CONTRASTING THREE ALTERNATIVE EXPLANATIONS OF INTERNAL AND EXTERNAL BOUNDARY SPANNING ACTIVITIES

By

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ABSTRACT

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A three year longitudinal investigation was conducted to study boundary spanners' communication activities over time to determine the relationships between the internal and external communication activities. Three boundary spanning models were proposed to explain boundary spanners' over time communication patterns. First, in the functional specialization model, individuals focus on either internal or external networks depending on their formal positions. The second model, the communication stars explanation, posits that individuals maintain high levels of communication in both internal and external networks because of their personal predisposition. The third model offers a cyclical explanation of individuals rotating their internal and external communication in a dynamic pattern because of inevitable systemic, behavioral, and psychological consequences. The data (N=74) used were part of a project designed to evaluate the internal communication within Cancer Information Service (CIS), a geographically-dispersed federal government health information program, over a four year period. The results indicated that more support was found for the functional specialization model. Organizations formally need to assign boundary spanning roles and officially define their responsibilities.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Organization, as an open human system, needs to sustain itself by communicating with a diverse and dynamic environment (Farace, Monge, & Russell, 1977). The goal of this study is to explore and contrast the communication flow streaming within and across organizational boundaries. The external communication transferred across organizational boundaries interacts with the internal flow, structures, procedures and control within organizational boundaries (Brown, 1966). The interaction with the external environments, often cast as boundary spanning activities, has been demonstrated to be an indispensable element for modern organizations to survive and to succeed (Adam, 1976; Aldrich & Herker, 1977; Church & Spiceland, 1987; Grover, Jeong, Kettinger, & Lee, 1993; Jemison, 1984; Kotter, 1979; Seabright, Levinthal, & Fichman, 1992). Consequently, individuals who communicate within and across organizational boundaries are the center of attention in the literature.

Defining Internal and External Boundary Spanners

Boundary spanners are individuals "who operate at the periphery or boundary of an organization, performing organizationally relevant tasks, relating the organization with elements outside it" (Leifer & Delbecq, 1978, p.40-41). They are responsible for making communication contacts with external information sources and supplying their colleagues

with information to cope with the outside environment. In general, two levels of boundary spanning activities have been examined in the past. First, boundary spanning activities occurred across different working units within an organization. Past research has studied boundary spanners across different product teams (Ancona & Caldwell, 1992), departments (Jemison, 1984), and project groups (Tushman & Scanlan, 1981a &1981b). Second, boundary spanning activities, in a more traditional sense, took place between an organization and its environment. Adams (1976) has identified the following organizational roles as boundary spanners: marketing and sales personnel, purchasing agents, dispatchers and traffic men, personnel recruiters, admission and placement staffs, advertising and public relations workers, information and intelligence gatherers and purveyors, legislative representatives, negotiators and bargaining agents, and so on (p. 1177). Thus, depending on the unit of analysis, boundary spanners can be interpreted differently. For the present study, I will use the organization, the Cancer Information Service (CIS), as the unit of analysis and will distinguish between internal boundary spanners and external boundary spanners. Viewing the CIS as an open human system, internal communication comprises the interdependent relationships between and among the elements within the system while external communication constitutes interorganizational relationships between the system and its environment. That is, the communication occurring between the 19 regional offices within the CIS consists of internal boundary spanning activities while the communication taking place between the CIS (the 19 regional offices) and its outside environment constitutes external boundary spanning activities.

Past research has focused on boundary spanners' functions in terms of the information flow in interorganizational relationships. They filter and facilitate information flow at an organization's boundary, and they cope with environmental constraints to maintain an organization's autonomy (Aldrich & Herker, 1977; Adam, 1976). They "represent an organization to its environments, and the environment to the organization" (Eisenberg, Farace, Monge, Bettinghaus, Kurchner-Hawkins, Miller & Rothman, 1985, p. 240). Thus, they play two distinctly structural roles: "a gatekeeper, who is a conduit for inflows to the group of which the boundary spanner is a member, and a representative, who is a transmitter of outflows from the group of which the boundary spanner is a member" (Friedman & Podolny, 1992, p. 32). Tushman and his colleagues (Tushman & Scanlan, 1981a, 1981b; Katz & Tushman, 1981) through their extensive research reinforced the distinction between gatekeeping and representational roles. They classified boundary spanners in terms of their communication networks. Individuals who focused their communication activities within the organization (internal network) were internal communication stars. The internal stars linked their colleagues to external environment but may or may not have been strongly linked externally. Boundary spanners who communicated with the outside units (external network) were external communication stars. External stars had external information contacts but did not relay the information inwardly. Those with a high amount of communication across both internal and external networks were boundary spanning individuals. These individuals strongly connected to the source of outside information, and were able to disseminate the information to their internal colleagues. In addition to the aforementioned studies, this

distinction of boundary spanners' communication activities has been supported empirically in different organizational contexts (Allen, 1989; Ancona & Caldwell, 1992).

Consequences Resulting from Boundary Spanning Activities

Various studies have examined the behavioral and psychological consequences of boundary spanners. Boundary spanners appeared to be more influential (Allen, 1989; Zoch, 1993; Jemison, 1984; Tushman & Scanlan, 1981b), and yet at the same time they experienced more role stress than non-boundary spanners (Zoch, 1993; Katz & Kahn, 1978; Miles, 1976; Singh, Goolsby, & Rhoads, 1994). These consequences have been associated with job outcomes. Research has shown that boundary spanners associated positively with project performance (Katz & Tushman, 1981), and with promotion (Katz, Tushman, & Allen, 1995). However, research has also demonstrated the negative correlations between role stressors and turnover, and role stressors and low job satisfaction (Singh et al., 1994). Thus, whether the consequences were negative or positive, they impacted on individuals' network activities within an organization. At one extreme, boundary spanning individuals were elevated in the organizational structure (promotion), while at the other extreme, they no longer existed in the network (turnover).

Thus, although it seems that the literature suggests various types of boundary spanners' communication activities (such as gatekeeping and representation), few studies have examined their internal and external communication patterns at the same time. Although the literature lent its support to the psychological and behavioral consequences

of boundary spanning activities, no longitudinal study has been conducted to study the stability of their communication contacts over time and thus examine consequential impacts resulting from boundary spanning positions. Thus, the primary goal of this dissertation is to trace communication activities over time to determine the relationships between the internal and external communication activities. Specifically, I am proposing three models to explain organizational members' internal and external communication activities.

Three Types of Internal and External Communication

Past studies have focused on boundary spanners who were prescribed configurationally by organizational structure or emerged coactivationally from recurrent patterns of interaction among organizational members (Dow, 1988). In other words, they emerged as boundary spanners because they assumed a high amount of communication due to their functional positions (such as customer service representatives, managers), or they were communication stars internally and/or externally on their own initiative. These two types of identifying boundary spanners give bases for two of the three communication models proposed in this dissertation.

First, the functional specialization model: individuals focusing on either internal or external networks were often associated with the prescribed functional positions (Figure 1). This first model emphasizes individuals' formal positions within an organization (e.g., salesmen). It is expected that organizational members will perform their functional

duties according to the organizational chart. Thus, the model suggests a differentiation between internal and external communication.

While the first model stresses the formal side of an organization, the second model underlines the informal side of an organization. The second model posits that individuals emerge as communication stars from the day-to-day interaction at the work place. They maintain high levels of communication in both internal and external networks because they are in the advantageous position of the information flow. Thus, this model suggests a mutual reinforcement relationship between internal and external communication (Figure 2).

Finally, the third model considers the consequential impact resulting from boundary spanning activities. It offers cyclical explanations of individuals rotating their internal and external communication in a dynamic pattern because of inevitable systemic, behavioral, and psychological consequences (Figure 3).

Thus, in general, for the over time test-retest relationships (the a_i, and b_i paths), both the functional specialization model and the communication star model argue the positive relationships, while the cyclical model suggests the negative relationships. For the relationships between internal and external networks (the c_i, d_i, and e_i paths), both the functional specialization model and the cyclical modes stress the negative relationships while the communication star model emphasizes the positive relationships. This research hopes to propose and examine the three contrasting explanations of the relationships between internal and external communication. A three-year period of investigation was conducted to answer these questions.

In the first chapter of this dissertation, I will discuss the three internal and external communication models. Research hypotheses will be proposed with respect to each model. Next, I will summarize briefly the proposed research hypotheses. Then, in the second chapter, research sites and measurement will be discussed at length. In the third chapter, results will be presented for the three models. Finally, the fourth chapter details the overall pattern of findings and implications for future studies.

FIGURES 1, 2, AND 3 ABOUT HERE

The following section introduces the three proposed boundary spanning models based on the relevant boundary spanning literature. Research hypotheses are proposed in respect of each model. Lastly, a brief summary of the three models is described as are the research hypotheses.

Chapter 1

INTERNAL AND EXTERNAL COMMUNICATION MODELS

First Model: Functional Specialization

Organizations must adapt themselves internally to the environment as the amount of information processing increases at the organizational boundaries (Galbraith, 1974). As a result, formal structures and assigned functional roles are created to deal with the external environment. A substantial proportion of the boundary spanner literature implicitly has adopted the two-step communication process notion[1] and explored either external communication or internal communication. For research studying boundary spanners with a high amount of external communication, a variety of topics and functional roles has been explored. For example, purchasing agents were associated with a theoretical model for the boundary-spanning process (At-Twaijri & Montanari, 1987), and their job satisfaction, and propensity to leave, resulting from their boundary spanning positions (Crawford & Nonis, 1996); customer service representatives' burnout rates due to the role stressors (Singh et al., 1994); the culturally sensitive training program advocated for the multinational corporations' public relations personnel (Burk, 1994); a role theory analysis for sales managers (Lysonski & Johnson, 1983), for chief information officers (Grover et al., 1993), for managerial, engineering, and supervisory personnel (Keller, Szilagyi, & Holland, 1976), and for labor negotiators (Friedman & Podolny, 1992). Jemison (1984)

demonstrated that boundary spanning activities such as customer contacts and meetings with the public on a regular base associated positively with influence on the organization's strategic decision making process. All the preceding studies assumed that boundary spanner's formal role provides external functional activities and focused on various outcome variables resulting from their positions.

Studies of boundary spanners' internal communication took place in the R&D setting almost three decades ago (Allen & Cohen, 1969). Allen and Cohen (1969) called those technical engineers who were much more frequently chosen than others for technical discussion "stars". The "stars" tended to make greater use of personal friends outside the lab as sources of information and they also tended to read more technical periodicals than their colleagues. They served as the "key links between the internal information network of the laboratory and the scientific and technological communities outside of the laboratory" (p. 17). Tushman and his colleagues (1981a, 1981b) further distinguished the "stars" as internal communication stars and investigated various topics associated with them. They found a positive association between being internal communication stars and being nominated as technically competent by peers. Internal communication stars also had more lab experience, more lab transfers, and more externally-oriented contacts than their colleagues. Barnard (1984) emphasized the strong-tie notion between and among various departments within an organization for a foreman's role in the new management. Using an external perspective, Ancona and Caldwell (1992) investigated new-product team members' communication activities within the organizational environment. They found that teams with particular types of external activities (such as upward

ambassadorial communication) within the organization performed better than those without.

Thus, whether considering either boundary spanners across organizational boundaries or boundary spanners within an organization, the basic assumption of the aforementioned studies in this section is that boundary spanners need and over time, will maintain, communication contacts with the outside units because of their formally assigned roles. Boundary spanners will perform either the internal information roles (foreman) or the external representation roles (MNC employees, negotiators, customer service representations). Given their functional positions, they will span their communication within the prescribed networks. Therefore, I am proposing the first model for boundary spanners' communication activities: boundary spanners will focus on either internal or external network over time (See Figure 1). They are expected to maintain a certain amount of communication activities within their prescribed networks due to their functional requirements. Thus, a comparable amount of communication should be observed over three points of time for each network (the a_1 and b_1 paths) while a negative static relationship should be observed at each point of time between internal and external networks (the c_1 path), and at each cross-lag correlations (the d_1 and e_1 paths). Under the assumption that networks are relatively temporally stable (Monge, Edwards, & Kirste, 1978; Rogers, 1983; Tichy, Tushman, & Fombrun, 1979), the following hypotheses are proposed:

H1a: For internal communication, positive correlations will be observed between T1 and T2, T2 and T3, and T1 and T3.

H1b: For external communication, positive correlations will be observed between T1 and T2, T2 and T3, and T1 and T3.

H1c: At each point of time, there will be a negative correlation between internal communication and external communication.

H1d: Internal communication at T1 will impact negatively on external communication at T2 and T3.

H1e: Internal communication at T2 will impact negatively on external communication at T3.

H1f: External communication at T1 will impact negatively on internal communication at T2 and T3.

H1g: External communication at T2 will impact negatively on internal communication at T3.

Further, building upon the functional specialization approach, it is plausible to assume that functional roles created to deal with the external environment have more external communication than functional roles created to deal with internal organizational issues. Thus, for the organization (the Cancer Information Service, CIS) under investigation, there should be a certain rank order of the external communication amounts corresponding to individuals' functional roles. Five major functional roles within the CIS were examined in this research: Office of Cancer Communications (OCCs), Project Directors (PDs), Outreach Managers (OMs), Telephone Service Managers (TSMs), and Principal Investigators (PIs). OCCs are in charge of coordinating and supervising the activities of the regional CIS network. PDs engage in a mixture of internal and external

communication coordinating work with OCCs, other regional offices, or their local cancer centers. TSMs mainly focus on the internal telephone service and referral services. OMs are active in the external network because they are responsible for developing relationships with community organizations. PIs are the principal investigators of the CIS contract (descriptions of each function role will be detailed in the method section). Based on their functional requirements, the following additional hypothesis is suggested:

H1h: External communication will have the following rank order from least to most based on individuals' functional roles:

a. TSMs
b. PIs
c. PDs
d. OCCs
e. OMs

Second Model: Communication Stars

Contrary to the functional specialization explanation, another portion of the boundary spanning literature suggested that boundary spanning was not completely a function of formal positions (Tushman & Scanlan, 1981a). The two distinctive external and internal communication roles also can be played by the same individual (Aldrich & Herker, 1978; Allen, 1989; Friedman & Podolny, 1992; Tushman & Scanlan, 1981a, 1981b; Katz & Tushman, 1981). Thus, a variety of research has focused on boundary spanners who have extensive external as well as internal communication activities. Nagpaul and Pruthi

(1979) reported that technical gatekeepers in R&D utilized external communication contacts for idea-generation while using internal communication networks during problem-solving. Allen (1989) reported that co-workers would turn to boundary spanners for external task-related information. She also found that most active boundary spanning individuals were perceived as more powerful. Similar findings were reported in Tushman and Scanlan's (1981a) investigation in a high-tech R & D facility. They found that boundary spanning individuals were likely to be chosen as a valuable source of new information. Church and Spiceland (1987) noticed the importance of the input from boundary spanners to enhance business forecasting. Further, Tushman and Katz (1980) and Katz and Tushman (1981) demonstrated that project groups with boundary spanning individuals functioning as gatekeepers performed better than those without gatekeepers. In a recent study, Katz and his colleagues (1995) showed that people reporting to gatekeeping supervisors had a higher likelihood of managerial promotion than those reporting to non-gatekeeping supervisors. Thus, for those boundary spanners who span their activities across both internal and external networks, there seems to be a mutual reinforcement effect between the two networks. They utilize the external networks to maintain their influential status in the internal network.

Literature on managerial work also provides support for boundary spanning activities across both internal and external organizational activities. Mintzberg (1973) described a manager's position as "the neck of an hourglass. Information and requests flow to him from a wide variety of outside contacts. He sits between this network of contacts and his organization, sifting what is received from the outside and sending much of it into his organization." (p. 48). He concluded that managers' jobs could be described in terms of

ten job roles[2] (3 interpersonal roles, 3 informational roles and 4 decisional roles). This role framework strongly implies the necessary boundary spanning activities within and across organizations. Empirical studies in general have adopted the role framework and further have distinguished these roles by hierarchical levels (Paolillo, 1981; Grover et al., 1993) and by functional areas (Paolillo, 1987).

Thus, based on the preceding discussion, it seems reasonable to suggest that boundary spanners can focus on both internal and external activities simultaneously because they are in the advantageous position of information flow. They acquire relevant information from their extensive external contacts and filter and feed the information inwardly within the organization. Consequently, they are perceived influential by their peers. Thus, I am proposing the second model for boundary spanners' communication activities: boundary spanners can engage simultaneously in both internal and external communication networks (See Figure 2). It is expected that they need to maintain a certain amount of communication in both internal and external networks to keep their advantageous positions. Thus, the over time communication amounts should be fairly stable for internal as well as the external networks (the a_2 and b_2 paths). Since they acquire information outside and transmit them inwardly to their internal colleagues, they engage simultaneously in both the internal and external networks. This dual engagement is expected to bring in a comparable amount of communication internally and externally at each point of time (the c_2 paths). Also, as the literature suggests that boundary spanners appear to be more influential compared with the non-boundary spanning colleagues, it is plausible to assume that their internal influential status will motivate their engaging in external activities and vice versa. Thus, it is expected that internal

communication at a previous point of time will impact positively on the external contacts at the following points of time, and their external contacts at a previous point of time will impact on their internal communication at the following points of time (the d_2 and e_2 paths). Accordingly,

H2a: For internal communication, positive correlations will be observed between T1 and T2, T2 and T3, and T1 and T3.

H2b: For external communication, positive correlations will be observed between T1 and T2, T2 and T3, and T1 and T3.

H2c: At each point of time, there will be a positive correlation between internal communication and external communication.

H2d: Internal communication at T1 will impact positively on external communication at T2 and T3.

H2e: Internal communication at T2 will impact positively on external communication at T3.

H2f: External communication at T1 will impact positively on internal communication at T2 and T3.

H2g: External communication at T2 will impact positively on internal communication at T3.

Third Model: Cyclical

Another portion of the literature seems to suggest a third alternative model for internal and external communication patterns. That is: boundary spanners may need to

shift their network focus due to the inevitable systemic, behavioral, and psychological consequences resulting from the boundary spanning positions, and also due to the dynamic organizational requirements, which will be discussed respectively below.

The behavioral and psychological consequences of boundary spanning activities have been widely explored in the literature. The Kahn study (1964) found that boundary spanning positions were likely to be conflict-ridden. Boundary spanning individuals, by virtue of their positions, were facing the incompatible expectations in their role set (Katz & Kahn, 1978). An investigation (Zoch, 1993) in a Chamber of Commerce showed that high level boundary spanners experienced more role conflict than low level boundary spanners and non-boundary spanners (although it did not reach significance due to small sample size). Also, Singh et al., (1994) reported that customer service representatives had high levels of burnout because they tended to experience role conflict, role ambiguity, and role overload. The study showed that burnout correlated with lower job satisfaction, lower organizational commitment, and higher turnover rate. Resulting from this role-conflict position was the development of the so-called "distrust cycle". Adam (1976) explained that boundary spanning individuals tended to be distrusted because they were closer to the outside environment than to their organizations. Thus, on one hand, boundary spanning individuals are anxious about how internal colleagues perceive them; on the other hand, the organization tends to monitor their behavior. In a recent study, Crawford and Nonis (1996) extended the concept of boundary spanner's anxiety and tested its relationships with job satisfaction and propensity to leave. They found that purchasing managers who perceived greater control and influence over their job had greater job satisfaction and decreased propensity to leave.

Facing the role conflict situations, boundary spanners can have several types of coping behavior, as suggested in the literature. First, they can passively accept the assigned roles through secondary adjustment (Zurcher, 1983), avoidance (Vliert, 1984), personal role redefinition (Hall, 1972), neglect or loyalty (Farrell & Rusbult, 1992), and the emotional-focused strategies (Goolsby, 1992). Second, they can choose to fulfill "one of the incompatible roles and make little or no attempts to fulfill the other one" (Van de Vliert, 1984, p. 69). Third, they can engage actively in role negotiation activities[3] with the internal constituents. They can employ various upward influence tactics (Kipnis, Schmidt, & Wilkinson, 1980), reinforce the two way communication systems with the constituents to insure congruence of expectations (Igbaria & Siegel, 1992), adopt direct resolution (Van de Vliert, 1984), voice (Farrell & Rusbult, 1992), and redefine structural roles with role senders (Hall, 1972). While the first reaction type implies the boundary spanner's continuous focus on his/her previous communication networks (as described in model 1), the second and the third types of reaction point to the possibility of shifting the networks' focus from internal to external communication or vice versa. The choice behavior reaction has suggested clearly that individuals will concentrate on one network to cope with role conflict. Boundary spanners will choose either an internal or an external network to avoid role conflict resulting from the incompatible expectations of both networks. As for the third type of reaction, all these role negotiation behaviors bring an increased amount of internal communication into the focal organization. Under this condition, boundary spanners will need to engage in a lot of internal communication with the authorized personnel. Thus, especially for external boundary spanners, although they still may work in the external network, this engagement in role negotiation does indicate

a shift of focus in their day-to-day working life. Thus, it seems plausible to suggest a cyclical communication pattern over time. While boundary spanners' internal influential stati motivate them to maintain a high amount of external contacts (as described in model 2), increasing internal communication is caused by extensive external communication.

Further, the cyclical communication pattern may provide explanations of the conflicting results regarding the role conflict positions of boundary spanners. Some empirical studies have failed to find the positive correlation between boundary spanners and role conflict (Keller et al., 1976; Lysonski & Johnson, 1983). A plausible explanation could be that these cross-sectional studies tapped into only one period of organizational evolution. Where role conflict may be found when an organization is in its convergence cycle, conflict-free roles may be the product of an organization being in its reorientation period (Tushman & Romanelli, 1990). Thus, dynamic organizational demands as an influencing factor could not be overemphasized for its impact on boundary spanners' communication activities. Friedman and Podolny (1992) reported that as the contract deadline for labor negotiation draws near, differentiation between informational and representational roles will increase in the bargaining groups. They argued that as tension increases when the deadline nears, both parties will become more active to enforce the role requirements. Since role conflict will increase over the course of negotiation, differentiation between the two roles is an adaptive response. Thus, their study implies that the intensity of role conflict will be contingent upon different time periods in the negotiation process. When role conflict increases, boundary spanners will focus on only one communication network. Also, based on Mintzberg's managerial role model, Grover et al., (1993) demonstrated the relationship between the maturity of the

information system (IS) of an organization and the chief information officers' (CIO) managerial role emphasis. They found that when IS matured, interorganizational roles (such as liaison) were more important than the roles functioning within the organization (such as leader). They argued that as IS systems become "more formalized and closely linked with overall organizational planning, the CIO is more involved in *out-flowing* communications to establish a web of intra- and inter- organizational contacts through the liaison" role (p. 121).

Thus, the preceding discussion suggests the possibility that boundary spanners need to shift their network focus due to their reaction to role conflict, and also due to the various organizational requirements as an organization evolves. It is plausible that boundary spanners actively will select one network (internal or external network) to work, instead of both networks to avoid role conflict. It is also possible that boundary spanners will employ various role negotiation strategies with the internal authority to clarify or eliminate incongruence regarding their job duties. These two types of coping behavior may suggest that boundary spanners do need to shift network focus to deal with role conflict. They also will need to adjust their network focus when different organizational requirements are in effect. Thus, I am proposing the third boundary spanners' communication model: boundary spanners will focus on either the internal or external network at the same time, and the pattern of their focus will change dynamically (See Figure 3). Because of the shifting network focus, a negative relationship should be observed for the same networks (internal or external network) for two consecutive points of time (the a_3 paths), while a positive relationship will be observed one point of time apart (the b_3 paths). Since they are shifting their network activities, it is possible that they

will not engage in both internal and external networks simultaneously. Thus, a negative static relationship is expected to be observed at each point of time between internal and external communication networks (the c_3 paths). For the lagged effects between internal and external networks, we should observe positive relationships between the networks. External communication at a previous point of time will bring in internal communication at the following points of time due to their reaction behavior; internal combination at a previous point of time will bring in external communication due to their internal star positions (the d_3 and e_3 paths). Accordingly,

H3a: For internal communication, negative correlations will be observed between T1 and T2, and T2 and T3, and a positive correlation will be observed between T1 and T3.

H3b: For external communication , negative correlations will be observed between T1 and T2, and T2 and T3, and a positive correlation will be observed between T1 and T3.

H3c: At each point of time, there will be a negative correlation between internal communication and external communication.

H3d: Internal communication at T1 will impact positively on external communication at T2 and T3.

H3e: Internal communication at T2 will impact positively on external communication at T3.

H3f: External communication at T1 will impact positively on internal communication at T2 and T3.

H3g: External communication at T2 will impact positively on internal communication at T3.

Summary of Research Hypotheses

The purpose of this research is empirically to test the three models of internal and external communication patterns suggested in the boundary spanning literature over three points of time. Basically, the literature suggests three sets of relationships that could be observed when contrasting internal and external communication networks over time. The first set of relationships are used to describe the stability of networks over consecutive points of time (Figures 1 to 3, the a_i paths) and lagged effects over one point of time apart (Figures 1 to 3, the b_i paths). For the a_i stability paths, either a positive correlation will be observed for both internal and external networks due to functional demands (as specified in model 1) and due to the advantageous positions of information flow (as specified in model 2), or a negative correlation will be observed due to cycles in activity patterns (as specified in model 3). For the b_i lagged paths, positive correlations will be observed across all three models. The next set of relationships (Figures 1 to 3, the c_i correlation paths) are to describe the static effects between internal and external networks from a cross-sectional point of view. The functional specialization model as well as the cyclical communication model predict a negative correlation between internal and external networks because individuals are prescribed to function in certain networks and they will rotate their communication focus resulting from dynamic organizational requirements

(models 1 and 3 respectively). A positive correlation will be predicted by the communication stars model because of the mutual reinforcement relationship between internal and external networks (model 2). Finally, the third set of relationships captures the cross-lagged effects between internal and external networks at consecutive points of time (Figures 1 to 3, the d_i paths) and at one point of time apart (Figures 1 to 3, the e_i paths). For both lagged effects, model 1 suggests negative correlations due to the prescribed functional emphasis, while model 2 and model 3 predict positive correlations due to the star positions and rotating organizational demands respectively.

The following section first describes the site where the research was conducted and the composition of the network. Then, sampling intervals and the data collection procedures are discussed. Next, in the measurement section, the operationalization of boundary spanning roles and the surveys for internal and external communication are described. In the last section, the statistic tools for analyzing the proposed models and the related research hypotheses are introduced.

Chapter 2

METHODS

Site

This research was conducted on a confederation of organizations composed of contractors who provided services to the Cancer Information Service (CIS). The CIS was established in 1975 by the National Cancer Institute (NCI) to disseminate accurate, up-to-date information about cancer to cancer patients, the relatives and friends of cancer patients, health care professionals, and to the general public. The NCI is the U.S. Government's lead agency for cancer research and for disseminating cancer research findings to the American people. Over the past 20 years, the CIS has compiled a remarkable record of achievement in fulfilling this critically important function for the NCI (Morra et al., 1993a). The public health mandate of the CIS is grounded in the National Cancer Act of 1971 and the amendments to that act made over the past 20 years (Morra et al., 1993b). The core element of the 1971 National Cancer Act that led to the formation of the CIS stipulates that the NCI, "Provide a program to disseminate and interpret... for practitioners and other health professionals, scientists, and the general public, scientific and other information regarding the causes, prevention, detection and treatment of cancer." In response to this mandate, the CIS currently maintains a network of 19 regional offices that are typically linked to NCI-funded regional cancer centers.

The activities of the CIS network are coordinated and supervised by the Office of Cancer Communications (OCC) at the NCI. These activities fall into two broad categories: 1) responding to requests for information over the telephone (the CIS operates a toll-free telephone number, 1-800-4-CANCER, in which callers are automatically triaged to their regional office for response from a trained and certified Cancer Information Specialist), and 2) conducting community outreach activities. The outreach program of the CIS serves as a catalyst and focal point for cancer education at the state and regional level. As NCI's primary outreach network, the 19 offices of the CIS serve as regional field offices in a nationwide effort to facilitate the adoption and use of OCC programs and materials to priority audiences, including such underserved high-risk populations as African Americans, Hispanic Americans, Native Americans/Hawaiians, and other populations with limited access to health care.

The CIS as a Contractual Network

The relationship between the Office of Cancer Communications and the regional offices (Figure 4) could be couched in terms of the classic relationship between headquarters and subsidiary units in multinational corporations, especially when parties act in their own interests, setting up relationships which are at one and the same time competitive and cooperative (Pahl & Roth, 1993). Perhaps the best label for the new organizational form represented by the CIS, is a contractual network (See Johnson et. al., 1995 for more detailed discussion). The unique characteristic of the CIS is its geographic dispersion in 19 regional offices serving the entire U. S. (Morra et al., 1993a). What brings all of the regional offices together is a classic fee-for-services contract which, in effect, hires temporary organizations, for a five year period, as work units and operational

systems, to conduct a specified scope of work for the NCI to accomplish common goals. The unique characteristics of the agency become apparent when contrasted it to more conventional organizational forms, because, even though the Regional Offices are formally members of other organizations, the agency itself has many of the characteristics of unitary organizations; with centrally determined goals, a formal bureaucratic structure of authority, a division of labor, formal plans for coordination (e.g., sharing of calls), a high normative commitment to providing service to callers, and targeted outreach activities to priority audiences. Performance standards are set nationally and are monitored by an extensive formal evaluation effort (Kessler, Fintro, Muha, Wun, Annett, & Mazen, 1993). However, important personnel issues such as salaries and fringe benefits are determined at the regional office level. Table 1 displays an overview of major goals and objectives of the CIS.

FIGURE 4 AND TABLE 1 ABOUT HERE

Composition of the CIS Network

For purposes of this dissertation, composition of the CIS network was decided upon, based on the combination of nominalist and realist views suggested by Lauman, Marsden, & Prensky (1983) in terms of how to draw the boundaries of networks. In the realist approach, the researcher adopts the vantage point of the actors in defining boundaries, while the nominalist imposes a conceptual framework that serves his/her own analytical

purposes. From a nominalist perspective, the core of the CIS network is composed of the national CIS staff and members of the 19 regional offices who are Project Directors (PDs), Telephone Service Managers (TSMs), and Outreach Managers (OMs). In a realist sense, some members of the OCC have recurring relationships with the regional offices focusing on a variety of work-related matters, including intervention strategies. While traditionally Principal Investigators (PIs) have had a periodic, strategic role in the network, some of them under the new contract have expressed a desire to have a more active role in the ongoing operations of the CIS. Accordingly, we allowed the members of the OCCs and the PIs in the various regions to self-nominate for inclusion in this research project after explaining its purpose to them. The resulting CIS network represents a blending of members of many separate organizations into a common network of focusing on the adoption of intervention strategies. Table 2 displays the job descriptions of these five functional groups and Figure 5 lists a generic CIS regional office organizational chart.

With respect to the respondents' characteristics for the current study, the sample sizes were 90, 85, 91 for external networks at T1, T2, and T3 respectively, and 101, 104, 110 for internal networks at T1, T2, and T3 respectively. After some sorting and merging procedures with the six networks, a final sample size of 74 was obtained. It consists of respondents who filled out the questionnaires for both internal and external communication over three points of time. Table 3 displays the demographic information for the 74 participants. The participants in this study were highly educated: 92 percent of the respondents had earned college degrees, 51 percent of which were graduate degrees.

The majority of respondents were low in tenure: fewer than one-third of respondents had worked for the CIS for five years or more, while nearly two-thirds had worked for the CIS for under five years.

TABLES 2, 3, AND FIGURE 5 ABOUT HERE

Sampling Interval

The study was part of a much larger project designed to evaluate the impact of three planned innovations over a four year period (see Johnson et al., 1994a for a much more complete discussion of methods and design issues). Selection of a sampling interval is always a problematic issue; one outcome of this research will be a better feel for the most appropriate sampling interval for a four-year investigation of the communication pattern for a new organizational form, the contractual CIS network. Because of extensive pretesting in the summer of 1993 and discussions with members of the network, it was decided to focus on a three day period every three months, rotating days of the week and weeks of the month, throughout the duration of the project. It was felt that this would be the best compromise in a number of conflicting concerns. For example, this sampling interval should be frequent enough to detect major cycles of activities within the CIS system, while sampling a three day period, rather than all communication activities within a three-month-period was necessary because of the limitations of respondent

memory and the vast volumes of data that can be generated by these measurement strategies. As a result of these concerns, internal communication network data were regularly collected at each of the 14 scheduled sampling periods for various purposes such as gaining knowledge of the internal operation of the CIS to facilitate the diffusion of innovation, ensuring greater uniformity, and resulting in more efficient use of resources (See Johnson et. al., 1994b for more detailed discussion). For the collection of external communication data, based on comments and suggestions from pretest participants, it was decided that radial communication network data should be collected once per year for three years. The questionnaires were disseminated at intervals of 11 months and 15 months respectively. Major events in the CIS network during this three-year period are chronologically listed in Table 4.

Data Collection

Internal communication data were collected quarterly from November 1993 to February 1996. Communication data on external contacts were collected at three points of time: May 1994, February 1995 and May 1996. At each period of time, a package was sent to respondents with a communication log and a battery of questions relating to their external communication contacts. To ensure completion, the self-report questionnaires were mailed to the respondents approximately ten days prior to the sample time period. A personalized letter explained the issues that would be examined and urged participation in the project. At the same time, an e-mail was sent to all participants to notify them that they would be receiving the questionnaires in the mail shortly. A second e-mail was sent

the day before the sample time period, reminding participants that they should begin recording their communication contacts for the next three days. A third e-mail was sent the day after the sample time period had concluded, to remind participants to return their questionnaires in the stamped, self-addressed envelope provided. Many follow-up steps (e.g., letters, faxes, e-mails) recommended in the literature (e.g., Dillman, 1978, 1991) were taken in these recurring data collections (see Johnson et al. 1994a for more details). Through these extensive follow-up efforts, we achieved a very satisfactory response rate of 93 per cent, 93 percent, and 95 percent at time 1, time 2, and time 3 respectively.

TABLE 4 ABOUT HERE

Measurement

Operationalization of Boundary Spanners

As mentioned in the introduction section, boundary spanners have been identified via either their formal functional positions or their high communication volume compared with that of their colleagues. While the former approach was taken for granted, several ways of distinguishing between communication stars and non-stars were employed for the latter approach. Allen and Cohen (1969) defined technological gatekeepers as those whose communication amounts were one or more standard deviations above the mean number of the total communication within the laboratory. Tushman and his colleagues used a 20% rule to select boundary spanners throughout their research: individuals need to be in the top fifth of the internal/external communication distribution to be able to be

stars in the internal/external networks (Tushman & Katz, 1980; Tushman, 1977; Katz & Tushman, 1981; Katz, Tushman, & Allen, 1995; Tushman & Scanlan, 1981a; Tushman & Scanlan, 1981b). Allen (1989) employed a triangulation of ways to identify boundary spanners. In addition to the daily interpersonal contacts as used by Tushman and his colleagues, she also averaged individuals' travel days and the average number of phone inquiries answered. She classified those individuals who were in the lower two percent of the total communication distribution non-boundary spanners, those who were in the middle 12 per cent low boundary spanners, and those who were in the top 86 per cent active boundary spanners. In the recent investigation in the Chamber of Commerce (Zoch, 1993), the author used a cluster analysis to distinguish among high level boundary spanners, low level boundary spanners, and non-boundary spanners. Thus, as the literature provided an inconsistent and somehow arbitrary way (Epton, 1981) to draw the line between communication stars and non-stars, the present researcher decided to examine the level of internal and external communication activities for all members in the organization. This approach not only can eliminate the problem of arbitrarily setting up a certain communication level but also can remove the risk of losing important information by excluding the low-level communicators.

Level of Analysis

The operationalizations of internal and external communication activities are contingent on the unit of analysis chosen by the researchers. A substantial portion of studies used organizations as the unit of analysis and distinguished between internal and external communication on the level of intra-organization and interorganizations respectively (Zoch, 1993; Allen, 1989). Yet, other researchers have focused on different

levels of analysis. For example, Tushman and Scanlan (1981a) chose the department as the unit of analysis within a R&D setting. They defined internal communication as the communication occurring within the department, while external communication comprised those activities taking place on an intra-organizational and extra-organizational levels. Ancona and Caldwell (1996), using groups as the unit of analysis, defined external activities as interactions between team members with members of other groups within the same organization. As a result of the different focus on the unit of analysis, external activities in one study may be treated as internal communication in others, while internal communication stars on an intra-organizational level may be defined as external communication stars on a group level. Thus, it is important to be clear on the level of analysis before any general conclusions can be made in terms of internal/external communication. For the present study, the unit of analysis is the CIS network. Thus, internal communication refers to the communication occurring between and among the 19 regional offices, and OCC, while external communication refers to the communication contacts occurring with the organizations outside the CIS network (e.g., American Cancer Society, Health Department, etc.)

Internal Communication

For internal communication contacts, respondents were asked to record their interpersonal communication contacts which they initiated with or received from individuals within CIS network for a three day period[4]. They were instructed to record the inter-regional communication on the national level[5]. For the respondents' convenience, a directory of individuals within the CIS network and pre-dated pages of the log were provided[6]. Respondents were asked to record their intervention strategies

communication network. These contacts include initiatives that relate to development or implementation of programs which focus on reaching various target populations such as counseling protocols for special target populations, targeted outreach activities using the telephone, and responses to calls associated with communication campaigns. Similar data collection instruments were employed by previous researchers (Allen, 1989, Zoch, 1993; Tushman & Katz, 1980; Tushman, 1977; Katz & Tushman, 1981; Katz, Tushman, & Allen, 1995; Tushman & Scanlan, 1981a; Tushman & Scanlan, 1981b).

External Communication

Respondents were asked to record the number of times they communicated with a member representing the outside groups about intervention strategies. The list of the outside groups were developed with considerable collaboration from the CIS staff, and it was finalized after several pretest procedures within the CIS network (See Johnson et al., 1994a). Separate questionnaires were developed for OCCs and other functional groups because of their job requirements. At time 2 and time 3, in the interest of reducing respondent burdens, various categories of outside organizations which were mentioned very sparingly at time 1 were eliminated from the questionnaire.

Analysis

The proposed communication models were analyzed with the path analytic technique of the PACKAGE computer program (Hunter & Lim, 1987). A MANOVA repeated measure was used to determine the differences between the five functional roles for external communication contacts over three points of time (Bray & Maxwell, 1990).

Paired T-tests were conducted for each functional group to see if external communication changes over time. The critical value was set at .05 for all analyses.

The following section introduces the results of the proposed models and the research hypotheses. First, descriptive analysis is discussed. Then, the results of the path analysis are described. Finally, the MANOVA results are discussed.

Chapter 3

RESULTS

Descriptive Statistics

Frequency, means, and standard deviations of internal and external communication contacts over time are presented in Table 5, while ranges, and Pearson correlations of the six communication variables, are presented in Table 6. More than one half of the respondents reported zero contacts for internal communication at time 1 and time 2 (n=43 and 44 respectively) and four-fifths of internal communication at time 3 are zeros (n=59). For external communication, nearly one-third of the respondents reported zero contacts across three points of time (n=23, 24, and 34 respectively). In general, respondents had a higher level of external communication contacts than internal communication contacts. Comparable amounts of communication contacts were observed for internal communication at time 1 and time 2 (mean=.78 and .74 respectively), and for external communication at time 2 and time 3 (mean = 6.26 and 6.30 respectively). Yet standard deviations were high in all of the internal and external communication across three points of time (range from .64 to 1.29, and from 9.86 to 20.91 respectively). The highest correlation was observed between external contacts at time 1 and time 3 (r=.83), while the communication at time 3 and external communication at time 2 (r=-.01).

TABLES 5 AND 6 ABOUT HERE

A Test of the Three Boundary Spanning Models

The data were analyzed with the path analytic technique of the PACKAGE computer program (Hunter & Lim, 1987). Path program assesses the fit of a model by providing two levels of information: local and global tests. First, local tests are conducted for each estimated path coefficients by a confidence interval approach. The path analysis will begin by estimating the path coefficients and the corresponding standard errors. Then, local tests will be performed on each path parameter by drawing a 95% confidence interval. If the estimated path parameters are included in the lower bound and the upper bound of the interval, they are significant at the .05 level. For the global test, the estimated path coefficients will be employed to generate the predicted correlations that are used to compare with the observed correlations. The discrepancies between the predicted and observed correlations which are calculated as chi square, or the sum of the squared errors, will be used to assess the overall significance test of the model. If the obtained chi square exceeds the critical value at the .05 probability level, the model provides a good fit to the data. As shown in Figure 6, the results indicated that the model were consistent with the data on a global level (X^2 = .79, df = 2, p = .675). However, for the local tests, most predicted paths were not significant (see Table 7 for path coefficients, the corresponding standard errors and confidence intervals). The only three significant paths were between internal communication at time 2 and time 3 (P_{23} =.31)

and for external communication between time 1 and time 3 (P_{46}=.82), and between time 1 and time 2 (P_{45}= .33).

FIGURE 6 AND TABLE 7 ABOUT HERE

Thus, for the first model, the first set of relationships, which predict that positive relationships will be observed over time for internal and external networks, were partially supported because of the three strong paths mentioned above. Thus, hypotheses 1a and 1b were partially supported. For the second set of relationships, the predicted negative static correlations between internal and external networks across three points of time was not supported although it was in the predicted direction at time 2 and time 3 (r=.05, -.10, and -.10 at time 1, time 2 and time 3 respectively). Thus, hypothesis 1c was not supported. Since weak and positive relationships were found for all the cross-lagged paths (P_{15} = .13, P_{16} = .07, P_{26} = .02, P_{42} = .03, and P_{53} = .05) excepting the one between external communication at time 1 and internal communication at time 3 (P_{43} = -.09), the third set of negative relationships predicted by model 1 was not supported. Thus, hypothesis 1d, which predicts internal communication at time 1 will impact negatively on external communication at time 2 and time 3, was not supported (path coefficients = .13 and .07 respectively). Hypothesis 1e, which predicts internal communication at time 2 will impact negatively on external communication at time 3, was not supported (path coefficients = .02). Hypothesis 1f, which predicts external communication at time 1 will impact negatively on internal communication at time 2 and time 3, was not supported although the latter prediction was in the right direction (path coefficients = .03 and -.09

respectively). Hypothesis 1g, which was not supported, predicts external communication at time 2 will impact negatively on internal communication at time 3 (path coefficients = .05).

For the second model which predicts that positive relationships will be observed for all three sets of relationships, it was partially supported because of the three significant paths mentioned above, and because of the overall weak and positive path coefficients. Thus, the first set of predicted positive relationships were partially supported. Hypothesis 2a, which was partially supported, predicts positive correlations between time 1 and time 2, time 2 and time 3, time 1 and time 3 for external communication (path coefficients = .33, .01, and .82 respectively). Hypothesis 2b, which was partially supported, predicts positive correlations between time 1 and time 2, time 2 and time 3, time 1 and time 3 for internal communication (path coefficients = .14, .33, and .02 respectively). For the static correlations between internal and external networks across three points of time, the second model predicts positive relationships will be observed between the two networks. It was not supported, although it was in the predicted direction at time 1 (r=.05, -.10, and -.10 at time 1, time 2 and time 3 respectively). Thus, hypothesis 2c is not supported. Since weak and positive relationships were detected for the cross-lagged paths, the third set of predicted positive relationship was not supported. Hypotheses 2d through 2g were not supported yet in the predicted directions.

The third model predicts that for the first set of relationships, negative correlations will be observed for internal and external networks at consecutive points of time, while

positive correlations will be observed for internal and external networks between time 1 and time 3. It was partially supported because of the positive and strong path detected between time 1 and time 3, (path coefficient were .82). Thus, hypothesis 3a, which predicts negative correlations will be observed between time 1 and time 2 (path coefficient = .33), between time 2 and time 3 (path coefficient = .01), and a positive relationship will be observed between time 1 and time 3 for external communication, was partially supported. Hypothesis 3b, which predicts that for internal communication, negative correlations will be observed between time 1 and time 2 (path coefficients = .14), time 2 and time 3 (path coefficient = .33), and a positive relationship will be observed between time 1 and time 3 (.02), was not supported. For the second set of relationships, the static correlations between internal and external networks across three points of time, the third model makes the same prediction as in the first model which predicts negative relationships will be observed between the two networks. It was not supported (hypothesis 3c) although it was in the predicted direction at time 2 and time 3 (r=.05, -.10, and -.10 at time 1, time 2 and time 3 respectively). For the cross-lagged relationships, this model makes the same prediction as in model 2 which predicts positive relationships will be observed. The relationships were not supported, yet in the right direction. Thus, hypotheses 3d through 3g were not supported.

Functional Role Differences in External Communication

Table 8 displays the MANOVA results for functional roles' differences in terms of their external communication. The results indicated that there were significant

differences between and among the five functional roles' external communication amounts ($F=3.73$, $df=4$, $p < .05$). OMs and PDs had higher external communication than TSMs and PIs. Thus, hypothesis 1h which expected the following rank order for the external communication from most to least: OMs, OCCs, PDs, PIs, and TSMs, was partially supported. OMs and PDs had high levels of external communication as predicted, while, contrary to expectation, OCCs and PIs had low levels of external communication. MANOVA did not detect main effect for time ($F=1.56$, $df=2$, $p > .05$). Paired T-tests were conducted to see if functional groups maintained the same levels of communication across three points of time. The results indicated that no significant differences were detected for any functional groups between the three time points. The T-values are listed as the following: for OMs between time 1 and time 2 ($t=.88$, $df=23$, $p> .05$), between time 1 and time 3 ($t=1.44$, $df= 23$, $p > .05$), and between time 2 and time 3 ($t=-.21$, $df=23$, $p > .05$); for OCCs between time 1 and time 2 ($t=.92$, $df=7$, $p > .05$), between time 1 and time 3 ($t=1.12$, $df= 7$, $p > .05$), and between time 2 and time 3 ($t=1.18$, $df=7$, $p > .05$); for PIs between time 1 and time 2 ($t=.42$, $df=7$, $p > .05$), between time 1 and time 3 ($t=2.19$, $df= 6$, $p > .05$), and between time 2 and time 3 ($t=1.29$, $df=6$, $p> .05$); for TSMs between time 1 and time 3 ($t=1.73$, $df= 21$, $p > .05$), between time 1 and time 3 ($t=.17$, $df=21$, $p > .05$), and between time 2 and time 3 ($t=-.90$, $df=21$, $p > .05$); for PDs between time 1 and time 2 ($t=1.95$, $df= 13$, $p > .05$), between time 1 and time 3 ($t=.62$, $df=13$, $p > .05$), and between time 2 and time 3 ($t=-.53$, $df=13$, $p > .05$).

TABLE 8 ABOUT HERE

The following section discusses the overall findings of the study. I compare and evaluate each model and discuss why it works and why it does not. Finally, limitations and future implications of the study are discussed.

Chapter 4

DISCUSSION

In general, the three proposed boundary spanning models did not fully explain the CIS boundary spanners' over time communication behavior. The three significant paths, between time 2 and time 3 for internal networks, and between time 1 and time 2, between time 1 and time 3 for external networks, provided more support to the functional specialization model than to the communication stars and the cyclical models.

Why the Models Fail

Two major factors could have contributed to the overall nonsignificant findings: the idiosyncratic nature of the CIS and its unique innovation content.

New Organizational Form

First, the unique organizational form of the CIS might contribute to the overall weak and unstable communication. As identified in a previous study, the geographic dispersion "coupled with multiple organizational memberships (e.g., formal employment relationships with local cancer centers, local cultures) produce a stronger identification with regional offices than with functional groupings" (Johnson et. el., 1995, p. 29). Consequently, each regional office may focus more on the day-to-day operation at the intra-regional (local) level than at the inter-regional (national) level. Thus, low levels of

internal communication were observed across three points of time. This identification of local cultures also could explain the discrepancy between internal and external networks regarding communication linkages over time: external linkages were at least eight times more than the internal linkages related to innovation. The CIS members, instead of boundary spanning across regional offices within the CIS network, put more emphasis on considering the regional offices as the focal organizations, and spanned their communication in their regions. Thus, for boundary spanning activities within the CIS network, a substantial amount of communication isolates were detected and a low frequency of communication linkages was reported. Further, this relatively sparse internal communication network also may have reflected the unstable innovative stage the agency was expected to be experiencing (Johnson, 1987). Previous research also has found that low levels of communication often were associated with innovation-related content (Albrecht & Ropp, 1984; Farace & Johnson, 1974; Johnson, 1993; Monge, Cozzens, & Contractors, 1992).

Content

The innovative nature of the CIS is the second major factor that may contribute to the overall sparse and unstable communication contacts. As demonstrated in the previous study, the CIS innovation-related communication networks were unstable over time (Chang & Johnson, 1996). The CIS members made communication contacts with different people across various phases of the three innovation projects. In examining the CIS chronology (See Table 4), the unstable nature of the innovation process is self-evident. While at time 1, CIS staff were trained for various pilot procedures for all three of the innovation projects; at time 2, project 1 shifted its focus from proactive counseling

for promoting mammography to the 5-A-Day. Project 2 began its follow-up studies for making outcalls to promote mammography, and project 3 began its tests calling for the smoking cessation campaign. At time 3, the 5-A-Day project began its training for the pilot study while preliminary results from the other two projects were discussed. Thus, the CIS members might need to contact different groups of people as the innovation projects went through the stages of planning, implementation, and review. In addition to the various phases of the innovation process which could have generated the unstable communication networks over time, the participation of the three innovation projects from the 19 regional offices could have contributed to the unbalanced communication distribution, and to considerable variance over time. Not all the 19 regional offices participated in the three innovation projects: twelve offices were involved with project 1, one office participated in project 2, and four offices engaged in project 3. As a result of the unequal participation, communication linkages as a whole could be unstable and sparse as the three projects worked through their own phases of the innovation process. Further ANOVA analysis (Table 9) revealed that at time 1, there were significant differences in terms of internal communication between the three innovation projects ($F=4.7$, $df=2$, $p < .05$). No significant differences were detected at time 2 and time 3 ($F=0.5$, $df=2$, $p > .05$ and $F=1.6$, $df=2$, $p > .05$ respectively). The involvement of different innovation projects had an impact on the internal communication at time 1 which may have contributed to the nonsignificant finding for the internal networks between time 1 and time 2 and between time 1 and time 3.

Moreover, another plausible explanation for the sparseness of the innovation networks is that communication data was collected during the implementation phase of

the CIS' innovation efforts. As explained by Johnson (1996), "...members of the CIS had buy in as a result of communication that occurred before the time period we measured, when the original grant was being formulated and it was just a question of operationalizing their original commitment and things were explained so well and commitment was so total that there was not a need for a major ongoing communication effort" (p. 20). The CIS members could have been so well trained in face-to-face meetings and the written rules were so specific that they may not have had the need to communicate a lot.

Furthermore, the data showed that external networks were relatively more stable than internal networks. It could be accounted for by the fact that there were different innovation focuses between the two. While the internal networks focused more on the three planned innovation projects described in the CIS chronology (See Table 4), the external networks were not limited to the three innovation projects only. For external networks, the CIS staff focused on more general innovation issues, such as any type of health communication campaign initiated by the outside organizations. Thus, higher and more stable communication was observed when compared with the internal networks.

Comparing and Evaluating Models

The three significant paths lent more support to the functional specialization model rather than to the communication stars and the cyclical models. Stable and positive boundary spanning communication was observed between time 2 and time 3 for internal networks while between time 1 and time 2, and between time 1 and time 3 for external

networks. The relationships between internal and external networks either correlated weakly and negatively at time 2 and time 3 or was close to zero at time 1. To some extent this finding is consistent with our understanding that CIS is a formalized organization demonstrated by the previous study (Johnson, La France, & Meyer, 1996). There are established written policies and procedures for CIS members to pursue their functions and responsibilities for day-to-day operations. As a result, the differentiation between internal and external boundary spanning activities is clear. The unexpected weak links observed between time 1 and time 2 for internal networks could be explained by the earlier unstable stage of the three innovation projects described in the previous paragraph. The CIS members talked with a diverse source of people during their training phase at time 1 and maintained more stable communication contacts at time 2 and time 3 when projects 2 and 3 began their follow-up studies. For external networks, although the path between time 2 and time 3 was relatively low, the correlation was relatively high. The observed low path coefficients were in part contributed by internal communication at time 1 and time 2 which further suggested the differentiation between internal and external networks. As for the unexpected high path coefficients observed between time 1 and time 3, it also could have to do with the innovative nature of the communication content. More externally-oriented contacts were needed when a project was in its piloting stage as well as in its review process for publicity reasons. It was important for the public to know the three innovation efforts at time 1 as it was important to share the results with the public at time 3. Thus, communication activities were highly correlated between time 1 and time 3.

The MANOVA results also lent partial support to the functional specialization model. As predicted, OMs and PDs had high external communication while TSMs had low communication over time. Contrary to prediction, OCCs had relatively low communication across time. One reason for the observed rank order could be that a separate instrument was developed for the OCC staff because their levels of contacts were different from the other functional groups. Paired T-tests indicated that all of the functional groups maintained equivalent communication over three points of time.

The lack of communication stars could be explained by the fact that the CIS is a formalized organization. As suggested by the support found for the functional specialization model, CIS members adhered to their functional responsibilities which encouraged the differentiation between internal and external networks. When the communication stars model suggested that boundary spanners needed to acquire their influential status by extending their external contacts, CIS members communicated externally just to fulfill their routine day-to-day jobs. Boundary spanning literature has shown the inverse relationship between job routinization and influential status (Allen, 1989). Aldrich and Herker (1977), using purchasing agents and sales personnel as examples, argued that "routinization is reflected in the existence of standard purchase and sales forms or contracts, standard operating procedures for soliciting and accepting bids, and standard operating procedures for calling on customers and closing sales" (p. 226). For CIS members, standardization of day-to-day operations is the goal they are striving for. They have automated call record forms, automated publication ordering system, automated call guides, automated outreach contact forms, and they are still in the process of standardizing other working procedures. Thus, there could be a lack of motivating

factors for CIS members to be stars because no power or influential status will be associated with their explicitly written functional roles no matter how extensive their contacts are.

Furthermore, no cyclical boundary spanning communication pattern was developed during the three years under investigation. Again, the fact that CIS is a formalized organization could have offered some explanations for the failure of this model. Although the Kahn study (1964) suggested that boundary spanners were likely to be in conflict-ridden positions, its researchers also noticed the negative relationships between formality and role conflict. They argued that role conflict would decrease considerably when individuals had established policies and rules to follow. This negative relationship between formality and role conflict was supported in the previous study of the CIS (Johnson et al, 1996b). Thus, with minimum role conflict, the suggested conflict-coping behaviors which led to the shifting between internal and external networks did not exist also. CIS members may not have to engage in role negotiation behaviors to deal with role conflict. As suggested in the functional specialization model, they may have to focus just on their prescribed functional networks. However, the second reason that this model failed could be that the planned one year intervals did not capture the development of the cycles. Considering the mixture of all the various phases of the three innovation projects, one may argue that many cycles could be formed within one year. But it may not be the case with the CIS innovation networks. The interpersonal communication, instead of forming cycles, declined gradually over a period of a two-year investigation (See Johnson, Chang, et al., 1995). However, it also could be the possibility that no cycles will be formed until all three projects are approaching stable stages at time 4, or time 5.

At that time individuals will have more concrete ideas about their roles in the innovation process and will begin to think more seriously about their chosen roles.

Alternative Operationalizations

As discussed in the method section, for the present study this researcher decided to look at the boundary spanning activities for all members instead of employing an arbitrary way to distinguish between boundary spanners and non-boundary spanners. To see if different results would be obtained by employing the arbitrary way of detecting boundary spanners, the 20% rule used by Tushman and his colleagues was applied to the study. Similar results were obtained (Table 10). Individuals in the top fifth of the internal and external communication were the high level internal and external boundary spanners in the present study. Compared with the external boundary spanners, fewer internal boundary spanners were boundary spanners over three points of time which was consistent with the observation that external networks were more stable than internal networks. Also, most of the boundary spanners who were in the top fifth of the internal communication distribution were not in the top fifth of external communication distribution. Few people were stars in both networks. A high percentage of OMs and PDs were external communication stars while a high percentage of TSMs were internal communication stars. Thus, it gave more support to the functional specialization model which suggested a differentiation between the internal and external networks than to the communication stars and the cyclical models.

Limitations

There are some limitations of the present study which can also account for the overall nonsignificant findings and considerable variances over time. First, although low levels of communication have been demonstrated to be associated with innovation-related content in previous research, the sparse communication linkages still affected the general outcomes, especially when the amounts of communication were the foci examined in this study. Second, the sample sizes were relatively small (n=74), which lowered the statistical power of the study. Third, in terms of the selection of sampling intervals, the unequal intervals between data collection points (11 and 16 months respectively) used in this study could have contributed to the overall low significant paths as well. The data were collected in May at time 1 and time 3, but in February at time 2. Although it was intended to capture a more complete communication picture by rotating months of data collection, it somehow might have introduced into the communication networks the seasonal factor which contributed to the high correlation between time 1 and time 3 for external networks as well.

Fourth, the data indicated that communication contacts had high dispersion, especially for external networks. It ranged from 167 to zero at time 1 and from 89 to zero at time 3. A more detailed look at the data showed that the two high range contacts were made by the same individual. If the outlier was removed from the data sets, standard deviations dropped considerably at time 1 and time 3 (from 20.91 to 10.13, and from 13.21 to 9.08 respectively). Thus, the fact the individual was not an outlier at time 2 (made 10 contacts) not only contributed to the high standard deviations but also to the

unexpected high path found between time 1 and time 3. Fifth, in order to maintain the long term relationships with the respondents, we had to make some changes in the survey instruments. With respect to the internal communication logs, the specification of local versus national issues was made in August 1995 (between time 2 and time 3). As mentioned before (See note 5), respondents were asked to record communication at the national level only at time 3. This could explain the drop of communication between time 2 and time 3 which affected the overall findings. With respect to the external measurement instrument, in the interest of reducing the respondents' burdens, at time 2 and time 3, we removed several categories of outside organizations which were mentioned very sparingly at time 1. This could explain the relatively high amount of external communication observed at time 1. Finally, as revealed by a survey investigation of CIS members' channel usage behavior (See Johnson et al.,1995), e-mail and facsimiles were heavily used by the CIS staff. We added the two communication modalities to the communication logs in August 1995 (between time 2 and time 3) in order to capture the more complete picture of the CIS' communication activities. The trend of increasing uses of other communication media could also explain the considerable drop of internal communication from time 2 to time 3.

Implications for Future Research

Few research studies have been conducted to study boundary spanners since the early 1980s (Manev & Stevenson, 1996), thus not much has been added to our understanding of boundary spanners, especially their over time communication behaviors. The present

study was the first attempt to understand boundary spanners' over time communication in a new organizational form. Although, in general, disappointing support was found for the proposed three boundary spanning models, the results of the study did offer some directions for future studies in the following aspects.

First, the study showed that boundary spanners were formally prescribed (functional specialization) rather than that they emerged informally from day-to-day interactions (communication stars). Thus, it did raise a question whether innovation roles should be formally prescribed as suggested in this study, or whether these roles will informally emerge on their own as most of the communication literature suggests (Monge & Eisenberg, 1987)? Considering relatively low levels of innovative communication reported in the present study as well as in the previous studies, and the emergence of new organizational forms (such as trade associations, franchises, research consortia, and network organizations, for more detailed discussion, please see Johnson et al., 1995), to assign innovation roles formally may be more practical than to wait for the emergence of these roles in order to maintain interorganizational relationships. More empirical studies need to be conducted to determine the balance between formalized structure and emergent communication networks.

Second, Tushman (1977), in his attempt to explore boundary spanning roles in the innovation process, suggested that the distribution of boundary spanners was contingent on the nature of organization's work. He found that "projects with more complex information-processing requirements consistently have more boundary roles than projects with less complex information-processing requirements" (p. 600). Thus, boundary spanners were needed especially when relatively high levels of complexity were

perceived by the CIS staff (Johnson, Meyer, Ethington, 1995). Yet, the results indicated the opposite: low levels of boundary spanning communication. Thus, the paucity of boundary spanning communication, especially the lack of communication stars may suggest the difficulties of being an influential boundary spanner. As mentioned in the introductory section, boundary spanners tended to suffer from some negative psychological consequences such as to be distrusted, and role conflict. Research (Keller & Holland, 1975) also has shown that the most effective boundary spanners have three particular traits: high verbal and memory skills, flexibility and extroversion, and high economic and political values[7]. It is as difficult to cope with role conflict as it is to be born with these traits. Consequently, few people are capable of being boundary spanners. It is a challenge to balance between individual comfortableness and organizational goals. Something comfortable on an individual level may not be at an organizational level. For example, salesmen always go back to old customers. Although they can perform their duties comfortably, the organization may prefer salesmen who keep finding and extending new contacts for overall profits. Thus, the balance between individual comfortableness and organizational goals is another topic for future studies.

Third, with respect to the measurement of boundary spanners' communication, the present study employed the method used by most of the previous research: internal communication data are recorded communication contacts in a communication log, while external communication data are communication contacts reported in a self-report questionnaire. These recorded contacts indicated by the respondents thus become the single item that will be used to determine one's boundary spanning communication activities, internally or externally. With one item, estimates of the reliability of the

measure are impossible for cross-sectional studies. As a result, measurement errors can not be corrected, which has the severe consequence of making a right model wrong, or a wrong model right. Thus, future studies should consider multiple indicators (such as measuring the perception of communication, or utilize sociometric methods) to measure boundary spanning communication.

Fourth, most of the boundary spanning research cited in this study, as well as the present study, examined the direct, interpersonal contacts only. As suggested by Weedman (1992), a variety of communication media are used in boundary spanning communication among three professional groups: editors, reviewers, and critics in the area of children's literature. Her study showed that although informal channels (defined as direct, personal contacts) were perceived as more important than formal channels (includes journals, memberships of associations and organizations, and conferences and bookfair attendances), there was clear indication that formal channels were important sources of information (50% of the respondents used both formal and informal channels, 39.9% of them used informal channel exclusively, and 10.1% of them used formal channels exclusively). Also, it was suggested by a previous CIS study (Pobocik, Johnson, Chang, & Darrow, 1996), that conferences which provided face-to-face interpersonal interaction were an effective tool to achieve the level of integration required by new organizational forms, such as the CIS. Thus, future studies should include a variety of communication media in order to capture a more complete picture of boundary spanning communication.

Finally, it needs to be noticed that the present study focused on the innovation-related boundary spanning communication only. Different boundary spanning patterns

may well be likely to be detected if other content area such as work-related communication was studied. Our other studies indicated that work-related communication contacts were much higher than the intervention strategies contacts over time (See Johnson et al., 1994b). As a result, more dense and stable networks may be observed for work-related boundary spanning activities. It will be interesting to collect boundary spanning communication of varied content and compare the resulting different boundary spanning patterns. Take the present study for example, the work-related boundary spanning models may have helped to explain the sparseness of innovation networks: the CIS members were too busy with their daily work to engage in the innovation-related matters. Future studies can measure boundary spanning activities in different content.

In conclusion, as mentioned before, this was the first attempt to understand boundary spanners' over time communication behavior. Overall, sparse and unstable communication contacts were detected. The three significant paths which were between internal networks and between external networks provided more support to the functional specialization model than to the communication stars and cyclical models. Although none of the proposed models could completely explain CIS boundary spanner communication activities, the results indicate that organizations formally need to assign boundary spanning roles and officially define their responsibilities. Also, the study offers some thoughts in terms of balancing the formal and informal sides of an organization and balancing individual needs and organizational goals in an innovation context. At the juncture when new organizational forms are proliferating, boundary spanners are critical for organizations to deal with more complex interorganizational relationships.

Accordingly, future research studies should build on this one, developing even more precise and sophisticated views of boundary spanning communication.

FOOTNOTE

1. "The two-step flow of communication" was formulated about 50 years ago by Lazarsfeld et al. (1948) when they observed that "ideas often flow from radio and print to opinion leaders and from these to the less active sections of the population" (p. 15). The suggested that mass media spread its influence by first reaching opinion leaders, "who, in turn, pass on what they read and hear to those of their every-day associates for whom they are influential" (Katz, 1957, p. 61).

2. Interpersonal roles include the roles of figurehead, leader, and liaison; informational roles include the roles of monitor, disseminator, and spokesman; decisional roles include the roles of entrepreneur, disturbance handler, resource allocator, and negotiator (Mintzberg, 1973, Table 2).

3. Role negotiation refers to "when two or more persons consciously interact with the express purpose of altering the others' expectations about how a role should be enacted and evaluated" (Miller et al., 1995, p. 13).

4. Considerable effort was expended during the first year of the project on the development of data gathering instruments. Extensive pretests were conducted during the summer of 1993. These pretests resulted in substantial modifications to the communication logs. The original instruments developed in the grant proposal were reviewed and revised based on additional research on the nature of the CIS and further

review of the literature. The criteria for evaluating the results of pretests following in rank order in importance from first to last: a) instruments should be likely to result in the high response rates needed for successful network analysis (e.g., 95 percent); b) instruments should minimize respondent burden; c) instruments should be couched in terms that are readily understood by respondents; and d) instruments should have compatible operationalizations across different methods of data collection.

With these criteria in mind several alternative formats of the communication log were discussed and considered. For example, instead of a roster it was decided to use a combination of communication log and directory, which minimized respondent burden, while also reminding respondents of the composition of the network. Based on the initial pretesting, it was also decided to change the content categories from operational to work-related and from innovation to intervention strategies based on feedback from respondents. The operational category was unfamiliar to respondents and innovation was a constant in this information services organization. (Other researchers have experienced similar difficulties with respondents making distinctions between production and innovation related contents (Bach, 1989; Cheney, Block, & Gordon, 1986) and others have noted on a conceptual level problems in distinguishing innovation and production (Stohl & Redding, 1987).

Since the major focus of this project was evaluation of new intervention strategies designed to reach target audiences within the CIS, it was decided it would be more appropriate to focus on this more limited type of innovation, which also may clear up some of the confusion found in prior studies when the broader category of innovation was used. While the CIS traditionally has engaged in a number of specific types of campaigns

designed to reach target audiences, this type of activity has often been sporadic and ad hoc, focusing on national initiatives. The program project was designed to gradually and systematically increase the adoption of specific intervention strategies within the CIS network. Accordingly, the intervention strategies category, while initially unfamiliar to some members of the network, would become increasingly familiar to them as the CISRC program project developed. Other work-related communication would provide an interesting baseline on which to compare the development of intervention strategy-related communication. Responses to open-ended questions concerning what operational and innovation messages meant to respondents were used to craft definitions and examples used in the next rounds of pretesting. It was also decided not to include other categories of communication (e.g., social) because of concerns over the sensitivity of respondents and respondent burden, since each additional content category vastly increases it (Marsden, 1990).

5. Historically in the project there has been some confusion over whether to record local vs. national communication in the logs. After repeated concerns were addressed to us, we decided in the next data collection, May 1995, to make clear the very limited situations in which communication at a local level should be reported.

6. The content of relationships has generally presented a difficult problem in network analysis \research with a variety of strategies developed to deal with this problem (Burt & Schott, 1985). "....naturally occurring relations to other people are bundles of specific interactions, some consisting of many elements, others containing very few" (Burt &

Schott, 1985, pp. 288; Richards, 1985). Typically, a network analyst makes a tradeoff between simplicity at the dyadic level in order to examine complexity at the social system level (Burt & Schott, 1985). Thus, in this research, we isolated those contents most directly related to the operation of the CIS as a system and the Program Project as an innovation. "The sociometric questions finally selected for a study can be no more than a compromise between the practical impossibility of gathering data on all kinds of relations in which respondents might be involved and the other extreme of initial hunches as to the correct identification of some minimal number of the most significant kinds of relations in a study population" (Burt & Schott, 1985, pp. 289). Researchers must also confront the problem of differential meaning between members of the study population and themselves (Burt & Schott, 1985). Especially for intervention strategies, since this is a relatively new concept within the CIS, it is expected that over time members of the network will converge on a common meaning for this content.

7. Some boundary spanning research were also conducted to investigate the characteristics associated with the most effective boundary spanners (Keller & Holland, 1975). Three particular traits were found common in boundary spanners. For general ability and intelligence, they have high verbal and memory skills. Boundary spanners need to watch their language to avoid the use of words that arouse unpleasant connotations for other parties. Their high memory skills "can be used to project the impression that he is really interested in those people" they are dealing with (p.77). For personality traits, they tend to be more flexible and extrovert. Their flexibility will motivate them to adjust their behavior according to the audience while the extrovert traits make them easily to establish and use friendship to get what they want. Lastly, they have

high economic and political values. They tend to favor a pragmatic style of thought and "have the habit of forecasting the effects of his statements and behavior on the attitudes of outsiders, as well as his own constituents." (p.78).

APPENDICES

APPENDIX A

Table 1

Overview of the Major Goals and Objectives of the CIS

Goals

- To use communication strategies to reduce cancer incidence, morbidity, and mortality.
- To provide NCI-designated cancer centers and other major community cancer organizations and intermediaries with a resource for developing outreach programs to reach their various audiences.
- To establish a high-quality system that can serve as a resource and a database for stimulating the development and implementation of new research projects in cancer communications.

Objectives

- To support a network of regional CIS offices throughout the country that will serve as local outlets for NCI to disseminate information on cancer to communities and serve as catalysts for the adoption and adaptation of NCI/OCC education programs, materials, and messages in the community.
- To operate a toll-free telephone service in the regional offices.
- To mobilize local media and community-based organizations to use and adopt OCC programs, materials, and messages in support of NCI education initiatives.
- To establish reliable data collection strategies and dissemination techniques to facilitate evaluation of the role of communication strategies in reducing morbidity and mortality from cancer.

Note. Abstracted from the Cancer Information Service Request for Contract Proposals, January 3, 1992; National Cancer Institute, National Institutes of Health.

Table 2

Functional Roles Descriptions of the CIS

Functional Groups	Job Descriptions
P.I.	Principal Investigator of the CIS contract. They are responsible for the overall strategic direction of the projects that take place within the CIS. About five percent of their time is spent working with different projects. Generally a high-level M.D. or Ph.D. in parent institution.
Project Directors	They are the day-to-day overall managers for regional CIS offices. Generally a master's level person with extensive experience. Typically spends 100% time on CIS contract, but may also have administrative duties for the parent institution not related to the CIS. Reports to the P.I.
Telephone Service Managers	They are in charge of managing the telephone service, and sometimes also the referral resources. A very hands-on position that typically involves training and monitoring staff. Generally has Master's Degree with clinical and/or counseling experience. Spends 100% time on CIS contract. Reports to Project Directors.
Outreach Managers	They are responsible for getting health messages out to the public through networking with other organizations such as local university, the American Cancer Society, state health department, etc.. They Generally have Master's Degree in public education, social work, or communication. The CIS contract funds one position, but many offices have in-kind support for other part-time positions. Generally reports to the Project Director.
Office of Communication Staff	They serve a variety of functions and is made up of a range of participants from branch chiefs to project officers. Most possess masters' degree in public health, or public administrations.

Source: Morra et al., 1993

Table 3

Demographics for the Cancer Information Service

Demographic	N	Percentage
Education		
High School Graduates / Some College	3	4.8
College Graduate	13	21.0
Some Post Graduate	13	21.0
Graduate Degree	32	51.6
Other	1	1.6
Missing	12	
Lenth of Service		
Less than 1 year	14	22.6
1-2 years	13	21.0
3-4 years	13	20.9
5-6 years	10	16.2
7-8 years	4	6.4
9+ years	7	11.2
missing	13	
Functional Roles		
Office of Cancer Communication staff	8	10.8
Project Directors	14	18.9
Telephone Service Managers	22	29.7
Outreach Coordinators	24	32.4
Principal Investigators	6	8.1

N = 74

TABLE 4
CISRC CHRONOLOGY

In June, 1993, the CISRC began the process of staffing, training, and piloting three new intervention strategies to produce services that meet the health information needs of traditionally underserved sectors of the American public. All three innovations are connected to the CIS 1-800-4-CANCER telephone service. Each intervention utilizes the toll-free number as a nexus from which to disseminate cancer information to targeted populations. The following document gives a brief description of each project and a detailed summary of major developments in each project over time, as well as a chronology of key events that affected the CISRC .

- **Project 1** (Proactive Counseling to Promote Mammography) involves the use of proactive counseling in the CIS to offer information about mammography screening to women aged 50 or older who would not ordinarily receive this information as part of usual service.

- **Project 2** is also concerned with encouraging women to receive regular mammograms. This new intervention strategy reaches out to women by making cold calls from the CIS to low income and minority women in targeted communities in Colorado.

- **Project 3** "Quit Today!" Smoking Program for African Americans) is a tailored, multichannel media campaign designed to increase the CIS call volume of low-income African American smokers and recent quitters. Specifically, this intervention strategy is geared toward promoting a smoking cessation program for African Americans.

- **5-A-Day** (5-A-Day for Better Health) involves the use of proactive counseling in the CIS to offer information about the inverse relationship between fruit and vegetable consumption and the risk of cancer to eligible callers age 18 and older who would not ordinarily receive this information as part of usual service.

Date	Project 1	Project 2	Project 3	National Meetings	Network Analysis	Other Key Events
9/93 - 11/93:	Project 1 staff prepared program materials and training materials for nine CIS offices that were selected to implement proactive counseling.	Project 2 staff conducted formative research, including focus groups and a review of the literature. The findings were used to formulate outcall protocols	Initially, Project 3 was entitled the "Pathways to Freedom Project" after a smoking cessation video by that name. Project 3 staff prepared program materials and training materials to be distributed at workshops at the November national meeting. Monitoring smoking-related calls at four CIS offices involved in the project, planning focus groups, developing outreach activities, and planning for the development of paid media were key events in building a strong foundation for Project 3.	In November, OCC staff participated in a quality control meeting in Washington. The Steering Committee Meeting took place in Denver on September 8-9.	The first Network Analysis data collection took place November 3-5, during the same month that there were numerous changes in the e-mail system.	The final regional office was in place and the program project grant was officially budgeted. Negotiations took place for evening hours on the telephone service.

Date	Project 1	Project 2	Project 3	National Meetings	Network Analysis	Other Key Events
12/93 - 2/94:	In December, 1993, two vanguard offices were selected to pilot Project 1.	In January, training for the outcall protocol began at the Rocky Mountain CIS. In February, 1994, project staff began a two-month pilot of the outcall protocols. Debriefing surveys and follow-up surveys were developed at this time.	Project 3 hired several new personnel to work in outreach and designing the telephone intervention, and began conducting focus groups and revised the Pathways to Freedom videotape.	In December, 1993, the National Conference was held in Atlanta.	The second Network Analysis data collection took place February 8-10. Harsh winter weather may have contributed to the delayed receipt of questionnaires for some offices.	In January, an OCC memo specified routing of requests from regional offices to other OCC staff through the Project Officer. In February, Kate Duffy Mazan announces her sabbatical, and Chris Thompsen becomes head of the CIS. At that time, task forces were in the process of forming. Individual e-mail id's were in place for people at the National Office, and a voice mail system was added across the network.
3/94 - 5/94:	Program staff at the vanguard offices were trained and began to implement a six month pilot of the intervention.	Biostat core collaborated with project staff to computerize outcall protocol. In May, CIS staff were trained to implement protocol. Debriefing surveys and follow-up surveys were pretested. In addition, TISs completed a process evaluation about making outcalls.	Continued revising Pathways to Freedom guide and videotape. Project 3 offices participated in a process evaluation in April. In May, completed focus groups and filmed video and TV PSA spot.		The third Network Analysis data collection took place during May 16-18.	

Date	Project 1	Project 2	Project 3	National Meetings	Network Analysis	Other Key Events
6/94 - 8/94:	Intervention protocols and survey interview protocols were slated for revision based on the pilot study. Following the national CIS meeting, data from pilot studies at Yale and Northern California CIS offices revealed an average baseline mammography adherence rate of 85%. By July, 1994, 13 CIS offices had committed to participate in Project 1, in the face of growing uncertainty about the future of Project 1.	In July, 1994, Project 2 was just beginning the main pilot study, and the CISRC was discussing various strategies to reach working women (e.g., making outcalls in the evening), and to create incentives for information specialists to make outcalls (e.g., financial reimbursements or hiring a half-time information specialist to make outcalls). Debriefing interviews were conducted, and by mid-August, Project 2 reported reaching women with a lower mammography adherence rate than women who were calling in to the CIS.	By July, 1994, Project 3 had made 5,000 copies of the video tape, and final touches were being added to the poster and facilitator's guide, as well as paid advertisements. The media campaign for Project 3 began in mid-August of 1995, once videos were distributed to participating stations.	The national CIS meeting took place in Washington, DC in June, 1994. The CISRC Members Council Meeting took place simultaneously with the meeting of the newly-formed Network Analysis Advisory Board in Washington from June 21-24. The CISRC Investigators Meeting took place in Denver on August 30-31.	The fourth Network Analysis data collection took place during August 24-26.	On June 9, the first issue of CISRC NEWS was distributed to the network in the Weekly Package.

Date	Project 1	Project 2	Project 3	National Meetings	Network Analysis	Other Key Events
3/95 - 5/95:	Development of follow-up mailings for 5-A-Day. Training for the pilot took place in May. Draft of the four-week follow-up interview was generated	Received 60 % of the needed sample in the three arms of Project 2. Preliminary results reported at the May Steering Committee indicate a statistically significant difference in mammography adherence rates between intervention and control groups. Also, TISs reported lower job satisfaction associated with making outcalls.	Test calls received positive reviews. One unanticipated consequence of the successful campaign was a high call busy rate at prime time. Rick Boyd and Al Marcus met with ACS to negotiate successfully an eight-month hiatus between airing the CIS media campaign (scheduled to end in July, 1996) and that of the ACS.	The CISRC Members Council Meeting took place in Denver on March 30-31.	The seventh Network Analysis data collection took place during May 16-18.	

Date	Project 1	Project 2	Project 3	National Meetings	Network Analysis	Other Key Events
9\94 - 11/94:	A survey of age-eligible female callers in all CIS offices interested in participating in Project 1 confirmed pilot results about mammography adherence rates. Following extensive consultation with NCI, OCC, the CIS Network, and a panel of experts, the focus of Project 1 changed to 5-A-Day. Shared information about 5-A-Day with all CIS offices interested in participating in Project 1. Formed external advisory committee for Project 1. Drafted baseline survey of 5-A-Day adherence among CIS callers.	Initiated evening hours for making outcalls to reach more working women. 650 subjects had been accrued into Project 2 at this time.	During this time, Project 3 began implementing quality control and monitoring. Project 3 reported at least 861 calls in response to the first media campaign, which began on August 16. Outreach activities began in the Year II communities. During this time period, some concern was expressed throughout the network about possible contamination effects in Project 3 due to the fact that the ACS was also planning to use the "Pathways" video. Met with ACS to facilitate cooperative relationships between the ACS "Pathways to Freedom" and the CIS "Quit Today!" projects, in communities where there is project overlap as well as those where there is not.	The Telephone Services Managers Meeting took place in Bethesda, MD, November 7-9. The Computerization Task Force met in Denver in November.	The fifth Network Analysis data collection took place during November 1-3.	Erroneous minutes of the General Session of the June CISRC Members Council Meeting were distributed by the CISRC. Revised minutes were sent out the following week.
12/94 - 2/95:	In January, there was an Expert advisory Meeting to discuss 5-A-Day.	Six-month follow up interviews were conducted . Lori Crane received a Department of Defense grant to add a fourth arm to the study, contingent upon receiving written informed consent from participants.	Project 3 began test calls for Project 3. Completed the distribution of videos to intervention groups.	The External Advisory Meeting took place in Denver on January 5-6. The Evaluation Task Force met in Washington on January 19-20.	The sixth Network Analysis data collection took place during February 6-8.	

Date	Project 1	Project 2	Project 3	National Meetings	Network Analysis	Other Key Events
3/95 - 5/95:	Development of follow-up mailings for 5-A-Day. Training for the pilot took place in May. Draft of the four-week follow-up interview was generated	Received 60 % of the needed sample in the three arms of Project 2. Preliminary results reported at the May Steering Committee indicate a statistically significant difference in mammography adherence rates between intervention and control groups. Also, TISs reported lower job satisfaction associated with making outcalls.	Test calls received positive reviews. One unanticipated consequence of the successful campaign was a high call busy rate at prime time. Rick Boyd and Al Marcus met with ACS to negotiate successfully an eight-month hiatus between airing the CIS media campaign (scheduled to end in July, 1996) and that of the ACS.	The CISRC Members Council Meeting took place in Denver on March 30-31.	The seventh Network Analysis data collection took place during May 16-18.	

Date	Project 1	Project 2	Project 3	National Meetings	Network Analysis	Other Key Events
6/95 - 8/95:	Project 1 changes focus from mammography screening to "Eat 5-A-Day for Better Health;" this intervention disseminates information proactively to CIS callers. Training program at AMC begins for Wave I.	Project 2 exceeded accrual goals, completing the project by the end of June.	Preliminary results reported at the May Steering Committee indicate that 578 African American smokers (a marked increase from matched control communities) called in to the CIS in response to the "Quit Today!" campaign: Ninety percent of these callers agreed to participate in initial counseling, receive materials, and be contacted at the six-month follow-up interview. As of May, the second wave of the media campaign had been completed, again exceeding the project goals. There were 931 African American callers at the end of year two. Rick Boyd replaced Tracy Orleans as project leader.		In July, Dave Johnson, co-director of the Administrative Core, went on sabbatical. The eighth Network Analysis data collection took place during August 22-24. We directly asked respondents to make a local/national distinction in their contacts and included electronic mail and facsimile communication in the communication log.	CISRC Newslett er distribut ed
9/95 - 11/95:	Wave I of the 5-A-Day intervention is completed. Preliminary results show an increase in fruits and vegetable consumption.	Intervention completed in June. Large discrepancies found in the self-reporting their last mammogram. SRL in the process of ding follow-up interviews.	Rick Boyd notes that the television campaign was very successful but the radio campaign was slower than expected.		The ninth Network Analysis data collection took place during November 6-8.	

12/95 - 2/96	Data was being gathered from the 4-5 month interviews.	Follow-up interviews were completed.	The Surgeon General's Report on Smoking features minority smoking.		Al Marcus distributed an overview paper describing the CISRC. Dave Johnson explicated the budget concerns of the network analysis portion of the project and decides to reduce the number of tasks performed by the team. The tenth Network Analysis data collection took place during February 13-15.	
3/96 - 5/96	Both the pilot study and Wave I had approximately 65% of callers reported eating less than 5 serving of fruity and vegetables per day. Wave II training held.	Outcall intervention aimed an increasing adherence to mammography screening was shown to be strongly associated with using a doctor as a source of health information.	Initial results showed that approximately 64 percent of the calls to the CIS were from African Americans noting that radio promotions initiated their call. Final advertising campaign takes place.	Renewal concepts were discussed during the CISRC Members Council Meeting held on March 23. Concepts included: provide education about genetic testing and colorectal cancer screening, continue the 5-A-Day project, pain management and telephone counseling, and evaluation of the CIS outreach component.	The eleventh Network Analysis data collection took place during May 15-17.	CISRC Newsletter distributed

6/96 - 8/96	Wave II started in 5 CIS offices; pilot and training study started	Preliminary analysis of project sent to co-investigators. Initial runs indicate little effect of intervention on behavior.	Final media wave ends. Preliminary calculations indicate that over 1,400 African American smokers call the CIS during the two-year intervention. Intervention phase is complete.		The 1996 continuation application was distributed; Al decided to not carry the network analysis portion of the project forward because of budgetary reasons. The twelfth Network Analysis data collection took place during August 20-22. Marcy Meyer and Susan Pobocik left the team.	

Sources

CISRC Investigators Meeting minutes, August 1994

CISRC Members Council Meeting minutes, June 1994, March 1995

CISRC Members Council Meeting minutes, March 1996

CISRC PO1 Conference Call minutes, August 1993 - August 1995.

CISRC Steering Committee Meeting minutes, September 1993

CISRC Steering Committee Conference call minutes, August 1995 - 1996

CISRC Newsletter (Vol. 2, Nos. 1 and 2)

CISRC Memorandum, June 1996

Table 5

Distribution of Communication Contacts Over Time

	Frequency					
Number of Communication Contacts*	Internal at T1	Internal at T2	Internal at T3	External at T1	External at T2	External at T3
0	43	44	59	23	24	34
1-5	30	29	15	17	23	19
6-10	1	1	0	18	16	8
11-15	0	0	0	4	3	4
16-20	0	0	0	2	3	3
21-25	0	0	0	4	1	1
26-30	0	0	0	3	1	1
>30	0	0	0	3	3	4
Mean	.78	.74	.26	9.47	6.26	6.30
SD	1.29	1.25	.64	20.91	9.86	13.21

n=74

Table 6

Descriptive Results

variables	N	Mean	SD	Max	Min	Correlation					
T1in	74	.78	1.3	7	0	-					
T2in	74	.74	1.3	6	0	.14	-				
T3in	74	.26	.64	4	0	.07	.32	-			
T1ex	74	9.47	20.91	167	0	.05	.04	-.06	-		
T2ex	74	6.26	9.86	50	0	.15	-.10	-.01	.34	-	
T3ex	74	6.30	13.21	89	0	.12	.06	-.10	.83	.30	-

Table 7

Path Coefficients, Standard Errors, and Confidence Interval

	Path Coefficients	Standard Errors	95% Confidence Intervals	
			Lower endpoint	Upper endpoint
P_{12}	.14	.11	-.08	.36
P_{13}	.02	.12	-.22	.26
P_{15}	.13	.11	-.09	.35
P_{16}	.07	.12	-.17	.31
P_{23}	.33*	.11	.11	.55
P_{26}	.02	.12	-.22	.26
P_{42}	.03	.12	-.21	.27
P_{43}	-.09	.12	-.33	.15
P_{45}	.33*	.10	.13	.53
P_{46}	.82*	.05	.72	.92
P_{53}	.05	.13	-.21	.31
P_{56}	.01	.12	-.23	.25

Note: Parameters are numbered as follows: 1 = Internal communication (time 1); 2 = Internal communication (time 2); 3 = Internal communication (time 3); 4 = External communication (time 1); 5 = External communication (time 2); 6 = External communication (time 3).

* statistically significant, alpha = .05.

Table 8

MANOVA Results*: Communication Contacts for Functional Groups

	External Communication		
Functional Roles	Time 1	Time 2	Time 3
OMs	m=18.0	m=11.8	m=12.7
n=24	sd=34.1	sd=12.7	sd=19.0
OCCs	m=2.3	m=1.8	m=.6
n=8	sd=4.5	sd=3.4	sd=.9
PDs	m=9.6	m=6.1	m=7.5
n=14	sd=10.1	sd=5.8	sd=11.6
PIs	m=8.0	m=6.4	m=.4
n=6	sd=10.3	sd=13.9	sd=1.2
TSMs	m=2.9	m=1.5	m=2.7
n=22	sd=5.4	sd=3.0	sd=7.5

N = 74

* MANOVA revealed significant difference between functional groups on their communication amounts across three points of time (F=3.73, df=4, p <. 05).

Table 9

ANOVA Results: Differences between Three Innovation Projects

	Project 1 N=44	Project 2 N=3	Project 3 N=17
Internal Communication at T1*	M=.55 Sd=.82	M=2.3 Sd=2.1	M=1.0 Sd=1.4
Internal Communication at T2	M=.68 Sd=1.3	M=.67 Sd=.58	M=1.1 Sd=1.4
Internal Communication at T3	M=.11 Sd=.32	M=.33 Sd=.58	M=.41 Sd=1.0
External Communication at T1	M=10.9 Sd=25.9	M=3.7 Sd=3.2	M=9.5 Sd=13.3
External Communication at T2	M=7.3 Sd=10.7	M=0 Sd=0	M=6.0 Sd=10.0
External Communication at T3	M=7.2 Sd=15.3	M=1.0 Sd=1.7	M=8.5 Sd=12.2

N=74

* Oneway ANOVA revealed significant differenct between the three innovation projects regarding the communication amounts ($F=4.7$, $df=2$, $p < .05$).

Table 10

Distributions of Communication Stars

	Time 1	Time 2	Time 3
Internal Communication	1*, 11, 23, 25, 26, 28, 29, 31, 32, 34, 35, 37, 38, 44, 45, 46, 47, 54, 58, 59, 95, 98, 99, 101, 110, 111, 114, 117, 128	11, 22, 24, 26, 28, 30, 32, 34, 37, 41, 44, 46, 47, 49, 50, 51, 52, 55, 56, 57, 58, 59, 98, 99, 102, 111, 117, 133	9, 11, 18, 27, 28, 31, 38, 46, 51, 55, 58, 99, 102, 110
External Communication	1, 20, 21, 29, 32, 37, 39, 44, 47, 51, 57, 65, 101, 118	1, 20, 21, 25, 26, 28, 29, 31, 32, 35, 37, 39, 44, 47, 50, 51, 96, 101, 118	21, 25, 26, 29, 30, 31, 32, 34, 37, 39, 44, 47, 50, 56, 101

* refers to the matrix numbers of the respondents.

Note: Matrix numbers from 1 through 15, 17 through 19, 94, 142, and 143 are OCCs; from 20 through 43, 117, 127, and 128 are OMs; from 44 through 62, 132, and 135 are PDs; from 52 through 76, 118, and 120 are PIs; from 95 through 115, 16, 36, 124, 126, and 133 are TSMs.

APPENDIX B

Figure 1: Model 1: Functional Specialization

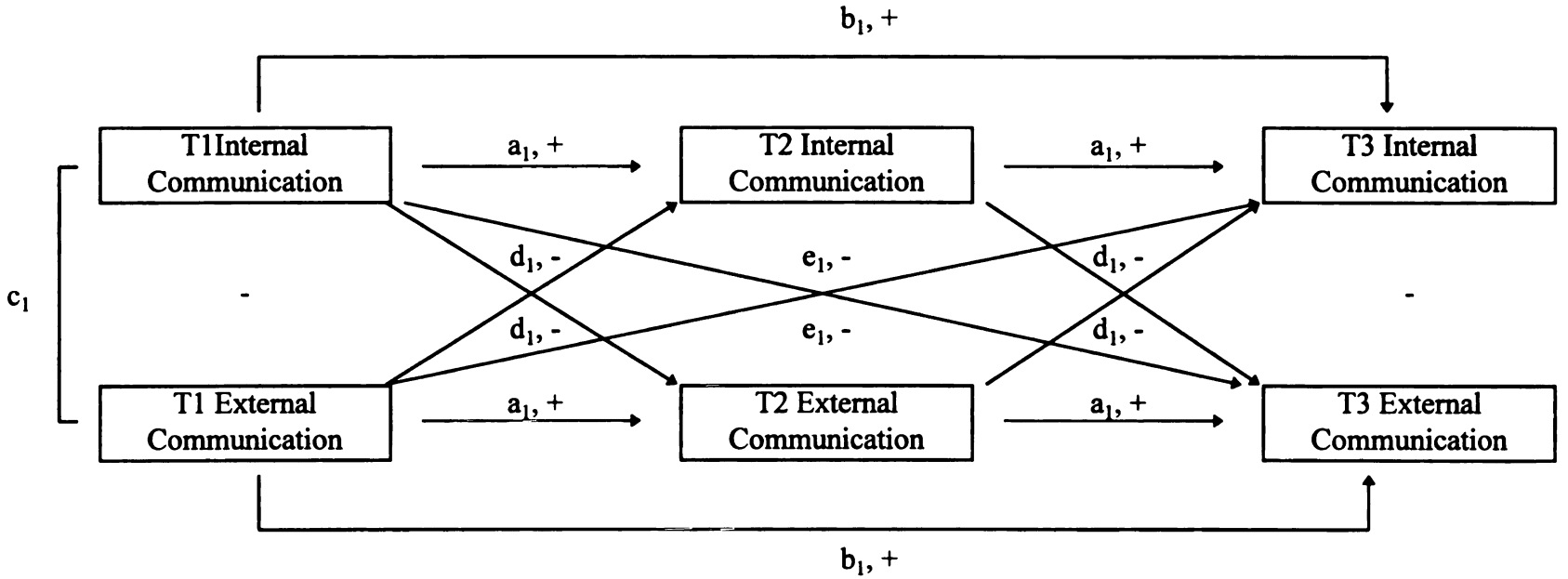


Figure 2: Model 2: Communication Stars

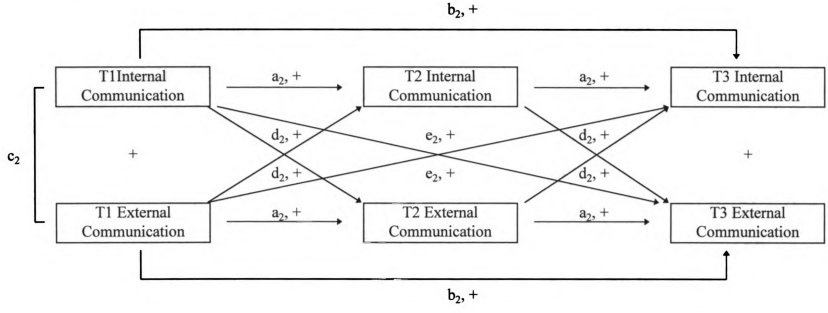


Figure 3: Model 3: Cyclical

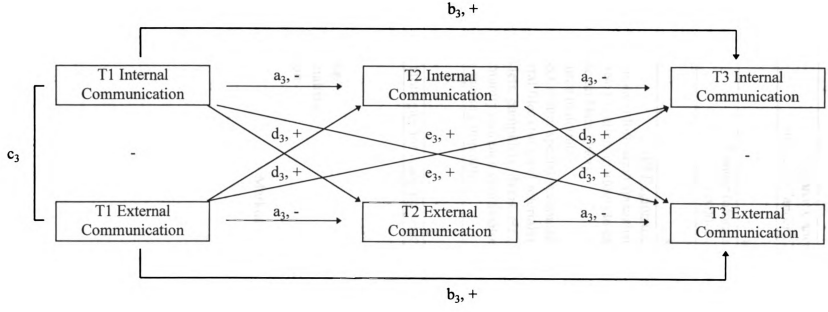
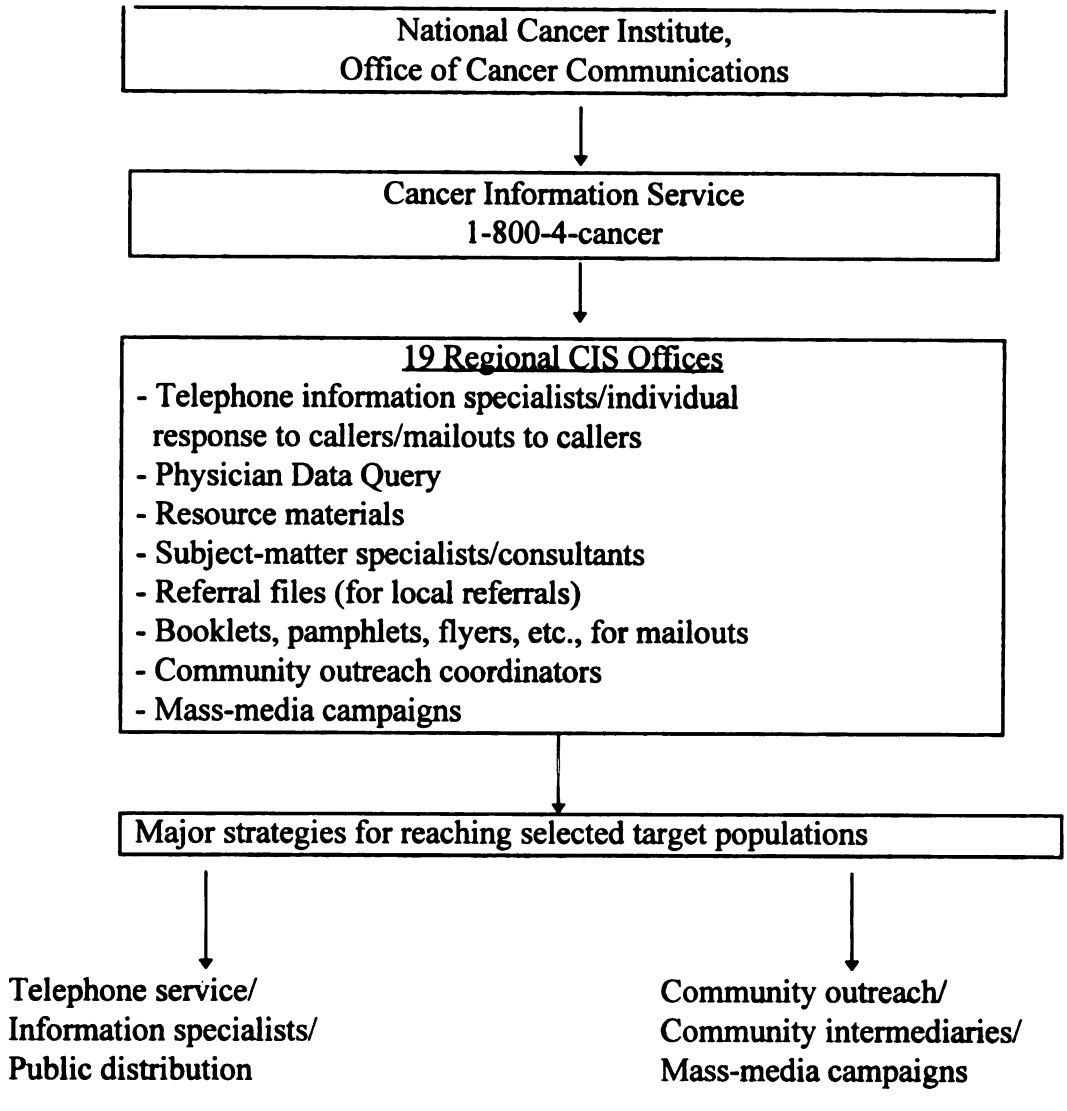
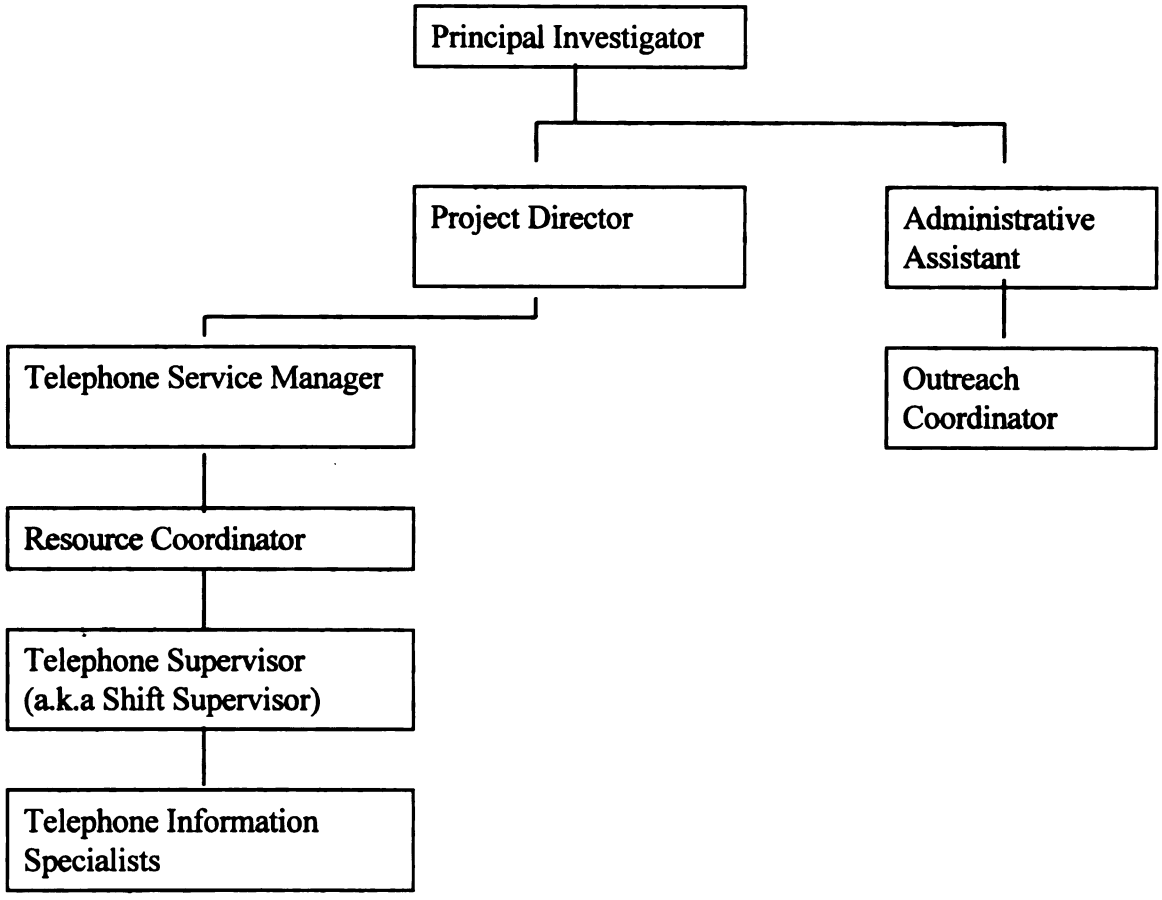


Figure 4: Overview of the CIS Network



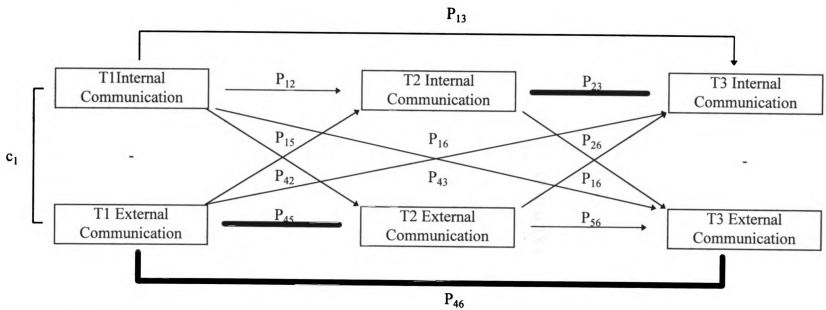
Source: Markus et al., 1993.

Figure 5: Generic CIS Regional Office Organizational Chart*



* Note: Each CIS office may be different, e.g., in some offices the Resource Coordinator and Outreach Coordinator report to the Telephone Service Manager.

Figure 6
Path Analysis Results



$X^2 = 0.79, df=2, p=.675$
$P_{23} = .31, p < .05$
$P_{45} = .33, p < .05$
$P_{46} = .82, p < .05$

APPENDIX C

CANCER INFORMATION SERVICE RESEARCH CONSORTIUM
COMMUNICATION LOG
PART A

This log asks you to record your work-related communication with individuals within the CIS/Program Project network on the dates of May 16 through May 18. We would like you to keep a diary of your work-related interpersonal contacts with members of the CIS/Program Project Network. It may be easier for you to record each communication event as it occurs. For your convenience, we have provided pre-dated pages for you to record your communication contacts within the CIS/Program Project network from **May 16 through May 18.** If you need additional space, please copy the extra page provided, date it, and attach it to the orange log.

For purposes of this study, this network includes the Office of Cancer Communication staff, Principal Investigators, Project Directors, Outreach Coordinators, and Telephone Service Managers at the CIS regional offices, and members of the Cancer Information Service Research Consortium (the Program Project Grant). A directory of individuals within the CIS/Program Project Network has been included for your convenience (see enclosure).

The next two pages describe in more detail how to complete the log. Each page of the communication log contains definitions for each of the categories for your convenience.

If you did not communicate with other members of the CIS/Program Project Network on a given day, please place a check in the appropriate space on the page for that day.

Please write your name and job title in the space provided below:

Name: _____

Job Title: _____

If you did not have any communication with other members of the CIS/Program Project Network between May 16 and May 18, please check this space _____, place this survey in the enclosed envelope, and complete the questionnaires in the pink packet.

COMMUNICATION CONTACTS LOG
Key Term Summary

NAME: Please print your name in the space provided.

TITLE: Please place a check in the space preceding your title. If your title is not listed, please check "Other", and record your title in the space provided.

REGION: Please record the number assigned to the CIS regional office in which you work. For example, the staff in the Kentucky office would record a "9" in the space provided. If you work in the National Office, please write the word "National" in the space provided. If you are a member of the Program Project staff only, please write "Program Project" in the space provided.

CONTACTS: We are only interested in the work-related interpersonal contacts (face-to-face or telephone) you *initiate* or *receive* with the Office of Cancer Communication staff, Principal Investigators, Outreach Coordinators, Telephone Service Managers, and Project Directors, and members of the Cancer Information Service Research Consortium (the P01 grant). Please indicate the *full name* of the person with whom you communicated. (See enclosed directory as needed.) Include as a contact phone calls where messages were left, even though you were not able to speak with the person directly. Please also indicate if the contact was part of a conference call (see details below).

TOPIC: We are primarily interested in national communication relating to CIS and Program Project issues. Please indicate whether the communication addressed

1) ***intervention strategies***, (initiatives that relate to the development or implementation of programs which focus on reaching various target populations such as counseling protocols, targeted outreach activities using the telephone, responses to calls associated with communication campaigns, etc.), especially like the ones developed by this Program Project;

or dealt with

2) ***other work-related*** issues focusing on maintaining and/or enhancing the day-to-day operation of the CIS (e.g., budgets, record keeping, ordering materials, or other administrative activities).

Please place an "X" in the space preceding the appropriate category. If both areas were discussed, place an "X" in the space preceding "***Both***". We are interested in important communication contacts you have which focus primarily on network-wide, national issues. Do NOT record conversations which are purely of local interest (e.g., "Would you please put toner in the copier?").

MINUTES: Please record the length of the communication contact in minutes.

CONFERENCE CALLS ONLY: For conference calls, please estimate the number of individuals who took part in the call, provide a general description of the topics discussed, and a description of the call participants' role within the CIS (e.g., Project

Directors). For "Communication Contact," pleade record the name of the individual who led the conference call.

If you have any questions about how to complete any part of this log, Principal Investigators and Outreach Coordinators contact Caroline Ethington at (517) 355-2170; Project Directors, Telephone Service Managers, members of the Office of Cancer Communication and Program Project staff may contact Marcy Meyer or Judy Berkowitz at (517) 355-5148.

APPENDIX D

EXAMPLE

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: Jay Doe.
Date: **Wednesday, May 17, 1995**

Title: ___ Principal Investigator ___ Outreach Coordinator
✓ Project Director ___ Telephone Service Manager
___ Other (please specify) → _____

Region: 24.

_____ Place a check in the space provided if you did not communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	MINUTES	TOPIC	FOR CONFERENCE CALLS ONLY
Chris Thomsen	50	___ Intervention Strategies ✓ Other work-related ___ Both	No. people: 18 Topic: monthly call to all project directors Roles: project directors
Al Marcus	15	✓ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:

AN EXAMPLE: On May 17, the following communication contacts occurred for the Project Director in Region 24. A conference call for all Project Directors with Chris Thomsen which lasted 50 minutes pertaining to other work-related matters. A call to Al Marcus which lasted 15 minutes concerning staff training on the new 5 A Day counseling protocol. A personal visit by the telephone service manager from Region 27 in which their upcoming Memorial Day Party was discussed for an hour over lunch. Note: The personal visit by the telephone service manager from Region 27 was omitted since it was not work-related.

EXAMPLE

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: Jay Doe.
Date: Wednesday, May 17, 1995

Title: ___ Principal Investigator ___ Outreach Coordinator
✓ Project Director ___ Telephone Service Manager
___ Other (please specify) → _____

Region: 24.

_____ Place a check in the space provided if you did not communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	MINUTES	TOPIC	FOR CONFERENCE CALLS ONLY
Chris Thomsen	50	___ Intervention Strategies ✓ Other work-related ___ Both	No. people: 18 Topic: monthly call to all project directors Roles: project directors
Al Marcus	15	✓ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:

AN EXAMPLE: On May 17, the following communication contacts occurred for the Project Director in Region 24. A conference call for all Project Directors with Chris Thomsen which lasted 50 minutes pertaining to other work-related matters. A call to Al Marcus which lasted 15 minutes concerning staff training on the new 5 A Day counseling protocol. A personal visit by the telephone service manager from Region 27 in which their upcoming Memorial Day Party was discussed for an hour over lunch. Note: The personal visit by the telephone service manager from Region 27 was omitted since it was not work-related.

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: ______________________

Title: ___ Principal Investigator ___ Project Director ___ Other (please specify) → ___ Outreach Coordinator ___ Telephone Service Manager ______________________

Region: _____

Date: **Monday, February 6, 1995**

______ Place a check in the space provided if you **DID NOT** communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	MINUTES	TOPIC*	FOR CONFERENCE CALLS ONLY**
		____ Intervention Strategies ____ Other work-related ____ Both	No. people: Topic: Roles:
		____ Intervention Strategies ____ Other work-related ____ Both	No. people: Topic: Roles:
		____ Intervention Strategies ____ Other work-related ____ Both	No. people: Topic: Roles:
		____ Intervention Strategies ____ Other work-related ____ Both	No. people: Topic: Roles:
		____ Intervention Strategies ____ Other work-related ____ Both	No. people: Topic: Roles:
		____ Intervention Strategies ____ Other work-related ____ Both	No. people: Topic: Roles:
		____ Intervention Strategies ____ Other work-related ____ Both	No. people: Topic: Roles:

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: ________________________.
Date: **Tuesday, February 7, 1995**

Title: ___ Principal Investigator ___ Project Director ___ Other (please specify) → ____________________
___ Outreach Coordinator ___ Telephone Service Manager

Region: _____

______ Place a check in the space provided if you **DID NOT** communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	MINUTES	TOPIC*	FOR CONFERENCE CALLS ONLY**
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: ____________________

Title:
___ Principal Investigator
___ Project Director
___ Other (please specify) → ____________________
___ Outreach Coordinator
___ Telephone Service Manager

Region: _____

Date: **Wednesday, February 8, 1994**

______ Place a check in the space provided if you **DID NOT** communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	MINUTES	TOPIC*	FOR CONFERENCE CALLS ONLY**
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:

COMMUNICATION WITHIN THE CISRC NETWORK

Your Name: ______________________

Title: ___ Principal Investigator ___ Outreach Coordinator Region: _____
___ Project Director ___ Telephone Service Manager
___ Other (please specify) ➔ ______________________

Date: ______________________

______ Place a check in the space provided if you **DID NOT** communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	MINUTES	TOPIC*	FOR CONFERENCE CALLS ONLY**
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:

CANCER INFORMATION SERVICE RESEARCH CONSORTIUM
Parts B, C, and D

This packet contains three parts. Please note that the green communication log is considered
Part A.

Part B asks how CIS members use several different modes of communication to communicate with one another.

Part C asks you to to indicate the number of communication contacts related to intervention strategies you had with individuals outside the CISRC network.

The questions in Part B of this packet could be interpreted in multiple ways. Please take each question at tis mose general level and avoid making subtle (even when valid) distinctions. Some questions in Parts B and C may be inappropriate for your own situations and, therefore, should be left blank. Answer all questions as well as you can.

Please feel free to write down any comments you have concerning communication within the CIS/Program Project Network in **Part D**, the Notes section of this booklet.

This questionnaire may be completed at any time, but we do request that you return both the salmon questionnaire and the pink communication contact log to us in the enclosed self-addressed, stamped envelope by **May 20, 1994**.

Please write your name and job title in the space provided below:

Name: _____

Job Title: _____

COMMUNICATION MODES QUESTIONNAIRE
Part B

1. In the space provided below, please estimate the number of communication contacts you initiated or received related to both intervention strategies and other work-related matters with the members of the CIS/RC network for each mode of communication listed below. The CIS/RC network is comprised of:

- Principal Investigators,
- Project Directors,
- Outreach Coordinators,
- Telephone Service Managers,
- Program Project Staff, and
- Office of Cancer Communication Staff.

Please note that since you have recorded your interpersonal communication contacts (telephone and face-to-face meetings) in Part A, the Communication Contacts Log, you do not need to record that information here. Only record those contacts you had between May 16 and May 18 for each of the modes listed. Please include intra-office communication, regardless if it addressed local or national issues.

NUMBER OF CONTACTS WITH:	FTS 2000 E-MAIL	OTHER E-MAIL SYSTEMS (such as INTERNET OR COMPUSERVE)	FACSIMILE	ANSWERING MACHINE OR VOICE MAIL
Principal Investigators				
Project Directors				
Outreach Coordinators				
Telephone Service Managers				
Office of Cancer Communication Staff				
Program Project Staff				

NUMBER OF CONTACTS WITH:	OVERNIGHT PRIORITY MAIL (such as FEDERAL EXPRESS)	MEMOS OR OFFICIAL MAIL CORRESPONDENCE	OTHER (SPECIFY MODE)
Principal Investigators			
Project Directors			
Outreach Coordinators			
Telephone Service Managers			
Office of Cancer Communication Staff			
Program Project Staff			

2. Thinking about your use of FTS 2000 electronic mail, in the course of a typical week, how often would you say you send a message intended for a specific individual using FTS 2000 e-mail rather than to a group of people, such as the entire network, or all people in a given position (e.g., Telephone Service Managers)?

_____ number of FTS 2000 E-mail messages sent to a specific individual at OCC only
_____ number of FTS 2000 E-mail messages sent to a specific individual at a Regional Office only
_____ do not use FTS 2000 E-mail at all to send messages

COMMUNICATION MODES QUESTIONNAIRE

Part B

3a. Thinking of each of the modes listed below, if you believe that this mode is used too much to communicate within the CIS, please place a check next to the item in the column labeled "TOO MUCH". If you believe that this mode is not used enough, please place a check next to the item in the column labeled "NOT ENOUGH". If you believe that the mode is used the right amount, place a check in the column labeled "RIGHT AMOUNT". If you are not familiar enough with the mode, leave the columns for Q. 3a blank.

3b. If you believe a specified mode needs improvement, please place a check in the column marked "IMPROVE".

MODE	Q. 3a TOO MUCH	Q. 3a NOT ENOUGH	Q. 3a RIGHT AMOUNT	Q. 3b IMPROVE
FTS 2000 E-MAIL				
OTHER E-MAIL SYSTEMS (such as INTERNET OR COMPUSERVE)				
FACSIMILE				
ANSWERING MACHINE OR VOICE MAIL				
WEEKLY PACKAGE				
CONFERENCE CALLS				
TELEPHONE CALLS				
OVERNIGHT PRIORITY MAIL (such as FEDERAL EXPRESS)				
MEMOS OR OFFICIAL MAIL CORRESPONDENCE				
FACE-TO-FACE MEETINGS				
OTHER (PLEASE SPECIFY)				

4. Which additional capabilities would you like to see the CIS use to facilitate communication among network members? These may include improvements or additions to current capabilities or new systems or methods of communication. (Please record your answer in the space provided. If you need additional space, please continue on the back of this page.)

5. Which current capabilities would you like to see the CIS discontinue using to facilitate communication among network members? (Please record your answer in the space provided. If you need additional space, please continue on the back of this page.)

EXTERNAL COMMUNICATION CONTACTS

Part C

In the space provided, please estimate the **number** of times you ***communicated*** with a member representing the following groups about ***intervention strategies*** by any of the means of communication listed in Part B. Within each category, do **not** count an individual more than once. Please include contacts you initiated or received. ***Intervention strategies*** refer to initiatives that relate to the development or implementation of programs which focus on reaching various target populations such as counseling protocols, targeted outreach activities using the telephone, responses to calls associated with communication campaigns, etc., especially like the ones developed by the CIS/RC Program Project grant.

CONTACT	NUMBER OF DIFFERENT INDIVIDUALS
Office Staff (Within your Regional Office)	
Clerical Workers	
Telephone Information Specialists	
Resource Coordinator(s)	
Volunteers	
Other Office Staff	
Other (Please specify) _____	
Contacts with the following 15 organizations should be recorded for regional office members only. **Regional Contacts**	
AARP	
American Cancer Society	
Cancer Center	
Clergy	
Health Department	
Intermediary Organizations	
Local Government (e.g., County, Municipality, etc.)	
Local Print Media (e.g., Newspapers, Magazines, etc.)	
Local Electronic Media (e.g., Television, Radio, etc.)	
Local Hospitals and Clinics	
Medical Community	
Public at Large	
State Government	
Other Cancer/Public Affairs Officers (Please specify) _____	
Other (Please specify) _____	
Contacts with the following 11 organizations in *italics should* be recorded for OCC staff only. National Contacts	
AARP	
American Cancer Society	
Congressional Staff	
Congresspeople (e.g., Representative or Senator)	
Other Government Agency Representatives (*Please specify*) _____	
National Print Media (e.g., Newspapers, Magazines, etc.)	
National Electronic Media (e.g., Television, Radio, etc.)	
Other NCI Programs	
NIH	
Science Organizations Scientists	
Other (Please specify) _____	

NOTES
Part D

Please provide any comments you have regarding communication within the CISRC network in the space provided. If you need additional space, please continue on the back of this page or attach other pages as necessary.

Thank you very much for your participation.

Please return this form by **May 20, 1994**
in the enclosed self-addressed stamped envelope to:

Dr. J. David Johnson
Department of Communication
473B Communication Arts & Sciences Bldg.
Michigan State University
East Lansing, MI 48824
(517) 432-3311
FAX (517) 432-1192

APPENDIX E

CANCER INFORMATION SERVICE RESEARCH CONSORTIUM
COMMUNICATION LOG
PART A

This log asks you to record your work-related communication with individuals within the CISRC network on the dates of February 6 through February 8. We would like you to keep a diary of your work-related interpersonal contacts with members of the CISRC Network. It may be easier for you to record each communication event as it occurs. For your convenience, we have provided pre-dated pages for you to record your communication contacts within the CISRC network from **February 6 through February 8.** If you need additional space, please copy the extra page provided, date it, and attach it to the orange log.

For purposes of this study, this network includes the Office of Cancer Communication staff, Principal Investigators, Project Directors, Outreach Coordinators, and Telephone Service Managers at the CIS regional offices, and members of the Cancer Information Service Research Consortium (the Program Project Grant). A directory of individuals within the CIS/Program Project Network has been included for your convenience (see enclosure).

The next two pages describe in more detail how to complete the log. Each page of the communication log contains definitions for each of the categories for your convenience.

If you did not communicate with other members of the CIS/Program Project Network on a given day, please place a check in the appropriate space on the page for that day.

Please write your name and job title in the space provided below:

Name: _____

Job Title: _____

If you did not have any communication with other members of the CISRC Network between February 6 and February 8, please check this space _____, place this survey in the enclosed envelope, and complete the questionnaires in the salmon packet.

COMMUNICATION CONTACTS LOG
Key Term Summary

NAME: Please print your name in the space provided.

TITLE: Please place a check in the space preceding your title. If your title is not listed, please check "Other", and record your title in the space provided.

REGION: Please record the number assigned to the CIS regional office in which you work. For example, the staff in the Kentucky office would record a "9" in the space provided. If you work in the National Office, please write the word "National" in the space provided. If you are a member of the Program Project staff only, please write "Program Project" in the space provided.

CONTACTS: We are only interested in the work-related interpersonal contacts (face-to-face or telephone) you *initiate* or *receive* with the Office of Cancer Communication staff, Principal Investigators, Outreach Coordinators, Telephone Service Managers, and Project Directors, and members of the Cancer Information Service Research Consortium (the P01 grant). Please indicate the *full name* of the person with whom you communicated. (See enclosed directory as needed.) Include as a contact phone calls where messages were left, even though you were not able to speak with the person directly. Please also indicate if the contact was part of a conference call (see details below).

TOPIC: We are primarily interested in national communication relating to CIS and Program Project issues. Please indicate whether the communication addressed

1) ***intervention strategies***, (initiatives that relate to the development or implementation of programs which focus on reaching various target populations such as counseling protocols, targeted outreach activities using the telephone, responses to calls associated with communication campaigns, etc.), especially like the ones developed by this Program Project;

or dealt with

2) ***other work-related*** issues focusing on maintaining and/or enhancing the day-to-day operation of the CIS (e.g., budgets, record keeping, ordering materials, or other administrative activities).

Please place an "X" in the space preceding the appropriate category. If both areas were discussed, place an "X" in the space preceding "***Both***". We are interested in important communication contacts you have which focus primarily on network-wide, national issues. Do NOT record conversations which are purely of local interest (e.g., "Would you please put toner in the copier?").

MINUTES: Please record the length of the communication contact in minutes.

CONFERENCE CALLS ONLY: For conference calls, please estimate the number of individuals who took part in the call, provide a general description of the topics discussed, and a description of the call participants' role within the CIS (e.g., Project Directors). For "Communication Contact," pleade record the name of the individual who led the conference call.

If you have any questions about how to complete any part of this log, contact Marcy Meyer at (517) 432-1124.

EXAMPLE

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: Jay Doe.
Date: **Wednesday, May 17, 1995**

Title: ___ Principal Investigator ___ Outreach Coordinator
✓ Project Director ___ Telephone Service Manager
___ Other (please specify) → _____

Region: 24.

_____ Place a check in the space provided if you did not communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	MINUTES	TOPIC	FOR CONFERENCE CALLS ONLY
Chris Thomsen	50	___ Intervention Strategies ✓ Other work-related ___ Both	No. people: 18 Topic: monthly call to all project directors Roles: project directors
Al Marcus	15	✓ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:

AN EXAMPLE: On May 17, the following communication contacts occurred for the Project Director in Region 24. A conference call for all Project Directors with Chris Thomsen which lasted 50 minutes pertaining to other work-related matters. A call to Al Marcus which lasted 15 minutes concerning staff training on the new 5 A Day counseling protocol. A personal visit by the telephone service manager from Region 27 in which their upcoming Memorial Day Party was discussed for an hour over lunch. Note: The personal visit by the telephone service manager from Region 27 was omitted since it was not work-related.

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: ____________________

Title:
___ Principal Investigator
___ Project Director
___ Other (please specify) → ____________________
___ Outreach Coordinator
___ Telephone Service Manager

Region: _____

Date: **Monday, February 6, 1995**

______ Place a check in the space provided if you **DID NOT** communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	MINUTES	TOPIC*	FOR CONFERENCE CALLS ONLY**
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: ______________________.
Date: **Tuesday, February 7, 1995**

Title: ___ Principal Investigator ___ Project Director ___ Other (please specify) → ________________ ___ Outreach Coordinator ___ Telephone Service Manager

Region: _____

______ Place a check in the space provided if you **DID NOT** communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	MINUTES	TOPIC*	FOR CONFERENCE CALLS ONLY**
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: ____________________

Title: ___ Principal Investigator ___ Project Director ___ Other (please specify) → ____________________ ___ Outreach Coordinator ___ Telephone Service Manager

Region: _____

Date: **Wednesday, February 8, 1994**

______ Place a check in the space provided if you **DID NOT** communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	MINUTES	TOPIC*	FOR CONFERENCE CALLS ONLY**
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:

COMMUNICATION WITHIN THE CISRC NETWORK

Your Name: ______________________

Date: ______________________

Title: ___ Principal Investigator ___ Outreach Coordinator Region: _____
___ Project Director ___ Telephone Service Manager
___ Other (please specify) → ______________

______ Place a check in the space provided if you **DID NOT** communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	MINUTES	TOPIC*	FOR CONFERENCE CALLS ONLY**
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:
		___ Intervention Strategies ___ Other work-related ___ Both	No. people: Topic: Roles:

APPENDIX F

CANCER INFORMATION SERVICE RESEARCH CONSORTIUM
Parts B, C, and D

This packet contains three parts. Please note that the green communication log is considered
Part A.

Part B asks how CIS members use several different modes of communication to communicate with one another.

Part C asks you to to indicate the number of communication contacts related to intervention strategies you had with individuals outside the CISRC network.

The questions in Part B of this packet could be interpreted in multiple ways. Please take each question at tis mose general level and avoid making subtle (even when valid) distinctions. Some questions in Parts B and C may be inappropriate for your own situations and, therefore, should be left blank. Answer all questions as well as you can.

Please feel free to write down any comments you have concerning communication within the CIS/Program Project Network in **Part D**, the Notes section of this booklet.

This questionnaire may be completed at any time, but we do request that you return both the salmon questionnaire and the pink communication contact log to us in the enclosed self-addressed, stamped envelope by **Feb 10, 1995.**

Please write your name and job title in the space provided below:

Name: _____

Job Title: _____

COMMUNICATION MODES QUESTIONNAIRE
Part B

1. In the space provided below, please indicate by check mark, whether or not you communicated by the specified communication modes with individuals who performed the following jobs in the CISRC network:

- Principal Investigators
- Project Directors
- Outreach Coordinators
- Telephone Service Managers
- Program Project Staff
- Office of Cancer Communication Staff.

For example, if you communicated with the Principal Investigator by E-mail during this three-day period, you would indicate this by placing a check in the appropriate box.

Please note that since you have recorded your interpersonal communication contacts (telephone and face-to-face meetings) in Part A, the Communication Contacts Log, you do not need to record that information here. Only record those contacts you had between February 6 and February 8 for each of the modes listed. Please include intra-office communication, regardless if it addressed local or national issues. Please note that we are only interested in whether or not a communication event occurred in a particular communication modality. You do not need to indicate how frequently you used each channel.

NUMBER OF CONTACTS WITH:	E-MAIL*	FACSIMILE (FAX)	MEMOS	OTHER
Principal Investigators				
Project Directors				
Outreach Coordinators				
Telephone Service Managers				
Office of Cancer Communication Staff				
Program Project Staff				

*including FTS 2000 and other E-mail systems

EXTERNAL COMMUNICATION CONTACTS
Part C

In the space provided, please estimate the number of times you *communicated* with a member representing the following groups about ***intervention strategies***. Within each category, do not count an individual more than once. Please include contacts you initiated or received. *Intervention strategies* refer to initiatives that relate to the development or implementation of programs which focus on reaching various target populations such as counseling protocols, targeted outreach activities using the telephone, responses to calls associated with communication campaigns, etc., especially like the ones developed by the CISRC Program Project grant.

ORGANIZATION	NUMBER OF DIFFERENT INDIVIDUALS
People Outside of Your Office	
Congressional Staff	
Congresspeople (e.g., Representative or Senator)	
Other Government Agency Representatives (Please specify) _____	
National Print Media (e.g., Newspapers, Magazines, etc.)	
National Electronic Media (e.g., Television, Radio, etc.)	
Other NCI Programs	
NIH	
Science Organizations/ Scientists	
Other (Please specify) _____	
Office Staff (Within OCC)	
Clerical Workers	
Branch chief, Reports and Inquiries	
Office Chief, Patient Education Office	
Section Chief, Public Inquiries Section	
Branch Chief, Information Projects Branch	
Section Chief, Reports	
Section Chief, Health Promotion	
Section Chief, Cancer Information Service	
Interns	
Other Office Staff	
Other (Please specify) _____	

PART D
NOTES

Please provide any comments you have regarding communication or any other issues within the CISRC in the space provided. If you need additional space, please continue on the back of this page or attach other pages as necessary.

Thank you very much for your participation.

Please return this form by **Feb 10, 1995**
in the enclosed self-addressed stamped envelope to:

Dr. J. David Johnson
Department of Communication
473B Communication Arts & Sciences Bldg.
Michigan State University
East Lansing, MI 48824
(517) 432-3311
FAX (517) 432-119

APPENDIX G

CANCER INFORMATION SERVICE RESEARCH CONSORTIUM
Parts B, C, and D

This packet contains three parts. Please note that the green communication log is considered
Part A.

Part B asks how CIS members use several different modes of communication to communicate with one another.

Part C asks you to to indicate the number of communication contacts related to intervention strategies you had with individuals outside the CISRC network.

The questions in Part B of this packet could be interpreted in multiple ways. Please take each question at tis mose general level and avoid making subtle (even when valid) distinctions. Some questions in Parts B and C may be inappropriate for your own situations and, therefore, should be left blank. Answer all questions as well as you can.

Please feel free to write down any comments you have concerning communication within the CIS/Program Project Network in **Part D**, the Notes section of this booklet.

This questionnaire may be completed at any time, but we do request that you return both the salmon questionnaire and the pink communication contact log to us in the enclosed self-addressed, stamped envelope by **Feb 10, 1995.**

Please write your name and job title in the space provided below:

Name: _____

Job Title: _____

COMMUNICATION MODES QUESTIONNAIRE
Part B

1. In the space provided below, please indicate by check mark, whether or not you communicated by the specified communication modes with individuals who performed the following jobs in the CISRC network:

- Principal Investigators
- Project Directors
- Outreach Coordinators
- Telephone Service Managers
- Program Project Staff
- Office of Cancer Communication Staff.

For example, if you communicated with the Principal Investigator by E-mail during this three-day period, you would indicate this by placing a check in the appropriate box.

Please note that since you have recorded your interpersonal communication contacts (telephone and face-to-face meetings) in Part A, the Communication Contacts Log, you do not need to record that information here. Only record those contacts you had between February 6 and February 8 for each of the modes listed. Please include intra-office communication, regardless if it addressed local or national issues. Please note that we are only interested in whether or not a communication event occurred in a particular communication modality. You do not need to indicate how frequently you used each channel.

NUMBER OF CONTACTS WITH:	E-MAIL*	FACSIMILE (FAX)	MEMOS	OTHER
Principal Investigators				
Project Directors				
Outreach Coordinators				
Telephone Service Managers				
Office of Cancer Communication Staff				
Program Project Staff				

*including FTS 2000 and other E-mail systems

EXTERNAL COMMUNICATION CONTACTS
Part C

In the space provided, please estimate the number of times you *communicated* with a member representing the following groups about *intervention strategies*. Within each category, do not count an individual more than once. Please include contacts you initiated or received. *Intervention strategies* refer to initiatives that relate to the development or implementation of programs which focus on reaching various target populations such as counseling protocols, targeted outreach activities using the telephone, responses to calls associated with communication campaigns, etc., especially like the ones developed by the CISRC Program Project grant.

Individuals in Other Organizations	**NUMBER OF DIFFERENT INDIVIDUALS**
American Cancer Society	
Cancer Center	
Health Department	
Intermediary Organizations	
Local Print Media (e.g., Newspapers, Magazines, etc.)	
Local Electronic Media (e.g., Television, Radio, etc.)	
Local Hospitals and Clinics	
Medical Community	
Public at Large	
State Government	
Other Cancer/Public Affairs Officers (Please specify) _____	
Other (Please specify) _____	
Office Staff (Within your Regional Office)	
Clerical Workers	
Telephone Information Specialists	
Resource Coordinator(s)	
Volunteers	
Other Office Staff	
Other (Please specify) _____	

PART D
NOTES

Please provide any comments you have regarding communication or any other issues within the CISRC in the space provided. If you need additional space, please continue on the back of this page or attach other pages as necessary.

Thank you very much for your participation.

Please return this form by **Feb 10, 1995**
in the enclosed self-addressed stamped envelope to:

Dr. J. David Johnson
Department of Communication
473B Communication Arts & Sciences Bldg.
Michigan State University
East Lansing, MI 48824
(517) 432-3311
FAX (517) 432-119

APPENDIX H

CANCER INFORMATION SERVICE RESEARCH CONSORTIUM
COMMUNICATION LOG
PART A

This log asks you to record your work-related communication with individuals within the CISRC network on the dates of May 15 through 17. We would like you to keep a diary of your work-related interpersonal contacts with members of the CISRC Network. It may be easier for you to record each communication event as it occurs. For your convenience, we have provided pre-dated pages for you to record your communication contacts within the CISRC network from **May 15 through May 17**. If you need additional space, please copy the extra page provided, date it, and attach it to the beige log.

We are still asking you to indicate whether your national, work-related contact was made using one of the following channels: ☎ = telephone (including face-to-face communication), 💻 = e-mail (including FTS-2000 and all other types), 🖹 = fax.

For purposes of this study, this network includes the Office of Cancer Communication staff, Principal Investigators, Project Directors, Outreach Program Managers, and Telephone Service Managers at the CIS regional offices, and members of the Cancer Information Service Research Consortium (the Program Project Grant). A directory of individuals within the CISRC Network has been included for your convenience (see enclosure).

The next two pages describe in more detail how to complete the log. Each page of the communication log contains definitions for each of the categories for your convenience.

If you did not communicate with other members of the CISRC Network on a given day, please place a check in the appropriate space on the page for that day.

Please write your name and job title in the space provided below:

Name: _____

Job Title: _____

If you did not have any communication with other members of the CISRC Network between May 15 and May 17, please check this space _____; place this log, along with the completed buff questionnaire, in the enclosed envelope.

COMMUNICATION CONTACTS LOG
Key Term Summary

NAME: Please print your name in the space provided.

TITLE: Please place a check in the space preceding your title. If your title is not listed, please check "Other", and record your title in the space provided.

REGION: Please record the number assigned to the CIS regional office in which you work. For example, the staff in the Kentucky office would record a "9" in the space provided. If you work in the National Office, please write the word "National" in the space provided. If you are a member of the Program Project staff only, please write "Program Project" in the space provided.

CONTACTS: We are only interested in the work-related communication you *initiate* or *receive* with the Office of Cancer Communication staff, Principal Investigators, Outreach Coordinators, Telephone Service Managers, and Project Directors, and members of the Cancer Information Service Research Consortium (the P01 grant). Please indicate the *full name* of the person with whom you communicated. (See enclosed directory as needed.) Include as a contact phone calls where messages were left, even though you were not able to speak with the person directly.

GROUP COMMUNICATION: For "Communication Contact," please record the name of the individual who led the event (e.g., who initiated the fax). For "Number in Group" (e.g., re: conference calls, broadcast e-mails, etc.), please estimate the number of individuals who took part in the contact and provide a general description of the contact for "Purpose." This description should include a description of the participants' roles within the CIS (e.g., Project Directors).

LENGTH: Please record the length of the communication contact such that: telephone contacts are estimated by minutes, e-mails and faxes are estimated in pages.

TOPIC: We are primarily interested in national communication relating to CIS and Program Project issues. Please indicate whether the communication addressed

1) ***intervention strategies***, (initiatives that relate to the development or implementation of programs which focus on reaching various target populations such as counseling protocols, targeted outreach activities using the telephone, responses to calls associated with communication campaigns, etc.), especially like the ones developed by this Program Project;

or dealt with

2) ***other work-related*** issues focusing on maintaining and/or enhancing the day-to-day operation of the CIS (e.g., budgets, record keeping, ordering materials, or other administrative activities).

Please place an "X" in the space preceding the appropriate category. If both areas were discussed, place an "X" in the space preceding "***Both***". We are interested in important communication contacts you have which focus primarily on network-wide, national issues. Do NOT record conversations which are purely of local interest (e.g., "Would you please put toner in the copier?").

MODE: For each contact at the national level, please indicate which communication mode was utilized based upon the following options: ☎ = telephone (including face-to-face contacts), 💻 = e-mail (including FTS-2000 and all other types), 🖹 = fax.

If you have any questions about these changes or how to complete any part of this log, contact Caroline Ethington at (517) 432-1124, or Betty La France at (517) 353-4466.

APPENDIX I

EXAMPLE

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: Jay Doe
Date: **October 28, 1996**

Title:
___ Principal Investigator
✓ Project Director
___ Outreach Coordinator
___ Telephone Service Manager
___ Other (please specify): ➔

Region: 24

_____Place a check in the space provided if you did not communicate within the CISRC Network on this day.

NOTE: Please use the following to determine your mode of communication for each contact (circle ONE): ☎ = telephone, 💻 = e-mail (including FTS-2000 and all other types), 🖷 = fax

COMMUNICATION CONTACTS	NUMBER IN GROUP*	LENGTH	TOPIC*	MODE
Chris Thomsen PURPOSE: PD Call	Number: 19	50	___ Intervention Strategies ✓ Other work-related ___ Both	☎ 💻 🖷
Al Marcus PURPOSE:	Number:	4	✓ Intervention Strategies ___ Other work-related ___ Both	☎ 💻 🖷
Jay Doe PURPOSE: Training procedures	Number: 8	3	✓ Intervention Strategies ___ Other work-related ___ Both	☎ 💻 🖷

AN EXAMPLE: On October 28, the following communication contacts occurred for the Project Director in Region 24. A conference call for all Project Directors with Chris Thomsen which lasted 50 minutes pertaining to other work-related matters. A four-page fax was sent to Al Marcus concerning staff training on the new 5 A Day counseling protocol. Jay Doe sent a three-page, broadcast e-mail to eight people about training procedures in relation to intervention strategies.

Note: The visit by the telephone service manager from Region 24 was omitted since it was not a national contact.

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: ______________________________.

Date: **May 15, 1996**

Title:
___ Principal Investigator
___ Project Director
___ Outreach Coordinator
___ Telephone Service Manager
___ Other (please specify): ➔ ______________.

Region: ______.

______ Place a check in the space provided if you did not communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	NUMBER IN GROUP*	LENGTH**	TOPIC	MODE***
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: ________________ Title: ___ Principal Investigator Region: ______
___ Project Director
___ Outreach Coordinator
___ Telephone Service Manager ______________
Date: **May 16, 1996** ___ Other (please specify): ➔

______ Place a check in the space provided if you did not communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	NUMBER IN GROUP*	LENGTH**	TOPIC	MODE***
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 🖳 🖹
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 🖳 🖹
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 🖳 🖹
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 🖳 🖹
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 🖳 🖹
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 🖳 🖹
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 🖳 🖹
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 🖳 🖹
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 🖳 🖹
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 🖳 🖹

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: ______________________________.

Title:
___ Principal Investigator
___ Project Director
___ Outreach Coordinator
___ Telephone Service Manager
___ Other (please specify): ➔ ____________.

Region: __________.

Date: **May 17, 1996**

______ Place a check in the space provided if you did not communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	NUMBER IN GROUP*	LENGTH**	TOPIC	MODE***
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 💻 📄
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 💻 📄
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 💻 📄
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 💻 📄
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 💻 📄
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 💻 📄
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 💻 📄
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 💻 📄
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 💻 📄
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	☎ 💻 📄

COMMUNICATION CONTACTS WITHIN THE CISRC NETWORK

Your Name: ________________ Title: ___ Principal Investigator Region: ______

___ Project Director

___ Outreach Coordinator

Date: ______________________ ___ Telephone Service Manager

___ Other (please specify): →

______ Place a check in the space provided if you did not communicate within the CISRC Network on this day.

COMMUNICATION CONTACTS	NUMBER IN GROUP*	LENGTH**	TOPIC	MODE***
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	
PURPOSE:	Number:		____ Intervention Strategies ____ Other work-related ____ Both	

CANCER INFORMATION SERVICE RESEARCH CONSORTIUM
Parts B, C, and D

This packet contains three parts. Please note that the green communication log is considered
Part A.

Part B asks how CIS members use several different modes of communication to communicate with one another.

Part C asks you to to indicate the number of communication contacts related to intervention strategies you had with individuals outside the CISRC network.

The questions in Part B of this packet could be interpreted in multiple ways. Please take each question at tis mose general level and avoid making subtle (even when valid) distinctions.
Please feel free to write down any comments you have concerning communication within the CISRC in **Part D**, the Notes section of this booklet.

This questionnaire may be completed at any time, but we do request that you return both the buff questionnaire and the green communication contact log to us in the enclosed self-addressed, stamped envelope by **May 27, 1996.**

Please write your name and job title in the space provided below:

Name: _____

Job Title: _____

COMMUNICATION MODES QUESTIONNAIRE
Part B

1. In the space provided below, please indicate by check mark (√), whether or not you communicated by the specified communication modes with individuals occupying the following positions within the CISRC network:

- Principal Investigators
- Project Directors
- Outreach Coordinators
- Telephone Service Managers
- Program Project Staff
- Office of Cancer Communication Staff.

For example, if you communicated with the Principal Investigator by E-mail during this three-day period, you would indicate this by placing a check (√) in the appropriate box.

Please note that since you have recorded your interpersonal, electronic mail, and facsimile communication in Part A, the Communication Contacts Log, you do not need to record that information here. Only record those contacts you had between **May 15 and May 17** for each of the modes listed. Please include intra-office communication, regardless if it addressed local or national issues. Please note that we are only interested in whether or not a communication event occurred in a particular communication modality. You do not need to indicate how frequently you used each channel.

NUMBER OF CONTACTS WITH:	MEMOS	OTHER
Principal Investigators		
Project Directors		
Outreach Coordinators		
Telephone Service Managers		
Office of Cancer Communication Staff		
Program Project Staff		

EXTERNAL COMMUNICATION CONTACTS
Part C

In the space provided, please estimate the number of times you *communicated* with a member representing the following groups about ***intervention strategies***. Within each category, do not count an individual more than once. Please include contacts you initiated or received. *Intervention strategies* refer to initiatives that relate to the development or implementation of programs which focus on reaching various target populations such as counseling protocols, targeted outreach activities using the telephone, responses to calls associated with communication campaigns, etc., especially like the ones developed by the CISRC Program Project grant.

ORGANIZATION	NUMBER OF DIFFERENT INDIVIDUALS
People Outside of Your Office	
Congressional Staff	
Congresspeople (e.g., Representative or Senator)	
Other Government Agency Representatives (Please specify) _____	
National Print Media (e.g., Newspapers, Magazines, etc.)	
National Electronic Media (e.g., Television, Radio, etc.)	
Other NCI Programs	
NIH	
Science Organizations/ Scientists	
Other (Please specify) _____	
Office Staff (Within OCC)	
Clerical Workers	
Branch chief, Reports and Inquiries	
Office Chief, Patient Education Office	
Section Chief, Public Inquiries Section	
Branch Chief, Information Projects Branch	
Section Chief, Reports	
Section Chief, Health Promotion	
Section Chief, Cancer Information Service	
Interns	
Other Office Staff	
Other (Please specify) _____	

PART D
NOTES

Please provide any comments you have regarding communication or any other issues within the CISRC in the space provided. If you need additional space, please continue on the back of this page or attach other pages as necessary.

Thank you very much for your participation.

Please return this form by **May 27, 1996**
in the enclosed self-addressed stamped envelope to:

Dr. J. David Johnson
Department of Communication
473B Communication Arts & Sciences Bldg.
Michigan State University
East Lansing, MI 48824
(517) 432-3311
FAX (517) 432-1192

APPENDIX J

CANCER INFORMATION SERVICE RESEARCH CONSORTIUM
Parts B, C, and D

This packet contains three parts. Please note that the green communication log is considered
Part A.

Part B asks how CIS members use several different modes of communication to communicate with one another.

Part C asks you to to indicate the number of communication contacts related to intervention strategies you had with individuals outside the CISRC network.

The questions in Part B of this packet could be interpreted in multiple ways. Please take each question at tis mose general level and avoid making subtle (even when valid) distinctions.
Please feel free to write down any comments you have concerning communication within the CISRC in **Part D**, the Notes section of this booklet.

This questionnaire may be completed at any time, but we do request that you return both the buff questionnaire and the green communication contact log to us in the enclosed self-addressed, stamped envelope by **May 27, 1996.**

Please write your name and job title in the space provided below:

Name: _____

Job Title: _____

COMMUNICATION MODES QUESTIONNAIRE
Part B

1. In the space provided below, please indicate by check mark (√), whether or not you communicated by the specified communication modes with individuals occupying the following positions within the CISRC network:

- Principal Investigators
- Project Directors
- Outreach Coordinators
- Telephone Service Managers
- Program Project Staff
- Office of Cancer Communication Staff.

For example, if you communicated with the Principal Investigator by E-mail during this three-day period, you would indicate this by placing a check (√) in the appropriate box.

Please note that since you have recorded your interpersonal, electronic mail, and facsimile communication in Part A, the Communication Contacts Log, you do not need to record that information here. Only record those contacts you had between **May 15 and May 17** for each of the modes listed. Please include intra-office communication, regardless if it addressed local or national issues. Please note that we are only interested in whether or not a communication event occurred in a particular communication modality. You do not need to indicate how frequently you used each channel.

NUMBER OF CONTACTS WITH:	MEMOS	OTHER
Principal Investigators		
Project Directors		
Outreach Coordinators		
Telephone Service Managers		
Office of Cancer Communication Staff		
Program Project Staff		

EXTERNAL COMMUNICATION CONTACTS
Part C

In the space provided, please estimate the number of times you *communicated* with a member representing the following groups about *intervention strategies*. Within each category, do not count an individual more than once. Please include contacts you initiated or received. *Intervention strategies* refer to initiatives that relate to the development or implementation of programs which focus on reaching various target populations such as counseling protocols, targeted outreach activities using the telephone, responses to calls associated with communication campaigns, etc., especially like the ones developed by the CISRC Program Project grant.

Individuals in Other Organizations	**NUMBER OF DIFFERENT INDIVIDUALS**
American Cancer Society	
Cancer Center	
Health Department	
Intermediary Organizations	
Local Print Media (e.g., Newspapers, Magazines, etc.)	
Local Electronic Media (e.g., Television, Radio, etc.)	
Local Hospitals and Clinics	
Medical Community	
Public at Large	
State Government	
Other Cancer/Public Affairs Officers (Please specify) _____	
Other (Please specify) _____	
Office Staff (Within your Regional Office)	
Clerical Workers	
Telephone Information Specialists	
Resource Coordinator(s)	
Volunteers	
Other Office Staff	
Other (Please specify) _____	

PART D
NOTES

Please provide any comments you have regarding communication or any other issues within the CISRC in the space provided. If you need additional space, please continue on the back of this page or attach other pages as necessary.

Thank you very much for your participation.

Please return this form by **May 27, 1996**
in the enclosed self-addressed stamped envelope to:

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