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ON THE IMPORTANCE OF MARGINALITY: ONE MORE STEP INTO THE TWO-STEP FLOW OF COMMUNICATION*

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This study applies cross-level network analysis to modify the Two-Step Model of communication flow, focusing on marginally positioned individuals and pointing out the "bridging function" of marginals in the flow of information between groups. The hypotheses examined derive from the concepts of the Balance Theory, applied to network analysis, suggesting that the "Strength of Weak Ties" and the related tendency toward intransitivity are the structural advantages of marginals in the process of communication flow. By and large, the findings support the claimed importance of marginals, suggesting the ability of network analysis to provide a micro-macro bridge in current sociological theory and research.

Past communication research has almost exclusively focused on the study of mass communication and the flow of influence and information from the media to the public at large. The audience has often been perceived as a passive mass, consisting of atomized individuals exposed to the omnipotent media. Empirical evidence has proved that the media have been "overrated" (Katz, 1980). The role of interpersonal relations in the flow of mass communication, initially pointed out by a set of well-known studies (Merton, 1949; Berelson et al., 1954; Lazarsfeld et al., 1948; Katz and Lazarsfeld, 1955; Katz, 1957), has undermined the image of a passive, atomized society and at the same time has caused a growing interest in personal networks as channels for disseminating information and influence. These studies have suggested the existence of "opinion leaders" in the flow of personal communication. Lazarsfeld and his collaborators suggested that messages from the media reach "opinion leaders," who then pass on what they read or hear to followers who look at them as a source of guidance and social confirmation. Since the introduction of this "Two-Step Flow of Mass Communication" idea, numerous studies have sought to advance the understanding of this concept, focusing mainly on the centrally located individuals, the "opinion leaders." (Several hundred of these opinion leadership studies are summarized in Rogers and Shoemaker, 1971). Some of these studies pointed out weaknesses of the Two-Step flow model, including:

(a) Ignoring evidence of direct flow. Several studies indicate that major news stories are spread directly by the mass media to a far greater extent than by personal sources (Westley, 1971).

(b) Ignoring the existence of different stages in the diffusion process, namely, the stages of awareness, interest, evalua-

tion, trial, and adoption (Rogers, 1962). In each of these stages, different sources and personal ties may be activated.

(c) Ignoring the possibility of a continuum instead of a crude dichotomy between opinion leaders and nonleaders (Lin, 1971:203), while in the flow of interpersonal communication various network positions may be activated.

(d) Ignoring the existence of a horizontal flow, the process of "opinion sharing" rather than "opinion giving" (Troldahl and Van Dam, 1965). The assumption of vertical flow underlying the Two-Step model implies that opinion leaders rely on the mass media only, thus ignoring the possible existence of other sources and directions of communication flow (Robinson, 1976).

(e) Artificial standardization of measurement, although different items of influence and information are concerned. Gitlin (1978) points out that the validity of applying the same methodological procedure when measuring the flow of consumer decision items and political influence is questionable.

The criticisms of the Two-Step model and the fact that the original model does not square well with recent empirical findings resulted in two possible modifications of the model. Menzel and Katz (1955:352) note, "We found it necessary to propose amendments to the two-step flow of communication by considering the possibility of multistep rather than two-step flow." The idea of multistep flow extends the possible direction of flow and accounts for the cases of direct flow and longer chains of flow. Robinson (1976:308–309) presents six different flows within the framework of the multistep model, including horizontal and reciprocal flow (among opinion givers or opinion receivers) as well as vertical, one-direction flow. Second, the analysis of communication flow should consider the type of item being disseminated and the different stages of the diffusion process which will enable clear distinction between the flow of information and influence.

The multistep model directs the theoretical and empirical effort to network positions other than centrally located individuals. While the ideas of "opinion leaders" and Two-Step flow focused on centrality (see Katz and Lazarsfeld, 1955:89), the introduction of the multistep flow and horizontal flow extends our attention to other segments of the interpersonal network and other directions of interpersonal flow. A different type of flow, from less centrally located individuals (or "marginals" in the social network) to the centrally located, "the opinion leaders," has already been noted in several

diffusion studies which have found that those who are on the periphery of the system are likely to adapt certain innovations earlier than others (Rogers and Kincaid, 1981:229). This tendency has several possible explanations: (a) the lower level of risk attributed to "marginals"; they have less to lose. In this way, they tend to be pioneer adoptors of low adaptive potential innovations or socially risky ideas (Becker, 1970:281). (b) "Marginals' " reliance on self-judgment and personal preferences rather than on the advice and guidance of others (Coleman et al., 1966:113–32). Thus, Burt found that "marginals" tend to adopt innovations on an individual basis, rather than as a part of a contagion process; the utility of adoption is considered, by the less centrally located, on personal rather than social reasons (Burt, 1980). (c) Innovators were characterized by Barnett (1953:380) as "truly marginal individuals." The inclination to innovate is often related to deviance, to nonconformity. Rogers (1962: ch. VII) suggests that in many cases marginal positions enjoy the advantage of lower rates of social conformity, enabling them to adopt new ideas or new products with greater ease.

The present study suggests that marginality should be considered advantageous in the process of communication flow not only due to the personal traits of marginals but to the unique combination of the structural benefits of marginality.

STRUCTURAL ADVANTAGES OF MARGINALITY

The hypotheses presented and examined in this study are derived from the concept of "cognitive balance" when applied to the analysis of social networks. Heider (1946) introduced the concept of "cognitive balance" based on ideas influenced by Spinoza (Heider, 1979). "Balance Theory" consists of a set of arrangements of sentiments and the statement that some of them are "balanced" and some are not, producing tension and low stability over time. Cartwright and Harary (1956) carried Heider's idea one step further, using a graph theoretical approach in applying Heider's claim to various interpersonal relations and specifying conditions under which a group's relational structure is balanced. Davis (1963, 1967) used "structured balance" as a case of clustering process, demonstrating how individuals in a group arrange themselves according to their interpersonal preferences, into subgroups or cliques. Thus, Davis's analysis served as a bridge between the claims of Balance Theory and sociological theories of group formation.

One of the most lucid efforts to apply the

"Balance Theory" theorems and findings to communication research is Granovetter's (1973). His "Strength of Weak Ties" theory asserts that the overlap of two individuals' networks varies directly with the strength of their ties, thus enabling only weak ties to serve as "local bridges" between groups, clusters, or cliques. The real strength of weak ties is derived, Granovetter claims (1973:1363–64), from their ability to exist in spite of the counter pressures caused by the tendency towards balance. In this way, weak ties serve as a crucial pathway for the flow of information between densely knit cliques or groups that would not be connected to each other at all were it not for the existence of weak ties (Granovetter 1973:1363). Without weak ties, any idea, fashion, or innovation would not spread beyond the clique, excluding most of the population. Thus, weak ties serve to agglomerate micro-level behavior, attitudes, and opinions to large-scale patterns of macro-level processes. The argument of the strength of weak ties has been useful in clarifying and explaining a variety of phenomena (for a detailed review, see Granovetter, 1981), especially when the bridging function of weak ties is applied to individuals. Studies of the strength of weak ties, from the individual's point of view (see Granovetter, 1981:3–14), suggest our first hypothesis that "marginals" make more use of the advantages of weak ties. Weak ties, used to connect different groups, are far more likely to connect individuals who are not highly integrated within their own groups (see Rogers and Kincaid, 1981:179–80) thus maintaining "external ties" with individuals from other groups. Weak ties, found in several studies (Lin et al., 1981; Friedkin, 1980; Langlois, 1977; Ericksen and Yancey, 1980) to serve as bridges between groups, are hypothesized to connect individuals who are less integrated in their own group.

Higher rates of weak ties as channels for new information should be regarded as only one advantage attributed to marginal positions. A second factor hypothesized to serve as a communicative advantage is the tendency towards intransitivity (for a detailed review and discussion of the transitivity model, see Hallinan, 1974). Heider (1958:206) was again the first to single out transitivity as an important structural feature of personal relations. By using a graph theoretic approach, Holland and Leinhardt (1970, 1971, 1972, 1977) presented a technique to measure the existence of transitivity in a given sociogram by examining every triad of distinct individuals, labelling those triads where an X chooses Y and Y chooses Z but X does not choose Z as intransitive. Arranging all sixteen triad types by the frequency of intransitive "triples" in the triad

enables the measurement of the tendency towards intransitivity. The significance of this tendency is tested by comparing the actual existence of intransitive triads with the rate expected by chance. If we regard transitivity as a limit to the flow of communication (Pool and Kochen, 1978:15; Weimann, 1980a: ch. 17, 1980b) by creating intraconnected, highly dense groups which limit intergroup flow and the existence of bridges, the tendency away from transitivity should be regarded as a communicative advantage: The existence of "forbidden triads" (those that contain intransitivity) is essential to the flow of information across the boundaries of subgroups or cliques as they provide the chains of communication when X, who is linked to Y who is linked to Z, receives information from Z without being linked to Z (thus being an intransitive triad) through the mediating actor, Y. The claim that "marginals," less integrated into their groups, will tend to have a higher rate of intransitivity in their interpersonal ties serves as the second hypothesis in the present study.

METHOD

The present paper reports a secondary analysis of data collected for a study of the flow of information and influence in the personal network of an Israeli kibbutz community (Weimann, 1980a, 1980b, reviewed by Granovetter 1981:29–30). A sociometric mapping of conversational ties was obtained by interviewing the entire community (270 members), using a prestructured interview. Each member was asked to list conversational ties with other members (unlimited number of choices) and was instructed to rate the strength of each tie by three scales: importance attributed to the tie (3 = very important, 2 = not very important, 1 = not important); frequency of contacts (3 = almost every day, 2 = about once a week or two, 1 = about once a month or less often); and tenure of the tie (3 = over ten years, 2 = five to ten years, 1 = less than five years); thus operationalizing Granovetter's definition of the strength of ties, assuming that the more frequent, important and durable the tie, the stronger it is. Every tie was rated by two respondents, and the scores given by each member of the dyad to the same tie were summed, thus adding the element of mutuality (i.e., the tie is considered most important when both of the linked persons rate this tie as important). Hence, the strength of each tie is rated on a 0 – 18 scale, where 18 represents the strongest tie.

The sociometric data were arranged in a who-to-whom matrix with each column representing the individual chosen. Each entry in this matrix is a conversational tie, charac-

terized by the attributes of frequency, importance, and durability. The identification of cliques was obtained by sequential reordering of the matrix (see Richards, 1975, 1977. A detailed illustration is presented by Rogers and Kincaid, 1981:163–82). Identifying the cliques enables us to characterize each tie by its direction: intragroup (when linking members of the same group) and intergroup (when linking members of different groups).

To study the flow of information, six different items were used, two from each category: "Gossip" (e.g., the rumor about a coming divorce of two members), "General News" (e.g., the arrival of a new physician to the Kibbutz) and "Consumer information" (e.g., a new product offered to the members). None of these items was publicized formally, but was disseminated only by interpersonal communication. Each member was asked whether he/she was aware of these items and to report on the source of his/her knowledge (who told him/her), thus identifying the tie activated for the flow. The efficiency of the flow was measured by three criteria: the accuracy of the flow (4 = knew all details correctly, 3 = knew most of the details correctly, 2 = knew some details correctly, 1 = knew no correct details); the speed of the flow (1 = first heard of item more than ten days ago, 2 = from 7–10 days ago, 3 = during the last week, 4 = yesterday or today); and the credibility of the flow (4 = trusts the "news" most firmly, 3 = firmly, 2 = only partially, 1 = not at all). As to the flow of influence, we used two decision-making items that were later put to vote in the ""assefa," the general assembly. These items were: (a) The decision to allow young members, after their military service, to spend a year outside the Kibbutz. (b) The decision to accept or reject

the application of a candidate for full membership. We asked each member about consulting, seeking advice, or being influenced in tracing this flow. The results presented an examination of the cross-tabulation of the network positioning with the measures of the flow of information and influence.

RESULTS

Marginals as Bridges

The communication matrix includes 2511 entries, that is, there are 2511 conversational ties interconnecting the 270 members. The analysis of the matrix structure according to Richards's procedure revealed 16 cliques. Using the clique identification, we computed the network position of each individual in his/her clique, by the number of choices received from his/her clique's members. The upper and lower quartiles of the choice distribution represent the "centrals" and "marginals." This procedure was repeated for each clique separately, thereby eliminating the possible effect of group size and allowing each clique to be represented by both network positions.

Communication was measured on the dyadic level ("who to whom"), comparing communicative activity of marginals and centrals on the volume of flow originating in each position, that is, the sum of ties activated for the flow of communication across the different items. The efficiency of the flow was measured separately for "centrals originating" flow and "marginals originating" flow by three, four–point scales for accuracy, speed, and credibility. Table 1 presents the communicative activity and efficiency of "centrals" and "marginals" in the flow of six information items. Table 1 reveals differences in communication

Table 1. Comparison of "Centrals" (C) and "Marginals" (M) by Rates of Communication Activity and Efficiency across Six Information Items

Type of Item		ACTIVITY[a]			Accuracy			EFFICIENCY[b] Speed			Credibility		
		% by C	% by M	P<	C	M	P<	C	M	P<	C	M	P<
Gossip	item 1	41.2	14.1	.001	2.3	2.1	n.s.	3.3	3.5	n.s.	1.9	1.2	.05
	item 2	46.3	16.8	.001	2.2	1.9	n.s.	3.4	3.6	n.s.	1.7	1.3	.05
General	item 1	58.4	11.1	.001	3.1	1.6	.01	2.4	1.5	.01	3.5	2.4	.01
News	item 2	53.1	16.3	.001	2.7	2.1	.05	2.3	1.6	.01	3.4	2.2	.01
Consumer	item 1	67.1	7.3	.000	3.3	2.2	.01	2.5	1.2	.01	3.1	2.2	.01
Information	item 2	61.2	9.1	.000	3.1	2.3	.01	2.2	1.4	.10	2.9	2.3	.05

[a] The activity percentages represent only the proportions of the flow carried out by "centrals" (C) and "marginals" (M), thus do not sum up to 100 in each row. The significance of the differences between each two proportions is tested under the null hypothesis that the proportions are drawn from the same population (one-tailed test).

[b] The efficiency measures are mean scores on a four-point scale (4 representing the most efficient flow) calculated separately for the flow originating from "centrals" and from "marginals." The significance of the differences between each two mean scores is tested under the null hypothesis that the sample means are drawn from the same population (one-tailed test).

behavior of different network positions: most of the flow of information is carried out by the centrally located individuals. The data in the first two columns indicate the dominance of "centrals" in communication activity. Though this dominance varies across the item types (highest in consumer information items and lowest in gossip items), the differences remain statistically significant for every item.

The inferiority of marginals in the flow of information is manifest not only in the rates of activity but also in the efficiency of the flow reported in Table 1. In most cases, the flow carried out by "centrals" is faster, more accurate, and more credible than that activated by "marginals." The exception is the flow of gossip: accuracy is very low in each case and speed is very high, with no significant differences between "marginals" and "centrals." Table 1 reveals an interesting variance across the type of information items—gossip is lowest in credibility and accuracy but enjoys the highest scores of speed, whereas the flow of general news and consumer information items is slower but much more accurate and credible. These interitem differences are consistent in both "marginals" and "centrals" flow.

The data in Table 1 does not encourage any claim to the communicative importance of marginality, unless we discriminate, according to our hypothesis, between different directions of flow: the intergroup flow, linking members of different cliques, and the intragroup flow, linking members of the same clique. Using clique identification, each communication act was classified by its direction—intergroup or intragroup—and then cross-classified with the positions of the individuals involved, focusing on "marginals" and " centrals." This analysis, presented in Table 2, indicates routes of infor-

mation flow by the direction of the flow and network positions being activated— "marginals" (M), "centrals" (C) and "others" (O).

The upper part of Table 2, describing the routes of intragroup flow of information items, reemphasizes the communicative dominance of centrally located individuals. The flow originated by "centrals," within the clique, significantly exceeds that of marginals in intragroup flow. Most of the intragroup flow is activated by "centrals," though the shares of "centrals'" activity differ from 77.47–78.31 percent in consumer information flow to 49.31–52.11 percent in gossip flow. "Marginals" are not active in the intragroup flow of information and their highest share of activity reaches 12.3–14.17 percent in gossip flow. The lower part of Table 2 (see "totals") provides quite a different picture: most of the intergroup flow is carried out by "marginals" serving as communicators. While the share of "centrals" in this type of flow is low in every item, ranging from 11.73 to 16.11 percent of the intergroup flow, the part played by marginals is crucial; they serve as the "bridging communicators," activating 48.31–71.82 percent of the intergroup flow. If we add the rates of flow directed to marginals ("central-to-marginals" flow) to the rates of intergroup flow originated by "marginals," we may conclude that, both as "transmitter" and "receiver," the marginal positions are most frequently used for intergroup flow. Though most of the information flow occurs within the group (we find a ratio of 6.3 intragroup acts to every act of intergroup flow), the importance of the bridges should not be ignored: without them the flow of information would be confined to the limits of a single group.

Intragroup flow appears to be vertical:

Table 2. The Routes of Information Flow according to Network Positions, Types of Information Items and Direction of Flow[a]

			By "Centrals"				By "Marginals"			
			C to C	C to O	C to M	Total by C	M to M	M to O	M to C	Total by M
Intra-group	Gossip	Item 1	11.72	24.63	15.76	52.11	2.17	5.72	4.41	12.30
		Item 2	9.83	22.76	16.72	49.31	3.59	6.76	3.82	14.17
	General News	Item 1	4.81	39.73	24.57	69.11	2.28	5.23	3.18	10.69
		Item 2	5.01	26.24	26.11	57.36	2.86	3.61	1.72	8.19
	Consumer Information	Item 1	8.12	41.31	28.88	78.31	2.16	3.52	2.13	7.81
		Item 2	12.78	46.82	17.87	77.47	2.67	2.54	3.01	8.22
Inter-group	Gossip	Item 1	2.32	5.67	3.74	11.73	36.16	8.22	3.93	48.31
		Item 2	2.19	6.85	4.12	13.16	35.53	10.63	5.76	51.92
	General News	Item 1	4.31	5.62	4.89	14.82	49.03	9.83	3.5	62.36
		Item 2	3.62	6.84	5.65	16.11	52.37	7.23	7.11	66.71
	Consumer Information	Item 1	5.62	6.39	3.61	15.62	48.31	12.86	4.28	65.45
		Item 2	4.13	5.88	2.37	12.38	46.23	18.80	6.79	71.82

[a] The percentages represent only the flow originated by "Centrals" (C) and "Marginals" (M) and not other positions (O), thus do not sum to 100 per cent in each row.

"centrals" tend to disseminate information in their group in a downward direction ("central-to-others" and "central-to-marginals") while the horizontal, "central-to-centrals," flow is less frequent. When "marginals" are involved as communicators in intragroup flow, they use vertical flow, this time upward: the "marginal-to-others" and "marginal-to-centrals" links are more frequently used than the horizontal "marginal-to-marginals." The horizontal flow is frequent in intergroup flow. Marginals, the most frequent activators of intergroup flow, mainly use the "marginal-to-marginal" link as a route. Thus, the most serviceable bridge links individuals who are "marginals" in their own cliques. The dominance of "marginal-to-marginal" bridges over other alternatives is clear in every type of intergroup flow, though less significant in gossip flow (35.53–36.16 percent of bridges) than for "general news" items (49.03–52.37 percent) and consumer information items (46.23–48.31 percent). The tendency of intergroup flow to be vertical does not include the less frequent bridges involving "centrals"; those few bridges contain vertical as well as horizontal links and even tend to be more horizontal.

The findings in Tables 1 and 2 demonstrate that various network positions are differently involved in the communication process. The flow of information in the group is dominated by centrally positioned individuals who are significantly more active and efficient in this intragroup communication, while the flow of information between groups is carried out mainly by "marginals" using the links between them as bridges for intergroup communication. This differential communication functioning portrays a new version of the multistep flow: the "marginals" serve as the "importers" of new information, while the dissemination of the information within the group is carried out by the "centrals" in a horizontal flow. This model implies that "centrals" rely on marginals for "imported" information, while "marginals" require the enlistment of "centrals" for spreading the information in the group. Thus, the original Two-Step flow model, assuming the existence of a downward vertical flow from

media to opinion leaders and from them to their followers, is to be modified as far as information flow is concerned; the model should include personal sources of information, other than the mass media, thus adding a new horizontal step: "marginal-to-marginal" intergroup bridges.

The communicative importance of marginals reveals itself only in the flow of information. The flow of influence in the process of decision making was studied by the respondents' acts of seeking advice from and being influenced by others. Data on the flow of influence, presented in Table 3, reveals different functioning of network positions in comparison with information flow. Most of the flow of influence occurs within the group (70.22 percent of the ties activated for advice, consulting, or influence were intragroup links). In the relatively few cases of intergroup flow of influence, the most frequent communicators were "centrals" (responsible for 80.75 percent of such flow). As to intragroup flow, the data reemphasize the correlation between opinion leadership and the central location in the personal network: most of the flow of influence within the group is carried out by "centrals," mainly in a downward, vertical flow: 63.1 percent of the intragroup ties activated were "centrals-to-others" and 27.63 percent were "centrals-to-marginals."

The communicative importance of network marginality is thus crucial only to the flow of information, while the flow of influence is highly concentrated within the group and activated mainly by centrally located "opinion leaders."

Why "Marginals"?

The second set of hypotheses examined in this paper suggests that the tendency of "marginals" to function as "communicative bridges" is derived from a combination of structural advantages, namely, the strength of weak ties and the tendency towards the intransitivity of ties.

The claimed tendency of weak ties to serve as bridges was introduced by Granovetter (1973) and tested empirically in several studies (for a review, see Granovetter, 1981). Friedkin

Table 3. The Routes of the Flow of Influence according to Network Positions and Direction of Flow[a]

| | % By "Centrals" | | | | % By "Marginals" | | | |
	C to C	C to O	C to M	Total by C	M to M	M to O	M to C	Total by M
Intragroup	11.12	37.27	32.36	80.75	0	1.51	4.81	6.32
Intergroup	4.11	63.10	27.63	94.84	0	0	2.03	2.03

[a] The percentages represent only the flow of influence (two items) originating from "Centrals" (C) and "Marginals" (M) and not from other network positions (O), thus do not sum up to 100 in each row.

Table 4. Strength of Ties by Network Positions

	Strong Ties (Means)			Weak Ties (Means)			Total (Means)
	Total	Intragroup	Intergroup	Total	Intragroup	Intergroup	
"Central"	11.38	9.31	2.07	5.36	4.17	1.19	16.74
"Marginal"	1.89	1.52	0.37	4.93	1.06	3.87	6.82
Ratio: C/M	6.02	6.12	5.59	1.08	3.93	0.30	2.45

(1980) provides evidence that bridges tend to be weak ties and, other things being equal, these bridges tend to be maintained over time, compared with those of strong ties. Weimann's (1980a) analysis of the strength of conversational ties in a kibbutz shows that weak ties serve as actual bridges, as they are the usable carriers of information between members of different groups in a rate significantly higher than can be expected by frequency only. Can the argument on "the Strength of Weak Ties" be related to the bridging function of marginals? To test whether or not marginals are making use of the strength of weak ties, we first collapsed the levels of strength of ties into two groups: weak (scores 1–9) and strong (scores 10–18). We then computed the volume of ties according to their strength separately for "centrals" and "marginals." Table 4 presents the means of weak and strong ties by the individual's network position—"central" (C) or "marginal" (M).

"Centrals," by definition, have more ties but they tend to have higher rates of strong ties among them. On the average two-thirds of the ties of "centrals" are strong, whereas marginals tend to have mostly weak ties (72 percent). Adding the direction of the tie into the analysis, the tendency of marginals to weak ties is more salient; "marginals' " weak ties are mainly intergroup ties, while "centrals' " weak ties are mainly directed to members of the same group. Thus, as expected, marginals, though less integrated socially, tend to have more weak ties and mainly bridging weak ties.

This finding reemphasizes the promising theory of "the Strength of Weak Ties" and adds an individual-level characterization to the communicative strength of weak ties, suggesting that this "strength" of weak ties is enjoyed more by marginally located individuals.

The tendency of marginals to higher rates of weak ties may be related to the previous findings on the differential routes of information and influence flow: The weakness of the tie, advantageous as it appears in the case of information flow (Granovetter, 1973:1370–73, 1974:76–80), seems to lack the basic ingredients essential to influence. Casual, unstable interactions, labelled as weak ties, lack the confidence, past experience, authority, and

trust that enable one to consult, advise, or influence others.

Weak ties, as a communicative advantage, are related to another structural concept: the tendency towards transitivity. Transitivity of personal ties, or the tendency of the friends of one's friends to be one's friends as well, may serve to detect the presence of structural tendency. This tendency towards transitivity results in a highly dense, intraconnected network, while intransitivity implies a loosely knit, open network, divided into cliques which are linked by bridges (Granovetter, 1973:1377, 1981:28). A triad of individuals is intransitive if, for at least one of the ordered triples that make it up (X, Y Z), it occurs that X is connected to Y and Y to Z but X is not connected to Z (see Holland and Leinhardt, 1970, 1971, 1972). The first step, then, is a triad census (Davis and Leinhardt, 1972). A triad census is obtained by examining all the links reported by X and classifying them into the 16 possible triad types, of which seven include at least one intransitivity. Comparing the observed frequency of intransitive triads with the frequency expected by chance is proposed by Holland and Leinhardt as a structural index of the tendency towards transitivity.[1] A one-sided test

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[1] The transitivity measure (τ) they propose is computed as follows: Let T equal the total number of intransitive triads in a given sociogram. When T = 0, the sociogram is transitive, and when T is small, the sociogram exhibits a strong tendency towards transitivity. The significance of this tendency is measured by comparing the observed actual frequency of intransitive triads with the mean number of intransitive triads (μ_T) expected under the null hypothesis that the sociometric choices are randomly distributed, with σ_T as the standard deviation of T values. Leinhardt's computer program SOCPAC II employs the distributions of mutual, asymmetric, and null pair relation in a given sociogram to state a "random sociogram" and calculate μ_T and σ_T. The transitivity index is thus defined as: $\tau = \dfrac{T - \mu_T}{\sigma_T}$. τ has the mean zero and variance one under the null hypothesis. The distribution of the index is approximately normal as demonstrated by Holland and Leinhardt (1970:406).

An alternative approach for measuring the transitivity tendency may be applied. In order to compare this tendency for the networks of centrals and

of the null hypothesis determines whether the given sociogram deviates significantly from intransitivity.

In order to study the relationship between the strength of ties and the tendency towards intransitivity, we examined the networks of weak and strong ties. For the strong ties' network (n = 1013 ties) the intransitivity tendency τ is −6.17, indicating a strong tendency towards transitivity (statistically significant at the .001 level). Weak ties' network (n = 1498 ties) shows a weaker tendency towards transitivity: the calculated τ is −1.01, indicating an insignificant tendency (p > .10). Thus the tendency toward transitivity is salient in the case of strong ties while weak ties tend to be transitive to a lesser degree, a fact attributed to the higher frequency of "forbidden," intransitive triples among them. This fact should contribute to our understanding of the communicative advantages of "marginals": As Granovetter demonstrates (1973:1363–64), bridges require the existence of "forbidden triads" when the fact that X is linked to Y and Z but Y is not linked to Z enables the X – Y or X – Z links to serve as bridges between different groups or cliques. The low tendency to transitivity, characterizing the weak ties, means loosely knit, outspread ties including those triadic relations that are essential for the bridging function.

Thus, "marginals" enjoy a combination of structural advantages that may account for their frequent functioning as carriers of information across the boundaries of cliques and subgroups.

CONCLUSIONS

The analysis presented in this study suggests both methodological and substantive conclu-

marginals, one may examine their personal networks (the two-step networks, that is, all triads comprising persons directly connected to the individual and all other persons who are connected to those who are directly connected, thus enabling the study of every triad linked to centrals or marginals). We applied this procedure to our relational data and it yielded significantly higher transitivity tendency measures for the centrals' personal networks in comparison with the marginals' personal networks. However, this finding may be interpreted as a validation of the clique algorithm and the assignment into network statuses because the same relational data served for the measurement of transitivity and the analysis of network structure. Hence, the greater tendency of marginals towards intransitivity may stem from their former assignment to "marginal" status. We would like to thank an anonymous reviewer for calling our attention to this issue and for suggesting the analysis of weak versus strong ties, ignoring the marginal-central distinction.

sions. From a methodological perspective, cross-level network analysis is highlighted as a means by which a host of difficulties and problems, inherent in data that is dependent on one-level analysis, may be surmounted. The present study demonstrates the advantage in crossing the boundaries between levels of analysis, illustrated by the case of network positions and their communicative activity and efficiency. The communication functions of certain positions are revealed by relating the individual's position to dyadic, triadic, clique, and network characteristics. Only then the "division of labor" in communication flow between various network positions can be traced and analyzed. Explaining the findings on the advantages of marginals in the intergroup flow of information required the use of structural analysis, involving triadic data (transitivity) as well as dyadic (strength of weak ties), thus illustrating the potential merits of cross-level network analysis.

From a substantive perspective, our findings have several implications for the relationship between communication flow and network positions. First, it appears that the original Two-Step model, modified into the Multi-Step model, should include the distinction between intragroup flow and intergroup flow. These two types of flow activate different ties and network positions. The importance of "centrals"—gregarious, well–integrated individuals—is revealed mainly in intragroup flow, whereas intergroup flow is contingent upon marginally positioned individuals. Second, this "division of labor" should be redivided according to the type of communication; distinguishing between influence and information flow and between various items of information is required. The flow of influence, carried out mostly within the group, is evidently vertical, with those centrally positioned serving as "opinion leaders," the source of advice, orientation, and guidance. Even when acts of influence cross the boundaries of groups, rarely are they activated by "marginals." When, however, the flow of information is considered, the function of "marginals" in bridging groups and cliques is crucial, while "centrals" are active and efficient mainly in disseminating information within their groups but not between them.

Third, the Multi-Step flow model suggests interpersonal sources of information, besides the mass media postulated by the original Two-Step model. Focusing on the interpersonal sources of "opinion leaders" and taking one step backwards from the "centrals," we find "marginals" serving as "scouts" or "importers" of information from their "external"

sources. Thus, the flow of information via personal ties includes horizontal flow (i.e., between "marginals") and upward vertical flow (i.e., from "marginal" to "central"), as well as the well-documented downward vertical flow. Evidence of the multistep and the multidirection flow of information may solve one point of controversy in diffusion studies. Some of them have indicated that early innovators are "marginals" (Rogers 1962:197), while others (e.g., Coleman et al., 1966) find that well-integrated subjects tend to be earlier adopters. Becker (1970) tries to explain this by the perceived risks of adoption, while Burt (1980) suggests that the structural utility of different network positions affects the decision and accounts for the "marginals'" tendency to be "early adopters." These claims leave us with an unsolved problem, as noted by Granovetter (1973:1367): "Central and marginal individuals may well be motivated as claimed but if the marginals are genuinely so, it is difficult to see how they can ever spread innovations successfully." The present study suggests that marginals function mainly as carriers of new information, "importers," while dissemination of the news is basically carried out by "centrals" in their groups. This may be best described as a Two-Step flow *within* each group. Finally, the communicative advantages of "marginals" appear to involve a combination of structured advantages, the strength of weak ties and the tendency toward the intransitivity of ties. Our findings point to the potential contribution of applying structural analysis methods to our understanding of individual-level behavior.

More broadly viewed, perhaps the most important conclusion from this study concerns the ability of network analysis to provide a micro–macro bridge in current sociological theory. The potential of network analysis to point out the means by which individual behavior is routinized and agglomerated into large scale patterns is illustrated by the strength of weak ties as intergroup bridges activated most frequently by "marginals." Without the bridges, any momentum, any innovation, fashion, or idea would not spread beyond the clique. Herein lies the true strength of weak ties along with the claimed centrality of "marginals."

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