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ELMER R. KIEHL, *Director*

The Potential of Interpersonal Communicative Networks for Message Transfer From Outside Information Sources

A STUDY OF TWO MISSOURI COMMUNITIES

HERBERT F. LIONBERGER AND REX R. CAMPBELL



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SUMMARY AND CONCLUSIONS

The purpose of this bulletin was to examine the interpersonal communicative network of farmers in two rural communities. Factors were sought that might have influenced transfer of information from sources outside of the network to individuals within it. The significance of these features for message transfer from various information sources outside of the network was assessed. Two hundred and nineteen farmers in a northwest Missouri community (Prairie) and 238 in a southern Missouri community (Ozark) provided data for the study.

The unit of analysis was the seeker-sought information-seeking relationship (dyad) in which each farmer was asked to indicate from whom he obtained information about farming methods. The aggregate dyads composed the network.

Each dyad was examined to determine whether the information seeker and the person sought as an information source were exposed to specific outside information sources, thus yielding four dyad types. Three factors pertinent to interpersonal message transfer from outside sources were considered:

1. The relative distribution of these dyad types in the network.
2. The proportion of persons directly exposed to specified outside sources of information.
3. The selectivity with which directly exposed persons were sought by others as personal information sources.

This provided the information needed for developing three measures of network potential. These included (1) indirect diffusion potential (the potential of a network to permit persons not directly exposed to an outside information source to get the information through an exposed referent); (2) reinforcement network potential, the network's potential to permit message reinforcement by direct exposure both from the outside source and through personal referents exposed to the same source; and (3) the total network potential (the potential of an interpersonal network to allow the transfer of information from a given outside source).

¹Professor and Instructor, respectively, Department of Rural Sociology, University of Missouri, Columbia, Mo.

The relative proportions of dyads of the indirect, reinforcement, and no-transfer types provided a rough indication of the favorability of a network for message transfer from various outside information sources. Mass media were generally in the most advantageous position in this regard. Exceptions were the low ratios of reinforcement to indirect transfer dyads for television and for the local newspaper in Ozark.

However, these ratios did not account for the selectivity with which those directly exposed to specific sources were sought as personal information referents. Selectivity of referents exposed to specific outside sources of information was computed by determining the extent to which the proportion of exposed persons selected as personal information referents exceeded or fell short of chance expectations.

Except for the PCA Office in Ozark, which had a negative selectivity of 26 percent, and the SCS Office in Prairie, where no selectivity occurred, the selectivity of persons *directly exposed* to the source was positive. Selectivity was highest for persons who obtained farm information from farm meetings in both communities. Persons who got information directly from the almanac were slightly underselected in both communities.

Much the same relative position prevailed for selectivity in the *indirect* message transfer dyads as in the reinforcement dyads. Positive selectivity in reinforcement dyads was highest for the ASC Office in Ozark and for agricultural bulletins in Prairie.

Measures of network potential were applied to determine the actual percentage use of the opportunity provided by a network to choose persons exposed directly to sources of information. Both direct exposure and selectivity of persons exposed were taken into account.

In Ozark, total network potential ranged from a positive 35 percent of the maximum for farm meetings and farm magazines to a negative 66 percent for the local PCA Office. In Prairie, a positive potential occurred for the county extension agent, all of the mass media, and for farm meetings.

The range in network potential for indirect transfer of information used in this study ranged from a near positive 100 percent to a near 100 percent negative. This potential was of special significance because it measured the possibility within the network for obtaining information indirectly through exposed referents by individuals who were not themselves directly exposed to the information source.

Indirect network potential in Ozark was highest for radio with a 66 percent of maximum. Significant indirect network potential occurred for both the ASC Office (22 percent) and for farm meetings (27 percent). A very high negative potential occurred for individual message transfer from people exposed to the PCA office (minus 65 percent); and a much lower but statistically significant potential (19 percent) was present for the local newspaper.

In Prairie, indirect network potential ranged from a positive 38 percent for farm magazines to a negative 21 percent for the SCS office. Network po-

tentials significant at or above the 0.05 confidence level were radio, 29 percent; farm meetings, 21 percent; the county extension agent, 11 percent; the University of Missouri, negative 13 percent; and the almanac, negative 15 percent.

Reinforcement network potential was highest in Ozark for farm magazines and farm meetings. The other extreme was represented by a negative 80 percent potential for persons who obtained information directly from the local PCA office. Thus, the potential for information transfer from likes to likes (i.e., exposed to exposed) was less than the potential for transfer from exposed to unexposed persons.

In Prairie, the highest reinforcement network potential occurred for the county extension agent (40 percent), with statistically significant positive potentials for the vocational agriculture teacher (22 percent), the SCS office (21 percent), agricultural bulletins (25 percent), local dealers (19 percent), and all of the mass media (16 to 27 percent). The most notable community differences were the larger reinforcement potentials for the county agent and the vocational agriculture teacher in Prairie than in Ozark.

In Prairie, positive reinforcement potential exceeded positive indirect transfer potential for 7 out of 13 sources considered. These ratios were very high for the county extension agent (78 percent), the vocational agriculture teacher (81 percent), and for local newspapers (75 percent). Cases where indirect potential decidedly exceeded reinforcement were for the local newspaper, radio, (both 25 percent) and for television.

The final measure used in the study was a combination of direct exposure (percent of persons who said they obtained information directly from a source) and the potential offered in the network for interpersonal message transfer from specified sources. The sums of the two were regarded as providing a comparative indication of the communication potential of the various sources of information considered.

This combination measure produced a source potential in Ozark ranging from a positive 126 percent for farm magazines to a negative 26 percent for the local PCA office. The range was from an approximate plus 200 percent as a maximum to an approximate 100 percent negative source potential, which represented the lowest possible. The only other source with a potential above 100 percent was radio. For both radio and farm magazines the contribution of direct exposure to the total measure far exceeded the network potential.

In Prairie, total source potential was highest for farm magazines (117 percent) and lowest for the University (as a direct source of information) (10 percent). Source potentials of more than 100 percent were reported by radio, farm magazines, and local newspapers. In all cases, the direct exposure component greatly exceeded the network potential, ranging from 17 percent for radio to 26 percent for farm magazines. The highest network potential was 31 percent for the county agent. This added to 66 percent direct exposure provided total source potential of 97 percent.

INTRODUCTION

The fact that farmers communicate with and influence each other in matters related to farming is well known. Many channels and change agents within and outside of the community are involved in the process by which farmers get information from primary research sources. In this process they are subjected to a flood of messages from the press, radio, and television. Change agents from the colleges of agriculture, government agencies, and industry supply them with information and persistently try to convince them that they should try something new or make changes in their farming operations.

Even though most of them have ample opportunity for exposure from information sources outside of the immediate locality, some remain relatively impervious to direct exposure and, indeed, avoid it by skipping the information sections in the paper or by turning the dial of the radio or television set to another station when farm information programs are on the air. Some farmers rely heavily on other farmers as sources of first information about new ideas in farming and a greater number depend on associates for additional information and advice in arriving at final decisions to accept changes for trial or adoption.

The interpersonal relationships through which farmers obtain information tend to be structured into distinguishable patterns or groups rather than occurring in a random manner. Social groups tend to facilitate communication with fellow members and, perhaps, to restrict exchange of information with outsiders. (1-2) Thus, message impact from press, radio, and television is influenced by interpersonal patterns of communication and group pressures.

Another significant feature of the transfer of information through interpersonal relationships is that persons sought as sources of information are frequently more exposed² to outside influences than those who seek influences from them. The associated tendency for persons who are more exposed to outside sources of information to transmit what they learn to others less exposed than themselves has been referred to as the two- or multi-step flow of information. (3) Basic assumptions in this theory are essential to the analysis of the diffusion potential of interpersonal communicative networks which follow.

Thus, certain limitations and features of this theory should be noted. A basic assumption is that information flow from outside sources³ occurs through the information seeker-sought dyad and that the transfer is in a direction from the more exposed to the less exposed persons in the dyad relationships. However, the reverse may occur. Furthermore, persons relatively unexposed or not exposed to outside information sources may be sought for advice and assistance more than those who are exposed. Also, there may be situations where virtually

²Exposed is defined as alleged receipt of farm information from a specified source during the year prior to interview.

³Referred to in this bulletin as information sources operating either outside of the network of communicating individuals or as a joint product of group interaction as in the case of farm meetings where information is attributed to the meeting and not to a specific individual.

no one in a given network of communicating individuals is exposed to any outside sources of information. In such cases, the interpersonal exchange of information becomes essentially a matter of sharing what is already in the possession of the interacting individuals. The net effect would seem to be one of reinforcing existing ideas and beliefs. A more likely condition is one in which the network of communicating persons is more favorable to information transfer from one outside source than from another. Whether this is true or not depends on how many people or persons are exposed to different outside sources of information, and to the differential frequency with which those so exposed are selected by others as personal sources of farm information. Thus, persons who obtain information from the almanac may be little sought as personal information referents while the reverse may be true for persons who are known to be in frequent contact with the county agent. Assuming equal amount of direct exposure, the network provided by the information seeking relationships would be more favorable for message transfer from the county agent than from the almanac.

The purpose of this bulletin is to:

- (1) examine features of interpersonal communicating networks which have an influence on the transfer of information to individuals within the network,
- (2) conceptualize mechanistic features of the network which determine network potential for reinforcement and indirect message transfer from outside sources,
- (3) develop an analytical scheme for taking these into account, and
- (4) use the scheme to assess the potential of interpersonal communicative networks for message transfer from outside information sources in two Missouri communities.

THE COMMUNITIES STUDIED

Bases of Selection

The communities included in the study were selected to represent widely divergent degrees of adherence to traditional methods in farming and thus variant positions on an assumed sacred-secular continuum. (4) *Prairie*, regarded as highly amenable to change, was selected from northwest Missouri. Conditions for farming are very favorable there and farm incomes are among the highest in the state. A high degree of rationality in farm management decisions had been assumed to prevail in this area. The other, referred to as *Ozark* in this study, was selected from south-central Missouri where land resources for farming are generally regarded as poor, where farm incomes are among the lowest in the state, and where people have been accused of being slow to accept change.

The communities were also selected as being generally representative of two relatively homogeneous social areas, each of which was assumed to approximate an extreme of such sacred-secular differences as exist within the state. (5)

(See Fig. 1.) Findings may therefore be regarded as indicative of conditions prevailing in the social areas of which the communities are a part and also as a limited indicator of existing sacred-secular differences among farm operators in the state.

All farm operators in the trade area communities were interviewed, except the fewer than 5 percent who refused. Two hundred nineteen schedules were taken in Prairie and 238 in Ozark. Interviews were completed during the fall of 1956 and the winter of 1957.

General Characteristics of the Farmers

In Prairie, virtually everybody who lived in the open country operated a farm or was a farm laborer, while in Ozark, only three out of eight were directly dependent on farming. Furthermore, of those in some degree directly dependent on farming, one out of every five reported off-farm income in excess of gross farm income. Almost 70 percent of the farm operators in Prairie reported no off-farm income and less than 10 percent reported as much as 100 days work off

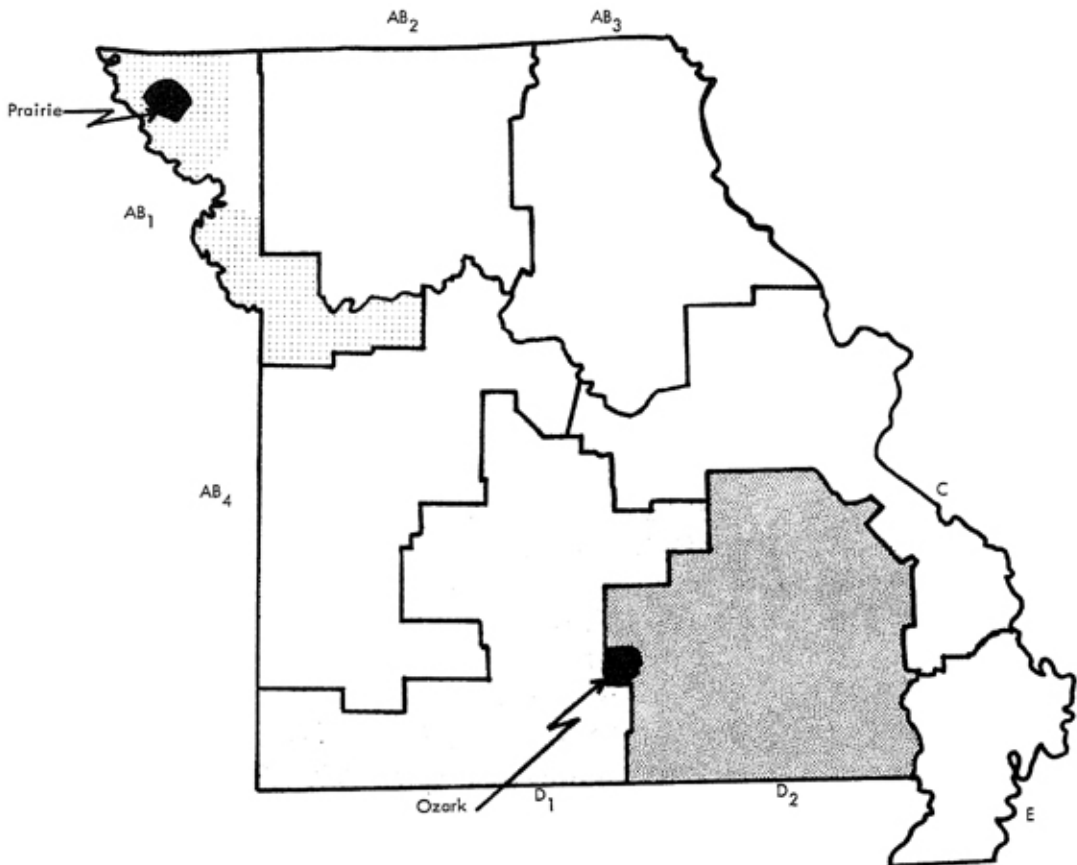


Fig. 1—Location of Ozark and Prairie with reference to rural social areas in Missouri.

their farms. Most of them derived their income from the production of corn, cattle, and hogs, while dairy production prevailed as a chief source of income in Ozark. Ninety-eight percent of the Ozark farmers owned farms which yielded a median gross income of less than \$2,800 per year in 1956. In Prairie, a median 231 acre farm yielded a median gross income of \$6,520. About 65 percent owned the farms they operated. The median age of the farm operator was 51.5 years in Ozark and 48.5 in Prairie. The median number years schooling completed was 8.8 for Ozark and 12.2 for Prairie.

In a sense, the quest for off-farm income and the change from general farming to dairy production in Ozark represented a secularizing influence born of economic necessity in an area where farmers were otherwise desirous of accepting change at a slower rate. Thus, Ozark selected as representative of a tendency to adhere to tradition, has actually been forced to make changes not yet regarded as necessary in the more prosperous Prairie community.

METHODOLOGICAL CONSIDERATIONS

Interviewing Procedure

Each farm operator in both communities was specifically asked whether he had obtained farm information during the past year from a designated list of potential sources. Upon naming friends and neighbors as a source, which was universally done, he was asked to name the specific persons from whom he had obtained information. Virtually all farm operators named one or more farmers as farm information referents, together with a variety of other sources outside the community. The persons named served as the basis for establishing interpersonal information, seeker-sought relationships. The aggregate of seeker-sought relationships in each community was regarded as an interpersonal communicative relationship (ICR) network or, in this bulletin, simply as the *network*. Sources of information other than friends and neighbors were regarded as "outside sources," meaning outside of the interpersonal network of communicating farmers.

Basic Assumptions

The farmers in each of the two trade-area communities included in the study were regarded as a universe of interacting persons who habitually talked to each other about matters related to farming. Basic assumptions in this study are that:

- (1) *People who say they get information from an information source do so in a recurrent manner.*
- (2) *People verbally transmit what they learn from information sources outside of the community to others in the community.*
- (3) *Relationships defined by one farmer naming another as a personal source of information are recurrently used when new information about farming is needed and when matters related to farming are discussed.*

- (4) *Information transfer takes place from the person sought as an information source to the one seeking the information.*
- (5) *The total relationships defined by questioning farmers living in a given community about specific persons as sources of information represent something of a communicative universe relative to the pattern being investigated.*

Limitations

Some limitations to the assumptions of information transfer on a person to person basis and to the methods used should be noted. Examination of information flow within the interpersonal network was limited to the one interpersonal transfer. It is unknown whether this is the first, second, or a later "step" beyond the outside source. Also, in the analysis, attention was directed only to one-directional flow of information (i.e., from sought to seeker) even though the reverse surely did occur in many cases and even though given individuals may appear on both ends of an information seeker-sought relationship. Also, not all recurrent communicative relationships among individuals become a matter of record in a research operation where each person is asked to name others from whom he obtains information about a particular subject. The information seeker-sought relationships included in this analysis were only the ones that individual farmers recalled and indicated when asked from whom they obtained information about matters related to farming during the past year.

Furthermore, the model used for analysis is concerned only with the mechanistic arrangement within the interpersonal network for information transfer and the possibilities that it offers for the transfer of messages from various outside information sources. How an intermediary alters, sorts, or distorts messages coming to an individual from another source is not a concern of this analysis.

STRUCTURAL FEATURES OF THE INTERPERSONAL COMMUNICATIVE NETWORK

The elemental social structure through which interpersonal communication occurs is the information seeker-sought communicative relationship (ICR) (also referred to as a dyad in this study). One basic requirement for interpersonal message transfer from an outside source is the existence of ICRs permitting such transfer. The second requirement is receipt of information from the outside information sources by the individual who is sought as a personal source. Actually, in a given ICR, the information seeker, the sought, or both may be exposed to a specific outside information source. Four pertinent dyad relationships are thus possible. (See Fig. 2.)

Situation A—Where both the information seeker and the one sought obtain information from an outside information source. In this case, information received directly by the seeker can be reinforced by that obtained from his referent.

Situation B—In this ICR, the information seeker obtains information directly from an outside source, but the one sought does not. Obviously, if one-way transmission is assumed, no potential for indirect information transfer is provided.

Situation C—Where the information seeker does not obtain information directly from an outside source, but the "sought" does. This provides an opportunity to get information from an outside information source second handed.

Situation D—In this case, neither the information seeker nor the one sought obtains information from the outside source. Again, the ICR permits no opportunity for message transfer.

Any communicatively interacting group of people may be regarded as consisting of an aggregate of ICRs, which can be classified into the four ICR types, depending on seeker-sought exposure to a specific outside information source. Collectively, the dyads form the ICR network; in this case, the ICR network of farmers in Ozark and Prairie.

Obviously, the possibilities for message transfer from an outside source of information are based on the number of persons in the network who obtain information directly from the source and the extent to which those who do are sought by others as personal sources of information. A brief statement of the conceptual scheme and measures needed for assessing the potential of ICR networks for communicative transfer of interpersonal communicative transfer can be found in Appendix A.

PERSONS SEEKING (Exposure to an Outside Source)	Total	PERSONS SOUGHT (Exposure to an Outside Source)	
		Exposed	Not Exposed
Total	I	XX	XX
Exposed	XX	(Reinforcement) Situation A Dyads	(Non-Transfer) Situation B Dyads
Not Exposed	XX	(Indirect Transfer) Situation C Dyads	(Non-Transfer) Situation D Dyads

Fig. 2—Diagrammatic illustration of the opportunity for information seekers and persons sought to be exposed to an outside information source.

MESSAGE TRANSFER THROUGH THE ICR NETWORKS

The potential for interpersonal message transfer may vary from one ICR network to another; also, the potential for transfer in a given network may vary for different outside sources. The communicative potential of a network is increased as exposed "soughts"⁴ increase. The opposite is true when exposed soughts are situated in a network that restricts communication with them or when a relatively few are exposed to an outside information source.

A second network feature of interpersonal message transfer relates to the degree to which exposed and unexposed persons interact exclusively among themselves. No opportunity is provided for communication of information indirectly from outside the network if unexposed persons consistently seek information from others who are likewise unexposed. Conversely, information transfer is enhanced if those effectively exposed to the outside source are frequently chosen as personal information sources by others. Thus, a selectivity measure is introduced to indicate the degree to which frequency of choice of exposed referents exceed or fall short of chance expectations. This measure is explained in a later section.

The number of persons in the ICR who are exposed directly to an information source (i.e., they say that they obtain information from it) and the relative frequency with which they are chosen as personal referents provides the basis for assessing the potential of the network for message transfer. A measure of total network potential is introduced for this purpose.

Obviously, there are situations where individuals who are not directly exposed to an outside source get information from those who are. Thus, the network provides an opportunity for indirect transfer of information. The frequency with which this condition is repeated in the ICR network provides the basis for assessing the indirect diffusion potential of the network for a specific outside information source.

A third feature of an ICR network is the opportunity it offers for reinforcement of a message from an outside source. This occurs when ICR situations permit information coming directly from an outside source to coincide with information coming indirectly from a personal referent who also obtains information from the same source. The significance of this relationship is based on the assumption that double exposure from information sources is more likely to influence personal behavior than single exposure. (6) The measure for assessing reinforcement potential of an ICR network used in this bulletin is based on this assumption.

In the paragraphs that follow, the three measures of total, indirect, and reinforcement network potential and a selectivity measure are discussed and applied to the communicative situation in Ozark and Prairie. All have meaning

⁴Persons named by others as personal sources of farm information when asked from whom they obtained farm information during the year preceding the interview with the respondents.

only when used on a comparative basis for message transfer from different information sources operating outside of the ICR network. Finally, a measure which attempts to assess total mechanistic source potential will be introduced. The last takes total direct exposure to the source and network potential into account.

NATURE AND POTENTIAL OF INTERPERSONAL COMMUNICATIVE NETWORKS IN OZARK AND PRAIRIE

Distribution of the Dyads

The same aggregate of dyads (ICR network) exists for all outside sources of information, but the possibilities offered for message transfer through the network are different. They vary with the number of individuals in the network who themselves are exposed to a given source of information originating outside of the interacting aggregate of individuals and the frequency with which they, in turn, are sought as sources of information. Sometimes persons seeking information from others are directly exposed to the same information source and sometimes they are not. The same is true for those from whom information is sought. Conditions resulting from such exposure provide the elemental basis for examining the potential of interpersonal networks for message transfer among those who name each other as sources of information. (See Fig. 2.)

The attention of the reader is first directed to the numerical distribution of the dyad types in the network, i.e., those permitting direct and indirect message transfer and those permitting no transfer. Situation A dyads are referred to as the reinforcement dyads. Situation C dyads are the indirect transfer type, and those in Situations B and D are types that permit no transfer. Collectively, A and C are the ones through which message transfer from an outside source is possible. They provide the elemental basis for assessing the total network potential.

Looking first at the proportion of total dyads permitting message reinforcement, i.e., receipt of information directly from an outside source and indirectly through the information referent, it is apparent that the mass media were generally in the most advantageous position. More than 80 percent of the dyads involving farm magazines and radio permitted double exposure. (See Fig. 3 and 4.)

However, reinforcement transfer dyads constituted only 5 percent of the total for television and 27 percent for newspapers in Ozark. In contrast, comparable percentages in Prairie were 41 and 77.

The next highest proportion of reinforcement dyads occurred for one or more of the agricultural agencies with farm meetings running a close second in both communities. In Ozark, the county extension agent headed the list with reinforcement possible in 37 percent of the dyads.

In Prairie, the local Agricultural Stabilization and Conservation Committee (ASC) Office took the first position for the agricultural agencies. Forty percent of the dyads permitted reinforcement of information from that source.

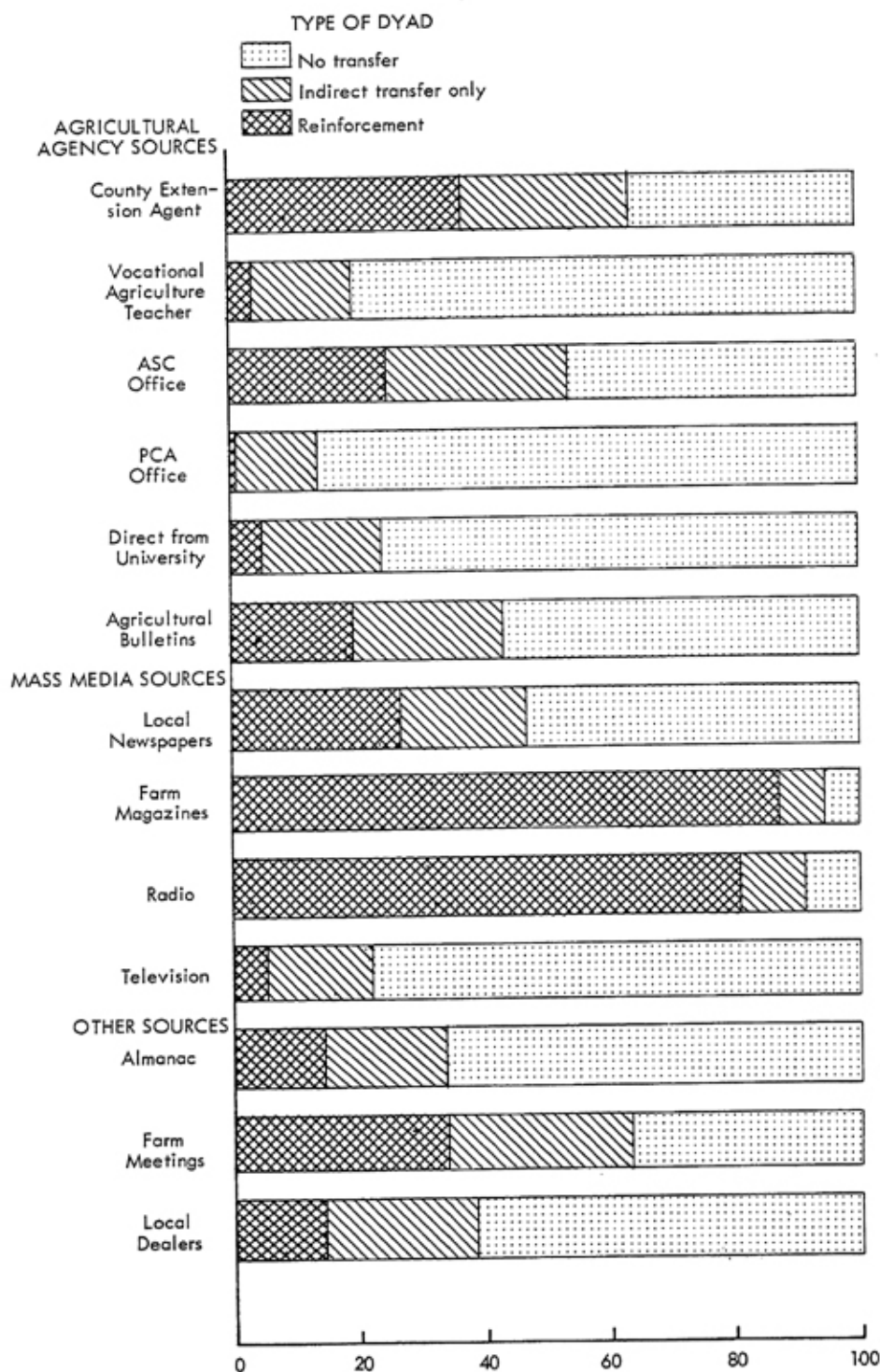


Fig. 3—Distribution of interpersonal dyad types for outside information sources in Ozark.

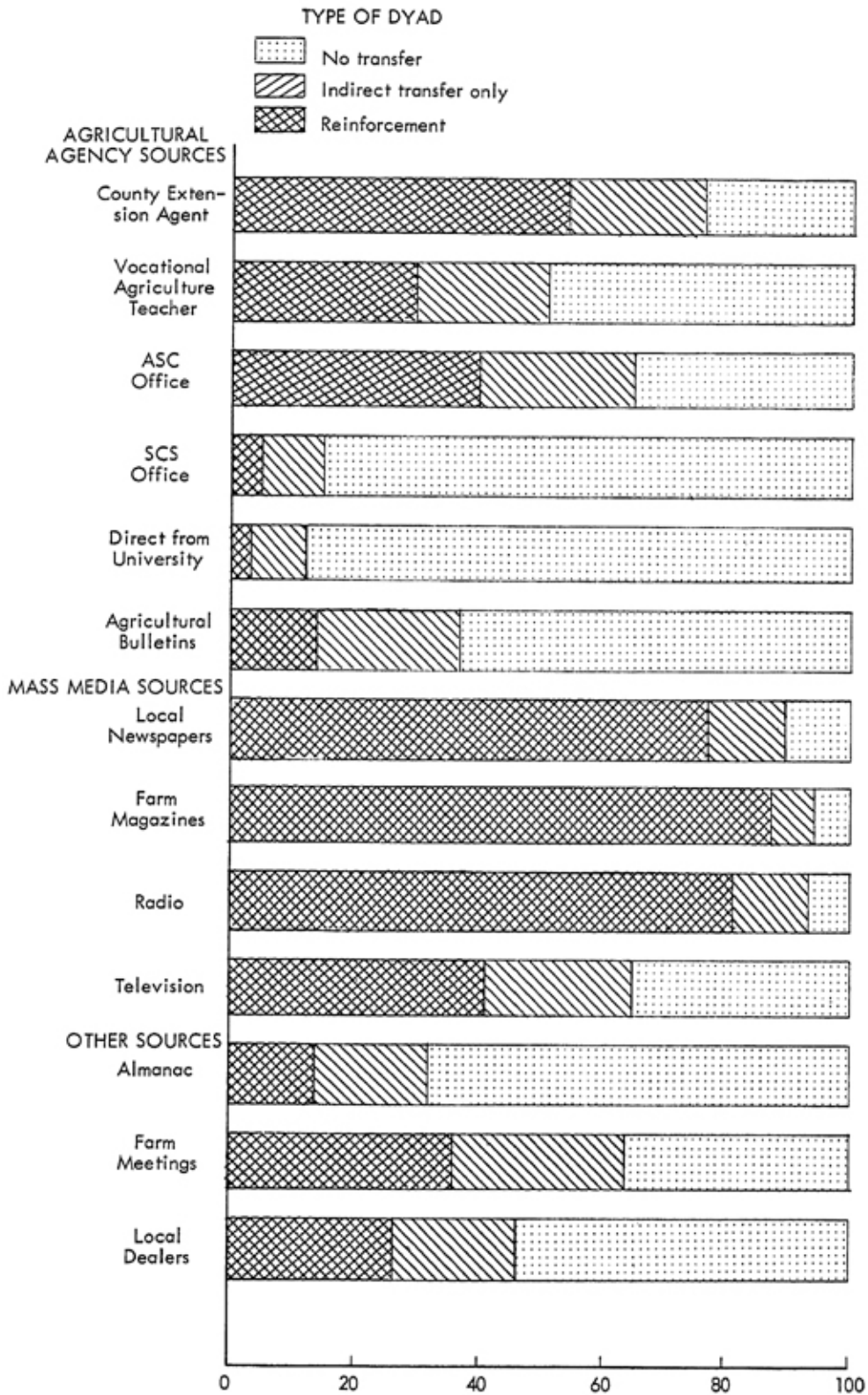


Fig. 4—Distribution of interpersonal dyad types for outside information sources in Prairie.

Reinforcement was also possible in 30 percent of the dyads for the vocational agriculture teacher in Prairie but in only 5 percent of the dyads in Ozark. The comparable percentage for the county extension agent in Prairie was 55. Percentages for other sources may be estimated from Figures 3 and 4.

The proportion of indirect transfer dyads (Situation C), which are the ones in which the information seeker is not directly exposed to the outside source but the seeker is, was highest for farm meetings in Prairie. Farm meetings and the ASC office tied for first in Ozark. Percentages of all dyads permitting exposure were 28 or 29 percent in all three cases. In Ozark, close seconds were provided for interpersonal information transfer from the county extension agent, agricultural bulletins, and local dealers. In Prairie, the closest second position was provided by the ASC Office. Agricultural bulletins, the county extension agent, the vocational agriculture teacher, and the local dealers followed in close succession.

Dyad situations A and C, collectively, are the ones permitting interpersonal message transfer through the network from outside information sources. Accordingly, those permitting interpersonal message transfer from radio and farm magazines in both communities and from local newspapers in Prairie were highly preponderant. (See Figures 3 and 4.) The proportion of dyads permitting transfer was near or above 90 percent in all cases.

Farm meetings and the county extension agent followed in Ozark with approximately 63 percent of the dyads permitting message transfer. Fifty percent or more of the dyads permitted interpersonal message transfer from each of the agricultural agencies in Prairie, but this was true only for the county extension agent and the local ASC Office in Ozark.

The position at the other extreme was represented by the local Production Credit Association (PCA) Office, for which only 13 percent of all dyads permitted interpersonal message transfer. In Prairie, the comparable position was held by the University of Missouri as an outside source. This was about equal to the number of persons in the community getting information directly from the University. However, 8.4 percent of the farmers in Ozark said they got farm information directly from the local PCA Office.

Comparison of mere number of dyads of the reinforcement type with those permitting only indirect transfer of information provides a rough estimate of the relative advantages of the two routes: (1) the network for message reinforcement and (2) indirect exposure from outside sources of information.

Figure 3 shows that *indirect exposure only* (Situation C) opportunities were greater than *reinforcement* (Situation A) opportunities in Ozark by 10 percent or more for the University, the vocational agriculture teacher, and the local PCA Office. A like but smaller balance in the direction of indirect transfer dyads was present for the ASC Office, agricultural bulletins, television, the almanac and local dealers. The reverse was true for all other sources. The very large excess of reinforcement over indirect transfer dyads for radio and farm magazines in both communities, and the local newspaper in Prairie was mainly due to the very

high proportion of persons making direct use of these sources of farm information.

In Prairie, indirect transfer dyads exceeded reinforcement dyads for agricultural bulletins, the local SCS Office, and the almanac by a margin ranging from 4 to 9 percent. Otherwise, the situation was one in which persons exposed to the same outside farm information source sought information from each other rather than one in which unexposed persons sought exposed ones.

Selectivity of Choice

The choice of other persons as sources of information was not random. Some people were selected in preference to others. It is not the intention of this study to determine the bases upon which selectivity rests or to determine the segregating or differentiating influence of personal attributes upon choice. Rather, the problem is to determine the amount of selectivity exercised in choosing persons exposed to selected sources of information about new farm practices. No assumptions are necessary in regard to why the choices were made.

If people choose sources of information in an entirely random manner, they would be expected to choose referents who obtain information from specific outside sources in approximately the same proportion as they obtain information directly from the various outside sources. Selectivity may occur in either a positive or negative manner and may occur in any or all of the four dyad types.

Although the procedure for computing selectivity is explained in detail in another publication,⁵ a brief description and illustration is included here. The dyads permitting interpersonal message transfer are used for illustrative purposes (Situations A and C in Figure 2). The proportion of the total dyads permitting transfer is represented by $\frac{A + C}{I}$. I represents the total number of dyads in the communicating network, C the dyads where seekers who were not exposed to X₁ source obtained information from individuals who were directly exposed, and A represents the dyads where both the information seeker and the persons sought were directly exposed.

To indicate choice, it is necessary to determine the extent to which the exposed personal referents differ from what may be expected by chance alone. The needed adjustment is accomplished simply by subtracting T, the total proportion of persons directly exposed to X₁ source, from the proportion of dyads permitting indirect message transfer or the formula $\frac{A + C}{I} - T$. "T" is used be-

cause personal referents are chosen among individuals and because selection occurs before the dyads are actually formed. Negative selectivity occurs where the

⁵Lionberger, Herbert F., Rex R. Campbell and John S. Holik, *Methods of Measuring the Communicative Potential of Interpersonal Communicative Networks*, Department of Rural Sociology, University of Missouri, Columbia, Missouri, 1962. (Unpublished paper).

proportion of referents chosen from among those who had been exposed to X_1 source is less than the proportion of people who were directly exposed to the X_1 source. Negative selectivity is computed the same way as positive selectivity but is represented by a minus quantity.

From an information dissemination standpoint, a network may be said to be favorable to message transfer when selectivity is positive and unfavorable when selectivity is negative. The range is represented by a plus 100 percent on the positive side to a minus 100 percent on the negative. Zero selectivity represents a neutral condition insofar as the selection of exposed or unexposed source referents is concerned.

In all transfer dyads, given an orientation to the acceptance of changes in farm practices, greatest selectivity may be expected for persons exposed to information sources most instrumental to the successful introduction of new farm practices. Since information sources vary in their utility for decisions and persons vary in their exposure to them, it may be assumed that a network more favorable for message transfer from one outside information source than from another would be created.

Agricultural agencies represent sources generally dedicated to direct dissemination of quality information to farmers. The almanac, although revised to include some useful information about farming, probably still appealed to many because of the information it offered about the signs of the zodiac.

Thus, a tenable hypothesis would seem to be that high positive selectivity would occur for persons directly exposed to the agricultural agency sources, particularly the county extension agent and vocational agriculture teacher and that high negative selectivity would occur for those directly exposed to the almanac as a source of information. High selection of persons obtaining information from farm meetings might also be expected since such meetings tend to be more frequently attended by technologically competent farmers than by less competent ones and since the dissemination of farm information is sometimes a planned part of their group activities.

Except for a notable exception in Ozark where persons getting information directly from the PCA Office were under-selected by a 26 percent margin, the selectivity hypothesis was generally supported, although not always by significant differences. The county extension agent, the ASC Office, the University of Missouri, agricultural bulletins, and the vocational agriculture teacher were all over-selected. Percentages ranged from a 15 percent over-selection of persons who obtained information directly from the ASC Office to a 2 percent over-selection of persons getting farm information directly from the vocational agriculture teacher. (See Table 1.) Over-selection of persons getting farm information directly from farm meetings was highest, at 20 percent.

Thus, from a potential-for-information-transfer point of view, the interpersonal network (aggregate of dyads) may be said to be favorable to information transfer or to have a facilitating effect on message transfer from these sources. Also, as hypothesized, persons getting information directly from the almanac were under-selected, although by a very small margin (minus 3 percent).

TABLE 1 - PERCENTAGE OF FARM OPERATORS GETTING DIRECT INFORMATION FROM VARIOUS SOURCES, THE PROPORTION OF DYADS PERMITTING INDIRECT INFORMATION TRANSFER AND THE DIFFERENCE BETWEEN THE TWO PERCENTAGES

Information Source	Proportion of Farm Operators Getting Direct Information		% of Dyads Permitting Indirect Transfer		Difference between % direct exposure and % of dyads permitting indirect Exposure	
	Ozark	Prairie	Ozark	Prairie	Ozark	Prairie
AGRICULTURAL AGENCIES						
County Extension Agent	55	66	63	76	8	10
Voc. Agr. Teacher	18	43	20	51	2	8
Agricultural Stabilization and Conservation Committee	39	62	54	65	15	3
Production Credit Association	40	XX	14	XX	-26	XX
Soil Conservation Service	XX	15	XX	15	XX	0
Direct from University	15	12	24	12	9	0
Agricultural Bulletins	40	29	44	36	4	7
MASS MEDIA						
Local Newspaper	44	86	46	89	2	3
Farm Magazines	91	91	94	93	3	2
Radio	90	91	91	93	1	2
Television	10	59	22	65	12	6
OTHER						
Almanac	37	32	34	31	-3	-1
Farm Meetings	42	52	62	64	20	12
Local Dealers	31	41	38	46	7	5

Although it is not the purpose of this bulletin to explain why selection occurs in the use of persons exposed to various information sources, it might be expected that farm meeting attendance would provide a tangible basis of selection. The tendency to select persons who got information directly from television suggests a likely association of television set ownership with a favorable economic position and a superior managerial ability which has been shown to serve as a basis for selecting information referents. (7) (Use of the local PCA Office could be associated with a negative feeling, the feeling that persons who used it were not as desirable personal information sources as persons with other associations.) Assuming knowledge among potential information seekers of who gets credit and who doesn't from this source, selection or failure to select on this basis would be likely. The only other group which were underselected in Ozark

were the users of the almanac. Since a person's reliance on the almanac as an information source may not be apparent, choice is more likely to be made on other attributes of the almanac user.

In accord with the hypothesis stated previously, positive selectivity occurred in Prairie, as in Ozark, for persons who obtained farm information directly from the county extension agent (10 percent), from the vocational agriculture teacher (8 percent), from agricultural bulletins (7 percent), and from farm meetings (12 percent). A slight positive selectivity also occurred for the ASC Office, but persons getting information directly from the Soil Conservation Service (SCS) and directly from the University were selected no differently than would be expected by chance. Again a very slight negative selectivity occurred for persons getting information directly from the almanac. This, too, is in accord with the selectivity hypothesis.

It will be further observed that interpersonal networks in the two communities were slightly favorable for indirect message transfer from all of the mass media sources as well as for local dealers as sources of farm information. (See Figure 5.)

In the reinforcement dyads, the manner in which selectivity in the choice of personal referents occurred revealed a general inclination for likes to choose likes insofar as exposure to outside information sources was concerned. This was particularly true in Ozark. Thus, for 8 of 13 information sources examined, positive selectivity in the reinforcement dyads was distinctly greater than the dyads permitting only indirect information transfer (choice of unlikes). (See Table 2.) A general tendency to avoid persons who got information from the PCA Offices was noted in both dyad types but the tendency was most evident in the reinforcement dyads.

Selectivity in the reinforcement dyads was high for information sources involving acquisition of information by overt, observable means. This was particularly true for the ASC and PCA Offices and acquisition of information from farm meetings. Percentages were 39.1, minus 8.4, and 42, respectively. However, high positive choice selectivity for persons getting information from newspaper and television exposed persons was also apparent in the reinforcement dyads (16 and 24 percent, respectively). Since these sources involve a type of information-seeking behavior not readily observable to the public, selection would likely be on other more observable bases. In Prairie, positive selectivity was greater in the reinforcement type dyads than in those permitting only indirect exposure to outside information sources for 9 of the 13 information sources examined. (See Table 2; also Figures 6 and 7.)

Selectivity of referents who obtained information from the various outside information sources was somewhat different in Prairie and generally not so great as in Ozark. Highest selectivity was manifest for persons obtaining information from agricultural bulletins and the SCS Office (18 percent) with the county extension agent, vocational agricultural teacher, and farm meetings each showing selectivities of over 10 percent in the reinforcement dyads. (See Figure 6.)

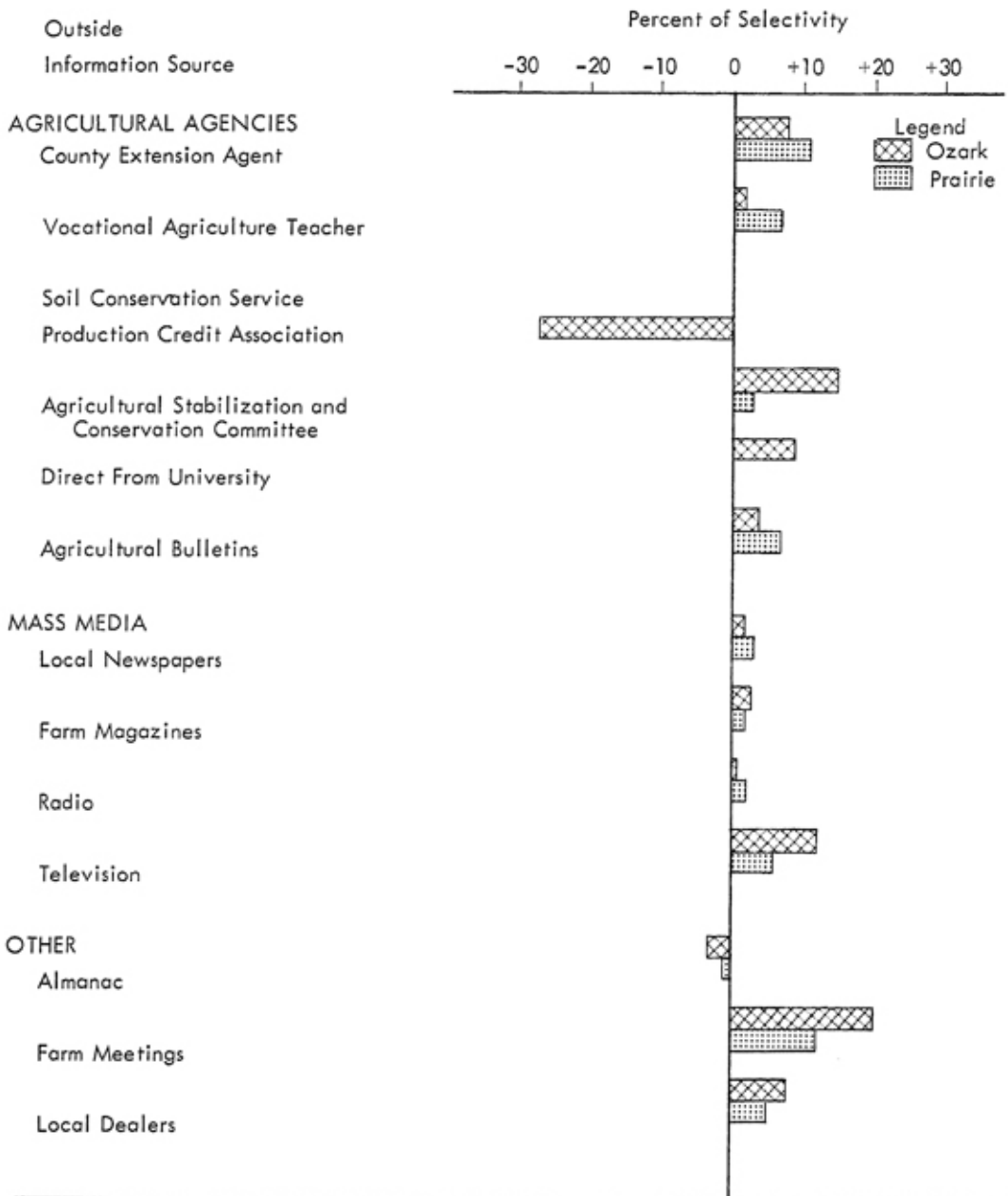


Fig. 5—Selectivity with which persons exposed to outside information sources were chosen as personal information sources in Ozark and Prairie.

TABLE 2 - RATIO OF INDIRECT TRANSFER TO REINFORCEMENT
DYADS FOR DESIGNATED INFORMATION SOURCES

Information Sources	Ratio of Indirect to Reinforcement Dyads	
	Ozark	Prairie
County Agent	70	81
Vocational Agriculture Teacher	375	70
Agriculture Stabilization and Conservation Committee	116	63
Production Credit Association	1300	XX
Soil Conservation Service	XX	200
Agricultural Bulletins	120	165
Local Newspapers	74	16
Farm Magazine	8	8
Radio	12	15
Television	340	59
Local Dealers	171	77
Direct from University	38	300
Almanac	143	129
Farm Meetings	52	100



Fig. 6—Frequency with which persons exposed to outside information sources were personally selected to permit message reinforcement.

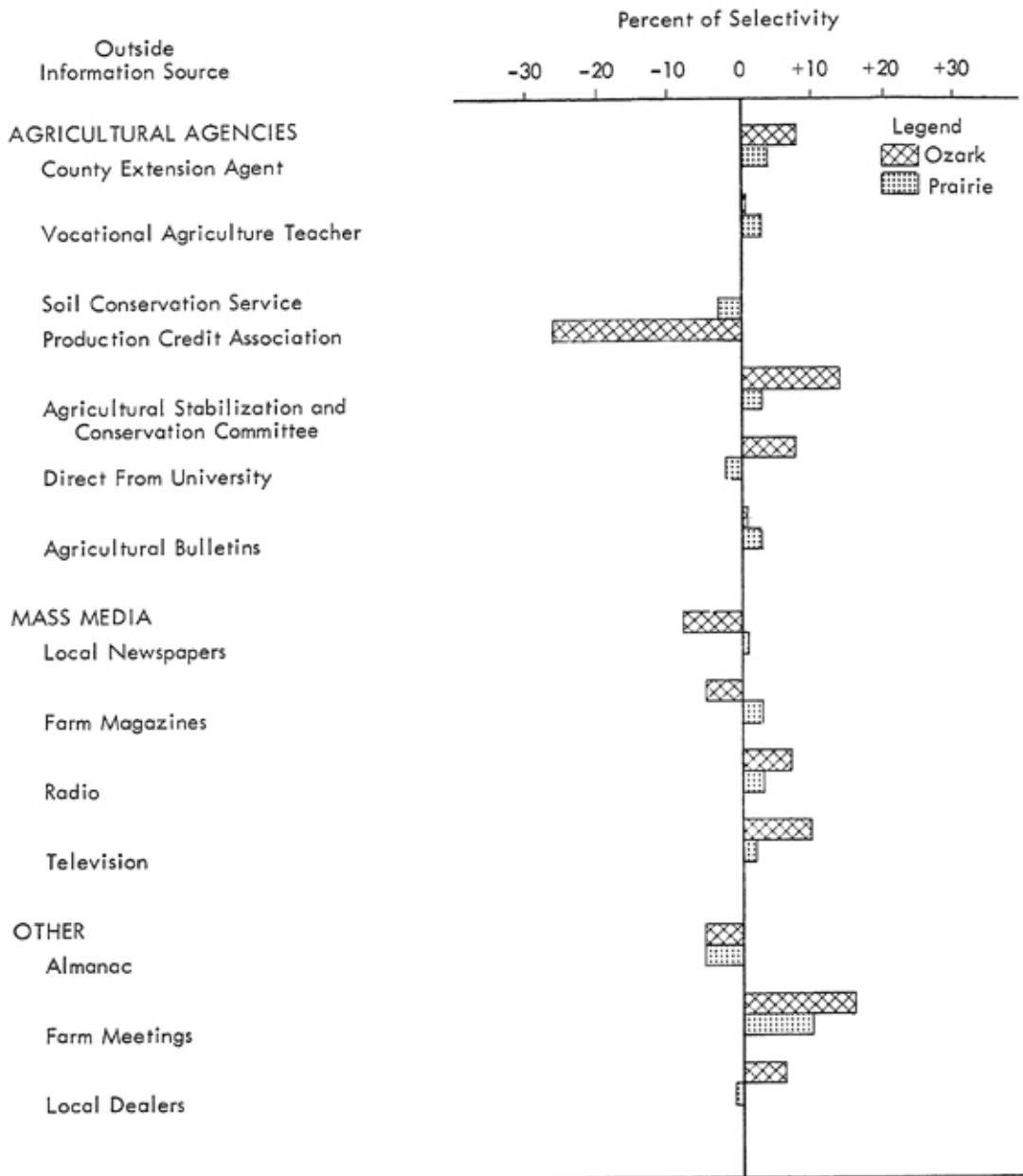


Fig. 7—Frequency with which persons exposed to outside information sources were personally selected to permit indirect message transfer.

In the indirect transfer dyads, selectivity was greatest (16 percent) for persons getting information from farm meetings. The ASC Offices ranked second with a plus 14 percent. Other information sources that showed between 5 and 10 percent positive selectivity were the county extension agent, radio, television, local dealers, and the State University. Negative selectivity was noted for persons who said they obtained information directly from the PCA Office. Negative selectivity of 5 percent or more was also noted for local newspapers, farm magazines, and the almanac. Thus, radio and television were in a much better position to permit message transfer through the interpersonal dyads than the other mass media.

In Prairie, farm meetings enjoyed a 10 percent selectivity advantage. No other source had a selectivity of as much as 5 percent. The almanac had a network with a negative 5 percent selectivity.

Network Potential for Message Transfer

This measure is concerned with all interpersonal connections in an ICR network which permit information flow through them from outside sources. It has been seen that an appropriate measure of potential must consider (a) exposure to specific outside sources of information, (b) the selectivity with which persons exposed to such sources are sought as personal information sources, and (c) the opportunity to select persons exposed to the various outside sources. The measure of choice selectivity has been explained in the previous section. By the nature of the selectivity measure (T), the proportion of persons directly exposed to S_1 source had to be considered. As described earlier, the selectivity measure for the choices in Situation A (reinforcement dyads) and Situation C (indirect transfer dyads) was:

$$\frac{A + C}{I} - T$$

where A represented the number of Situation A dyads, C , the number of Situation C dyads, I , the total number of all of the dyads, and T , the proportion of persons getting information directly from S_1 source.

This leaves one additional measure to be dealt with: opportunity to select persons either exposed or not exposed to S_1 outside source. Again the chance factor enters. Opportunity to select is algebraically defined as $1.00 - T$. The 1.00 represents all of the opportunity to select persons in the universe; T represents the proportion of choices that could be expected to go to persons exposed to S_1 source by chance alone. The remainder represents opportunity for selectivity, the reason being that selection of T percent of S_1 -source-exposed persons could be expected by chance.

Thus, if 10 percent of the persons interacting in a given network are directly exposed to S_1 source, the amount of selection differing from 10 percent ($1.00 - T$) or 0.90 (90 percent) would represent the range in which selectivity

can occur. In a sense, the problem of measuring network potential is one of determining what the percent actual selectivity is of that possible in a given dyad situation.⁶

The final formula with a constant (k) added to keep the range to a more understandable ± 99.99 , or approximately ± 100 percent becomes:

$$\frac{A + C - T}{I} k$$

$$1.00 - T$$

From an information dissemination standpoint, an ICR network may be regarded as favorable to message transfer when the potential is positive and unfavorable when it is negative. Zero potential represents a neutral position insofar as message transfer through the network is concerned. The ratios computed may be regarded as representing a percent of maximum potential that the interpersonal network offers for message transfer through the interpersonal dyads from each of the outside information sources.

The range in network potential in Ozark from 35 percent of maximum for farm meetings and magazines to a minus 66 percent for the PCA Office was determined. (See Table 3.) In all three cases direct exposure was represented by the simple percentage of persons who said they obtained information directly from the outside source. (See Table 1.) Refer to this table for further comparisons. In the case of farm magazines and farm meetings, the interpersonal network was such that a 35 percent multiplying effect over and above the direct exposure figure could be expected in the dyad relationships, assuming indirect information transfer from exposed information referent to unexposed information seekers. At the other extreme, for the PCA Office, a 66 percent message inhibiting influence could be expected in the interpersonal communicative network. Persons who used this office to obtain farm information were grossly underselected as information referents by others. The only other information source in either community where the interpersonal network had a potential inhibiting influence was the almanac. In Ozark, an 8 percent restriction was found while in Prairie, the inhibiting influence was 3 percent. Neither of these were statistically significant at the .01 confidence level.⁷ For all other information sources in Ozark, a

⁶Since negative selectivity could also exist the opportunity for this occurring must be measured. The limits of negative selectivity would range from T to 0. Thus, opportunity for negative selectivity would be .10 - 0 or 10. The maximum amount of negative selectivity would occur if no one sought a person exposed to S₁ outside source. For example, negative selectivity is provided by a network where 10 percent of the people in the universe were exposed to S₁ source and where none of them were used as information referents. Opportunity for negative and positive selectivity always existed in the ICR network for a given medium. However, for this research opportunity for positive selectivity was considered if the total effect was positive and the opportunity for negative selectivity was considered if the total effect was negative. For a more detailed description of the method involved see: Lionberger, Herbert F., Rex R. Campbell and John S. Holik, *Methods of Measuring the Communicative Potential of Interpersonal Communicative Networks*, Department of Rural Sociology, University of Missouri, Columbia, Missouri, 1962. (Unpublished paper).

⁷The use of tests of statistical significance is based on the assumption that the dyads represent a sample of what exists in the social area of which the community is a part. On the other hand, the dyads considered represent all of those existing among the farmers interviewed, subject only to limitations in the methods used and farmers' ability to recall and respond in the manner requested.

TABLE 3 - TOTAL INTERPERSONAL NETWORK POTENTIAL FOR MESSAGE TRANSFER FROM OUTSIDE INFORMATION SOURCES

Outside Information Source	Total Interpersonal Network Potential	
	Ozark	Prairie
AGRICULTURAL AGENCIES		
County Extension Agent	17**	31**
Vocational Agriculture Teacher	3	13
Agricultural Stabilization and Conservation Committee	25*	8
Agricultural Bulletins	7	13**
Production Credit Association	-66*	XX
Soil Conservation Service	XX	0
Direct from University	10	2
MASS MEDIA		
Local Newspapers	4	24*
Farm Magazines	35*	26*
Radio	13	17*
Television	13	15*
OTHER		
Almanac	-8	-3
Farm Meetings	35*	25*
Local Dealers	11	8

*Significant at the .01 confidence level

**Significant at the .05 confidence level

facilitating influence on message transfer was indicated in the network although the only additional positive network potentials significant at the 0.05 confidence level or above were a 25 percent for the ASC Office and a 17 percent for the county extension agent.

In Prairie, a network potential significant at the 0.01 confidence level was found for the county extension agent, all of the mass media, and farm meetings. Percentages ranged from a positive 31 percent potential for the county extension agent to a 15 percent for television. Among the mass media the potential was highest for local newspapers and farm journals (approximately 25 percent). (See Table 3.) This was about the same as for farm meetings.

Indirect Network Potential

Indirect network potential refers to the mechanistic opportunity provided by the interpersonal network for message transfer for specified outside information sources. The measure is based on the interpersonal dyads permitting only indirect exposure to outside information sources through exposed referents or

the situation C dyads. (See Figure 2.) The formula used for computing indirect potential is:

$$\frac{\frac{C}{C + D} - T}{1.00 - T} k$$

The letters C, and D represent the proportion of the respective dyads in the interpersonal network; T, the percent of persons directly exposed to a given outside information source, and k, a constant of 100 for reducing the decimal points.

As in other dyad situations, an information-seeking relationship between an information seeker and a personal information referent does not insure that the latter will in fact transmit information he received from a specific outside source. But such transfer is possible and was assumed for purposes of analysis in this study. This is a basic proposition of the two or multi-step flow of information previously stated. The Situation C in the interpersonal communicative network and the attendant measure of indirect diffusion potential represented an important aspect of the interpersonal communicative network because it was the only dyad arrangement permitting transfer of information to persons who did not obtain the information directly. Indirect network potential, then, was a measure of the interpersonal communicative network permitting information transfer from outside information sources to those who had not established a direct means of obtaining it.

Again the potential for indirect message transfer varied for each outside information source even though the dyads in the network remained the same. Variations occurred because the proportion of persons getting information directly from each outside source (directly exposed) varied with the selectivity with which directly exposed persons were sought as personal information sources by others. Since the indirect diffusion potential of a network varied from a maximum of near 100 on the positive side to a near 100 on the negative side, the ratio cited may be regarded as representing the positive or negative increment of the networks for indirect message transfer. A positive potential indicated a transfer facilitating influence and a negative potential indicated a transfer restricting influence.

Thus, in Ozark, the indirect network potential for radio was highest with 66 percent of maximum. Significant and high indirect transfer potentials also existed for the ASC Office (22 percent) and for farm meetings (27 percent). The greatest network-restricting influence in the indirect transfer dyads of type C was a negative 65 percent for the local PCA Office. Although other negative potentials occurred, the only other one significant at or above the 0.05 level was for the local newspaper. (See Table 4.) The indirect network potential for the county extension agent was sizeable but not statistically significant at the 0.05 confidence level.

In Prairie, indirect network potential ranged from a positive 38 percent for farm magazines to a minus 21 percent for the SCS Office. (See Table 4.) Thus, for the former, an increment of indirect transfer of 38 percent of that possible

TABLE 4 - INDIRECT AND REINFORCEMENT NETWORK POTENTIAL FOR MESSAGE TRANSFER FROM OUTSIDE INFORMATION SOURCES IN OZARK AND PRAIRIE

Outside Information Sources	Indirect Network Potential		Reinforcement Network Potential	
	Ozark	Prairie	Ozark	Prairie
AGRICULTURAL AGENCIES				
County Extension Agent	17	11**	18	40*
Vocational Agriculture Teacher	1	5	14	22*
Agricultural Stabilization and Conservation Committee	22**	9	28*	10
Agricultural Bulletins	0	4	16	25*
Production Credit Association	-65*	XX	-80*	XX
Soil Conservation Service	XX	-21*	XX	21*
Direct From University	10	-13**	13	6
MASS MEDIA				
Local Newspaper	-19**	9	29*	27*
Farm Magazines	-5	38*	43*	25*
Radio	66*	29*	8	16**
Television	11	5	26**	22*
OTHER				
Almanac	-13	-15*	0	9
Farm meetings	27*	21*	43*	28*
Local Dealers	8	-3	16	19**

*Significant at the .01 confidence level

**Significant at the .05 confidence level

to the interpersonal communicating network might be expected (with existing direct exposure) while a substantial restricting effect (21 percent of that possible with existing direct exposure) could be expected for indirect information transfer from the SCS.

Radio also enjoyed a highly favorable network for indirect message transfer with the potential of 29. Other indirect potentials of sufficient size that were statistically significant at or above the 0.05 confidence level were a 21 for farm meetings, an 11 for the county extension agent, a minus 13 for the University of Missouri, and a minus 15 for the almanac.

Reinforcement Network Potential

Reinforcement network potential reflects the ability of an interpersonal communicative network to permit reinforcement of messages received directly by means of referents who likewise obtained information from the same source. The dyad type basic to this measure is the one in which both the information seeker and the person sought obtained information from the same outside source. (Situation A, Figure 2.) Since it represents a choice of likes selecting likes, conditions are favorable for confirmation of opinions already held and information already obtained and not necessarily favorable to the acquisition of information not already obtained by more direct means.

Reinforcement potential, which takes into account both seeker-referent selectivity and direct exposure, was computed by the following formula:

$$\frac{\frac{A}{A+B} - T}{1.00 - T} k$$

Again, terms A and B represent the dyad types in the interpersonal network; T, the total percent of persons directly exposed to a given outside information source; and k, a constant which reduces the range to the familiar $\pm 99.99+$ (percent) range.

The reinforcement potential of the interpersonal communicating network for various outside information sources ranged from a positive 43 percent for farm magazines and farm meetings to a negative 80 percent for the PCA Office in Ozark. This means that the reinforcing potential of the network was 43 percent of maximum for the former and that avoidance was 80 percent of that possible for the selection of PCA information users by their own kind. The reinforcement potential in the network was also strong for the local newspaper and the ASC Office. Other rather sizeable but not statistically significant positive reinforcement potentials were also in evidence. (See Table 4.) Contrary to other measures of network potentials, no selectivity, either positive or negative, was evident for persons obtaining farm information from the almanac.

In Prairie, the highest reinforcement potential occurred in the network for the county extension agent (40 percent). (See Table 4.) Significant positive potential also existed for the vocational agriculture teacher, the ASC Office, the local SCS Office, agricultural bulletins, farm meetings, and for all of the mass

media. Local dealers also had a positive potential of 19 percent, which was significant at the 0.05 confidence level. Perhaps, the most notable difference in Ozark from Prairie was the related absence of opportunity for message confirmation in the network for messages from the county extension agent and the vocational agriculture teacher.

Contribution of Indirect Transfer and Reinforcement Dyads to Network Potential

This section is devoted to an explanation of the extent to which total network potential was due to *indirect transfer* only and to the *reinforcement*, the two component elements of total network potential. The ratio of reinforcement to indirect transfer dyads discussed previously gave a gross picture of the dyad situation in this regard but without reference to the amount of direct exposure or to the selectivity existing within the network.

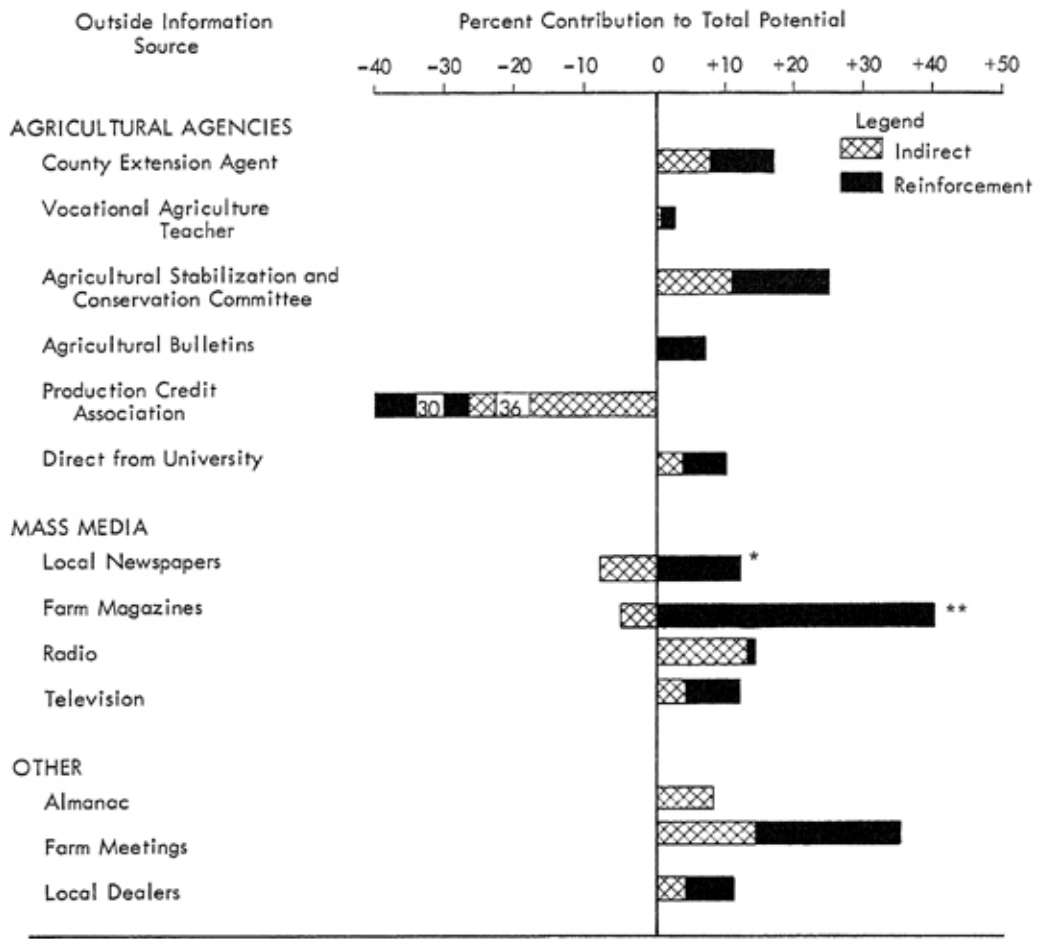
The measures, illustrated in Figures 8 and 9, disclose how much of the total network potential for each outside source was due to indirect network transfer and how much to reinforcement. Thus, outside information sources having a very high reinforcement potential in comparison to indirect transfer potential are farm magazines in Ozark and local newspapers, television, agricultural bulletins, the vocational agriculture teacher, the county extension agent, and local dealers in Prairie. There was a tendency to greater reinforcement than to indirect transfer potential for eight or more of the 13 outside information sources in both of the communities studied.

Indirect transfer potential still may exceed reinforcement potential. This means that the network transfer potential is mainly of the type permitting people not otherwise exposed to an outside information source to get information through the network rather than having what they have already learned reinforced through a personal referent. The ratio of indirect to reinforcement potential was especially high for radio in Ozark and was considerably in evidence for farm magazines in Prairie. (See Figure 9.)

The only outside information source for which both reinforcement and indirect network potential was negative was for the local PCA Office in Ozark. The tendency toward avoidance of persons as an information source was a little greater for dyads permitting only indirect exposure to the outside source than for those permitting reinforcement.

A number of cases occurred where the potential for indirect transfer was negative but where the reinforcement potential was positive. In such cases, total network potential was represented by positive reinforcement potential minus the negative indirect potential. This condition occurred in the interpersonal network for newspapers and farm magazines in Ozark and for the almanac in Prairie. In the last case, the negative indirect potential was greater than the positive reinforcement potential which left a negative potential of 3 percent. (See Figure 9.)

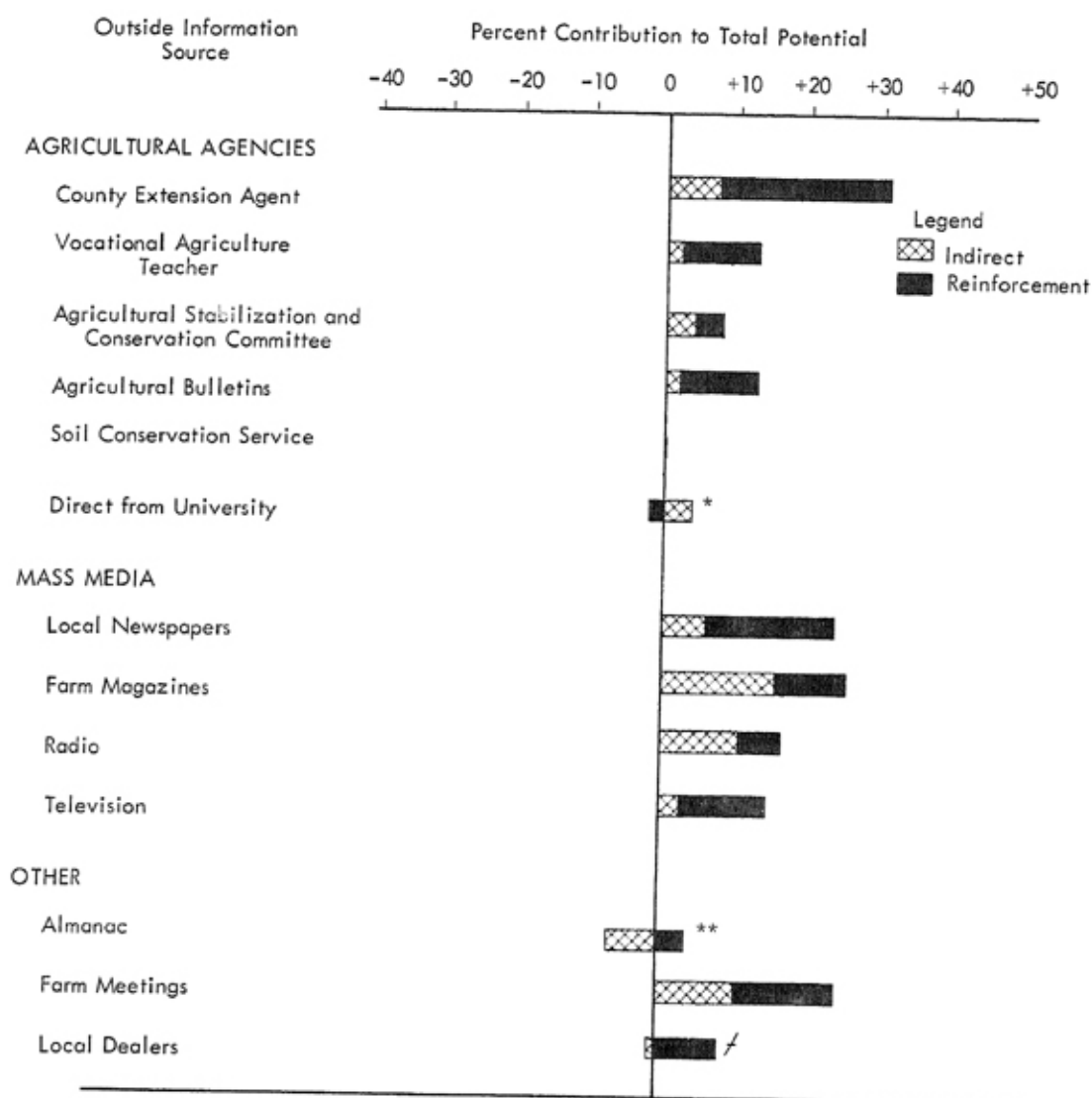
The only case where a negative reinforcement potential was coupled with a positive indirect potential was for the University as an information source in



*Total potential, 2 percent reinforcement when negative indirect potential is subtracted

**Total positive, 35 percent reinforcement

Fig. 8—The relative contribution of indirect and reinforcement network potential to total network potential for designated outside information sources, Ozark.



*Total potential, 2 percent positive indirect when negative reinforcement Potential is subtracted

**Total negative, 3 percent indirect

/Total positive, 8 percent reinforcement

Fig. 9—The relative contribution of indirect and reinforcement network potential for designated outside information sources, Prairie.

Prairie. Although both total direct exposure to this source and network potential were small, the network represented the only case where exposed likes under-selected each other in terms of chance and where unexposed seekers sought exposed soughts in numbers exceeding chance expectation. In other words, conditions in the network for this particular source were such that indirect exposure to the outside information source through a personal referent was relatively greater than the possibility for reinforcement by the same means.

SOURCE POTENTIAL

The potential that a source has for disseminating information to individuals consists of two elements. One relates to the relative proportion of persons who get information directly from the source, the other to the potential that an interpersonal communicative network offers for permitting message transfer from the source. The two are not additive, in the sense that given quantities of direct exposure can be equated with equal quantities of indirect exposure through an exposed referent. But the two taken together roughly approximate the potential that an information source has for message transfer from a mechanistic point of view. It was on this basis that network transfer potential was added to the proportion of persons directly exposed to the source to provide a measure of source potential.

Thus, if 35 percent of the people in an interpersonal network were directly exposed to S_1 source and the interpersonal network was operating at a 30 percent interpersonal exposure level, total potential would be regarded as the sum of direct exposure and network potential, or in this case, 65 percent.

Such a measure provides a 200 percent maximum positive and an approximate 100 percent maximum negative potential. The 200 percent level would occur where all persons are directly exposed to an outside information source and where the network is operating at a 100 percent person to person indirect exposure level. A near negative limit would occur when one person was directly exposed to the outside information source and when everybody avoided him as a personal referent. Negative potential would be computed in this case by subtracting the percentage that one person is of the total number of persons involved in the network from 100 percent negative network potential.

In thinking of the 200 percent maximum, the reader should remember that computation of network potential is restricted to one person-to-person transfer as compared to the direct source exposure. This is arbitrary in the sense that transfer may and surely often does occur in a multiphasic manner; i.e., via several persons in succession by word of mouth.

The foregoing limitations should all be kept in mind when viewing source potential as the sum of direct exposure and network potential as is done here. When so computed, farm magazines took the top source potential position in both Ozark and Prairie. Percentages were 126 and 117, respectively. (See Figures 10 and 11.) The great difference in potential for local newspapers in Ozark and

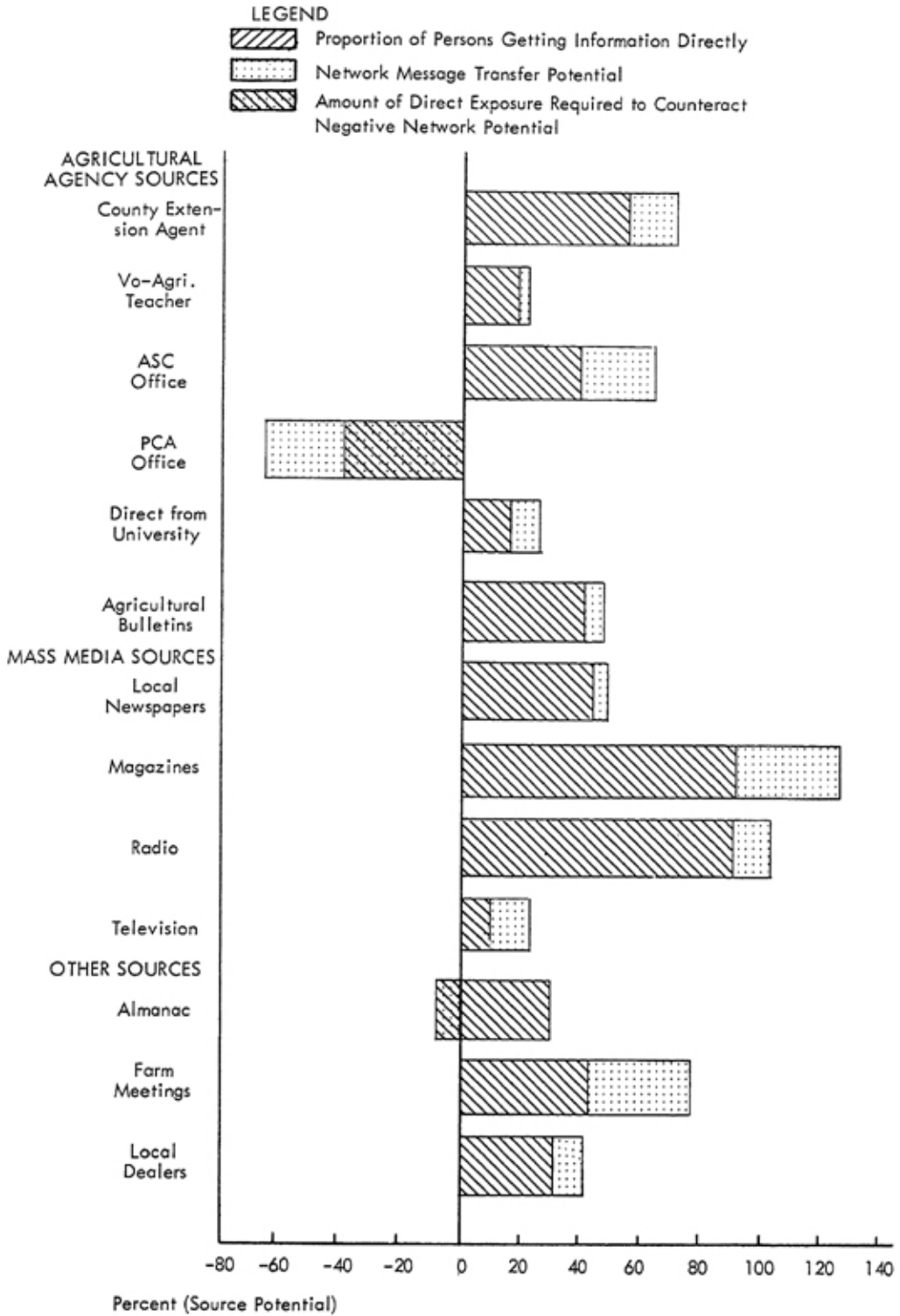


Fig. 10—Source potential of outside information sources in Ozark.

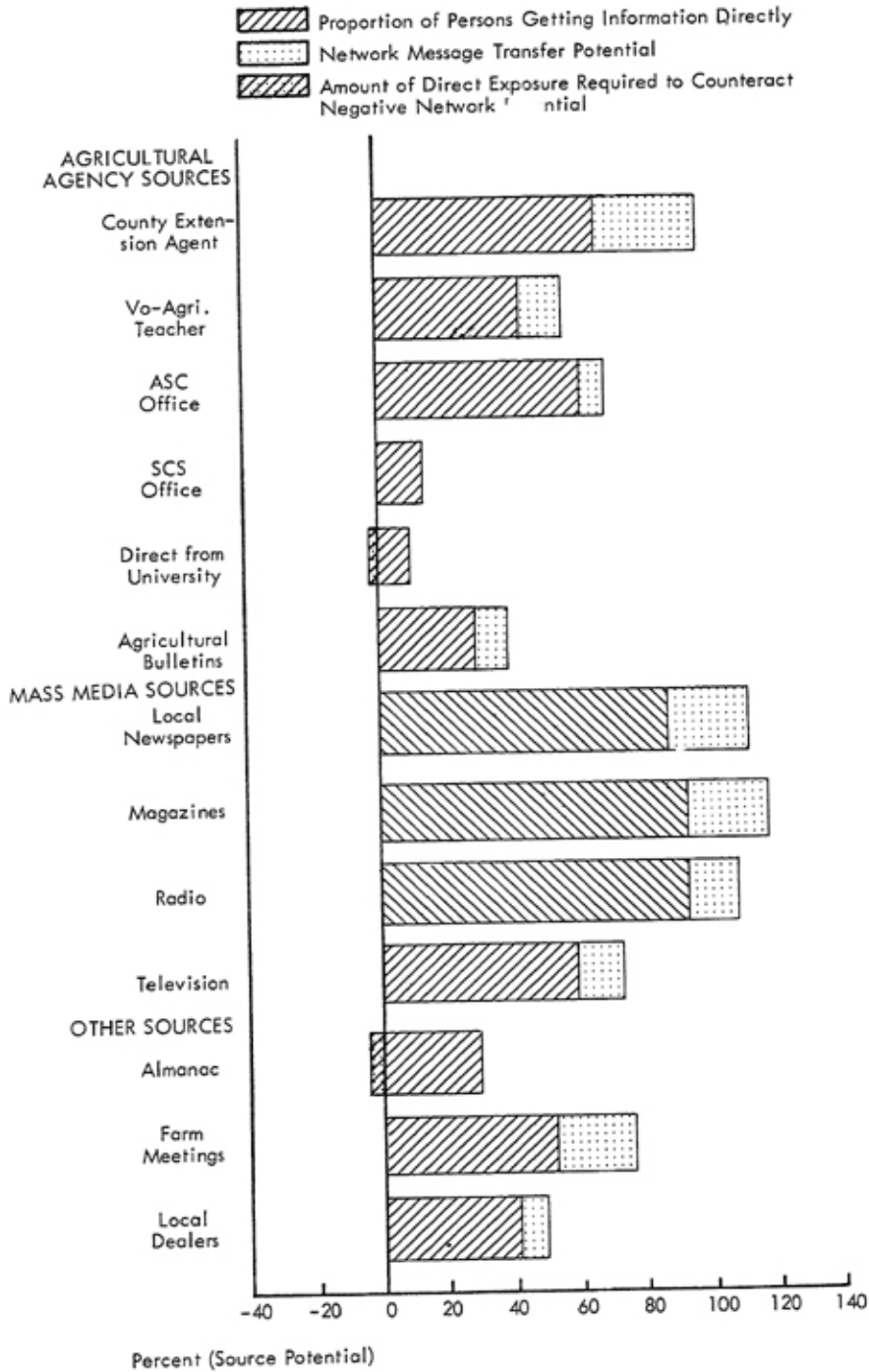


Fig. 11—Source potential for outside information sources in Prairie

Prairie (48 and 110 percent, respectively), was probably due in large measure to the manner in which the editors related themselves to the agricultural agencies and the differential manner in which they reported farm news and information in their newspapers.

The potential for radio was above the 100 percent level in both communities. The higher potential for television in Prairie (Figures 10 and 11) was mainly due to a much higher direct exposure of persons in Prairie than in Ozark.

Of the agricultural agencies, source potential was highest for the county extension agent in both communities, although the aggregate was distinctly higher in Prairie than in Ozark. The percentages were 97 and 72, respectively. The ASC Office rated second among the agricultural agencies in both communities while the vocational agriculture teacher was in a much better information dissemination position in Prairie than in Ozark. The percentage of persons making direct use of the vocational agriculture teacher as an information source was about twice as high in Prairie as in Ozark. Also, the network potential for person-to-person transfer of information was much greater in Prairie than in Ozark. One reason for these differences was probably the manner in which the vocational agriculture teacher assumed the role of dealer in Prairie. This was in addition to his usual role of vocational agriculture teacher. Here the vocational agriculture teacher sold commercial fertilizers to farmers and students to whom counseling services were extended.

The information-diffusion potential of local dealers, which was over 40 percent in both communities, was mainly due to direct exposure while for farm meetings direct exposure and network potential combined for a 77 percent source potential in both communities. The interpersonal network contributed relatively more in Ozark than in Prairie while the reverse was true for direct exposure.

The only situation where the total source potential was negative was for the PCA Office in Ozark. Here, while 40 percent of the persons got information directly from the local office, the person-to-person transfer potential stood at a negative 66 percent, leaving a source potential of a minus 26 percent. The reader may question whether a negative potential is logically possible with 40 percent direct exposure. Indeed, the logic is more difficult to defend than where the network potential is positive. Only one reason is offered: the 66 percent negative potential could be counteracted on a 1 to 1 percentage basis by direct exposure. In the other three cases involving information sources outside of the communicative network with negative potentials, direct exposure was substantially greater than the negative potential. (See Figures 10 and 11.)

IMPLICATIONS FOR RESEARCH AND ACTION

The conceptual-analytical scheme described in this bulletin, provides a means of extending the analysis of the two or multi-step flow of information and of its consequences. It provides a more decisive way of measuring the potential of an

aggregate of interpersonal dyad relationships for permitting indirect transfer of information and for permitting reinforcement of information already received. In doing so it provides a means of determining the relative advantage that various outside information sources have for indirect message transfer and reinforcement. A third measure permits assessment of total potential of the network for message transfer on a person-to-person basis from given outside information sources. In general, the analytical scheme conceptualizes and operationalizes basic conditions in an interpersonal network which are pertinent to message flow through it. The interpersonal dyad rather than the person is used as the unit of analysis.

Limitations are imposed by assumptions of unidirectional flow of information in dyads, ability of farmers to recall pertinent personal relationships, and by the relative permanency with which these relationships continue to exist. Although essentially mechanistic in nature, the measures may be applied to qualitative aspects of interpersonal information flow, as, for example, within different kinds of group structures. Personal referent selectivity within and outside of various group structures may be explained and compared for exposure to outside sources of information as well as to the relative selectivity of persons with special characteristics which are assumed to be pertinent to the dissemination of information; e.g., innovativeness, information source orientation, and technological competence.

Although the measures presented can provide change agents with a knowledge of the relative advantage that information sources have for indirect message transfer and for reinforcement, a practical limitation stems from the detailed data needed for making the determinations and the difficulty of obtaining them. However, it is possible that sufficient accuracy of determination may be obtained either on a sampling basis or on the basis of findings from the relative advantages of information sources growing out of repeated researches. When reasons for selectivity are examined, further light may be thrown on the importance of personal characteristics and known use of the direct information sources as bases for selecting persons as sources of information.

REFERENCES CITED

1. Lionberger, Herbert F. "The Relation of Informal Social Groups to the Diffusion of Farm Information in a Northeast Missouri Farm Community," *Rural Sociology*, 19 (September, 1954).
2. Lionberger, Herbert F., and Hassinger, Edward "Neighborhoods as a Factor in the Diffusion of Farm Information in a Northeast Missouri Farming Community," *Rural Sociology*, 19 (December, 1954).
3. Katz, Elihu "The Two-Step Flow of Communication: An Up-to-Date Report on an Hypothesis," *The Public Opinion Quarterly*, 21 (Spring, 1957).
4. It was assumed in selecting the communities that they could be positioned in Howard S. Becker's sacred-secular construct. For a general description of the construct see:
Becker, Howard S. "Process of Secularization: An Ideal-Typical Analysis with Special Reference to Personality Change as Affected by Population Movement," *The Sociological Review*, British (April-July and October, 1932).
5. Also see:
Gregory, C. L. *Rural Social Areas in Missouri: An Analysis of the Social Structures*. Columbia, Missouri: University of Missouri, Agricultural Experiment Station Research Bulletin 665 (April, 1958).
6. Katz, Elihu, and Lazarsfeld, Paul F. *Personal Influence*. Glencoe: The Free Press, 1955, pp. 82-83.
7. Lionberger, Herbert F., and Coughenour, C. Milton. *Social Structure and Diffusion of Farm Information*. Columbia, Missouri: University of Missouri, Agricultural Experiment Station Research Bulletin 631 (April, 1957).

APPENDIX A

CONCEPTUAL SCHEME FOR MEASURING THE POTENTIAL OF INTERPERSONAL COMMUNICATIVE NETWORKS FOR MESSAGE TRANSFER FROM OUTSIDE SOURCES

Terms	General Definition	Operational Definition	Limits of Variation	Meaning*
STRUCTURAL FEATURES				
a. Information Seeker	A person who "goes outside" of his own personal experience to secure information about a new idea or practice.	A person who names another as a source of information for a specific purpose in response to questioning.		
b. Person Sought	A person named by another as a source of information.	Persons named by individuals as sources of information for specific purposes in response to direct questioning.		
c. Outside Source	Any communicative medium or agent exclusive of friends and neighbors named by respondents as a source of information.	Defined by answers to the question "where or from whom did you secure information for a specified purpose?" (Sources exclusive of the interpersonal network are regarded as outside sources.)		Provides the means of introducing new ideas into a system of interacting individuals.
d. Interpersonal Communicative Relationships (ICRs or dyads)	The elemental structural unit through which interpersonal message transfer can take place.	Dyad defined by one person naming another as a source of information for a specified purpose.		

*If not evident from general and operational definitions.

Terms	General Definition	Operational Definition	Limits of Variation	Meaning
e. Communicative Network	A system of communicating and thus interacting individuals.	The sum total of seeker-sought dyads in the universe of communicating persons		Is the mechanistic structure through which message transfer takes place.
f. Directly Exposed	A condition in which individuals are in direct communicative relationship with a specified information source outside of the interpersonal communicative network.	Individuals who state that they obtain information directly from an outside source (T).	0 - 100%	An indication of the proportion of persons in a specified universe who obtain information from a source outside the interpersonal communicative network.
g. Non-Exposed	A condition in which individuals are not in direct communicative relationship with a specified outside information source.	Individuals who state that they do not obtain information directly from an outside source.	0 - 100%	The proportion of persons in a network who are not exposed to an outside source. Directly exposed--non-exposed is a dicotomy including all individuals in the universe when any one specific source is being considered.

Terms	General Definition	Operational Definition	Limits of Variation	Meaning
ICR SITUATIONS				
h. Reinforcement	Condition in which a decision is confirmed or where information already possessed is reinforced by the same or similar information from another source.	A dyad situation in which a person seeking information and the one sought are both exposed to the same outside source. (Situation A)		
i. Indirect Transfer	Condition in which a person gets information from a source to which he is not directly exposed.	A dyad situation in which the seeker is unexposed and the person sought is exposed to an outside source. (Situation C)		
j. Non-Communicative	Structural conditions which do not permit message transfer on a person to person basis.	Dyad situation in which the person sought as an information source is not exposed to an outside source. These are represented by situations B and D.		

Terms	General Definition	Operational Definition	Limits of Variation	Meaning
SELECTIVITY CONCEPTS				
k. Source Selectivity	The tendency for individuals to exercise preferences in choosing information sources.	Percent of information seekers who name exposed persons minus percent of persons (T) obtaining information directly from the outside source.		Is a measure of the facilitating inhibiting character an ICR network for message transfer through the system from specific outside sources; also provides the measure of "actual" selectivity for use in measures of network communicative potential.
(l) Positive	A condition in which individuals tend to choose those who are exposed to an outside source as personal sources of information.	Percent that selection of exposed persons exceeds that expected by random choice.	0 + 100%	Represents a condition mechanistically favorable to message transfer through the ICR network from an outside source.
(m) Random	Condition in which no exercise of preference is apparent in choosing persons exposed to a specific outside source.	Preferences exercised in choosing persons exposed to an outside source does not deviate from chance expectation.	0, which means no selectivity	Selection of persons is at random.
(n) Negative	A condition in which individuals tend to choose persons as information sources who are not exposed to an outside source.	Percent that selection of unexposed referents exceeds that expected by random choice.	0 - 1.00%	Represents a condition mechanistically unfavorable to message transfer through the ICR network from an outside source.

Terms	General Definition	Operational Definition	Limits of Variation	Meaning
o. Selectivity Opportunity	The amount of selectivity possible is limited by the amount of random selectivity existing in the ICR network. Thus the selectivity opportunity is the total amount of selectivity possible.	<u>Positive</u> 1.00 - T, where T equals the proportion of all persons who say they obtain information from a specified source.	0 - .9999	Provides a measure of opportunity to select exposed persons which serve as a basis of determining how much of the opportunity to select is actually used.
		<u>Negative</u> T - 0 or T	0 - .9999	
MEASURES OF COMMUNICATIVE POTENTIAL				
p. Reinforcement Network Potential	Opportunity provided within ICR network for information seekers who are already exposed to an outside information source to confirm or fortify previously received information by talking to persons who are also exposed to the outside source.	<u>Gross measure</u> $\frac{A}{A+B}$ or the percent of all exposed seekers (A+B) naming persons who are also exposed to a specified outside source (A).	0 - 100 Percent	Minus 100 indicates that no one is in a position to verify the same information through the ICR network that they obtain directly from an outside source; plus 100 means that all those directly exposed also have an opportunity to get the information indirectly through the ICR network!
		<u>Selectivity adjusted measure</u> $\frac{\frac{A}{A+B} - T}{1.00 - T}$ k	Minus 100 to plus 100	

Terms	General Definition	Operational Definition	Limits of Variation	Meaning
q. Indirect Network Potential		Gross measure $\frac{C}{C+D}$ or percent of all unexposed seekers (C+D) naming persons who are exposed to a specified outside source (C).	0 - 100 Percent	
	Opportunity provided within an ICR network for transfer of information to unexposed seekers from a specified outside source through persons sought as sources of information.	<u>Selectivity adjusted measure</u> $\frac{C}{C+D} - T$ k 1.00 - T	Minus 100 to plus 100	Minus 100 indicates an ICR condition permitting no indirect transfer of information from an outside source; plus 100 indicates that all persons not directly exposed have an opportunity to get the information from those who are.
r. Total Network Potential		<u>Gross measure</u> $\frac{A+C}{I}$ or percent of all information seekers (I) who name persons directly exposed to a specified outside source (A + C).	0 - 100 Percent	
	Total opportunity provided within an ICR network for direct and indirect exposure to a specified outside source of information.	<u>Selectivity adjusted measure</u> $\frac{A+C}{I} - T$ k 1.00 - T	Minus 100 to plus 100	Minus 100 denotes that no dyads permit exposure to an outside source via exposed persons; plus 100 indicates this is possible in all dyads.