

IN W. RICHARDS, JR. + G. BARNETT (EDS.)  
PROGRESS IN COMMUNICATION SCIENCES VOL 12,  
NORWOOD, NJ: ABLEX, 1993

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## Using Network Concepts to Clarify Sources and Mechanisms of Social Influence

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### References

I thank Dr. Lynne Markus for her role in initiating the larger research project. I thank David Krackhardt, Bill Stevenson, Howard Nixon, Jr., and Joseph Schmitz for their comments on an earlier version of this chapter. I thank George Barnett for encouraging me to actually write this chapter. I especially thank my colleague in the empirical project that motivated this theoretical framework, Dr. Carolyn Aydin, for her exceptional operational, analytical, and conceptual contributions.

new tasks or inexperienced users, the effects of social information are likely to be stronger (Festinger, 1954; Thomas & Griffin, 1983; Woelfel & Haller, 1971). Social influence may also be more likely when the individual has to make a choice from a set of alternatives, due to the more detailed focus necessary, or because issues involving choice may involve topics of greater salience (Sheppard, Hartwick & Warshaw, 1988).

So, influence based on the need to reduce uncertainty is less likely to the extent that both individuals are certain, when the group is certain, or when the stimulus is unambiguous. However, when not uncertain about the phenomenon, an individual may still be influenced by sources on the basis of affiliation, resources or authority, or by sources who are mediators to sources of information about the phenomenon (Moscowi, 1976). One implication here is that a fully specified model of social influence needs to measure the perceived uncertainty, ambiguity, or novelty of the phenomenon, the individual's prior experience with the phenomenon, and the nature or importance of one's sources of influence. Moscowi, however, critiques this pervasive linkage of influence to uncertainty, arguing that it reifies the object of uncertainty (including others and self, such as in social comparison). Indeed, he argues, ambiguous situations may even lead to more divergent views, and attempts by others to influence individuals may actually increase differences in attitudes (Moscowi, 1976, Chapter 2). Normative influence may also be more likely in cooperative situations, regardless of their uncertainty (Ajzen & Fishbein, 1973).

## 2. Exposure to Influence

Social information processing theory postulates that individuals may be influenced by cues from others about what to attend to, how to value the salient dimensions of workplace phenomena, and how others evaluate the same phenomena. For example, co-workers may provide social information through overt statements, calling attention to or increasing salience of referents, providing interpretations, and influencing others' needs by making more salient rewarding or dissatisfying situations (Salancik & Pfeffer, 1978). Central to this proposition, however, is the assumption that individuals are able to be exposed to the attitudes, information, etc. of those others.

Moscowi (1976) extends this assumption by arguing that all members of a social context are both sources and receivers of influence, which is aimed at change as well as consensus, but depends upon the extent to which the currently operating group norms emphasize objectivity (accuracy), preference (taste), or originality (compared to others).

Thus, theories of social influence implicitly rely on some conceptualization of the amount and type of *social proximity* among all members of the relevant social system. Social proximity, in this context, is defined as the extent to which one can be exposed to influence from others in a given social system.

Social proximity is not the same as homophily, or the similarity of two individuals with respect to various socio-demographic characteristics (Burt, 1987; Rogers, 1983). However, homophily may be highly associated with some forms of proximity. Further, this assumption about exposure requires the theorist to justify, and the researcher to

This chapter attempts to clarify some unresolved or unclarified issues in applying social influence theories. It first reviews the fundamental components of social influence models, making specific reference to social information processing theory. It then applies network analysis constructs (Burt, 1987; Rice & Richards, 1985; Rogers & Kincaid, 1981) to identify the conceptual foundations of three proximity mechanisms (relational, positional and spatial) and two sources (individual and group) of social information processing. This discussion may help to make explicit some of the motivations behind particular choices in testing theories of social influence.

## I. SOCIAL INFLUENCE AND SOCIAL INFORMATION PROCESSING IN ORGANIZATIONS

The social information processing model, developed in reaction to the failure of individual attributes or objective task measures to sufficiently explain reactions to workplace phenomena, brought theories of social influence to the organizational setting (Salancik & Pfeffer, 1978). According to this model, individual perceptions of organizational phenomena (such as task characteristics) are not influenced solely by objective characteristics of the phenomena and one's past experiences and individual attributes, but also by the opinions, information, and behaviors of salient others. One review concluded that, while methodological and conceptual problems cloud the issues, both objective task characteristics and social information cues appear to influence individuals' perceptions of their tasks (Thomas & Griffin, 1983).

### A. Components of Social Influence

Social influence models in general, and the social information processing model in particular, include three essential components: the ambiguity or uncertainty of the situation, exposure to influence, and some "source other" who is valued by the individual and who is the source of the social information. The following sections summarize these components and identify unresolved or problematic aspects of each.

#### 1. Ambiguity of Situation

According to Sherif, "Under conditions lacking objective structure in some focal aspect, the individual becomes increasingly uncertain...[and] is more prone to be influenced by the words, actions or other communications of other individuals, groups and mass media" (Sherif, 1969, p. 71, quoted by Moscowi, 1976, p. 25). Similarly, Secord & Backman argue that "the more ambiguous the non-social situation, the more likely [the dependence] on social reality for orientation" (Secord & Backman, 1964, p. 331, quoted by Moscowi, 1976, p. 32). Thus, in unfamiliar or new settings, or in situations involving

identify, both the specific "source other" and the specific proximity mechanism implied by the theoretical or empirical focus of the research.

### 3. Importance of Source Other

But simply *identifying* the "source other" is insufficient. Social information processing theory postulates that the influence of socially constructed meanings is affected by factors such as credibility, status, adoption behavior, etc. -- that is, the general salience or importance to the individual of the source other. Krassa (1988) showed, using computer simulations, that the importance individuals place on others' opinions significantly influences the rate at which public opinion changes due to diffusion through interaction. An analysis might weight specific others by perceived and/or formal power, which is a property of organizational and personal attributes as well as position in the organizational structure (Brass, 1984).

### 4. Other Components of Influence

This section must end with a strong cautionary note. No model of social information processing argues that one's attitudes, beliefs, etc., are developed wholly or substantially through social influence. Many theorists of social influence have made it quite clear that factors such as self-reflexiveness (inferences about self based on confronting self when responding to an object), other attitudes (especially those similar to the new phenomenon), prior experience with the phenomenon, perceived attributes of the phenomenon (such as an innovation), and others also play strong roles in developing attitudes and guiding behavior (Ajzen & Fishbein, 1973; Rogers, 1983; Woelfel & Haller, 1971). Further, when the "others" are largely anonymous, and the phenomenon is brief or trivial, social influence is typically small or non-existent (Kilduff & Regan, 1988).

### B. Problems with Social Influence Models

Most theoretical discussions are fairly ambiguous or even silent about some aspects of the necessary operationalizations. However, because testing such propositions, particularly in field settings, requires explicit operationalizations that are always subject to a wide variety of threats to validity and reliability, research failures or contradictory results are rarely laid at the doorstep of the initiating theory. Social influence theories, including social information processing theory, in general fail to provide explicit guidance as to how to (1) identify the relevant source other, (2) operationalize different mechanisms of social influence, or (3) specify the sources of influence at different levels of analysis. "It is one thing to say that networks have an effect on social evaluation processes and quite another to say precisely what the effects are, how they are produced, and more generally, what networks add to the explanation of social evaluation phenomena" (Gartrell, 1987, p. 59). Even social comparison theory (Festinger, 1954) rarely specifies the sources of comparison: "...work on the theory...has generally not considered the larger social context in which the social comparison operates" (Gartrell, 1987, p. 55, quoting Pettigrew).

### 1. Identification of Source Other and Source Other's Attitudes

Shaw's (1980, p. 45) explication of social information processing theory postulates that "socially relevant others...serve to influence a worker's perceptions of and reactions to a job", yet, as with other social information processing researchers, does not specify who those relevant others might be. The influential "other" may be a single specific other, a single "generalized other", or even multiple reference groups (Ajzen & Fishbein, 1973). Woelfel & Haller (1971) argue that these "relevant others" might include both those who provide expectations of how the actor should behave or believe, and those who provide role models of behavior and beliefs. Many social information processing studies have been conducted in laboratories where the specific sources of social information are provided by the researcher (i.e., a research confederate, written statements from a generalized other, etc.), or, as Woelfel & Haller (1971) point out, in limited field studies where the sources are small panels of pre-selected significant others. However, this tradition allows theories to avoid developing conceptual justifications for identifying the nature or the number of influential sources. Thus, in general, there is little guidance for how to formally specify the source other, or the mechanisms whereby the individual may be exposed to such source others.

As a consequence, some studies have relied on some combination of what may be termed either "generalized others" -- no specific individuals, but just some category of others deemed influential by the respondent -- and "social projection" -- the estimation by the individual of what the other's attitudes, information, etc., are. Thus the approach that is least rigorous but may provide the strongest results is to use an individual's social projection of generalized others' attitudes as the social information basis for predicting an individual's attitude.

For example, Fulk and Ryu (1990) reported that respondents' estimates of their coworkers' and of their supervisors' perceived usefulness of electronic mail had beta coefficients of .55 and .43, respectively, and, along with other variables, jointly explained 27% of the variance in the respondents' evaluation of electronic messaging. They presented these results as support for applying social information processing theory to organizational phenomena such as new media. However, such analyses necessarily assume that the respondent can accurately estimate an other's attitudes or behaviors. This is a dangerous and generally unsupported assumption both for specific others, as well as for generalized others such as "co-workers". For example, Rice & Mitchell (1973) found that there was no significant correlation between subjects' ratings and the ratings of the subject's coworkers of the extent of their collaboration or their social interaction. And, Urberg, Cheng & Shyu (1990) found that adolescent smokers overestimate their friends' smoking.

Estimating others' attitudes has been labelled social projection (Gerard & Orive, 1987; Woelfel & Haller, 1971). Social projection is similar to false consensus, or "egocentric bias that occurs when people [over]estimate consensus for their own behavior" (Mullin, Atkins, Champion, Edwards, Hardy, Story & Venderklok, 1985). It is difficult to interpret results involving projected estimates of generalized others' attitudes because

of the common method bias inherent in these estimations. Evidence of the invalidity of using social projection of specific or generalized others would consist of the respondent's estimate of the attitude of a (generalized or specific) other being correlated with the respondent's own attitude, while not being correlated to the attitudes that the specified others themselves report (as found by Rice and Aydin, 1991). This result is what Gerard & Orive (1987) call "disconfirmed projection". The authors conclude that opinion change based on disconfirmed projection is rather fragile because less cognitive work is involved.

This is not to say that these estimates or social projections about specific others or generalized others, though inaccurate, may not still be influential: attitudes may influence social norms through false consensus, which is the projection of one's own attitudes onto others (Davis, Bagozzi & Warshaw, 1989; Oliver & Bearden, 1985). This process, however, is quite different from social influence, and especially social information processing, which argues that the other's actual attitudes, information, and behaviors influence the individual. After all, if there were no theoretical or empirical linkage to the others' actual attitudes, then why would we need the concept of social information processing?

## 2. Mechanism and Strength of Influence

"Social information processing has not articulated the mechanisms by which social information flows to and from individuals." (Contractor & Eisenberg, 1990, p. 7). Latane, whose theory of social impact does postulate a structural context for social influence, noted that even his own theory "does not say when social impact will occur or detail the exact mechanisms whereby social impact is transmitted" (Latané, 1981, p. 343).

There seem to be two main aspects of influence mechanisms that need to be explicated: the conceptual basis for determining the nature of the exposure mechanism, and the conceptual basis for determining the strength of that exposure. Note also that proximity is a continuous variable; the typical measure of the simple presence of a "source other" (or, in some cases, the number of source others present, or who communicate with the individual) is a very weak measure of proximity, regardless of the proximity mechanism involved.

Thus more complete social information processing models would weight the influence of information from various sources both by the importance of the other to the respondent (Shaw, 1980) and by the extent of proximity (potential for exposure) between the individual and the source other(s) with respect to specific proximity mechanisms.

## 3. Level at Which Influence Occurs

The third category of operationalization problems associated with social influence theories has to do with the level of analysis involving the source other -- individual or group. That is, does social information processing affect an individual through separate, individual source others, or through some higher-level group effect, such as membership or reference group norms? Even when the source others are specified, it is unclear whether their influence should be conceptualized as some sort of net or average effect,

or as part of the norms and shared meanings developed within a specific group to which the respondent belongs.

## II. PROXIMITY MECHANISMS AND SOURCE LEVELS FOR SOCIAL INFORMATION PROCESSING

Traditionally, tests of social influence explain similar attitudes or behaviors among a set of individuals on the basis of attributes aggregated and averaged over that set. Indeed, Woelfel & Haller (1971) successfully used a variety of such variables to identify likely significant others for a set of students; then these others' expectations strongly predicted the educational expectations of the set of students. However, structural or network theory argues instead that people develop these shared attitudes, norms or behaviors through exposure to proximate others in a social network (Wellman, 1983). Individuals are embedded in particular social structures which influence their interpretations of communications and attitudes (Riley & Riley, 1972). Perceptions are affected by one's experiences in the local social context (Powell & Butterfield, 1978). Even Kurt Lewin postulated that behavior is a function of *both* the individual *and* the individual's social environment, but this original dual emphasis has often been missing in subsequent research on influence and change (Krackhardt & Porter, 1985).

### A. Network-Based Proximity Mechanisms for Social Influence

Through networks, members exchange information, individuals can vicariously experience others' behaviors, and others legitimate changes associated with and reduce uncertainty about an event, idea or phenomenon (Burt, 1973; Davis, 1966; Rogers & Kincaid, 1981; Tichy & Fombrun, 1979). "The other people with whom an individual interacts can affect profoundly how that person thinks, feels and acts" (Hackman, 1983, p. 1455). "Dense communication networks engender similarity of perceptions and opinions among their members" (Laumann & Marsden, 1979). Danowski (1980), for example, found that as the correspondence increases between the content on which communication networks and attitude beliefs are defined, increasing group attitude uniformity is associated with increasing group connectivity.

Woelfel & Haller (1971, p. 76) stated the underlying proposition clearly, quite early on: "Structural factors influence the kinds of significant others to which ego is exposed and the kinds of information that those significant others communicate to ego, and that information, along with what ego can observe from his own activities, provides the basic corpus out of which he sets his attitudes."

Thus, networks provide the channels through which individuals have access to, or are exposed to, others' information, influence, and behavior. That is, networks provide the mechanism by which individuals are more or less *socially proximate* to each other. Yet, theories of social influence in general, and social information processing in particular,

rarely make the specific form of proximity explicit or justify it theoretically, and rarely invoke network constructs as the basis for such proximity.

Network-based proximity mechanisms in organizations can be conceptualized in three ways (Dow, 1988; Erickson, 1988; Johnson, 1988; Tushman & Romanelli, 1983, and others noted below). Two are traditionally opposed: (1) *relational* or *coactivational*; and (2) *positional* or *configurational*. There is also a sort of default mechanism: (3) *spatial* or *physical*. Past formulations of social information processing have generally assumed (and often only implicitly) a relational mechanism.

Each of these mechanisms conceptualizes proximity in different ways, yet each provides opportunities for shared contexts for comparing and interpreting one's own as well as others' prior behaviors or attitudes that influence one's subsequent attitudes (Dean & Brass, 1985, p. 571; Hackman, 1983, pp. 1458-59; Pfeffer, 1982, p. 116; Salancik & Pfeffer, 1978). As Lewin argued, "the social network, then, describes the topology of forces that reverberate throughout the network" (Krackhardt & Porter, 1985, p. 246).

### 1. Relational Proximity

In the *relational* view, an organization is "a communication network in which actors or subunits recurrently process resources and information" (Dow, 1988, p. 56). Purposes, goals and attitudes are constructed by the participants as they interact while performing their work. Thus, the influence mechanism from the relational view is communication proximity, or the extent to which individuals are directly or indirectly linked (Rogers & Kincaid, 1981). Groups or cliques consist of individuals who are strongly linked to one another and are thus "cohesive" or "densely connected". A relational model of social influence is based upon the proposition that "people are most likely to compare with and come to agree with others to whom they are more strongly tied" (Erickson, 1988, p. 115).

### 2. Positional Proximity

The *positional* network view conceptualizes proximity as the extent to which individuals occupy the same (or similar) social roles or positions, rather than the extent to which two individuals communicate with each other. Other researchers have also noted the important distinction between relational and positional bases for interaction and influence. Ranson, Hinings & Greenwood (1980) distinguished between formal roles and procedures as the basis of organizational structure, and interactions via regularities and processes. Allen (1977) found that formal and informal communication are functionally independent, though formal communication is slightly more important. Blau (1954) posited two integrative organizational processes: (1) expertise, embedded in formal structure and roles, and (2) informal relations. Rice & Mitchell (1973) distinguished between (1) formally defined positions, subgroups or roles (called "dimension structure" and measured by status and influence), and (2) interpersonal relations irrespective of positions or roles (called "interaction structure" and measured by direct and indirect ties, centrality, and prominence).

**a. Organizational proximity.** In an organizational setting, we can identify two forms of position. The first is *organizational proximity*, which is the extent to which two individuals occupy similar positions in the formal organizational structure.

In the positional view, organizational structure consists of both the configuration of horizontally and vertically differentiated job positions, as well as the stable set of instrumental relations among the positions (Dow, 1988). "The key channels in an organization are those which link positions differing in rank or function" (Lincoln & Miller, 1979, p. 183). These channels are formally represented by not only the direct but also the indirect relations between job positions as portrayed by the organizational chart (Lincoln & Miller, 1979; Tichy, 1981).

This approach has considerable theoretical justification in prior research and theorizing. Organizational structure provides the channels for information and control among functionally interdependent tasks created by the division of labor (Lincoln & Miller, 1979; Tushman & Romanelli, 1983). Organizations attempt to minimize the complexity of these channels in two ways. First, bureaucracies "unbundle" social relationships by "stripping relations of all content but that which is strictly applicable to the attainment of organizational ends" (Lincoln, 1982, p. 21). Second, "subtasks are coordinated by placing related activities under the supervision of a single manager". In this way subordinate relations are mediated through superiors, in order to achieve organizational goals purposively (Dow, 1988, p. 56). Thus, an organizational role or "job" is essentially defined not on the basis of direct linkages, but on the basis of a structural location in the relevant system (department, organization), perhaps identified by the formal organizational chart. Thus, interactions and information flow result from members' communication needs as well as from the opportunities that the organizational structure provides for communication (Brewer, 1971). For example, "organizational structure influences several employee reactions by influencing the challenge and complexity of employee's jobs", and by generating shared social influence (Oldham & Hackman, 1981, p. 78). Corman (1990) found that formal organizational structure -- in particular, the other's formal position within an organization -- was a strong influence on perceived communication relationships. For example, adoption of an innovation by one's supervisors and co-workers influences one's own adoption, especially if the work unit is cohesive (O'Keefe, Kernaghan & Rubenstein, 1975). Different supervisors' norms for acceptable communication behaviors also explained differences in how subordinates handled clients in two otherwise similar agency units (Blau, 1955).

Thus the raw network matrix for identifying organizational proximity would be the formal reporting patterns (generally symmetrized) involving all members of the organizational unit under investigation. This matrix could be converted into a matrix of path distances among all individuals, symmetrized, and then converted into euclidean distances or correlations to represent the organizational proximity between any two individuals. A more *local* conceptualization of organizational proximity, based in this same theoretical framework, would be simply to identify all horizontally proximate others as those who report to the same supervisor, and the vertically proximate other as one's supervisor.

**b. Structural equivalence.** The second conceptualization of positional proximity is actually the more commonly used, and is more general. Structural equivalence is the extent to which individuals have similar patterns of interaction with the same other (Burt, 1987). Thus, the pattern of interactions, both present and absent, direct or indirect, among all members of a social system is the building block of social networks. The raw network matrix here is the interaction matrix, which is generally converted to euclidean distances or correlations, which represent positional proximity.

Thus, according to the positional conceptualization, two individuals may have similar attitudes not necessarily because they are linked with each other (as in the relational mechanism), but because they jointly occupy a position, and thus are linked to or model similar others, from whom they both develop similar attitudes, and with whom they both share similar attributes. "Individuals may be the focus of similar information, requests and demands from members of their role set, creating an information field in which they are embedded, which, when internalized, creates even more powerful pressures to conform than discussions with similar alters" (Hartman & Johnson, 1989, p. 525). The positional approach implies status differences between members of different positions, thus lending some support to Shaw's (1980) argument that social information processing is based primarily upon social modelling rather than social comparison.

### 3. Spatial Proximity

*Spatial proximity* is a third potential mechanism for social information processing. Simply working close to one another increases the likelihood of interaction among individuals, who then may develop similar attitudes. Festinger, Schacter & Back (1950), for example, found that physical and functional spatial proximity strongly predicted friendship patterns among married students living in university housing. Face-to-face dyadic communication is heavily influenced by physical proximity, and drops off rapidly by 75-100 feet (Allen, 1970; Conrath, 1973). Further, organizational designs often locate similar or interdependent activities or roles close to one another (e.g., Allen, 1977; Conrath, 1973). However, boundaries may be more consequential than mere distance alone; i.e., perceptions of distance may be ordinal, based on the number and type of boundaries (Corman, 1990). Many other studies show relationships between physical proximity and communication interaction (Altman, Taylor & Wheeler, 1971; Bamlund & Harland, 1963; Evans & Wilson, 1949; Gullahorn, 1952; Johnson, 1988; Merton, 1948; Nahemow & Lawton, 1975).

Increased social density (up to certain levels) within an organizational space, can, among other things, increase friendship opportunities, job feedback, and information exchange (Sziilagyi & Holland, 1980). However, for those with repetitive and routine tasks, non-private spaces may prevent boredom by increasing the level of interpersonal stimulation, and provide opportunities for social facilitation of the task (Sundstrom, Burt & Kamp, 1980).

Spatial proximity may also affect social information processing because those who

work in the same physical area will be exposed to the same ambient stimuli -- other individuals, task materials, and aspects of the workplace (Hackman, 1983). Physical factors can influence both the climate and the formation of subgroups within organizations (Ashforth, 1985). Technology and architecture both affect one's visual access to others, and thus interaction (Archea, 1977; Canter & Kenny, 1975). Archea (1977) has developed an elegant theoretical conceptualization of materially-based private and public behavior. To the extent that one's material surroundings allow one to perceive others' behavior (through sight or sound), one has access to information about "public" (for example, organizational) norms, behaviors, conventions. However, to the extent that the surroundings allow, others also have access to one's behavior. To the extent that such access is asymmetric and is consciously controlled, individuals may strategically manage their public identities and gain understanding of situationally defined acceptable behavior.

Davis (1984) proposes three main elements of physical office environment: physical structure, physical stimuli, and symbolic artifacts. With respect to physical structure, "The nature and placement of furnishings also influence the occurrence and type of interaction that takes place." "Location can influence the information one is privy to and one's inclusion or exclusion from organizational events", especially for newcomers. "Physical stimuli in the environment affect what people attend to and concentrate on." Further, symbolic artifacts of the physical setting "individually or collectively guide the interpretation of the social setting" and indicate differences in status and social influence.

### B. Possible Relative Influences of the Three Mechanisms

Note that these three proximity mechanisms are not necessarily *empirically* distinct. That is, spatial proximity is clearly a different underlying mechanism than relational proximity, yet it may increase relational proximity. Or, an organization may design its structure and job responsibilities so that relational proximity closely matches positional proximity. However, the three mechanisms are *conceptually* distinct, and assume quite different bases for influence. Studies of social influence should be explicit as to which underlying proximity mechanism motivates the theoretical predictions or explanations. For example, a study may find that there are departmental differences in attitudes that employees hold toward a new phenomenon such as a health information system (Aydin & Rice, 1991). Are these departmental differences due to relational, positional, or spatial mechanisms, or some clearly defined combination of the three? Hartman & Johnson (1989) concluded that relational and positional proximity are not mutually exclusive, but complementary and contingent. By making these assumptions more explicit, researchers may be more likely to understand the relative strengths of their results. The following paragraphs suggest some of the ways these differences can be justified.

Meanings are constructed proactively, as organizational members interact to make sense of their environments. To the extent that making sense of ambiguous new aspects requires conscious, proactive construction of meaning with relevant others, there should be increasing effects of social information processing as the sources become less

constrained and embedded, either physically or formally. Thus, the effect of social information processing should be stronger as proximity changes from spatial to positional to relational mechanisms.

Hartman & Johnson (1989) found that organizational commitment was better predicted by relational proximity than by positional proximity, because its increased likelihood of involving direct contact meant increased variety and repetition of information. The relational mechanism seems the strongest source of influence of the three mechanisms, precisely because it explicitly emphasizes strong individual and within-group interactions.

The positional mechanisms would be more influential in situations where status, power, and role behavior were more important than individual relations, and in organizations with more mechanistic climates (Brass, 1984). Van Maanen (1978) argued that positional proximity may even lead to more discrepant social information processing, while cohesion may lead to more convergent, because there are more directly linked and common perceptions.

Spatial proximity by itself -- independent of the amount of interaction associated with proximity -- may be a weak mechanism for social information processing because (1) ambient stimuli are rarely noticed, (2) the diversity of ambient stimuli declines over time, and (3) private inferences about such ambient stimuli are not examined publicly (Hackman, 1983). However, attitudes toward organizational changes which are spatial in nature -- such as changing to an "open landscape" office design -- would be most consistently explained by spatial influence mechanisms.

### C. Alternate Levels of the Social Information Process

Social information processing may occur through specified others at at least two levels of analysis -- individuals and groups (see Rice, Grant, Schmitz & Torobin, 1990, for a consideration of an intermediate level, that of dyads). These two sources of influence may operate through any or all of the three proximity mechanisms described above. However, each approach still requires the researcher to identify explicitly the source other(s), and determine how to weight their influences.

#### 1. Individual Level Influences

An individual is exposed to a wide variety of social information (Shaw, 1980), culminating in a net influence from one's peers (which Latane, 1981, called an "impact vector"). Further, the weight of the social information that each specific other contributes to that net influence depends on how proximate *and* valued each specific other is.

#### 2. Group Level Influences

*Groups*, especially those consisting of co-workers in ongoing social structures such as an organizational unit, represent strong influences on information, values, perceptions, norms, and behaviors in general (Hackman, 1983). This influence occurs because "groups

control many of the stimuli to which an individual is exposed in the course of his [sic] organizational activities" (Hackman, 1983, p. 1456). Reference group theory postulates that groups provide a standard against which the individual evaluates oneself and others (Riley & Riley, 1972). They also provide values and include one's values, which may become central values, or the basis of internal debates. Groups also provide approval, reward, and negative sanctions. However, there may be joint and overlapping reference groups. Friedkin & Cook (1990) suggest that social influence operating through network mechanisms is best represented by a simple "peer effects" model (as one of a variety of influence models), where the relevant group effect is simply the mean of the attitudes of the group's members. However, they warn that such effects are most likely for small, homogenous groups that have achieved a stable norm. Further, they qualify the notion of a "group" as being only an "analytical construction that may be employed to estimate the magnitude of pressures toward uniformity in a peer group" (p. 122).

Within an organization, however, different definitions of a group are possible. The *relational* network model conceptualizes a group as comprising the highly cohesive subset of all those to whom one is proximate. Relational network analysis programs, such as those based upon graph theory, may be used to identify such groups, and the liaisons among the groups. Erickson (1988) and Hackman (1983) propose that relational mechanisms should provide greater influences on attitudes for more densely connected groups, because individual attitudes would be more homogenous and the individual would be more likely to be exposed to others' attitudes. Krassa (1988) showed, through computer simulations, that the more integrated the social system, the more easily those individuals whose opinions are valued can influence public opinion.

The *positional* model, as noted above, may conceptualize proximity as either organizational proximity (both overall and local), or structural equivalence. Individuals may be identified as jointly occupying positions based upon multidimensional scaling, factor analyses, and hierarchical clustering of the overall proximity matrices. The spatial model conceptualizes a cluster as consisting of all those similarly close to each other and distant from other individuals. Spatial clusters may also be identified through multidimensional scaling, factor analyses, and hierarchical clustering.

Models of social influence need to better specify the relevant local reference group, because rank, importance, and strength of relationship, etc. is relative to proximate others (Gartrell, 1987). Even the analysis of the influence of specified others through a specific mechanism requires hard choices about social boundaries (Laumann, Marsden & Prensky, 1983). In each case, there may be theoretical or empirical rationales for using threshold values to decide when weakly proximate influences are too "weak" to include; that is, what "cutoff" level to use.

Other and multiple measures of each of the network mechanisms might capture more of the social information. Certainly the traditional organizational chart imperfectly captures the nature of organizational position. Many other factors determine functional positions, such as politics or temperament, and individuals may have multiple vertical reporting relationships, especially in complex organizations. For example, Brass (1984)

analyzed a wide variety of separate network measures to identify how network position affects individuals' organizational influence. Walker (1985) combined nearly a score of measures to show how network position predicted cognition about software development practices.

#### D. Possible Relative Influences of the Two Source Levels

Different source levels make different assumptions about the size of one's social space over which social information processing should occur. At the individual level, the relational model uses all the individuals with whom one has interactions; the local organizational proximity model uses only the specific supervisor and the small number of co-workers while the global organizational proximity model and the structural equivalence approach use all members within the sample; and the spatial model uses all individuals in the sample. Thus, group-level analyses of the overall organizational, structural equivalence, and spatial proximities would be more likely to reveal differences than would individual-level analyses because the sphere of influence involves a smaller number of people defined precisely on the basis of proximity. For example, Walker (1985) found that less-aggregated network positions were better predictors of cognition about locally relevant software development practices. However, relational and local organizational proximity analyses would likely reveal stronger influences than the group-level influences because they involve subsets of direct interactants or co-workers. For example, Urberg, Cheng and Shyu (1990) used a respondent's best friend's smoking behavior (as self-reported by the best friend) to predict the respondent's smoking in a later grade. Influence was measured as the *difference* between the respondent's and the best friend's smoking behavior, interpreted as the strength of the pressure for one or both persons to change their attitudes, behavior, etc. toward the other's. Urberg et al. found that this measure of social influence had greater effect than did the more traditional measure of the percent of all the respondent's friends who smoked. Further, both sources were statistically independent influences.

#### CONCLUSION

In summary, social information processing can be conceptualized as a social influence process occurring (1) through strong or frequent *exposure* to attitudes (or information, behavior) of (2) *valued* and (3) *specific* others or *classes* of others (but not generalized or projected others), (4) through three possible *proximity* mechanisms (relational, positional, or spatial), (5) involving at least two different levels of *sources* (individual and group).

Table One summarizes this general framework for applying network constructs and analytical tools to social influence models. Studies of social influence and social information processing should be explicit about which proximity mechanism and which level of

analysis, and their related assumptions, are motivating the analysis. Differences or contradictions across studies may, to some extent, be due to incorrect assumptions about both the comparability, and the validity, of the studies.

Table 1 -- Framework for Identifying Network Proximity Mechanism and Level of Social Influence

Proximity Mechanism for Exposing Individual to Network Influences	Levels of Analysis of Influence	
	Individual	Group
Relational -- Contact among individuals; coactivational view of organizations; communication proximity	Direct and indirect links exchange information, influence	Dense, cohesive relations within groups reinforce norms, values
Positional -- Configurational view of organizations; also roles, statuses, obligations; Organizational proximity (local: work units; global: paths of formal reporting) or structural equivalence	Similar relations to same (or similar) others provide shared exposure to attitudes, and involve similar activities, obligations	Positions include sets of individuals who are positionally proximate to each other, and thus represent common attitudes, status; communication within positions not necessary
Spatial -- Proximity	Individuals who are co-located more likely to interact, be close to same ambient stimuli, organizational symbols and culture	Clusters include sets of individuals who are similarly distant from other sets of individuals
Nature of Source Other --	Single, multiple, or class of specific source other(s), weighted by strength of exposure and importance of source to individual	Group norms, beliefs, social information different for different groups, with "peer effect" above and beyond individual differences

Figure One, below, summarizes, in visual fashion, what a network-based model of social information processing might look like. The model shows the components of such influence on a respondent's (R) attitude ( $A_r$ ) toward a phenomenon (P) using the positional mechanism at the individual level of analysis. The C's are the co-workers, and the S is the supervisor. The  $A_c$ 's and  $A_s$  are their respective attitudes, as reported by the individuals. The  $E_c$ 's and  $E_s$ , with the bi-directional arrows represent the extent to which a respondent may be exposed to the others' attitudes. The  $I_c$ 's and  $I_s$  indicate the extent

to which those sources' attitudes are important to the respondent. The respondent, of course, has a personal history ( $H_r$ ), prior attitudes ( $A_r$ ), sociodemographic contexts ( $D_r$ ), etc. The respondent will also be able to make social projections of the others' attitudes ( $A^* \dots A^*$ ) which will be correlated with  $A_r$ . Finally, the phenomenon itself has perceived and objective characteristics ( $C_p$ ) (for example, innovation attributes) which will be taken into account in the respondent's attitude. Note that each particular proximity mechanism, and each level of analysis, would identify a different set of  $C_s$  and a different set of underlying exposure measures, and would thus lead to different results. For empirical results of a test, in a single organizational setting, of the full network-based social influence model discussed in this chapter and following this visual model, please see Rice & Aydin (1991).

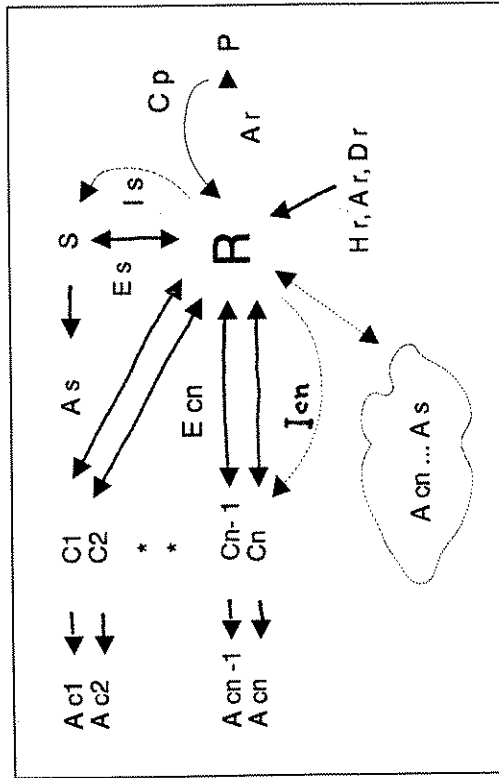


Figure 1

It should be noted that communication networks may also be changed because the proximity mechanisms of influence are altered by the phenomenon of interest itself. And, mechanisms may have differential influence at different stages of the change process. For example, in Burkhardt and Brass' (1990) study of how the implementation of a computerized nutrient data analysis and distribution system altered influence networks, results showed that interaction patterns at the 4th measurement period (9 months after implementation) had greater influence on who adopted the system than did the initial interaction patterns during the 1st measurement period (three months before implementation). While all members increased in power and in centrality, earlier adopters gained

the most power/influence (average rating by all others) and had more interactions.

This chapter has proposed that studies of social influence, especially social information processing, apply network concepts and methods to develop clearer operationalizations and more valid results concerning (1) the proximity mechanisms whereby individuals have access to, or are exposed to, social information, (2) the appropriate source levels of analysis, and (3) the specific nature of the "source other" and explicit measures of importance and strength of exposure for that other (or others). Thus tests of the social information processing model must involve far more explicit conceptualizations and operationalizations of the proximity mechanisms, the levels of the sources, characteristics of the social context and the phenomenon, individual differences, and multiple casual relations. A network approach helps resolve some of these challenges.

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