.

Theoretical Perspectives

The study, the setting, and the data can to some extent be seen within the framework of organizational interdependence. Societal models developed by Tocqueville (1945) and Kornhauser (1959) emphasize the importance of autonomous and competing organizations for viable democratic processes. In theory, these models were designed on the assumption that various processes of interdependence, conflict and cooperation exist in social reality. In the past, sociological theory has been criticized to have viewed social processes in a too static fashion and theorists were accused to have neglected the importance of such notions as interdependence and conflict in their conceptualizations (Wrong, 1961; Coser, 1956; Dahrendorf, 1958). The study of interorganizational activities is one area that appropriately studies and emphasizes the notion of interdependence.

A second theoretical area with the emphasis on the notion of exchange, was found useful to some extent in ordering the data and potentially locating new areas of and designs for research and investigation. Social exchange processes have been investigated by Homans (1961) Thibaut and Kelley (1967), Blau (1964), Dahlström (1966), Sahlins (1965, 1968) and Burns (1973), among others. Homans, Thibaut and Kelley, Dahlström, and partially Blau derived their formulations of exchange theory from the economic model of exchange.

A third theoretical perspective, Structural-Functionalism, appears to be the most applicable theoretical framework within which to view this study. This distinct approach to the study of systems is the combination of structuralism and functionalism. This approach stands in contrast to the General Systems Theory and the Cybernetic Theory. The latter two approaches concentrate on such terms as whole, parts, relationships, interdependency, and control of these parts to each other and on the ontological goal that through ordering and organizing these parts a whole persists that has become more than the sum of its parts.

The Structural-Functional systems approach uses the same definition for a system that is used by General Systems theory, namely a "set of elements in interaction (von Bertalanffy, 1956)," or "a set of elements together with relationships between the objects and between their attributes (Hall & Fagen, 1956)," or "a whole that is composed of many parts. . . . Any phenomenon that can be described by a large number of variables (Cherry, 1963)." Within the Structural-Functional systems approach these definitions of the concept of a system, the discussion of its environment as well as of its boundaries are corresponding with General Systems theory. The primary concern of Structural-Functional Systems Theory, however, is with the notion of maintenance and regulation of the system (Wright, 1960; Dexter & White, 1964; Merton, 1957; de Fleur, 1966).

A number of Structural-Functional systems theorists view a system under the assumption that a given (to a large extent existing

and agreed upon) system has certain survival-conditioned factors built in. Survival-conditioned factors are here understood as the retention of substantial features through which the system is recognizable and identifiable as such. Although highly differing structural patterns may be ascertained in the analysis of a system, according to this approach it is ultimately possible to generate and differentiate a set of vital functions. Such functions have to be performed in order to form and, obviously, to maintain a system (Levy, 1952, p. 149; Wiley, 1942). In this sense, functions are here understood as objective consequences of action patterns pertaining to the system in which they occur (Prakke, Dröge, Lerg, & Schmolke, 1968). With regard to actions of social service agencies, they were identified in this study as (a) direct treatment/service delivery, (b) planning innovation, (c) interpersonal relations, and (d) referral activities. Actions viewed in this process may be of a functional as well as of a dysfunctional nature, or--what might be of more importance--they may have simultaneously functional and dysfunctional consequences. Merton (1957, p. 51) defines [similarly defined with Levy (1952, p. 57)] functions as "those observed consequences which make for the adaption or adjustment of a given system; and dysfunctions [as] . . . those observed consequences which lessen the adaption or adjustment of the system." A further distinguishable characteristic of the Structural-Functional Systems Theory is based on the assumption that actions are either manifest, i.e., intended and recognizable,

or latent, i.e., neither intended nor recognizable (Merton, 1957, p. 51; similarly Levy, 1952, p. 83).

Whereas functions are the consequences of action patterns within a system, structures in this sense relate to action patterns as well as to resulting institutions of the system. Parsons (1954, p. 219) presents one definition of structure that seems most applicable to a Structural-Functional approach: Structure "does not refer to any ontological stability in phenomena but only to relative stability to sufficiently stable uniformities in the results of underlying processes so that their constancy within certain limits is a workable pragmatic assumption." Nevertheless, within given systems functions are performed by various structures which does not imply a mono-causal relationship and constitutes a major criticism in the works of Parsons. A single function can be accomplished by a complex combination of structures as well as that existing structures may have functional as well as dysfunctional consequences for a multitude of performances. Critically, one might add that possibly on a highly abstract level specific functions or variations of functions are latent when analyzing the system. Communication scientists, therefore, developed a number of taxonomies of system-maintaining functions which are more or less described as being system-relevant (Lasswell, 1960). This school of thought attempts to develop a logical categorization of such functions, hoping that eventually a list of system-relevant and thus system-determining functions will result (Ronneberger, 1964; Wright, 1960).

One might term such an attempt as "deductive functionalism": The designing of lists with functional requirements has to result, consequently, in requirements of corresponding functional structures which can be met (fulfilled) by such functions. It is this writer's belief that this point of view of Structural-Functional Systems Theory with emphasis on maintenance of a given system gives priority to the term structure rather than function.

The concept "system" in terms of Structural-Functional Systems Theory according to Merton (1957), Wright (1960), Dexter and White (1964) and de Fleur (1966) asks by definition, namely the emphasis on maintenance and regulation of the system, primarily for the determining of structures and those that need to be determined. Only then it asks for functions which are necessary for the maintenance of structure as well as for environmental conditions under which such a process occurs (Matejko, 1967). Also Luhmann (1967, p. 616) states that under this approach system-internal performances become the focus of attention at the cost of other system/environment relations. Furthermore he states that Structural-Functional analysis orients itself with respect to static relations, the survival of the system, the necessity of constant adaption and/or the relations between structure and functions as long as they serve the maintenance of the system.

Another criticism of structural-functionalism is the notion that this theory underlies functional teleology (Levy, 1952, p. 52). Functional teleology shows a dominating tendency to interpret conditions or patterns of actions as functional

requirements necessary for the survival of the system. This notion, however, stands in contrast to the argument that origin and the existence of structures cannot be explained by stating that certain recognizable structures perform important functions. Systems usually have other alternative possibilities through which certain performances may be accomplished by using other structures. The idea of functionalism, therefore, should always deserve preference while analyzing a system using the Structural-Functional approach.

Throughout the literature ideological criticism can be found that Structural-Functional Systems Theory implies conservatism (Dahrendorf, 1961, p. 104) and would lead to the rationalization and/or toward the strengthening of the status quo of systems. Two important distinctions need to be made with regard to such arguments:

(1) Such criticism confuses analysis with the evaluation.

(2) Such criticism may in a specific research situation not consider that only the maintenance or strengthening of the status quo is desired. When the functioning of existing, given structures of systems are to be analyzed, then one cannot infer from the results of such an analysis that the existence of a system in the found structure(s) may be valued as relatively good or bad.

According to the above definition with the apparent emphasis on structure, the notion of teleology, the argument of constituting deductive functionalism, and the criticism of implying conservatism

may easily lead to the distortion of empirical realities. As an interorganizational example one might look at the American railroad companies in the 1930's. Since railroad executives considered themselves to be in the railroad business, conceptual emphasis was put on structure, i.e. the railroad system or network. If there would have been emphasis on functions of the railroad companies, one would have realized that these companies were not in the railroad business but in the transportation business. It has been said many times that the failure to analyze this situation correctly led to the deplorable state or bankruptcy of today's railroad companies. In the light of this study of social service agencies, a plea is made to view the Structural-Functional approach with major emphasis on the functions to be analyzed; the definitional framework of Structural-Functional Systems Theory consequently should be restated in terms of functions and, possibly, the entire theoretical approach should be renamed as functional-structural system approach. The functional-structural system analyst ought to view a system under the following four aspects (modified from Merton [1957]):

(1) the need of a function for the survival and maintenance of a system;

(2) an account through which these system requirements are met;

(3) the lookout for alternative functions; and

(4) an account of the structure for which and through which a function exists and is fulfilled.

The above four safeguards are most obviously of crucial importance for the social service field. The major theoretical perspective that is proposed here with its emphasis on systems, functions and structure demonstrates especial high utility for the activities of social service organizations. This theoretical approach suggests scientific utility since falsifiability, usefulness, precision and parsimony is empirically testable. In the following discussion section, this theoretical perspective is viewed in the light of this study and certain recommendations are made.

Discussion

A high amount of inter-agency communication takes place in the Lansing metropolitan area studied and certain organizations emerge who are pivotal in their effectiveness: The Ingham County Health Department, the Ingham County Department of Social Services, and the Michigan Employment Security Commission are three. Currently, however, many agencies compete with one another for the same funding dollar. In addition, an attitude of protectiveness for the own agency and jealousy toward other agencies was frequently encountered by research team members in the field. As social problems increase in complexity, inter-agency cooperation becomes more difficult, and directors must spend more and more time keeping their own houses in order. These attitudes are understandable especially in the light of economic problems, but are not conducive to efficiently getting help to those who need it. Efforts have

been made in both research and practice toward bridging communication gaps and simplifying the tasks of the helping professional.

A study of a successful effort at multiple-agency planning services (Aram and Stratton, 1974) found that convergence of interests and emergence in leadership roles of key persons from agencies with more immediate, more recent, and more numerous goals were factors most central to successful collaboration.

Merely selection of effective leaders, however, will not insure success. Constant input and feedback from sources close to the people must be maintained for the system to remain viable. Largely as a result of the federal enabling legislation of 1963, community mental health centers have often occupied a central position in the constellation of care-giving agencies. Despite widespread agreement about the need for integration of service providers, two divergent models have characterized the involvement of community mental health units (Schulberg and Baker, 1970). The medical model presumes a mental health center under medical direction which has responsibility for and even supervision of the other mental health services which are seen basically as support services. Foley and Sanders (1966) schematically represent this arrangement by a circle of service providing agencies with a community mental health center at the hub.

The alternative human services model regards mental health as one of many community resources designed to serve the needs of the population. In this case, the community mental health center

works jointly with multi-problem clients, cooperates in developing new programs, and attempts to minimize competition.

Because the multi-problem client is the rule rather than the exception, considerable thought has gone into the development of computerized record-keeping. Efforts similar to those in Chattanooga, Tennessee, are underway in several U.S. cities yet many smaller organizations will not reap their benefits due to lack of funds and/or expertise. Redundant records will continue to be kept. To improve communication and coordination it is recommended that terminals be made accessible to community agencies for purposes of case preparation and referral. It is also suggested that individual privacy and computer records need not be mutually exclusive.

The dangers raised by the storage of confidential information in data banks revolve around technical problems and ethical issues: who should have access to what kinds of information about what with what guarantees of accuracy? Once such parameters are decided, how can the system be provided with adequate physical security (Brooks, 1974)?

In this area as in many others, technological problems have yielded to solution faster than human problems. Baruch (1972) and Feistel (1973) have proposed a wide variety of methods for data collection, processing, and storage such as enciphering all materials for data banks and authenticating the legitimate origin of any command to the computer. Several proposals for a national registry of computerized data banks (Westin, 1971;

Greenberger, 1971) have been advanced to develop mechanisms for solving problems in the security areas.

With regard to adequate safe-guards to prevent misuse of the data by individuals or organizations possessing it, Nagel (1952) states,

> The crucial question is not whether control of social transactions will be further centralized. The crucial question is whether despite such a movement, freedom of inquiry, freedom of communication and freedom to participate actively in decisions affecting our lives will be preserved and enlarged. It is good to be jealous of these rights; they are the substance of a liberal society. The probable expansion of automatic technology does raise serious problems concerning them. But it also provides fresh opportunities for the exercise of creative ingenuity and extraordinary wisdom in dealing with human affairs.

In conclusion, further research is not recommended. This study provides policy makers with sufficient information for directed distribution of social service funds as well as for the restructuring and organization of communication and coordination among social service agencies in the Lansing metropolitan area. Consolidation and application of current technology as well as relaxation, not in the service area but in the communication barriers dividing person from person, group from group, are recommended. Consistent checks on information flow by network analytic techniques could assess the impact of a new agency or program. Furthermore, hypotheses could be formulated about the expected effect of program innovation on social service delivery and data collected to verify the hypotheses (Nelson, 1974) for continued organizational and structural renewal. In a relatively short time span, it would be possible to derive the kind of information most

useful to helping social service professionals in a decision-making capacity for needed interorganizational activities.

Research Implications

It is not a clear-cut task to recommend additional research in other interorganizational settings when the variables discussed in this study are relatively untested in similar research settings. The field of interorganizational research, in many respects, is still in its infancy, thus no research tradition per se exists.

This study investigated intraorganizational goal attainment as a dependent variable. In terms of the described overall framework, it would be useful to know how various "organization-set"-goals, i.e. truly interorganizational goals, relate to the independent variables. Such measures are difficult to develop, many times they appear ambiguous or at such a high theoretical level that the linking with data from a much lower level appear no longer very meaningful.

There are some questions whether the dependent variable Goal Attainment was operationalized in the appropriate fashion. Was the combination of elements comprising the Goal Attainment index correct? Should various elements be weighted differentially? Further studies of interorganizational activities may have to be conducted in order to provide answers to these questions.

Further research should investigate for example the effects of various interagency competition and conflicts onto the entire interorganizational system. This again suggests a study over at least two points in time.

Considering various cooperation and coordination efforts, what steps are administrators to take to stimulate increased cooperation among interdependent groups? What types of interactions are to be sought out? What are the obstacles to secure higher levels of cooperation?

Future research might also be designed such that some information is gained on how interorganizational activities relate to a larger societal setting. How do interorganizational activities as reported in this study relate to the functioning of social activities in a neighborhood or an entire city? Will increased interorganizational activities of the appropriate agencies be instrumental in alleviating social problems in that neighborhood or city? Such studies might very well bridge the gap between microscopic organizational and macroscopic institutional levels of analysis.

As became evident in the discussion of the cybernetic model of interorganizational activities, future studies might also be concerned with studying <u>feedback</u> in order to attain goals. In this vein, one should also point out the need for time series analyses and mathematical models reflective of time-variant processes.

Little if anything is known about the "rate of return" or reward for individuals or agency to engage in interorganizational activities. Although exchange theory is in part based on the notion of reward, little is known what these rewards are like. If such rewards could be conceptually isolated within the framework

of an empirical study, this would shed further light on the problem of specifying interorganizational goals.

More information should be available about organization-sets within different classes of organizations. Is there a difference between social service organizations and cultural, political, civil defense, industrial, military and other organizations?

Future research might also be conducted to investigate the underlying dimensions for the occurrence of group and coalition formation. Lawler and Youngs (1975) made an initial attempt at such an issue by developing a multi-causal model for explaining coalition formation.

Networks, role relationships, and interlocking role obligations have been largely uninvestigated in interorganizational settings.

Although the work by Thompson and McEwen (1958), Litwak and Hylton (1962), and Guetzkow (1966) and others is useful in identifying types of organizational interactions, little is known so far about a classification scheme of interorganizational activities and relations. Few recommendations can be made at present to administrators of social service agencies about types of interactions, which steps to take, what obstacles must be encountered and have to be overcome in order to stimulate increased cooperation among groups or agencies to achieve a joint goal.

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APPENDICES

APPENDIX I

INTERAGENCY COMMUNICATION QUESTIONNAIRES

INTERAGENCY COMMUNICATION

QUESTIONNAIRE

The task of identifying and meeting human needs is a vital concern in society today. In recent years this compelling need has given rise to a proliferation of social welfare agencies. In this expanding field, issues of and strategies for interagency cooperation and coordination of services have become important.

The National Science Foundation, recognizing the need for exploratory research in this area, has sponsored this study of inter-organizational coordination of social services in the Lansing metropolitan area. The study intends to chart the extent and types of interagency communication. Our aim is highly practical--to improve the overall quality of social services in our community, not by evaluation of agency effectiveness but rather by focusing on service delivery and coordination.

All of the items on this questionnaire are self-explanatory. They are intended to elicit information concerning a personal description of you and your job, a description of your agency, and your communication patterns with other agencies. The information you give will be entirely anonymous and confidential; no one in your agency will ever see any of your answers. Only the researchers will have access to the data and they will treat it in an aggregate and anonymously coded form. Consequently, we request that you be as thorough and honest as possible in your replies to these questions. Based on our pre-testing, we estimate it will take you roughly twenty minutes to complete this questionnaire. After the completion of this study, copies of the report may be obtained through your agency director. We thank you in advance for your help and participation in this important endeavor.

CONFIDENTIAL

1. When was your agency founded? (write in year)

_____

2. What is the total number of your agency's full-time equivalent staff in each of the following categories? (write in numbers)

_____ professional staff

_____ paid paraprofessional staff

_____ clerical staff

_____ volunteer staff

3. In your best estimate, what is the educational background of your staff? (please indicate percentages)

_____% some high school

_____% high school diploma

_____% some college

_____% bachelor's degree (B.A.; B.S.)

_____% some graduate study

_____% advanced degree (M.A.; M.S.W.; Ph.D.; M.D.)

TOTAL: 100%

4. In your best estimate, the largest group of your employees falls between the ages of: (check one)

_____ below 20

_____ 20-24

_____ 25-29

_____ 30-34

_____ 35-39

_____ 40 and above

5. How many staff members have left your agency in the past year? (write in number of persons)

_____

6. All things considered, what size do you expect your total staff to be one year from now? (write in number of persons)

_____

7. What is your total annual operating budget?

$_____

8. How much of your funding comes from each of the following sources? (please indicate percentages)

_____% from local government

_____% from state government

_____% from federal government

_____% from private fundraising

_____% from parent organization

_____% from community chest (e.g., United Way)

_____% from other source (please specify)

TOTAL: 100%

9. Which of the following best describes your client fee schedule? (check one)

_____ flat fee

_____ sliding scale

_____ no charge

10. What is the total number of individual clients your agency served during the past fiscal year? (write in number of clients)

_____

11. What percentages of your agency's clients fall into each of the following ethnic groups? (please indicate percentages)

_____% Black

_____% Chicano

_____% Native American

_____% White

_____% Other (please specify)

12. What percentage of your clients falls into each of the following income brackets? (please indicate percentages)

_____% less than $4500

_____% $4501-7500

_____% $7501-10,000

_____% $10,001-12,500

_____% more than 12,500

13. What are the major services that your agency offers? (place a single check by all services offered, and a double check by the one most important service offered by your agency)

_____ information/referrals

_____ coordination/planning

_____ direct service/treatment

_____ research/program evaluation

14. What is the number of new programs your agency has started in the past year? (write in number)

_____

15. Please list the names of these new programs.

16. Is there a referral directory available to your staff members?

_____ yes

_____ no

If your answer is yes, which directory(s) is available to your staff members? (please list names)

CONFIDENTIAL

1. What is your age? _____ years

2. What is your sex? (check one)

_____ female

_____ male

3. How much education have you had? (check the highest educational level you have completed)

_____ some high school

_____ high school diploma

_____ some college

_____ bachelor's degree (B.A., B.S.)

_____ some graduate study

_____ advanced degree (M.A., M.S.W., Ph.D., M.D.)

4. How would you best describe your position in your agency? (check the one term that best describes your job)

_____ administrator

_____ supervisor

_____ staff worker

_____ clerical

5. How long have you worked in this agency? (write in number of years and months)

_____ years _____ months

6. How long have you worked in the social service field in the Lansing area? (write in number of years and months)

_____ years _____ months

7. Is there an orientation process in your agency which includes acquainting new employees with services offered by other agencies? (check one)

_____ yes

_____ no

8. Have you received a formal orientation to services offered by other agencies? (check one)

_____ yes

_____ no

9. To what extent do you consider your job to be routine? (check one)

_____ always routine

_____ frequently routine

_____ occasionally routine

_____ rarely routine

_____ never routine

10. To what extent do you consider your job to be prestigious? (check one)

_____ extremely prestigious

_____ quite prestigious

_____ somewhat prestigious

_____ slightly prestigious

_____ not at all prestigious

11. In general, how well do you get along with your co-workers? (check one)

_____ extremely well

_____ rather well

_____ neither well nor poorly

_____ rather poorly

_____ extremely poorly

12. "If I have a <u>new</u> idea I feel it will be heard". (Check the one response which best describes your opinion)

_____ strongly agree

_____ agree

_____ no opinion

_____ disagree

_____ strongly disagree

13. "If I have a <u>good</u> idea, it will generally be implemented". (Check the one response which best describes your opinion)

_____ strongly agree

_____ agree

_____ no opinion

_____ disagree

_____ strongly disagree

14. "If I have a legitimate complaint, I'm usually listened to". (check the one response which best describes your opinion)

_____ strongly agree

_____ agree

_____ no opinion

_____ disagree

_____ strongly disagree

15. "I feel I have a fair share in the decision-making process in this agency". (check the one response which best describes your opinion)

_____ strongly agree

_____ agree

_____ no opinion

_____ disagree

_____ strongly disagree

IN THE NEXT TWO QUESTIONS WE WOULD LIKE TO OBTAIN YOUR IMPRESSIONS OF THE GENERAL ENVIRONMENT OF SOCIAL SERVICE DELIVERY IN THE LANSING AREA:

16. In general, social service agencies in the Lansing area seem to be: (check one)

_____ highly competitive

_____ somewhat competitive

_____ neither competitive nor cooperative

_____ somewhat cooperative

_____ highly cooperative

17. In general, social service agencies in the Lansing area seem to be: (check one)

_____ highly interdependent

_____ somewhat interdependent

_____ neither interdependent nor independent

_____ somewhat independent

_____ highly independent

18. In general, how much of your communication with other agencies is by each of the following means? (please indicate percentages)

_____% by memo/letters

_____% by face-to-face contacts

_____% by telephone

_____% by newsletters/bulletins

TOTAL: 100%

IN THE FOLLOWING QUESTIONS WE WOULD LIKE TO OBTAIN A MEASURE OF HOW ADEQUATELY RESOURCE NEEDS ARE CURRENTLY BEING MET:

19. To what extent does your agency need more of each of the following resources? (place a checkmark in the appripriate column for each resource listed)

	no need at all	some need	great need
clients			
staff			
funds			
equipment			
expertise in treatment "techniques"			

20. Since many clients bring multi-faceted problems to social agencies, what percentage of your clients require additional services in each of the following problem area: (please indicate percentages; the total need not equal 100%)

_____% employment

_____% drug and/or alcohol

_____% family services

_____% legal assistance

_____% physically handicapped

_____% mental health

_____% physical health

PERSONAL CONTACT CHECKLIST INSTRUCTIONS

1. On the attached checklist are spaces for information about your communication with members of other Lansing area agencies. You will be asked: how frequently, in general, have you communicated with members of the listed agencies during the last year, how important is this communication, what is the general function that your contact serves?

2. Communication among members of social service organizations typically falls into three main categories: (a) direct treatment and social service delivery, (b) planning and innovation, and (c) interpersonal relations. On the following pages you will find these three categories listed along with a short description of each.

3. "Communication" includes face-to-face conversation, formal or informal meetings, memos, letters, intercom, telephone conversations, etc. with any member, including volunteer and clerical personnel. (a) First, you will be asked to read the name of the first listed agency--in our example below--JOHN DOE FOUNDATION (05). If you have never contacted this agency during the last year, place an "X" into the first column labeled "NEVER CONTACTED AT ALL". (b) If you have communicated with this agency about "DIRECT TREATMENT/SERVICE DELIVERY," then ask yourself how often you have communicated with this agency according to the following scheme: (1) once a day or more often, (2) once or twice a week, (3) once or twice a month, (4) once or twice every three months. Once you have made your decision, place an "X" in the appropriate cell in the section labeled DIRECT TREATMENT/SERVICE DELIVERY. (c) Next, please ask yourself how important you consider this communication to be. To answer this question, place a number from 1 to 5 in the "IMPORTANCE" column; note that a "1" indicates 'low importance' and a "5" indicates 'high importance'. (d) Then go to the next section, PLANNING/INNOVATION, and repeat the above steps, etc. Your communication with an agency may include all three topic areas, any two, only one or none at all.

4. Below is an example how to do this part of the questionnaire. In each case, use the best possible answer: THERE IS NO SINGLE CORRECT ANSWER TO ANY QUESTION.

EXAMPLE:

WITH WHICH ORGANIZATIONS DO YOU COMMUNICATE ABOUT . . .	NEVER CONTACTED AT ALL	With which organization do you communicate about ... DIRECT TREATMENT/SERVICE DELIVERY: (e.g., casework consultation, referrals, information, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)	With which organization do you communicate about ... PLANNING/INNOVATION: (e.g., new programs, in-service training joint activities, outreach efforts, budgeting, PR, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)	With which organization do you communicate about ... INTERPERSONAL RELATIONS: (e.g., maintaining contacts, purely social conversations, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)
JOHN DOE FOUNDATION (05)			X			3			X		1					
MAIN STREET CLINIC (57)		X				5									X	4

WITH WHICH ORGANIZATIONS DO YOU COMMUNICATE ABOUT . . .	NEVER CONTACTED AT ALL	(e.g., [illegible] referrals, information, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)	(e.g., new programs, in service training, joint activities, outreach efforts, budgeting, PR, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)	(e.g., networking contacts, purely social conversations, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)
YOUTH DEVELOPMENT CORPORATION (05)																
MICHIGAN ECONOMIC OPPORTUNITY OFFICE (15)																
OPERATION MAINSTREAM (09)																
CAREER OPPORTUNITY CENTER (01)																
GOODWILL INDUSTRIES (07)																
HUMAN RESOURCES DEVELOPMENT INSTITUTE, AFL-CIO (13)																
MICHIGAN EMPLOYMENT SECURITY COMMISSION-MANPOWER DIVISION (06)																
MICHIGAN EMPLOYMENT SECURITY COMMISSION-UNEMPLOYMENT DIV. (02)																
VOCATIONAL REHABILITATION, DEPT. OF SOCIAL SERVICES (11)																
HUMAN RIGHTS CENTER (08)																
PINE LODGE HALFWAY HOUSE (04)																
GREATER LANSING LEGAL AID (03)																
JUVENILE HOME-INGHAM COUNTY (10)																
LANSING POLICE DEPARTMENT (12)																
MICHIGAN DEPARTMENT OF [illegible] (14)																

WITH WHICH ORGANIZATIONS DO YOU COMMUNICATE ABOUT . . .	NEVER CONTACTED AT ALL	(e.g., casework consultation, referrals, information, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)	TRAINING/INNOVATION: (e.g., new programs, in-service training, joint activities, outreach efforts, budgeting, PR, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)	PURELY SOCIAL RELATIONS: (e.g., maintaining contacts, purely social conversations, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)
YOUTH DEVELOPMENT CORPORATION(05)																
MICHIGAN ECONOMIC OPPORTUNITY OFFICE (15)																
OPERATION MAINSTREAM (09)																
CAREER OPPORTUNITY CENTER (01)																
GOODWILL INDUSTRIES (07)																
HUMAN RESOURCES DEVELOPMENT INSTITUTE, AFL-CIO (13)																
MICHIGAN EMPLOYMENT SECURITY COMMISSION-MANPOWER DIVISION (06)																
MICHIGAN EMPLOYMENT SECURITY COMMISSION-UNEMPLOYMENT DIV. (02)																
VOCATIONAL REHABILITATION, DEPT. OF SOCIAL SERVICES (11)																
HUMAN RIGHTS CENTER (08)																
PINE LODGE HALFWAY HOUSE (04)																
GREATER LANSING LEGAL AID (03)																
JUVENILE HOME-INGHAM COUNTY (10)																
LANSING POLICE DEPARTMENT (12)																
MICHIGAN DEPARTMENT OF CORRECTIONS (14)																

WITH WHICH ORGANIZATIONS DO YOU COMMUNICATE ABOUT . . .	NEVER CONTACTED AT ALL	With which organization do you communicate about ... DIRECT TREATMENT/SERVICE DELIVERY: (e.g., casework consultation, referrals, information, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)	With which organization do you communicate about ... PLANNING/INNOVATION: (e.g., new programs, in-service training joint activities, outreach efforts, budgeting, PR, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)	With which organization do you communicate about ... INTERPERSONAL RELATIONS: (e.g., maintaining contacts, purely social conversations, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)
ACCESS CENTER FOR HUMAN REPRODUCTIVE HEALTH (43)																	
GENETICS COUNSELING CENTER MICHIGAN STATE UNIVERSITY (31)																	
INGHAM MEDICAL HOSPITAL HYPERTENSION CLINIC (36)																	
CRISTO REY ADULT CLINIC (45)																	
LANSING REG. INTERAGENCY COORD. COMM.FOR DEVELP.DISABILIT. (33)																	
MODEL CITIES HEALTH SERVICES(39)																	
GREATER LANSING VISITING NURSES ASSOCIATION (41)																	
INGHAM HEALTH DEPARTMENT (44)																	
AMERICAN NATIONAL RED CROSS, MID-MICHIGAN CHAPTER (35)																	
SPARROW HOSPITAL (32)																	
CAPITAL AREA COMPREHENSIVE HEALTH PLANNING ASSOC. (37)																	
ALCOHOL PREVENTION & TREATMENT SERVICES, INGHAM COUNTY (38)																	
HOUSE OF COMMONS HALFWAY HOUSE (40)																	
SOL DE AZTLAN (42)																	
MAINTENANCE AND DETOXICATION CLINIC (34)																	

WITH WHICH ORGANIZATIONS DO YOU COMMUNICATE ABOUT . . .	NEVER CONTACTED AT ALL	With which organization do you communicate about ... DIRECT TREATMENT/SERVICE DELIVERY: (e.g., casework consultation, referrals, information, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)	With which organization do you communicate about ... PLANNING/INNOVATION: (e.g., new programs, in-service training joint activities, outreach efforts, budgeting, PR, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)	With which organization do you communicate about ... INTERPERSONAL RELATIONS: (e.g., maintaining contacts, purely social conversations, etc.) HOW OFTEN? (Check one column) ONCE A DAY OR MORE	ONCE OR TWICE A WEEK	ONCE OR TWICE A MONTH	ONCE OR TWICE EVERY THREE MONTHS	HOW IMPORTANT IS THIS COMMUNICATION? IMPORTANCE 1 2 3 4 5 low high (Enter the appropriate number)
ALANO CLUB (49)																	
COMPREHENSIVE DRUG TREATMENT PROGRAMS (60)																	
ST. LAWRENCE ALCOHOL UNIT (55)																	
MICHIGAN ASSOCIATION FOR RETARDED CHILDREN & ADULTS (46)																	
RECOVERY, INC. (53)																	
DRUG EDUCATION CENTER (48)																	
OPEN DOOR CRISIS CENTER (57)																	
ST. VINCENT'S HOME FOR CHILDREN (59)																	
MICHIGAN STATE UNIVERSITY PSYCHIATRIC SERVICES (51)																	
MICHIGAN STATE UNIVERSITY PSYCHOLOGICAL CLINIC (47)																	
RIVERSIDE STATE HOSPITAL (IONIA) (58)																	
ST. LAWRENCE COMMUNITY MENTAL HEALTH CENTER (50)																	
MICHIGAN DEPARTMENT OF MENTAL HEALTH (54)																	
COMMUNITY MENTAL HEALTH PROGRAMS FOR THE RETARDED (52)																	
INGHAM MEDICAL HOSPITAL COMMUNITY MENTAL HEALTH CENTER(56)																	

PLEASE READ THE FOLLOWING INSTRUCTIONS COMPLETELY
BEFORE BEGINNING THIS TASK

Enclosed in the questionnaire envelope you will find a deck of computer cards of various colors. Each of the light tan cards has the name of a Lansing area agency at the top of it. Please sort these agencies into as many or as few groups as you wish on the basis on how similar you perceive them to be.

If there are agencies which, by there names, are unknown to you, set them aside into a separate pile.

When you are satisfied with the similarity groupings you have made:

1) Gather up the pile of "unknowns" and place them behind the yellow card marked "UNKNOWN".

2) Gather up the sorted groups, one by one, placing each group behind a card marked "DIVIDER". If you find you have too few divider cards, please indicate this to the interviewer, who will supply you with extras, or improvise make-shift dividers of your own.

3) Re-assemble the deck, now in grouped form, secure it with the rubber band, and return it to the envelope.

*****

Thank you very much for completing this questionnaire. We are very interested in the opinions, ideas and reactions of practitioners in the field to the problem of coordination and delivery of social services. Please use the space below to express any thoughts or questions you may have.

APPENDIX II

DESCRIPTIVE STATISTICS OF INDEPENDENT VARIABLES

TABLE 3A.--Descriptive Statistics for the Variables Comprising the Goal Attainment Index.

Variables	Mean	S.D.	Range
Need for Clients[a]	1.57	.51	1.80
Need for Staff[b]	2.17	.47	2.00
Need for Funds[b]	2.44	.47	2.00
Need for Equipment[b]	2.07	.45	2.00
Need for Treatment Expertise[b]	1.94	.47	2.20

[a] N = 67

[b] N = 68

TABLE 11A.--Descriptive Statistics for the Variables Comprising the Centralization Index.[a]

Variables	Mean	S.D.	Range
New Idea - Being Heard[a]	4.24	.42	1.7
Good Idea - Being Implemented[a]	3.86	.53	3.0
Complaint - Being Listened To[a]	4.22	.40	2.0
Fair Share in Decision-Making[b]	4.37	.33	1.5

[a] N = 69

[b] N = 68

TABLE 13A.--Descriptive Statistics for the Variables Comprising the Satisfaction Index.

Variables	Mean	S.D.	Range
Routineness of Job[a]	3.44	.64	4
Prestigiousness of Job[a]	2.96	.77	4
Getting Along on Job[b]	4.37	.33	2

[a] N = 69

[b] N = 68

TABLE 18A.--Descriptive Statistics for the Variables Comprising the Need for Additional Services Index.[a]

Variables	Mean	S.D.	Range
Need for Employment	34.20	28.75	100
Need for Drub/Alcohol	19.22	22.55	100
Need for Family Services	29.09	20.24	96
Need for Legal Assistance	17.49	21.27	100
Need for Physically Handicapped	18.31	25.30	100
Need for Mental Health	26.43	21.34	97
Need for Physical Health	29.01	24.90	100

[a]N = 66 for each variable.

TABLE 20A.--Descriptive Statistics for the Variables Comprising the Source Variability of Agency Funds Index.

Variables	Mean	S.D.	Range	N
Local Government Funds	8.87	20.98	90	61
State Government Funds	18.26	31.35	90	61
Federal Government Funds	19.95	31.01	97	62
Private Fund Raising	15.21	27.92	90	63
Parent Organization Funds	6.26	21.42	90	62
Community Chest Funds	8.91	24.72	90	63
Other Funds	9.56	23.31	90	59

APPENDIX III

A CYBERNETIC COMPUTERIZED MODEL EXEMPLIFYING INTERORGANIZATIONAL ACTIVITIES

```
      PROGRAM MODEL(INPUT,OUTPUT)
      DIMENSION C(2),XI(2),G(2)
      DO 1 I=1,2
      C(I)=XI(I)=G(I)=0
    1 CONTINUE
   10 READ 2,NIT,C(1),XI(1),G(1),ALPHA,BETA,GAMMA,DELTA,EPSILON,ZETA,ETA
     +,THETA,XMU,ENVP
      IF(NIT.LT.0)GO TO 999
    2 FORMAT(I3,13F3.0)
      PRINT 4,NIT
    4 FORMAT(1H1,*THIS SET OF TRAJECTORIES WILL HAVE*I4* TIME PERIODS*)
      PRINT 5,C(1),XI(1),G(1),ALPHA,BETA,GAMMA,DELTA,EPSILON,ZETA,ETA,
     +THETA,XMU,ENVP
    5 FORMAT(1H-,*THE PARAMATERS ARE C-0=*F5.1* I-0=*F5.1* G-0=*F5.1* AL
     +PHA=*F5.1* BETA=*F5.1* GAMMA=*F5.1* DELTA=*F5.1/1H-,*EPSILON=*F5.1
     +* ZETA=*F5.1* ETA=*F5.1* THETA=*F5.1* XMU=*F5.1* ENVR=*F5.1)
      PRINT 6
    6 FORMAT(*-*,*  TIME                              C                   I
     +                 G*)
      I=0
      PRINT 7,I,C(1),XI(1),G(1)
    7 FORMAT(1H0,I6,4X,3F20.4)
      DO 99 I=1,NIT
C     COMPUTE NEW VALUES
      C(2)=ALPHA*XI(1)+BETA*G(1)+GAMMA*ENVP
      IF (C(2) - 12000.0) 22,21,21
   21 C(2)=12000.0
   22 XI(2)=DELTA*G(1)+EPSILON*(XMU-XI(1))
      G(2)=ZETA*(XMU-XI(1))+ETA*(ENVP-XMU)+THETA*G(1)
      IF(C(2).LT.0.0)C(2)=0.0
      IF(XI(2).LT.0.0)XI(2)=0.0
      IF(G(2).LT.0.0)G(2)=0.0
C     PRINT OUT NEW VALUES
      PRINT 7,I,C(2),XI(2),G(2)
C     MOVE NEW VALUES TO OLD
      C(1)=C(2) + C(1)
      XI(1)=XI(2) + XI(1)
      G(1)=G(2) + G(1)
      IF(G(1).EQ.0.0.AND.XI(1).EQ.0.0.AND.G(1).EQ.0.0)GO TO 98
   99 CONTINUE
      PRINT 8
    8 FORMAT(1H ,*END OF THIS TRAJECTORY*)
      GO TO 10
   98 PRINT 9
    9 FORMAT(1H ,*SINCE ALL VALUES ARE ZERO, TRAJECTORY WILL TERMINATE*)
      GO TO 10
  999 PRINT 11
   11 FORMAT(1H-,*END OF COMPUTATIONS FOR ALL TRAJECTORIES*)
      STOP
      END
```

APPENDIX III.--A Cybernetic Computerized Model Exemplifying Interorganizational Activities.

where: $C = C_n$ = Communication

$XI = I_n$ = Interdependence

$G = G_n$ = Goal Attainment

ENVR = E = Environmental Influences

XMU = μ = Pressure Level

ALPHA = α

BETA = β

GAMMA = γ

DELTA = δ

EPSILON = ε

ZETA = ζ

ETA = η

THETA = θ

} parameters

APPENDIX IV

A SAMPLE OUTPUT PAGE FROM THE CYBERNETIC MODEL WITH DATA

THIS SET OF TRAJECTORIES WILL HAVE 30 TIME PERIODS

THE PARAMATERS ARE C-0= 50.0 I-0= 5.0 G-0= 50.0 ALPHA= 1.0 BETA= 1.0
GAMMA= 1.0 DELTA= 1.0
EPSILON= 1.0 ZETA= 1.0 ETA= 1.0 THETA= 1.0 XMU= 25.0 ENVR= 50.0

TIME	C	I	G
0	50.0000	5.0000	50.0000
1	105.0000	70.0000	95.0000
2	270.0000	95.0000	120.0000
3	495.0000	120.0000	145.0000
4	750.0000	145.0000	170.0000
5	1055.0000	170.0000	195.0000
6	1430.0000	195.0000	220.0000
7	1845.0000	220.0000	245.0000
8	2310.0000	245.0000	270.0000
9	2825.0000	270.0000	295.0000
10	3390.0000	295.0000	320.0000
11	4005.0000	320.0000	345.0000
12	4670.0000	345.0000	370.0000
13	5385.0000	370.0000	395.0000
14	6150.0000	395.0000	420.0000
15	6965.0000	420.0000	445.0000
16	7830.0000	445.0000	470.0000
17	8745.0000	470.0000	495.0000
18	9710.0000	495.0000	520.0000
19	10725.0000	520.0000	545.0000
20	11790.0000	545.0000	570.0000
21	12905.0000	570.0000	595.0000
22	12000.0000	595.0000	620.0000
23	12000.0000	620.0000	645.0000
24	12000.0000	645.0000	670.0000
25	12000.0000	670.0000	695.0000
26	12000.0000	695.0000	720.0000
27	12000.0000	720.0000	745.0000
28	12000.0000	745.0000	770.0000
29	12000.0000	770.0000	795.0000
30	12000.0000	795.0000	820.0000

END OF THIS TRAJECTORY

APPENDIX IV.--A Sample Output Page from the Cybernetic Model with Data.