WRC RESEARCH REPORT NO. 82

FIDELITY OF INFORMATION TRANSMISSION IN LOCAL CAMPAIGNS ON WATER ISSUES

Frederick C. Fliegel and Joseph E. Kivlin

FINAL REPORT

Project No. B-052-ILL

The work upon which this publication is based was supported by funds provided by the U.S. Department of the Interior as authorized under the Water Resources Research Act of 1964, P.L. 88-379
Agreement No. 14-31-0001-3513

UNIVERSITY OF ILLINOIS
WATER RESOURCES CENTER
2535 Hydrosystems Laboratory
Urbana, Illinois 61801

March 1974

ABSTRACT

FIDELITY OF INFORMATION TRANSMISSION
IN LOCAL CAMPAIGNS ON WATER ISSUES

Most issues involving water supply are public issues, and achieving consensus for solution of problems in this area is problematic, therefore a study was designed to assess whether information about water issues is distorted in successive transmissions, thereby inhibiting achievement of consensus. The issue in the study community hinged on expansion of its sewage treatment facility, or losing local industry in order to abate the flow of inadequately treated effluent into a local river. Analysis showed that degree of exposure to information about water pollution, and especially to official information sources, contributed to consensus on the seriousness of the problem, but not to consensus on problem solution. Therefore it seemed unlikely that sheer information loss or other modifications of message content in successive transmissions of information could account for a lack of consensus on problem solution. However, analyzing respondents' basic attitudes as determinants of positions on pollution issues, showed more promising results. Tentative findings indicate that people who view themselves as dependent, and lacking in ability to predict events, are most prone to favor corporate action. It is suggested that information campaigns on public issues should take into account the link between peoples' basic attitudes and issue-specific attitudes.

Fliegel, Frederick C., and Joseph E. Kivlin

FIDELITY OF INFORMATION TRANSMISSION
IN LOCAL CAMPAIGNS ON WATER ISSUES

Final Report of the Office of Water Resources Research,
Department of the Interior, Washington, D. C., March, 1974, pp. 1-102.

KEYWORDS--Plan Implementation, Information Transmission, Message Distortion, Vote.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

I. Introduction and Project Objectives

Water supply and the disposition of wastes resulting from water use are not only of universal concern to people, but any issues in this area are almost by definition issues which involve substantial numbers of people. It is obvious that in contemporary society few individuals have immediate control over private water supplies or waste disposal systems. Water issues are commonly public issues. It follows that decision-making involving such matters hinges on the availability of accurate and complete information about the issue for all or a majority of the individuals who participate in the decision.

The availability of accurate information is, of course, not in itself a sufficient condition for optimum resolution of an issue. It is, however, necessary for such problem resolution, except in situations where sheer power is invoked to impose a solution. The central concern of this project was to examine the process by which information about water issues is disseminated to and within a local community, and to isolate factors that might serve to distort the information as it passes from a sender to a receiver, from that receiver to still another person, and so on, throughout the community. We were concerned, in other words, with both formal and informal communication processes, and specifically with the effect, if any, of these processes on message content.

In greater detail, the objectives of this research were to identify a local situation in which a campaign was being directed to the public about a water-related issue, and, in that context, to determine:

a. To what extent the relevant audience had been even minimally exposed to information on the issue.

b. Among those members of the audience at least minimally exposed to campaign information, which information sources were regarded as most influential, and the intensity of any such exposure.

c. After classifying audience members by type and intensity of exposure, what meanings were attached to selected aspects of the relevant issues by audience members.

d. In order to assess, finally, the extent to which indirect versus direct exposure to relevant information resulted in distortion of message content.

II. Background of the Research Problem

There has been a great deal of research done on the dissemination of information in the past generation or two. Most of that research is of no direct interest to us here, except insofar as it affects the conceptual paradigm within which contemporary work is being done. We will therefore briefly touch on some major themes in research on communication processes, especially mass communication processes.

Mass Media Research

The mass media have obviously had a major impact on information dissemination. Some decades ago, when what are now called the mass media were still to some extent earning the "mass" label, there was extant a widely held assumption that the difficulties encountered in the past in informing the public about issues had been substantially resolved (for an overview see Katz and Lazarsfeld, 1955). It was

assumed that the emerging mass media could provide a direct and effective link with a mass audience. Earlier, concern had focussed on the difficulties involved in reaching an audience. With widespread use of radio, for example, this was no longer the concern. A single broadcast effort could and did reach large numbers of people. A technological innovation had, in other words, provided a solution to a host of practical, and essentially social problems. In that era, research focussed on ways and means to attract large media audiences, as large as possible, and on holding the attention of those audiences.

Before long, however, it became apparent that attracting an audience was by no means tantamount to persuading that audience to a particular point of view, to buy a particular product, or cast the desired ballot, or whatever (Katz and Lazarsfeld, 1955:31-42). It was realized that reaching an audience represented only the tip of the problem iceberg. Studies showed that media audiences attended imperfectly, that many audience members were not persuaded by what they heard or saw, that they might ignore or even react quite negatively to a message, and so on. Innovations in media technology, in other words, provided a solution to communication problems at a basic level, reaching an audience, and permitted attention to be focussed on a host of more subtle problems involving actual impact on that audience. This led to many studies on audience characteristics, essentially differentiating the "mass" into more specialized audiences. And from these efforts, in turn, has come the now familiar phenomenon of media efforts directed to certain age groups, specialized interest groups, and so on. Not only did target audiences come to be more meticulously defined but message content,

also, was shaped and reshaped to maximize impact on a particular audience or segment of an audience.

As previously indicated, however, most of the research we have touched on here has no direct bearing on the present study. It sets the stage, so to speak, for a wide variety of more specialized research foci, some of which, including ours, are not exclusively concerned with the mass media. One branch or extension of the media research is of direct interest to the present effort, however, and this will be briefly described below.

Multi-step Communication

Closely related to the general idea that specialized audiences could be attracted and more effectively swayed by media content tailored to their characteristics, is the idea that this audience could, in turn, influence other people (Katz and Lazarsfeld, 1955, and for issues more in the "public interest" realm see Rogers, with Shoemaker, 1972). On the one hand we are referring here to the now familiar phenomenon of, for example, persuading parents by means of influencing an audience composed of children. More broadly, however, we are referring to communication efforts intended, once again, to influence "the mass," in the maximal sense, not only directly now but also indirectly.

Information campaigns on public issues are concerned, almost by definition, with quite diverse audiences. Reaching one specialized audience via direct contact with another specialized audience may well be desirable, in that context, but the total effort could involve many specialized audiences. For quite practical reasons, then, attention has shifted to broader questions of communication strategy. If specialized

audiences are to be singled out, then which such audience provides maximum secondary effects? If secondary and tertiary audiences are reached via a primary audience, is some reinforcement needed in order to get the message across or will the indirect message suffice? To what extent is the entire relevant population of a given area actually reached by such indirect approaches? Many such questions were and are being asked, depending on the specific purpose of given campaigns.

For our purposes, the main point of interest in the research referred to above is what is often referred to as the two-step or multi-step process (see, for example, van den Ban, 1969), especially with reference to some "objective" first source, the initial receiver then conveying the message to one or more others, they in turn quite possibly reconveying the information. The multi-step phenomenon tends to rely on interpersonal communication, especially in its later stages. If decisions on public issues can benefit from public discussion, which presumably is the case, then the detailed workings of a multi-step communication process are quite central to our research problem. Strangely, however, the research in this specialized area has taken almost no account of the possibility of information loss and/or distortion as a message is conveyed through such an interpersonal network. Researchers have attempted to identify the "nodes" (key persons, leaders, influentials) in such networks and the degree to which a potential audience is penetrated by existing networks. A good bit of attention has been given to identifying issue- or problem-specific nodal persons (van den Ban, 1969), all with the intent of maximizing efficiency in the information dissemination process. To repeat, however,

the distinct possibility that information is altered in the process has largely been ignored. In fact, most research of this kind implicitly takes the position that information is neither altered nor lost in the multi-step process.

Rumor Studies

Another avenue of research, largely independent of the communications research discussed above, has concentrated on rumor processes. Since rumors have reference to informal and interpersonal communication processes it seemed to us that research on rumors might shed some light on our research interest. Rumors have been of interest primarily to social psychologists until recently, and their study has thus been subject to the relatively precise controls of the laboratory experiment (Campbell, 1958). There is available now a body of reasonably conclusive research data on rumor processes, though popular ideas about rumors have not necessarily been affected by the data.

It is probably true, for example, that rumors do not "grow" as is popularly thought (Campbell, 1958:337). On the contrary, a given body of information, whether fact or fiction, is subject to shrinkage rather than growth, i.e. information is lost in successive transmissions. One function of information loss is that the relative importance of a given bit of information may well be substantially altered, i.e. the context is altered and a bit of retained information may then take on a different meaning (Campbell, 1958:342). Such changes in meaning may well give rise to perceptions of message growth. The important point for present purposes, however, is that serial transmission of information on an interpersonal basis demonstrably involves a substantial loss. Most of

the loss apparently takes place early in a series of transmissions (Higham, 1951). This suggests that multi-step communication processes intended to inform a public on some matter of public concern, say a water issue, are highly vulnerable.

On the other hand, there is also some evidence to suggest that information loss is maximal in situations where the information is of little inherent interest to the people concerned (Hyman and Sheatsley, 1947). This of course seems plausible and is in any case comforting since we are here concerned primarily with information about issues of public concern.

Finally, some recent research on rumors under field conditions has drawn attention to the existence of multiple exposures to "the same" information in relatively closed systems, and also to the existence of feed-back loops of various kinds (Buckner, 1965). It is inherently difficult to map in detail and analyze the existence and function of multiple exposure and feed-back under field conditions. There is some evidence to show, however, that in a relatively closed system, and assuming non-trivial information is being conveyed, the possibility of interacting with an information source (feedback), and the possibility of acquiring bits of information from a variety of different sources, has the net effect of conveying information throughout a system without significant information loss or significant distortion. This point will be raised again and in more detail in a later section.

In summary, the research on rumor processes calls attention to the possibility of information loss in successive and serial transmissions. It also helps to dispel fears that misinformation somehow mysteriously emerges in the process of successive transmissions, though the relative

importance of a given bit of information may be altered if some bits are lost from the total context. Sheer misinformation probably enters a communication network in much the same way that supposedly legitimate information enters. And finally, the possible utility of multiple exposure and feedback in closed systems is suggested, in the sense that they may minimize information loss or distortion. Exploring these ideas in the realm of public decision-making, on water or other issues, has not yet been attempted, however.

Community Organization and Decision-making

Another line of research, that which relates community structure to public decision-making, is only inferentially related to our research objectives but worthy of brief mention nevertheless. At the risk of oversimplifying, it can be said that several recent studies have provided some grounds for believing that some aspects of community structure which have conventionally been assumed to be expeditious in resolving community issues may actually be deterrents to problem resolution (see, for example, Crain, Katz, and Rosenthal, 1969). These studies are of interest here in that they deal explicitly with decisions made by "the public" and because it seems likely to us that communication problems are the basic reason for the somewhat surprising results.

In brief, these studies suggest that a multiplicity of community organizations, especially voluntary organizations, while they may be functional in explicating an issue to the public, may also serve to polarize that public with stalemate rather than problem solution as the end result (Crain, Katz, and Rosenthal, 1969:103). In other words, a community which is "poor" in organized interest groups may be able to

solve public problems more efficiently than its "richer" neighbor. Similarly, and possibly for the same basic reasons, a community which has a relatively high proportion of highly educated citizens, or a high proportion of professionals relative to manual workers, will tend to reject proposed solutions to public problems more often than another community which is not so "advantaged."

There has in fact been no research on the mechanisms which may underlie the results cited above. Nor is it known whether such results are generalizable to a wide variety of public issues or only certain kinds of issues. We are inferring that maximal articulation of an issue in the public arena will in some instances also maximize the potential for conflict. This in turn could lead to nonaction rather than action, and of course our practical objective is to increase the likelihood of resolving issues.

Information Distortion

To this point we have described an assortment of studies which deal with information transmission and have used the term "distortion" rather loosely to designate modifications in message content which may occur in the communication process. In this brief section we wish to specify the concept of distortion a bit more clearly, and describe a particular study which we carried out shortly before the present study and which served as something of a model for this study.

We are using "distortion" as a general term to refer to such changes as may occur in message content as a function of the "normal" communication process. Somewhat more specifically, we are not concerned with deliberate changes in message content, with change or distortion in the

sense of perversion. We are concerned with imperfect reproduction of a message in successive transmissions in a social network, thus our use of the term has a metaphorical relationship to the concept of distortion as it might be used by an audio-engineer. To what extent the metaphor is useful or possibly misleading remains to be seen. It should be obvious that the components and processes involved in a social network cannot be monitored, controlled or altered in ways that could be applied to an electronic system.

The immediate forerunner of the present study attempted to specify some aspects of information distortion in a field setting (Fliegel, Kivlin, and Sekhon, 1971). Specifically, the study was designed to assess information distortion in a sequential transmission process from a presumably objective "first" source, to persons who interacted directly with that source, and, in turn, to persons who did not interact with the first source but presumably did interact with the persons having such direct contact.

In several respects the study benefitted from an advantageous setting. It was concerned with the transmission of information about agricultural innovations in rural India, in which setting, for all practical purposes, a single agency has monopoly control over the innovations themselves. Government employees, in this case Villege Level Workers, are the major and almost only source of "development" inputs into the agricultural economy at the level of the masses. The mass media as yet play only a minor role in information dissemination; radio is a government monopoly; and our farmer respondents, the audience in this case, were selected to be illiterate, thus they were not directly affected by the print media.

Respondents of two kinds were selected: those who had close contact with Village Level Workers, and from the same residential settings, those who had no such contact. The two types of farmers were matched on a series of other variables: all were illiterate, as already mentioned, all were of the same age group, all had very similar types of farms, similar sizes of farms, and most important, they had all presumably received some relevant information about the innovations because they had all adopted those innovations. Our main concern then was with differences in information available at three points in a serial transmission "chain."

Given the enormous difficulty of assessing amounts of information and accuracy of such information about a sufficient number of objects to yield stable results, and over a sufficient number of subjects to yield stable results, we chose instead to analyze perceptions of the objects. We assumed the perceptions were a function of information, and the information, in turn, a function of position in the serial transmission chain. In short, we assessed differences in perceptions of 50 different objects (agricultural innovations) at three points in an ordered sequence. Our basic hypothesis was that perceptions would be more similar between two adjacent points in the sequence than between the extremes. This hypothesis is based, essentially, on the results of controlled experiments on rumors, which showed that information is lost in sequential transmissions. If our "objective" information source, the sample of Village Level Workers (N = 18), perceived the innovations to permit a savings of time, for example, at some level X, then farmer respondents in close contact with them (N = 111) were expected to

perceive time savings at level X plus or minus some quantity, and our "no contact" respondents (N = 108) were expected to perceive time savings at level X plus or minus some larger quantity.

We in fact tested our basic hypothesis in several different ways, involving both mean differences and differences in variances, for 11 different kinds of perceptions. And our basic hypothesis received very little support. By far the majority of comparisons showed more similarity between respondents at the extremes of the chain than between adjacent sets of respondents. The data lent little or no support to the hypothesis of progressive information loss in serial transmission. On the contrary, the data could best be interpreted as demonstrating a "network effect." Since we were dealing with a relatively closed communication system, and with information of some importance to our respondents, we could assume repeated exposure to information about the objects in question and also feedback. If we assume that our "high contact" respondents were dependent on the Village Level Worker for information and thus least likely to be exposed to a multiplicity of different messages about the object, we would expect some loss of information and therefore discrepancy in perceptions between these two groups. The "no contact" respondents, on the other hand, could be expected to have interacted with a variety of information sources. Repeated exposure to information from different sources, plus their own experience with the innovations, seems to account for a high degree of similarity between their perceptions of agricultural innovations and the perceptions of the official sources (the Village Level Workers).

Review of Problem Statement

Now, what does all this have to do with information programs concerning water issues? Suppose that a locality is faced with a public issue such as expansion of the local sewage treatment plant. The local people may well be called on to vote in a referendum on a bond issue to finance the expansion. It is clear that in such a situation the public will have to be informed of the problem and of the merits of the proposed solution. Since referenda often fail to pass there is some reason to think that information campaigns are less than perfectly effective.

Our brief review of the research literature was intended to sketch in the background for two alternative research hypotheses. On the one hand, it is possible that in sequential transmissions of information about a bond referendum there is enough loss or other distortion of the original message to result in negative votes because of insufficient or otherwise faulty information. If such were the case a possible remedial strategy might be to depend less on informal communication processes and intercede at more points in the total system with the original message (though this could be very costly). If, on the other hand, some sort of network effect could be expected to level out information discrepancies, then an appropriate strategy might be to allow enough time before a vote is taken for the network effect to work. Or, it might be critical to stress the importance of the message to the voter in order to encourage interaction about the issue (i.e. it might be more critical to stress the importance of the issue than to stress objective information about the issue) in order to obtain the benefit of a network effect.

At this point, about the only certainty in research on information campaigns on public issues is that very little is known with any substantial degree of assurance. Publics are faced with issues, and solutions are often proposed in good faith, only to be rejected. The prevailing rationale is that the public "simply didn't understand." Vast amounts of time, money, and energy are expended on information campaigns, often with no result. It would obviously be desirable and it may even be possible to obtain more systematic knowledge of the communication processes involved in such situations, and on that basis to improve efficiency. At the same time, we are fully aware that a contemporary American community is by no means a closed communication system. Furthermore, the American public is bombarded with information from a variety of media. It is clear that tracing out information flows and assessing communication processes in such a situation will have to depend on many approximations. The study to be described below is only one small and very tentative effort to gain a more systematic assessment of the problems involved in informing a public about public issues.

II. Research Procedure

Selection of a Research Site

Since we wanted to assess communication patterns in as much detail as possible, and since we had limited resources to work with, we decided that it was essential to select a site which had a major pollution problem (relative to the size of the community), and a problem which was acute enough so that local people could be expected to be concerned about problem solution. Toward that end we examined the lists of communities designated as having water pollution problems by the Illinois Pollution Control Board. A number of communities were selected from those lists, basically those smaller Illinois communities identified as "needing" large per capita investments to meet current pollution control standards. Census and other secondary data were then examined in order to assess at least the gross demographic characteristics of these communities. Several were dropped from our tentative selection list because, for example, they were so enmeshed in a larger metropolitan complex that the pollution problem and proposed solutions did not seem likely to coincide with local political boundaries. We wanted, to the extent possible, to identify a problem situation which could reasonably be understood and addressed within a relatively small community.

Several possible sites were visited to get an impression of the nature of pollution problems from local officials. Consulting engineers were also contacted to get a more technical perspective on particular problems and likely solutions to those problems. Though we had originally intended to select several comparable communities, and essentially to replicate at least parts of our study in each of these,

we ultimately had to abandon that plan. We decided that selecting similar communities, having similar pollution problems, would commit us to rather more travel than we had allowed for in our planning. We thus finally selected a single small town, Momence, Illinois, for our study.

Momence had a population (in 1970) of 2,626. It still has the appearance of a small rural-oriented trading center but is in many ways more nearly an industrial suburb of the nearby city of Kankakee. Momence has six light industries which provide most of the local employment. Common services are provided locally in a variety of small shops and other enterprises. Specialized services, such as television programming and specialized professional services are provided by the city of Kankakee. In many respects, Kankakee is also only a part of the still larger Chicago metropolitan economic sphere but, for our purposes, it is sufficiently distant from Chicago to be relatively independent of regional influences on local decision-making. And the small town of Momence is relatively independent of Kankakee, in that it has full control over and responsibility for the usual range of government services, including water and sewer service.

In the fall of 1970, when our site selection was made, Momence could be described as having an acute water pollution problem and somewhat less acute air pollution problems. Popular descriptions of these problems tended to focus on a local pork-packing plant, the largest local employer (with some 300 employees). Local officials described the situation, in general terms, as involving expansion of production in the packing plant to the point at which the local sewage treatment plant could no longer properly treat sewage. As a result, improperly treated

effluent was being discharged into the Kankakee River, which runs through the middle of town. Pinpointing "the" cause of a pollution problem is no easy matter. It is a fact, however, that an agreement had been reached some years before to locate the packing plant in Momence and to process its sewage up to a certain level of daily production. That level had since been exceeded and the town was faced with an apparent choice of expanding its sewage treatment plant or reducing the load on that plant (and thus probably losing jobs).

In addition to water pollution, there was some local concern about air pollution. Here again the pork packing plant was singled out. Depending on wind direction, some parts of the town were subjected to offensive odors at times. These odors apparently stemmed from the packing plant. Though air pollution was a topic of lively discussion, the water pollution problem was unquestionably viewed as more acute. Momence in fact had no choice but to reduce the flow of inadequately treated sewage into the Kankakee River in order to meet the standards set by the State of Illinois.

If it was clear that something had to be done about water pollution, it was at that time much less clear what could or should be done. Should the sewage treatment plant be expanded or not? If expanded, what should its capacity be and at what cost? And, most important of all, whatever was to be done, who would bear the cost? In short, it seemed like an ideal site for a study of information flows about public issues. With the polluted Kankakee River running through the center of the town it seemed likely that there should be maximum awareness of water pollution problems. And with major expenditures in

the offing it seemed likely that public concern about solutions to the pollution problem would be high.

Sample Selection

Data were ultimately obtained from three sets of respondents. First, a systematic sampling of community residents was made to obtain data about communication processes in the public sector. Second, a much smaller "sample," essentially a census, of community leaders was selected to obtain information about more or less "official" perceptions of the pollution problem and its solution. And third, a sample of high school students was contacted in order to obtain more of an "in-depth" perspective on social structural factors as they affect information flows. The latter sampling, that of high school students, was in part an offshoot of our earlier decision to conduct the study in one community only. By restricting our geographic scope we could conduct a somewhat more intensive study in the single setting.

Community residents were selected by taking every fourth household from a list of water subscribers. Only adult respondents, heads of households, were interviewed, and male and female respondents were selected in alternate households. The number of respondents in this sample was 213. Later, the sample households were located on a grid map of the community, indicating an even distribution of respondents across the community as a whole.

The second sample, of community leaders, consisted of those individuals in major decision-making positions in the community and, in a number of cases, holding public office. We contacted the mayor, members of the town council, newspaper editor (Momence has a weekly paper),

bank presidents, school board chairman, superintendent of the sewage treatment plant, high school principal, chief of police, and heads of the three major civic organizations. A total of 22 community leaders were included in the study. Those individuals defined as community leaders who had been selected as part of the larger community sample were also included in the analysis of the community sample.

High school students were more arbitrarily selected. All 1971 high school seniors present in the local public high school on a given day were interviewed, for a total of 97 interviews. For reasons to be detailed below, high school respondents were re-interviewed about one month after the first contact. For a variety of reasons, such as absence from school, all 97 respondents were not contacted on the second occasion. In all, 78 students were interviewed twice, and these constitute the high school sample for most analytic purposes.

Design of Questionnaire

Basically the same information was obtained from the three types of respondents (students, leaders in the community, and general community members). This consisted of (1) descriptive information such as age, education, and occupation; (2) a series of questions on local pollution issues to assess the awareness of those issues, and, at a crude level, attitudes toward the issues; and (3) a series of questions on sources of information about pollution matters. Then, at a somewhat more abstract level, we obtained information on (4) respondents' attitudes toward problem solution in general (e.g. optimism-pessimism); (5) their perceptions of their own position in the social structure relative to problem solution (e.g. occupying a position of relative

independence from the actions of others); and, finally, (6) a more rigorous measure of attitudes toward pollution-related issues.

The questionnaire was designed to be self-administered, therefore complete instructions were given with each set of questions as well as a rationale for asking the questions. In the actual field situation the interviewer served only to introduce the study, describe the procedure for responding to the questions, and remain available for clarification of particular points of doubt. The interviewer remained present while the respondent filled out the questionnaire and then sealed the completed document in a blank envelope to assure the respondent of anonymity.

Since basically the same questionnaire was used for all samples, only the "community resident" version is included in this report (see Appendix A).

Field Work

The two waves of interviews in the Momence High School were conducted in March and April of 1971. In this case the questionnaires were group-administered at a prearranged time by two of the research assistants who did the major share of the work on this project, Louis H. Bluhm and Robert H. Orr.

Field interviews with the community sample and the community leaders were conducted in May-June of 1971, by locally hired interviewers. These interviewers were trained and supervised by Bluhm and Orr.

Local community cooperation with the study and its sponsors had been obtained earlier by carefully explaining the study to relevant community officials. Thus school officials sanctioned the use of

school time for the interviews and cooperated fully with the project. The town council discussed the study and agreed to support it. And the community at large was informed about the purposes of the study via the active cooperation of the editor of the local newspaper, the Momence Progress Reporter. Given the favorable advance publicity our interviewers were on the whole very well received, experiencing only a negligible rate of refusal in the field interview situation.

Measurement of Major Variables

Many of the questions asked of respondents are sufficiently straightforward so that details as to their purpose and their metric qualities need not be presented here. Several more complex measures were also included in the questionnaire, however, and these will be briefly described below.

Attitudes toward pollution issues, as we indicated previously, were assessed in two ways. Straightforward questions, such as "How do you personally feel toward pollution control?", need no explanation. For most analytic purposes, however, we needed attitude measures which could be depended upon as both reliable and valid. We therefore chose to use a widely used and less direct technique, the semantic differential (Osgood, Succi, and Tannenbaum, 1957). The semantic differential is a technique which permits assessment of several aspects of the meaning of a concept to a respondent or set of respondents. We have employed the technique for a more restricted purpose, only to assess respondents' attitudes toward a concept; in other words we are concerned with the evaluative dimension of meaning (Osgood, Succi, and Tannenbaum, 1957).

The concepts we chose to assess were the following: water pollution, air pollution, sewage treatment, Federal funding for local anti-pollution programs, and local anti-pollution bond referendum. These concepts were selected to provide a reasonable coverage of concepts denoting both pollution problems and possible solutions to those problems. In each interview, the respondent was presented with a statement of the concept, exactly as given above, and was then asked to indicate his reaction to the concept on each of 15 seven-point scales. The scales, following standard procedure, consisted of pairs of adjectives separated by a straight line divided into seven equal intervals. For example, the pair of adjectives good-bad was presented to each respondent for each of the five concepts, and the respondent was asked to mark one of the seven spaces intervening between the two adjectives to indicate his reaction to water pollution, say, as relatively "good" or "bad." Other pairs of adjectives, for purposes of illustration, were complex-simple, unimportant-important, and safe-risky. The complete list is given in Appendix A.

Raw scores for each respondent on each of the 15 scales were then factor analyzed to permit eventual construction of a composite index of attitudes. This procedure was carried out separately for the community and high school samples but that distinction is of no concern here since the procedure was exactly the same for both samples. Specifically, scores on the 15 scales for each of the five concepts were inter-correlated to yield a 75 x 75 matrix. This matrix was factor analyzed (principal components with orthogonal rotation) and that initial factor analysis yielded two results. First, scores on Federal funding and bond

referendum (the two "means" concepts) did not coincide well with scores on the remaining concepts. This is hardly surprising in that designation of something as problematic does not preclude consideration of a variety of means to solve that problem. This is what we expected, in other words, and it is a prime reason for mounting information campaigns. The result is worth mentioning because it adds to our confidence in the validity of the measurement technique. And second, the preliminary factor analysis permitted us to delete 5 of the 15 adjective pairs which contributed little or nothing to the resultant factors. This was the prime reason for the initial factor analysis, to prune down the list of scales to those that would yield valid composite measures.

A second factor analysis was then performed, using the 10 scales remaining and with respondents' average scores on the 5 concepts. Again using the principal components with orthogonal rotation procedure, the results showed a strong first factor which could be interpreted as representing the evaluative dimension of meaning, or attitude toward the concepts. These results are shown in Table 1. For present purposes the second factor need not be interpreted since that factor does not enter into our analysis. Loadings on the second factor are shown to demonstrate a clear separation between the first and second factors (third and higher factors could have been presented also to demonstrate the same point).

It is clear that four scales load substantially on Factor 1, see Table 1. These scales, underlined in the table, are: fair-unfair, good-bad, reassuring-threatening, and safe-unsafe. These scales and these alone load substantially (.53 or higher) on the factor, and none

Table 1. Varimax rotated factor matrix, 10 scales with combined scores across all 5 concepts, Momence community sample.

	Factor 1	Factor 2
Simple-complex	.28304	- .48867
Weak-strong	.20169	- .44352
Scientific-unscientific	.03899	.56106
Active-passive	.03107	.54515
Fair-unfair	.53360	.12642
Small-large	.36425	- .49716
Good-bad	.60750	- .41058
Reassuring-threatening	.72760	- .38152
Unimportant-important	.28139	- .47713
Safe-unsafe	.79948	- .18170

of the scales have comparable loadings on the second factor. Given the content of the scales (fair etc.) we felt confident in treating that factor as reflecting an attitudinal dimension with respect to the concepts.

Finally, having deleted 5 scales and having established that an evaluative dimension was being measured by the remaining scales, we subjected the data to a final factor analysis in order to derive weights for index construction purposes. Using standardized raw scores we essentially repeated the procedure described immediately above, with results as shown in Table 2. The factor coefficients are essentially partial regression coefficients. Perusal of Table 2 will show, as we expected, that the four scales underlined (fair, good, reassuring, safe) are clearly the major contributors to the evaluative dimension. The coefficients shown in Table 2 were used as weights to construct indices of attitudes. Respondents' standardized raw scores, for a given concept, were simply multiplied by the factor coefficients; the results were summed and the sums represent composite attitude scores with respect to that concept. The same procedure was used for each of the 5 concepts, using the same (aggregate) weights, to yield concept-specific attitude scores for analysis.

Political attitudes were measured through use of an abbreviated Kerlinger Social Attitudes Scale (Robinson, Rush, and Head, 1969). Eleven items (see Appendix A) were presented to respondents with 6 pre-coded response alternatives (from agree very much to disagree very much). This scale was intended to assess respondents' political attitudes, from relatively conservative to relatively liberal. The measure was included as one possible factor which could influence respondents' reaction to

Table 2. Factor coefficient matrix, data and procedure as shown in Table 1.

	Factor 1	Factor 2
Simple-complex	- .00068	- .16457
Weak-strong	- .02505	- .15296
Scientific-unscientific	.12722	.27039
Active-passive	.09517	.25048
Fair-unfair	.17724	.15022
Small-large	.04064	- .18384
Good-bad	.15974	- .11325
Reassuring-threatening	.31876	- .09280
Unimportant-important	- .01176	- .16605
Safe-unsafe	.44255	.12991

information about pollution issues as well as their attitudes toward pollution problems and their solutions.

Responses to the 11 scale items were factor analyzed, following procedures analogous to those described above. On the whole the scale, although it has been used in a number of other studies, demonstrated a rather modest degree of validity. Four items were deleted as a result of the first factor analysis. The seven remaining items were again factor analyzed and the loadings on the first principal component, shown in Table 3, were used as weights in constructing an index. It will be seen, in Table 3, that several of the items retained have loadings which approach the conventional minimum for item retention (.30).

Optimism-pessimism is another variable measured via a composite scale, and intended for use in the analysis in a manner comparable to that described for the political attitude scale. Ten items were used, scored on a 6 point agree-disagree scale. Index construction procedures were identical to those for the political attitude scale. The factor loadings, given in Table 4, demonstrate quite an acceptable degree of internal consistency among the responses on the items, i.e. we feel fairly confident of the validity of the resultant index. No items had to be dropped and the loadings, on average, are fairly high.

Perception of position in the social structure is the last, somewhat complex measure to be described. We were attempting, in this context, to assess a characteristic of the respondent as an "audience" member, his perception of his position relative to others. It was the assumption that the respondent's structural position could serve to bias or distort information received (details will be given in conjunction with data analysis).

Table 3. First principal component factor loadings, political attitude items, Momence community sample.*

Item	Factor Loading
People who are against churches...	.50
Rich persons should be taxed heavily...	- .33
...better off if scientists took no part...	.57
To make sure that all people get proper care...	- .33
...the protection of private property.	.67
The well-being of a nation...	.49
There are too many (radical) professors...	.75

* For a complete statement of each item see Appendix A.

Table 4. First principal component factor loadings, optimism-pessimism items, Momence community sample.*

Item	Factor Loading
Things look pretty grim...	.56
...things are improving.	.34
Our government is working against my interests.	.56
A person should store up food...	.36
A person can plan for the future.	.38
A person doesn't know who he can trust...	.59
...big war looks inevitable.	.73
...country will fall apart.	.78
A person really can't predict...economy.	.52
Things are becoming worse and worse.	.87

* For a complete statement of each item see Appendix A.

Three separate measures were constructed to assess respondents' perceptions of their roles, relative to the roles of others, with respect to dependence-independence, predictability-lack of predictability, and feeling threatened versus not feeling threatened. A short paragraph was used to introduce the idea behind each of the three measures. For example, regarding "dependence" respondents were asked to read the following paragraph (for the others see Appendix A):

> "This type of person is very independent--socially and economically. He has few commitments and obligations. He seldom gets himself in so deep that he loses his power of choice."

After reading the introductory statement, the respondent was asked to choose which of nine roles most nearly fit the description. Specifically, respondents were presented with a list of nine roles, in all possible paired combinations (disregarding order within pairs). Thus they were asked to make 36 decisions, each time selecting the role most like that described in the introductory paragraph. The same series of 36 choices was repeated for each of the three structural measures. The roles were: yourself, housewife, professional, high school student, businessman, community leader, working mother, blue collar worker, and white collar worker (clerical). The results were used in several ways, but principally to arrive at the ranking of "yourself" (relative to the other roles) for each respondent. The rankings are a straightforward ordinal measure of role perceptions in structural terms.

Validity of the role perception measures was assessed by factor analysis, again, with orthogonal rotation of factors. Rankings for all

Table 5. Loadings on three orthogonal factors, rankings of social roles, Momence community sample.

Role	Variable	First Factor	Second Factor	Third Factor
Housewife	Independence	-.70	.14	-.07
Working mother	Independence	-.47	.25	-.03
Professional	Independence	.68	-.32	.07
High school student	Independence	-.44	.22	.03
Blue collar worker	Independence	.12	.51	-.07
White collar worker (clerical)	Independence	.61	.16	.02
Businessman	Independence	.68	-.29	-.03
Yourself	Independence	-.68	-.26	.03
Community leader	Independence	.59	-.26	.05
Housewife	Predictability	-.23	.55	.03
Working mother	Predictability	-.14	.58	-.06
Professional	Predictability	.20	-.69	-.06
High school student	Predictability	-.15	.49	.03
Blue collar worker	Predictability	.21	.37	.02
White collar worker (clerical)	Predictability	.27	-.16	-.04
Businessman	Predictability	.27	-.61	-.06
Yourself	Predictability	-.39	-.11	.23
Community leader	Predictability	.16	-.53	-.12
Housewife	Threat	.02	.06	-.75
Working mother	Threat	-.03	-.01	-.57
Professional	Threat	-.06	.15	.73
High school student	Threat	.13	.06	-.44
Blue collar worker	Threat	.06	-.10	-.10
White collar worker (clerical)	Threat	.12	-.03	.52
Businessman	Threat	.05	-.05	.69
Yourself	Threat	-.17	-.25	-.34
Community leader	Threat	-.07	.14	.53

three measures were combined in a single factor analysis in order to determine empirically whether rankings on the three expected dimensions (threat, predictability, and independence) would emerge as three distinct and substantial factors. For the results of this procedure see Table 5. With minor exceptions, the three factors described in Table 5 correspond well with the expected three dimensions, thus we are satisfied with the validity of the measures.

III. Analysis of Data

In the following pages we will describe the major segments of data analysis in an attempt to summarize what our data show with respect to the project objectives. Many details have been omitted, largely because the major findings can be presented briefly and other and more detailed reports are available.

Public Attitudes and Communication Links*

Our first concern, of course, was to establish the extent to which information exposure had a bearing on peoples' attitudes toward pollution. Following this we could then begin to trace out the possible differential effects of direct versus indirect information exposure, and so on. In all phases of the analysis we used attitudinal measures as dependent variables, thus inferences about information distortion are necessarily indirect. In the present section we focus on our index of attitude toward water pollution, ignoring our other attitude scales, because the results are quite similar no matter which scale is used. In this section we are concerned with the community sample only.

Most of our respondents were at least superficially aware that local pollution chiefly stems from local industry. Eighty percent of our respondents correctly identified the pork packing plant as the greatest contributor to pollution in the town. Our respondents were also aware that the packing plant paid more than any other industry for use of the sewage treatment plant. All but 15 respondents (less than 7 percent of the sample) knew this.

---

* Research Assistant Navin C. Sharma did much of the analysis reported in this section.

Most of the sample felt that the town benefits from industry, and 33 percent felt that it "benefits a great deal." Only six respondents disagreed on industry benefits. At this very general level, then, most of the respondents were favorable to industry. However, when they were asked the question, "If you personally had to decide either to allow the present level of pollution in the community or to close down a polluting industry, which would you favor?," 42 percent favored closing the industry and 58 percent chose to allow current levels of pollution. Thus, while most respondents recognized the importance of industry to the community, a substantial proportion of them regarded pollution as a serious enough problem to warrant the sacrifice of a polluting industry.

There is, as one might expect, a substantial correlation between a predisposition to close down the polluting industry and the amount of unemployment respondents were willing to accept to solve the pollution problem ($r = .42$). At the same time, there is no significant relationship between absence of an inclination to close down the polluting industry and a willingness to spend more tax dollars to upgrade sewage treatment facilities and thus keep the polluting industry in town ($r = .04$). Those who favored keeping a polluting industry in town were not in agreement on the use of tax resources to solve the problem. One infers that many citizens may be taking a "do nothing" stance, an alternative that is ruled out by state law. Thus, there was an apparent consensus on the nature of the local problem, but an absence of consensus on problem solution. There was also an apparent lack of agreement between attitudes toward means and attitudes toward corresponding ends.

Although closing a polluting industry is a radical solution to the problem, our sample was more nearly polarized in its responses to this

question than on other similar questions. For this reason we chose to seek out factors which might mediate peoples' attitudes on this issue, and developed a four-stage causal model (Figure 1). Taking the variables in reverse order, starting with (stage 4) the question of whether or not to close down the polluting industry, we considered (stage 3) attitude towards pollution, (stage 2) communication channel usage and personal interaction in the community, and (stage 1) socioeconomic status, age, and length of residence in the community.

It is an obvious proposition that those who are more intolerant of water pollution in general should be in favor of closing down an industry that is indirectly responsible for water pollution. The zero order correlation between tolerance of pollution and an inclination to close the polluting industry was -.19, a low correlation but in the expected direction (see Figure 1).

Interaction and activity in the community: It was proposed that attitudes toward water pollution in general, and the inclination to close down a polluting industry, would depend on the information received about pollution as a problem, both within the community, and in the country at large. Furthermore, people who were more concerned about issues in general, and who were active in the political process, should be concerned about the local pollution problem. We therefore analyzed the effect of the following five variables in the area of personal interaction and information:

(1) Voting behavior. This was an aggregate of participation in the 1970 national elections, the 1971 Aldermanic elections in the town, and a recent school bond referendum. A high score

(maximum of 6) in the Voting Behavior Index indicates high political participation.

(2) Information about local pollution from the radio. This was measured by asking the question "How much have you heard about local pollution problems on the radio?" and was scored on a four-point scale, from "none" to "a great amount."

(3) Information about local pollution from the local newspaper. This was measured, as in the case of radio information, on a four-point scale.

(4) Interaction with the Mayor and Aldermen was measured by the question, "How much have you discussed local pollution with the Mayor and Aldermen?," on a four-point scale. We assumed that this question would assess contact with an "official" source of information.

(5) Interaction with family and friends. This was an aggregate index, constructed from three four-point scales that measured how much each respondent had discussed local pollution problems with (a) spouse, (b) children, and (c) friends and acquaintances outside the family. Since two of the components measure family interaction, the scores on these two components were summed and the aggregate was halved before adding it to the component of interaction with friends and acquaintances. Thus equal weights were given to family interaction and interaction with friends. For those respondents for whom family interaction was not applicable, their score on interaction with friends was substituted as a measure of personal interaction.

Exogenous variables: One could reasonably expect that involvement in the community, and attitudes toward pollution and toward polluting industries, should depend on one's socioeconomic status, age, and length of residence in the community. We therefore analyzed the effect of the following variables: age; income, on a seven-point scale, ranging from $2,500 annually to over $15,000, in increments of $2,500; education; occupational prestige, using North-Hatt (Hodge et al. 1964) ratings converted to standardized scores for the sample; and length of residence in the town.

Results: For this part of our analysis, we constructed a causal model, with four stages as outlined above, and subjected it to path analysis (see Figure 1 and Table 6). The form of path analysis used here assumes that residuals of the variables are uncorrelated and that there is no interaction between variables. These assumptions are violated in our data, though not too seriously, but we felt that the process of multiple regression in a causal sequence would give us a good idea of the effects of the variables and their causal links.

A preliminary run on this model indicated that two variables, education, and radio information, were quite ineffective in the whole causal sequence. There were no significant paths between education and any of the consequent variables. Similarly, radio information did not show any significant linkages. This was not too surprising, since the town does not have a local radio station, and radio stations from a nearby city probably did not attach much importance to pollution problems in the town. As these two variables had very little effect in the model,

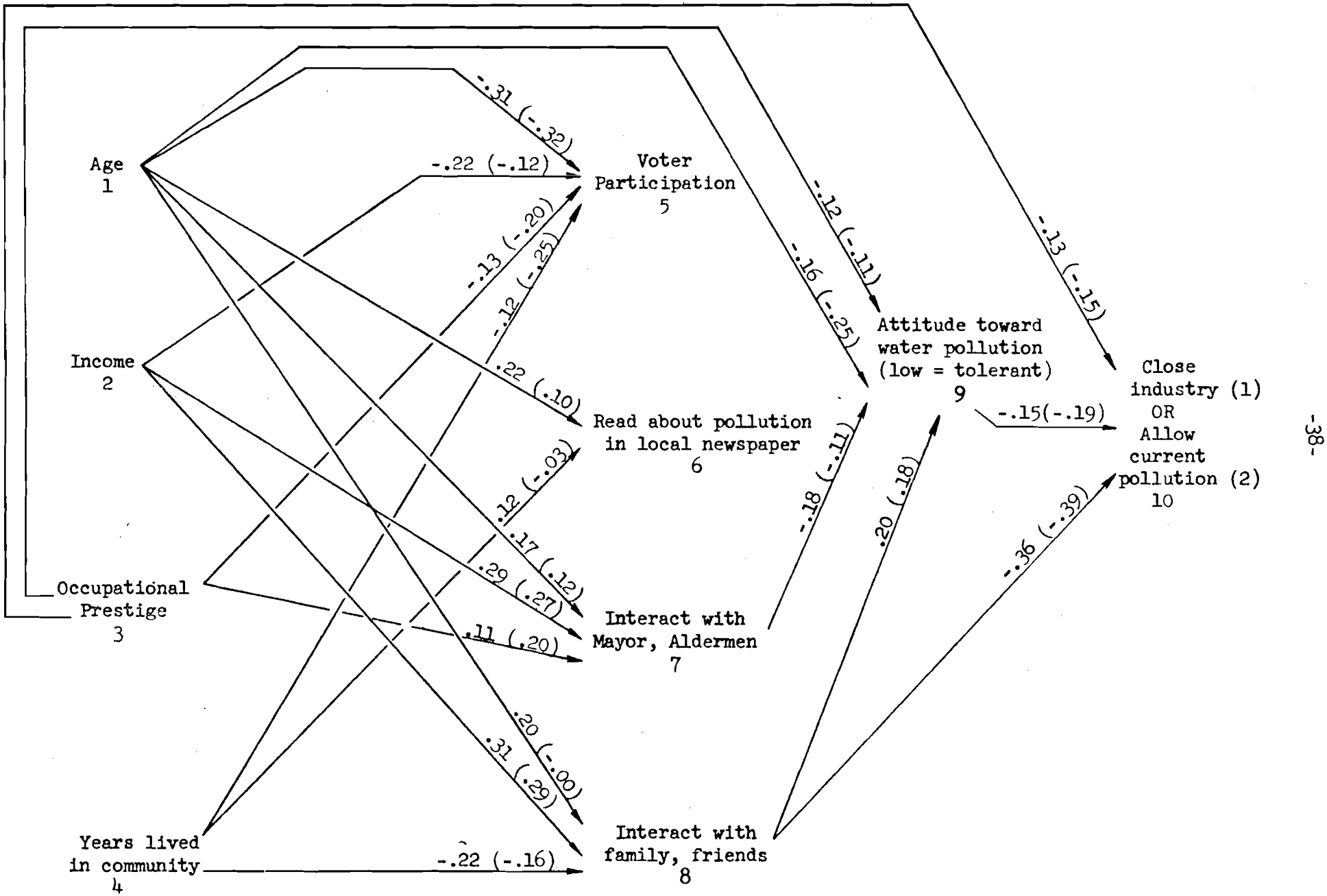

Figure 1. Factors mediating peoples' attitudes on a pollution issue (N = 225). (Numbers enclosed in parentheses are zero order correlations; unenclosed numbers are corresponding path coefficients.)

Table 6. Results of stage-by-stage buildup of the model.[a/]

Variables added	1, 2, 3, 4	5, 6	7, 8	9
1. Age	- .10	- .05	- .01	- .04
2. Income	- .14	- .10	- .00	- .02
3. Occupational prestige	- .07	- .10	- .10	- .13
4. Years lived in community	+ .17	+ .14	+ .07	+ .05
5. Voter participation		- .02	- .06	- .06
6. Read about pollution in local newspaper		- .10	+ .04	+ .05
7. Interact with Mayor, Aldermen			+ .03	+ .08
8. Interact with family and friends			- .39	- .36
9. Attitude towards water pollution				- .15
Variance explained (R^2)	.04	.06	.17	.19

a/ Table shows the direct paths between variables and the dependent variable, starting with a model which includes only the exogenous variables, and then adding intervening variables to the model as shown in the columns. The last row indicates the variance explained in the dependent variable at each step.

we dropped them, and ran another path analysis. All possible causal paths were considered, but only the significant paths are shown in Figure 1.

We did not even consider television as a source of information because we knew at the outset that the nearest station was at a substantial distance from the town and was not much concerned with local affairs. Murch (1971) found that television was chosen by the largest percentage of respondents as a source of information on environmental pollution. However, he also indicated that national rather than local problems are stressed in the mass media.

The only significant direct paths to the dependent variable come from: Discussion with family and friends, Attitude toward water pollution, and Occupational prestige. People who discuss pollution with their family and their friends, who have an unfavorable attitude toward pollution, and who stand higher on the occupational prestige ladder, are more in favor of closing down the polluting industry, rather than allowing current levels of pollution in the community.

What seems more interesting, however, is the fact that other variables that were proposed as important on this issue were not significantly related to the dependent variable. Thus, neither information about local pollution from the newspaper nor voting behavior polarizes people on this issue.* Furthermore, neither of these variables are significantly related to the attitude measure in the path model. Although there is a significant zero order correlation (0.13) between the amount

* The local newspaper, a weekly, gave substantial coverage to the pollution problem and to various proposed solutions, both before the survey and to the present.

of information gathered on local pollution from the newspaper and a predisposition to close down the polluting industry, this relationship vanishes when controlled for as in the model (path = 0.05).

We also find that age, income, and length of residence in the community do not relate significantly with the dependent variable. Older age is linked with a degree of tolerance of water pollution but not with the dependent variable.

On consideration of the results of the path model, we decided to further explore some of the relationships, and to test for possible interactions between variables. Specifically, we tested the following propositions:

(1) Does the relatively large path between Interaction with family and friends and the dependent variable indicate that pollution solutions are dependent chiefly on "grass roots" activity, and not on institutionalized political processes?

(2) Are people with higher occupational prestige more inclined to close down a polluting industry because they would be less affected by this measure?

(3) Is there a possible interaction between age and length of residence in the community in the effect of these variables on concern with pollution? Age and length of residence are highly interrelated (r = .56).

Discussion with family and friends: This variable is meant to measure the degree of interpersonal interaction and discussion of problems with reference groups, apart from those involved in the political process. It is the strongest predictor of the dependent

variable and of our measure of attitude toward pollution. These relationships seem to indicate that decisiveness, at least about pollution problems, depends on the amount that people discuss the problem with their friends and their families. "High interactors," people who discuss the pollution problem in informal groups, appear to be more committed to solving pollution problems when faced with drastic alternatives. Given other alternatives, however, they are willing to compromise. Over 90 percent (84 out of 91 high interactors) are willing to negotiate an agreement rather than impose heavy fines on the polluting industry. However, if faced with the clear-cut alternative of allowing current levels of pollution, or closing the polluting industry, 50 out of the 91 people who rank as high personal interactors would close the industry, as compared with only 40 out of the 130 people who rank low on personal interaction. The high interactors are also more willing to accept unemployment than the low interactors (F ratio = 7.23, $p < .01$).

There is a suggestion here, then, that regardless of socioeconomic status or age, those who discuss pollution problems with their friends and families are more likely to favor closing the polluting industry. As something of a contrast, however, high interactors were more apt to pick the mass media as reliable sources of information on local issues such as pollution rather than their friends and family as sources (48 percent chose the media, 33 percent chose public meetings, and 19 percent chose friends and family). In this respect, they are not much different from the low interactors, 65 percent of whom chose the media, 29 percent chose public meetings, and 7 percent chose friends and family. These findings are consistent with recent research (Murch, 1971:101). Although the media are generally considered more reliable,

there is some reason to think that they have little or no effect on polarizing views on public issues.

Occupation: We expected to find that those people who were less directly involved with industry would be more likely to favor closing a polluting industry. Instead, we found a more complicated pattern. Of 13 teachers in the sample, nine chose to allow current levels of pollution. Of 21 people who were self-employed or had private businesses, 13 chose to allow current levels of pollution. Of the 17 people who were classified as government officials, doctors, or dentists, seven chose to allow pollution. Salesmen and people in white collar jobs were evenly split on the issue. Of the 101 respondents who were classified as blue collar or service workers, 70 chose to allow the present levels of pollution. We recognize, of course, that only in this last category are numbers of respondents sufficient to permit drawing conclusions as to direction of relationships between occupation and attitudes toward pollution. In categories other than blue collar and service workers, numbers are too few and comparative percentages are not warranted. In general, over 50 percent of white collar and professional respondents said they would allow pollution if they had to make a decision. Conversely, 30 percent of blue collar workers said they would close industry.

Perhaps the most convincing evidence of the importance of occupation is the fact that, as our model is built up stage by stage, this variable becomes increasingly important as a predictor of attitudes toward pollution (see Table 6). It is the one variable whose importance increases with the addition of intervening variables. However, there is clearly not a simple, direct relationship between occupational prestige

and a hypothetical decision to allow pollution or to close an offending industry.

Age and length of residence in the community: It was expected that people who had resided in the community for a major part of their lives would be more aware of industrial pollution than would newcomers to the community. However, we also expected that younger respondents would have a greater concern for environmental pollution than would older respondents. To sort out these counteracting effects we conducted a two-way analysis of variance on several variables.

We found that older people tended to view pollution as less of a serious problem than young people (F ratio = 2.9, p = .08). But there was also an interaction effect: younger people who had not spent a major part of their lives in the town, and older people, who had spent a major part of their lives there, thought that pollution was less of a serious problem than the two other groups (F ratio = 6.50, p = .01).

On the question of closing the industry, age but not proportion of the life span spent in the town had an independent effect (p = .01). There was no interaction.

On the question "How much unemployment would you accept to solve the pollution problem in this town?," there was a significant interaction between age and number of years of life span spent in the town (F = 7.03, p = .01). The results show that younger people who have mostly lived in other places and older people who have mostly lived in the town, are less willing to accept a high level of unemployment to solve the pollution problem relative to the other two groups.

In general, then, we find that old people who have resided in the community for a long time are quite consistently opposed to solutions

for the pollution problem; in fact, they do not regard the problem as serious. We also find that younger people who have not spent a major part of their lives in the town tend to be less committed to pollution solutions. We can find no clear-cut explanation to this, but a tentative answer is presented. Younger people who have not spent all their lives in the town are probably people who came there looking for jobs, and closing the industry or creating unemployment is not an acceptable move for them.

Conclusions: Awareness of pollution is to some extent a new phenomenon in most communities. Our data suggest that pollution may be less a political issue of enduring concern than a passing topic of private conversation, possibly even a "fad." Although pollution problems in our sample town were quite acute, concerns have not crystallized into a coherent movement toward solution. Many of the relationships we had expected to find were not present in our data.

Mass media exposure has not created a general attitude against water pollution in our sample town. And, we did not find mass media variables useful in predicting commitment to solving the local pollution problem.

Our results also seem to indicate that the usual political process, and involvement in that process, are not effective in generating anti-pollution sentiment. In fact, linkages shown in our model suggest a slight tendency for those involved in the political process to be less committed to solutions which entail a high cost to the community. This seems understandable in view of community dependence on industrial employment. But, note that interaction with Mayor and Aldermen about pollution problems is negatively related to our general measure of

(negative) attitude toward water pollution (path = -.11). This attitude measure was specifically designed to avoid confounding attitudes toward pollution problems with attitudes toward other local problems. Thus, our data suggest a possible cleavage between the institutionalized political process and "grass roots" activity on pollution issues. Whether the "grass roots" activity will or can be institutionalized into a coherent and effective anti-pollution movement is not at all clear from our data. And given the distinct possibility of conflicting information from different information sources, the possibility of making inferences about distortion of a given message is all but ruled out.

Age and length of residence in the community show a generally interactive pattern. Young people who have grown up in the community seem to be more concerned about pollution problems than either "old timers" or more recent young migrants. This is clearly not a case of new suburbanites coming in to fight noble battles and suggests that any "grass roots" activity may be firmly anchored in the community.

There are two major characteristics that define people who seem to be committed to the solution of the local pollution problem. First, people who do not have too much to lose if an industry is shut down tend to favor closing the polluting industry, if that is the only alternative to pollution. This linkage is both statistically and substantively quite weak, however. A second characteristic, discussion of pollution problems with family and friends, is more closely linked to a commitment to solution of the problem. This relationship further suggests that a well-anchored "grass roots" movement may eventually emerge to combat pollution (cf. Morrison, Hornback, and Warner, 1972). But here we are

clearly speculating, for we cannot argue very strongly that informal discussion of pollution problems is antecedent to a commitment to problem solution; the causal path may well run in the other direction. As in Murch's (1971) North Carolina study of environmental pollution, public concern does not lead to problem solution in a straightforward way.

One thing is clear from this segment of the analysis: more research is needed. Expressing that idea in a less trite way, we suggest a similar kind of analysis in a community which does not have an acute pollution problem. A similar pattern of results would suggest that environmental pollution, while a lively topic for discussion, may soon be replaced by some other topic. We expected our survey data to show a fairly clear pattern precisely because the sample community was faced with a problem of crisis proportions. Few of the expected patterns showed up. What the situation may be in other communities we don't know at this point.

Some Implications for Pollution Control Campaigns

In the preceding section we came to the conclusion that inferences about distortion of information about pollution in a local situation would have to be less direct than we had hoped. We found no evidence that mass media contact served to polarize the study population with respect to attitude toward local water pollution, the major local pollution problem. We found that information contacts with official information sources (Mayor and Aldermen) and with friends and relatives seemed to contribute to differences in pollution attitude rather than reinforce one another.

Though we could not trace out sequential steps in the information transmission process it seems likely that at least two somewhat conflicting

processes may be involved, rather than a single and sequential process. We infer that the influence of friends and relatives is consequential via information gain from extra-community sources, the mass media. And we infer that the influence of official information sources is consequential via information from an intra-community perspective, a perspective which recognizes the positive impact of local industry and may therefore be more "tolerant" of pollution from that industry, though not necessarily more tolerant of pollution in more abstract terms. In absence of more substantial crystallization of positions on local water pollution the questions we have raised about information distortion may well be premature, in this particular situation.

Nevertheless, we felt it would be desirable to exploit the present data to gain whatever we could that would be useful in conducting campaigns on pollution issues. Toward that end we carried out an analysis of the antecedents of regarding pollution as a serious problem. To define a given type of situation as problematic is presumably the first step in pollution control, and weighing the pros and cons of different means to problem solution only becomes relevant later.

Below we offer several pieces of evidence that may be useful in at least the early, or "awareness," stages of information campaigns on pollution issues.* First, we found a clear association between distance from "official sources" of information and the seriousness with which pollution was viewed, Tables 7 and 8. Clearly, the "closer" respondents were to official sources of information, the more likely they were to view pollution seriously or very seriously. The differences in percentages, from 86% to 20%, are striking and suggest that attitude change may

* These materials were prepared by J. E. Kivlin.

Table 7. Perceived seriousness of the pollution problem as a function of distance from information source, Momence community sample.

Respondent grouping*	N	Distance from Source: Know which is most polluting industry**	Talk with friends about pollution	Read about pollution in local paper	Talk w/mayor, aldermen about pollution	% saying pollution serious
A	21	Yes	Yes	Yes	Yes	86%
B	22	Yes	Yes	Yes	No	64%
C	19	Yes	Yes	No	No	47%
D	47	Yes	No	No	No	23%
E	25	No	No	No	No	20%

* These letter-groupings are characterized by the Yes-No distinctions given in the table. Although the four measurement points have a scale-like quality, e.g. those who talked with the mayor/aldermen tended to read and talk about pollution, we do not claim that these items make up a scale.

** We recognize that knowledge about polluting industry is not a "source" as are the other three points used in measuring "distance." For our sample, the basic knowledge of the most polluting industry seemed like a good place to begin measuring.

Table 8. Selected characteristics of respondent groupings which vary by distance from official source of information, Momence community sample.

Characteristics	Respondent Groupings* A	B	C	D	E
Percent responding pollution serious or very serious (from Table 7)	86	64	47	23	20
Percent responding "close industry" vs. "allow pollution and retain industry"	74	55	58	39	16
Percent accepting no unemployment as a social-economic cost of pollution control	16	27	37	53	50
Percent male	57	27	58	30	32
Percent lived in community 1-9 years	19	23	26	28	20
Percent blue-collar occupation	58	63	58	64	80
Number	21	22	19	47	25

* See explanations in footnotes to Table 7.

well accompany information gain. As Greenberg (1964) has indicated "the more one learns, the greater...the attitude change...in either direction" (emphasis in original). Table 8 shows similar striking and consistent differences in the respondent groupings. Percentages of those who responded "Close industry" vs. "Allow pollution and retain industry" went from 74% for those closest to the "official source" to 16% for those who lacked knowledge as to which was the most polluting industry. There was a similar but somewhat less striking range in groupings, from 16% to 50%, on the percent of respondents who would accept no unemployment as a social-economic cost of pollution control.

Important differences are not apparent among the distance groupings in the selected characteristics of percent male, percent who lived in the community 1-9 years, or percent in blue collar occupations, Table 8. This relative absence of demographic differences tended to characterize our data. In many communities, as for American society as a whole, one would expect rather strong, positive, zero-order correlations between awareness of social problems and social categories such as income, occupation and education. We interpret the data in Table 8 to indicate that concern for pollution control, to the extent that it exists, is widely distributed. Affluent blue-collar workers do not yet share many middle-class value orientations, but their relatively low education and occupational prestige levels are not likely to represent major obstacles to success of pollution control campaigns.

The second communication factor in our research which has implications for information campaigns is interpersonal interaction. This variable was measured by an aggregate index of how much each respondent

discussed local pollution problems with (1) spouse, (2) children, and (3) with friends and acquaintances outside the family. Interpersonal interaction, long recognized as a key element in communication research, was the best predictor of attitudes toward pollution control and of willingness to pay some social or economic cost of cleaning up the environment for our sample. To illustrate the relative importance of this key variable, we have prepared three "cumulative impact" tables, Tables 9, 10 and 11. These tables, a tabular form of analysis of variance, present information on four variables concisely and clearly. In Table 9, for example, reading the percentages for "Close industry" (vs. Allow pollution) from left to right, it is apparent that the figures increase markedly, from 10% to 70%. The cumulative impact of residence, schooling, and talk about pollution is obviously very great. It is also clear, however, that the greatest effect is that of interpersonal communication. Again reading from left to right, but this time focusing on differences within pairs (first pair, second pair, third pair, fourth pair) it may be seen that the percentage figure for "Much talk about pollution" is in each pair from two to four times greater than the figure for "Little talk about pollution." Differences are apparent between pairs (controlling on years of schooling), and between the first four and last four figures (controlling on years of residence), but these differences are not nearly as great as the differences within pairs. Again, we interpret these findings to indicate that prospects for campaign success can be enhanced by the widespread effect of interpersonal communication, a variable that cuts across income, education, residence and other variables.

Table 9. Cumulative impact of length of residence, education, and interpersonal communication on percent responding "close industry" (vs. "allow pollution").

Years of residence	From 1 to 23 years				From 24-90 years			
Years of schooling	Less than 12		12 or more		Less than 12		12 or more	
Talk about pollution	Little	Much	Little	Much	Little	Much	Little	Much
Percent saying "close industry"	10*	46	21	54	21	67	36	70

* Cell N's for Tables 3, 4 and 5 are necessarily small as a result of considering four variables simultaneously. However, they are generally adequate for percentage comparisons.

****

Table 10. Cumulative impact of length of residence, income, and interpersonal communication on percent responding "close industry" (vs. "allow pollution").

Years of residence	From 1 to 23 years				From 24-90 years			
Income	Low		High		Low		High	
Talk about pollution	Little	Much	Little	Much	Little	Much	Little	Much
Percent saying "close industry"	14	47	24	55	30	65	31	71

****

Table 11. Cumulative impact of three variables on percent responding "close industry" (vs. "allow pollution").

How serious is pollution	Not Serious				Serious			
Unemployment accepted	None		Some		None		Some	
Talk about pollution	Little	Much	Little	Much	Little	Much	Little	Much
Percent saying "close industry"	6	14	26	62	29	42	65	82

Any pollution control campaign must reckon with a very complex set of competing interests, technological problems, seemingly inconsistent value-orientations and other situational factors, as we noted earlier. We will now consider several pieces of evidence which further explicate this point. First, it is likely that simply informing people about a problem (creating awareness) is not likely to lead to concerted action. Decisions to act upon a problem do not flow easily from awareness because proposed solutions affect the whole community and may affect different community members very differently. What is a "solution" for one citizen, in the abatement of pollution odors, for example, may be a personal disaster for another citizen, when the industrial curtailment that reduces pollution costs him/her a job at a critical time.

This factor of perceived self-interest greatly magnifies the complexity of pollution control and is probably the chief explanation for seeming inconsistencies among respondents to our questions. For example, 36% of those who said "Close industry" also responded that pollution was "Little or no problem." Conversely, 25% of those responding "Allow pollution" rather than close the industry said that pollution was a serious problem. Some citizens suffer from pollution, and others benefit from the polluting industry. Thus the same stimulus presented in pollution control campaigns may lead to contradictory responses from individual members of a community.

We also discovered what appears to be a more general kind of "subjective bias" among our respondents, Table 12. These data show that respondents tended to regard themselves, as compared to others, as more concerned about pollution, more favorable to social change, more

Table 12. Self - other comparisons on aspects of pollution control.

Questions	Response categories	Percent of responses for Self	Others
How serious do you (others) feel pollution is, in the town	Serious, very serious	40	25
How do you (others) feel toward change	Favorable, very favorable	89	64
How do you (others) feel toward "pollution control"	Favorable, very favorable	91	73
If you had to decide, would you (others) close industry or allow pollution	Allow pollution	57	70
How much unemployment would you (others) accept to control pollution	No unemployment	41	54
How much tax money should be spent to control pollution	Spend no tax money	33	41

favorable to pollution control, and more likely to accept unemployment or pay taxes in order to control pollution. These findings reflect a sociological tenet that is probably an underlying component of most social problems: opinions and behavior are oriented toward enhancement of the self. Communication campaigns to bring about pollution control will have to take the possibility of subjective bias into account as a factor in the complexity of pollution problems. This bias may affect citizen behaviors, and thus information campaigns, differently. Community action will be more difficult to achieve if biased citizens reason that "Because the other person is less interested in control and may be the chief contributor to pollution, let him/her clean it up." But, the favorable self vs. other comparison in regard to pollution will further participation and campaign success if citizens tend to make their behavior consistent with attitude and opinion. That is, if they see themselves as viewing pollution more seriously than others, they may be more apt to do something about it. Thus, the self-other subjective bias which we have explored here seems to be a factor which may distort communication and add to the complexity of pollution problems (Mehrabian and Reed, 1968).

The kinds of campaign strategies suggested by our data clearly favor the small community. Advocates of solutions to pollution problems can be brought into direct contact with the citizenry. Grass roots discussion of issues can be meaningfully encouraged. Both of these campaign strategies have a Town Meeting flavor which would be extraordinarily difficult to achieve in the metropolis. Sponsors of campaigns must recognize, however, that diverse aspects of pollution problems can lead to

seeming inconsistencies in responses. With this recognition in hand, it should be possible to encourage face-to-face discussion and thus achieve a working consensus.

Structural Factors and Pollution Attitudes*

Community respondents had been asked to rank their perceptions of their own role in the community, relative to the roles of others, in order to permit us to determine whether these perceptions of their position in the social structure would influence attitudes toward pollution control. We are concerned here with characteristics of the "audience," so to speak, which could help to predict greater or lesser receptivity to information on pollution topics. Given that pollution problems and their solutions are typically beyond the direct control of individual citizens, we expected that their perceptions of their own roles as relatively dependent on the actions of others, for example, would lead either to neutrality on a public issue (let George do it), or a feeling of alienation and a resultant negative attitude.

In the following paragraphs we present representative results from the analysis of role perceptions as predictors of pollution attitudes. We have selected attitude toward a local anti-pollution bond referendum as the most appropriate dependent variable from a communication perspective. A local referendum is often crucial in implementing a problem solution, and proponents of referenda are faced with the difficult task of stimulating interest in the issue and persuading the public to support the proposal. The analysis described below provides some small insight into the delicate balance between passivity and negativism among voters who feel least able to directly control events in the world about them.

* The data reported in this section were analyzed by Robert H. Orr. For greater detail see Orr (1973, 1974).

Two role perception measures are of interest in this analysis: respondents' rankings of their own roles as relatively dependent in comparison with the roles of others, and their rankings of their roles as lacking in predictability (we treat the latter as corresponding to a feeling of anomie). Table 13 shows that, at the zero-order level, respondents who perceive of themselves as dependent and lacking in predictability took a mildly negative position with respect to a local anti-pollution bond referendum. Neither coefficient is significant, however, and their linear additive effect on the attitude variable is negligible in terms of explained variance (R = .07).

When a multiplicative interaction term is added to the equation, however, the resultant multiple correlation coefficient approaches conventional levels of statistical significance (R = .19, p = .10). This is a fairly clear indication that the simple additive model does not adequately represent the situation. Respondents who perceive of themselves as both dependent and lacking in predictability apparently take a somewhat stronger position on a local bond referendum. The three right-hand columns in Table 13 show, furthermore, that the interactive effect of the two role perception variables is positive, whereas the zero-order effect of each had been negative. In other words, respondents who feel both dependent and lacking in predictability tend to take a positive position toward a local bond referendum. Given that the interaction term is statistically significant it is impossible to assess what the unique effect of either of the role perception variables may be with respect to the dependent variable. The most plausible interpretation of these results is that the combined effects of

Table 13. Zero-order, multiple, and partial correlation and regression coefficients describing relationships between role perception measures and attitude toward bond referendum, Momence community sample.

Respondent perceives own role as:	Attitude toward local anti-pollution bond referendum: Zero-order and multiple coefficients	Partial regression (Beta)	t value	Significance level
Dependent	r = -.07	-.42	2.52	.02
Lacking in predictability	r = -.06	-.33	2.37	.02
Additive effect of both of the above	R = .07	--	--	--
Multiplicative interaction term alone	--	.60	2.54	.02
Additive effect of both plus interaction	R = .19	--	--	.10

dependence and lack of predictability lead to an essentially passive attitude toward a bond referendum, i.e. withdrawal from the political process. We infer that voter apathy rather than negativism may be the more serious problem for that portion of an electorate that feels least in command of its own destiny.

Community Residents and Community Leaders*

As another step in tracing out the effect of "audience" characteristics as predictors of pollution attitudes, with implications for information campaigns, we were interested in assessing the possible effect of differences between community residents and their leaders. Our regression analysis of the communication variables, as such, had indicated that contact with official information sources (Mayor and Aldermen) had contributed to a more tolerant attitude toward water pollution. And conversely, maximal contact for information with friends and relatives contributed to less tolerance of pollution. This suggested a possible cleavage within the community on pollution issues and we wanted to examine that possibility in greater detail. In order to do this we used our role perception measures to construct a derived measure of "marginality with respect to community leadership." Specifically, we correlated individual community respondent rankings of their perceptions of their roles as dependent and lacking in predictability, with average rankings for the sample of 22 formal and informal leaders (described in the section on sampling). A low correlation indicated minimal correspondence between an individual's ranking (of his own role) with the average rankings of the leaders (of their roles), and this we have

* This portion of the analysis was carried out by Robert H. Orr (1973).

termed "marginality." At the other extreme, a high correlation of rankings would indicate commonality of role perceptions and thus an absence of marginality.

Our analysis was designed to determine whether marginality to community leadership (or cleavage between leaders and followers) would in a general sense influence attitudes on pollution issues. In very broad terms, we wanted to determine to what extent "grass roots" attitudes and "leadership" attitudes were at variance with one another. Simply looking at mean differences in attitude scores is, of course, the most direct way to address this question. Mean differences show the leaders to be in fact more opposed to pollution and more favorable to possible solutions than the average community respondent (Orr, 1973:96). The mean differences are not great but clearly suggest that community leaders, in the aggregate, are also leading in anti-pollution efforts. Analysis of the effect of the "marginality" variable largely confirms this finding but also indicates that there are some inconsistencies on specific attitudes.

Table 14 shows the results of a correlation analysis of the two "marginality" measures and three of the pollution attitude measures. Marginality to community leadership has a nonsignificant and negative effect on attitude toward a local anti-pollution bond referendum. At the least this does not indicate grass roots support for a referendum in opposition to the leadership. However, one marginality measure (based on dependence ratings) shows a negative but very low relationship with the water pollution attitude score (see Table 14), and the other marginality measure is significantly and positively correlated with attitude toward water pollution. Respondents who are most marginal to

Table 14. Zero-order and multiple correlation coefficients describing relationships between two measures of marginality to community leadership and three pollution attitude measures, Momence community sample.

Marginality to Leadership:	Favorable attitude toward: Local referendum	Water pollution	Federal funding
a. Measure based on dependence rankings	r = -.07	r = -.03	r = -.21 (p = .01)
b. Measure based on lack of predictability rankings	r = -.06	r = .17 (p = .05)	r = -.20 (p = .01)
	R = .08	R = .17 (p = .05)	R = .25 (p = .001)

the community leadership are also most tolerant of water pollution. This finding does not support the inference from analysis of the communication variables. We are of course here dealing with a broader sample of community leaders (not just Mayor and Aldermen) thus the comparison is lacking in precision. Clearly, however, these data indicate that respondents who view their roles in terms similar to those of leaders are more likely to take an anti-pollution stance. The last column in Table 14 also shows results consistent with this conclusion, and in this case the coefficients are statistically significant. Those who are marginal with respect to the community leadership are most likely to oppose Federal funding for pollution control purposes. In general we infer that community leaders, as defined, are also leading in anti-pollution matters and thus the dissemination of information via the leadership should not be particularly problematic.

Analysis of Data from the High School Sample*

To this point we have made no mention of the data from the high school sample. In part this is because these data were obtained to serve a subsidiary purpose. Given that we had restricted our study to a single community, we decided that we could afford to do a somewhat more intensive study in that community. The sub-study of high school students is part of that effort to do a more intensive study. In addition, however, analysis of these data led to a different theoretical perspective, or at least the possibility of a different theoretical perspective for the study of information distortion (on public issues). This development led, in turn, to the gathering of some additional data (Bluhm, 1974), under

* The data reported here were analyzed by Louis H. Bluhm (1973, 1974).

separate auspices, and a very partial test of that revised theoretical perspective. In a sense then, the high school data are reported last because they suggest a different approach to the whole problem area.

The experiment and its results: Our initial purpose in contacting high school students was to run an experiment in persuasion on pollution issues, or, more precisely, to determine some of the factors that might contribute to attitude change as the result of an attempt at persuasion. Toward that end we made a bench-mark survey, divided the sample into experimental and control groups, subjected the experimental group to a persuasive speech, and then did a second survey to assess the results.

In the bench-mark survey we obtained almost precisely the same information from the senior class of the Momence High School (N = 93) as from the community sample (see Appendix A). The several composite measures were validated separately for the high school sample, using the same procedures already described for the community sample. Then, again using procedures already described for the community sample, students' individual rankings of their perceptions of their roles (with regard to dependence, lack of predictability, and threat) were used to divide the sample into eight sub-types (low versus high dependence, and so on). Finally, half of the students in each of the sub-types were randomly selected to represent the "treatment" group, and the other half were used as controls. The net effect of this procedure was to permit us to assess students' perceptions of themselves with respect to dependence, predictability, and threat, as factors in attitude change.

The experimental group was then exposed to a talk by the president of the Momence Junior Chamber of Commerce on local pollution problems.

The speech stressed local initiative in dealing with pollution problems (see Bluhm, 1973:186-191). Several weeks after the speech the attitudes toward pollution issues of the entire class were again assessed. Seventy-eight students responded to the follow-up survey and thus the analysis of treatment effects is based on 78 cases (half in the experimental group, half control).

In brief, the results of the analysis of treatment effects showed that the speech had a significant effect, shifting student attitudes in the direction of being against government intervention in solving pollution problems. Of greater interest, however, is the fact that only certain types of students were swayed by the message. Students who regarded themselves as high in predictability and high in dependence tended to accept the message. Perceptions regarding threat had significant interactive effects with the perceptions of dependence. In very broad terms, what these results suggest is that respondents who view themselves as dependent, in a highly ordered and predictable social context, are most easily swayed by a persuasive message (of the kind to which they were exposed). And even more broadly, the results suggest that some very basic "attitudes," in this case peoples' perceptions of their roles relative to the roles of others, may profitably be analyzed to explain attitudinal positions and attitude change of a more transitory nature.

The point of interest in the above discussion is the possibility of shifting away from a "distortion in the process of transmission and retransmission" metaphor, which proved to be less than completely illuminating in our analysis of what is admittedly a very complex information dissemination situation in a real-world context. We thought that it might

be possible to gain a better insight into behavior, with regard to information reception and the effects of such reception, by examining the effects of quite basic attitudes, or "world views." Hopefully, this shift in our view of the research problem will become more clear when we present some further data in the next sub-section. For the present, however, we must state clearly that while we regard our results as suggestive the findings to date do not permit other than very tentative inferences.

Additional data:* It was possible to obtain two additional sets of data as a result of a rather fortuitous set of circumstances. Shortly after the Momence data were obtained, one of the research assistants, Louis H. Bluhm, left for a year's research in southern Brazil. While there he was able to obtain limited comparative data on two Brazilian samples: a sample of small-town high school students (N = 91), and a sample of operators of small farms (N = 64) from the immediate environs of the same small town.

The design of the small, comparative study, described below, focusses exclusively on respondents' rankings of dependence-independence. Data gathering and measurement procedures were identical for the Momence and Brazilian samples, though not all of the measures were replicated for the latter samples. The samples themselves, however, could be ranked with respect to objective dependence-independence, to permit us to gain insight into possible relationships between objective and subjective rankings. Specifically, we argued that small, peasant farmers can be viewed as relatively self-sufficient and therefore objectively independent. High school students, on the other hand, are legally and socially dependent

* The data reported here were both gathered and analyzed by Louis H. Bluhm (see especially, Bluhm, 1974), with financial support from the Midwestern Universities Consortium for International Activities (MUCIA).

(on their parents and others) in objective terms. And the Momence community sample, which represents the entire array of roles to be found in a community, could, when respondents' scores were averaged, be regarded as representing a point roughly midway between the two extremes of objective dependence and independence.

If we can argue that peasant farmers, average small-town residents, and high school students represent three points on a continuum from objective independence to objective dependence, then we can examine subjective rankings of respondents within those samples (their rankings of themselves as dependent-independent) to assess the correspondence between objective and subjective rankings. The hypothesis involved here is that objective and subjective rankings will be negatively related (and as we hope to show, below, this may have more than a little bearing on positions on public issues and communication about those issues).

The reasoning behind our hypothesis is, briefly, as follows. Peasant farmers, though relatively self-sufficient and therefore independent of the actions of others, are also imbued with an ideology of mutual aid, providing food for the stranger, and so on, an ideology which emphasizes inter-dependence, or a lack of independence. On the other extreme, a person in a highly industrialized, complex modern society, typically plays a highly specialized role, or set of roles, and is therefore by no means self-sufficient. On the contrary, a person in a modern society is by definition a specialist, and therefore objectively dependent on others for various goods and services. Yet the ideology of most modern societies highlights personal mobility, self-advancement, freedom from group ties, or, in other words, independence. This suggests the possibility that social structures give rise to ideologies which contrast with (and

possibly compensate for) the objective social situation. And if this is the case our objectively independent sample, the peasant farmers, should rank themselves as relatively dependent, and the high school data should show the opposite pattern.

The data presented in Table 15 support our expectations. Brazilian peasant farmers see themselves as highly dependent (though the more general category "farmer" is ranked higher). Both samples of high school students, objectively dependent, rank themselves high in independence. And the average for the Momence community sample is to rank "yourself" in the middle. As we indicated above, these data are suggestive and no more than that. One hypothesis has been tested, in a less than definitive way, and a direct link with communication behavior remains to be established. What the data show is that different social structures may give rise to contrasting ideologies. And our interest is aroused by the possible implications for communication strategies.

Pollution problems are largely public problems. Solutions to pollution problems often hinge on corporate decisions of one kind or another. An ideology of individualism is not likely to provide a fertile ground for corporate problem solution, and this may help to account for the popularity of "self-help" pollution-solutions in our own society. One implication is that proposed solutions may have to be tailored to offset the effects of an individualistic ideology. Trite as that may sound, the fact is that the relationship between social structure and ideology has yet to be definitively explored, and the implications for public decision-making, also unexplored, may be quite substantial. In any case, we currently regard a less direct approach to distortion of information, especially

Table 15. Subjective independence for samples having different objective independence characteristics.

1
Brazilian Peasant Farmers
(N - 64)
High objective independence

Rank	Role
1	High school student
2	White collar
3	Housewife
4	Lawyer
5	Farmer
6	Worker
7	Community leader
8	Businessman
9	Yourself
10	Working mother

2
Brazilian High School Student
(N - 91)
Low objective independence

Rank	Role
1	High school student
2	Yourself
3	Housewife
4	Farmer
5	White collar
6	Worker
7	Community leader
8	Businessman
9	Working mother
10	Lawyer

3
Momence High School Student
(N - 78)
Low objective independence

Rank	Role
1	Professional
2	High school student
3	Yourself
4	Businessman
5	White collar
6	Blue collar
7	Working mother
8	Housewife
9	Community leader

4
Momence Community Sample
(Cross section of roles)
(N - 227)
High to low objective independence

Rank	Role
1	Professional
2	Businessman
3	White collar
4	Community leader
5	Yourself
6	Housewife
7	Blue collar
8	High school student
9	Working mother

information involving public decisions, as potentially fruitful. We draw attention, in particular, to the implications of social structure, and basic attitudes (or world views) as possible determinants of positions on public issues and as factors in communication behavior. We are suggesting that it may be appropriate to shift to a more fundamentally sociological model, taking a person's position in a social structure into explicit account, and then focus on factors which may contribute to differential receptivity to given kinds of information. Returning to our original (electronic) metaphor, that means that research effort would shift from inter-system linkages to the setting and functioning of system components.

IV. General Summary

Only a very brief summary will be presented here. Since each portion of the analysis was separately summarized, no useful purpose would be served by repeating that detail here. The major themes which were derived from each portion of the analysis will be briefly restated here, however, in an effort to tie the several sections together more succinctly.

This study was designed to determine whether information on a major public issue could be traced through the complex communication network of an actual community, in order to assess the possibility that such information is partially lost and/or distorted in the process of sequential transmissions. Interest in such a topic stems from the very practical fact that pollution concerns, and other problems in the public sector, are brought to peoples' attention, concern is aroused, solutions are proposed, and yet in many instances it is difficult if not impossible to gain the degree of consensus needed for problem solution.

The first phase of our analysis showed fairly clearly that our theoretical model, based largely on laboratory studies of rumor processes, did not provide substantial insight into information dissemination processes in the study community. Though that community had an acute water pollution problem, our analysis of type and amount of contact for information on the problem showed only very modest and not entirely consistent relationships between such contact and peoples' positions on the issue. Perhaps the issue was not sufficiently critical for the kinds of crystallized communication patterns which we had hoped to analyze to have emerged. Or, perhaps our approach was too simplistic for analysis of communication in a complex social network. We are inclined toward the latter view.

The second phase of our analysis suggested that different kinds of information contact did apparently have a cumulative effect in arousing public awareness of pollution problems. These results were consistent with our theoretical expectations in that, for example, contact with official information sources clearly contributed to peoples' definition of pollution problems as serious or very serious. These results were suggestive for at least the first phases of information campaigns, creating public awareness that a problem exists. Moving beyond that, however, to some degree of consensus on problem solution, is probably a more complex kind of process.

In the third portion of our analysis we analyzed some of our data on peoples' perceptions of their roles, relative to the roles of others, to get more insight into factors related to consensus on issues and ultimate action on those issues. These results are suggestive but hardly more than that since the original study was not designed to dig very deeply into this area. The data do suggest, however, that respondents who view themselves as dependent and lacking in ability to control circumstances may well not oppose initiatives suggested by others in order to protect their own interests, but simply withdraw from the political process.

Then, in the fourth phase of the analysis we again looked at data on role perceptions, this time in terms of correspondence or lack of correspondence between the role perceptions of "ordinary" citizens and the perceptions of community leaders. Here, again, the results are suggestive only, but they again confirm our belief that achieving consensus on public issues is possible in the conventional manner, via

initiatives taken by people in recognized leadership positions. Specifically, the analysis showed that lay respondents who were least marginal to the community leadership also had attitudes similar to the leadership, in this case taking an anti-pollution stance. This tends to rule out the possibility, at least for the study community, that a major cleavage between citizenry and leadership would result in opposition or inaction with respect to problem solution.

Finally, in the fifth and last phase of the analysis, we again examined the role perception data, in this case from the perspective of some additional, comparative materials. Very briefly, this phase of the analysis indicated a negative relationship between objective role definitions and subjective perceptions of those roles. People who are objectively most dependent, view themselves as least dependent. And conversely, people who are objectively independent tend to view themselves as dependent on others. While these data do not have explicit implications for the kind of information distortion model we started with, they do have substantial implications for communication strategy in dealing with public issues. The data provide a fundamental insight into the common-sense observation that our individualistically oriented society does not provide a fertile ground for corporate problem solution. The individualistic ideology may well be a reaction to the structural fact of maximal inter-dependence in modern society. While the implications of this suggestive finding for ultimate solution of pollution problems are not clear at this writing, we are inclined to think that further research at this more basic level would be profitable if we are to gain greater efficiency in solving public problems. Appeals to the idealism of young people, for example,

are not indicated by these findings, since young people seem to subscribe maximally to an individualistic ideology. Such speculation is premature, but it does seem to indicate a direction for future research on information dissemination with regard to pollution and other public issues.

V. Dissertations and Reports Resulting from Project

Bluhm, Louis H., Some Pollution-related Attitudes of High School Youth in the United States and Brazil. Unpublished Ph.D. dissertation, University of Illinois, Urbana, 1973.

Bluhm, Louis H., "Some Conceptual Implications of Subjective and Objective Independence: Data from U.S. and Brazil," paper to be presented at the annual meeting of the American Sociological Association, Montreal, Canada, August, 1974.

Kivlin, J. E., Frederick C. Fliegel, and Navin Sharma, "Prospects for Pollution Control Campaigns," unpublished paper, University of Illinois, Urbana, 1973.

Orr, Robert H., Community Alienation and Pollution Control. Unpublished Ph.D. dissertation, University of Illinois, Urbana, 1973.

Orr, Robert H., "The Additive and Interactive Effects of Powerlessness and Anomie in Predicting Opposition to Pollution Control," paper presented at the annual meeting of the Rural Sociological Society, College Park, Maryland, August, 1973.

Sharma, Navin C., Joseph E. Kivlin, and Frederick C. Fliegel, "Environmental Pollution: Is There Enough Public Concern to Lead to Action?," unpublished paper, University of Illinois, Urbana, 1972.

REFERENCES

Bluhm, Louis H., Some Pollution-Related Attitudes of High School Youth in the United States and Brazil. Unpublished Ph.D. dissertation, University of Illinois, Urbana, 1973.

Bluhm, Louis H., "Some Conceptual Implications of Subjective and Objective Independence: Data from U.S. and Brazil," paper to be presented at the annual meeting of American Sociological Association, Montreal, Canada, August, 1974.

Buckner, H. Taylor, "A Theory of Rumor Transmission," Public Opinion Quarterly 29:54-70 (1965).

Campbell, Donald T., "Systematic Error on the Part of Human Links in Communication Systems," Information and Control 1:334-369 (1958).

Crain, Robert L., Elihu Katz, and Donald B. Rosenthal, The Politics of Community Conflict. Indianapolis: Bobbs-Merrill, 1969.

Fliegel, Frederick C., Joseph E. Kivlin, and Gurmeet S. Sekhon, "Message Distortion and Diffusion of Innovations in Northern India," Sociologia Ruralis 11:178-192 (1971).

Greenberg, Bradley S., "On Relating Attitude Change and Information Gain," Journal of Communication, 14:157-171 (1964).

Hodge, Robert W., Paul M. Siegel, and Peter H. Rossi, "Occupational Prestige in the United States, 1925-1963," American Journal of Sociology, 70:286-302 (1964).

Higham, T. M., "The Experimental Study of the Transmission of Rumor," British Journal of Psychology, 42:42-55 (1951).

Hyman, Herbert H., and Paul B. Sheatsley, "Some Reasons why Information Campaigns Fail," Public Opinion Quarterly, 11:413-423 (1947).

Katz, Elihu, and Paul F. Lazarsfeld, Personal Influence. Glencoe, Illinois: Free Press, 1955.

Mehrabian, Albert, and Henry Reed, "Some Determinants of Communication Accuracy," Psychological Bulletin, 70:365-381 (1968).

Morrison, D. E., K. E. Hornback, and W. K. Warner, "The Environmental Movement: Some Preliminary Observations and Predictions," pp. 259-279 in W. R. Burch, N. H. Cheek, Jr., and L. Taylor, Social Behavior, Natural Resources, and the Environment. New York: Harper and Row (1972).

Murch, A. W., "Public Concern for Environmental Pollution," Public Opinion Quarterly, 35:100-106 (1971).

Orr, Robert H., Community Alienation and Pollution Control. Unpublished Ph.D. dissertation, University of Illinois, Urbana, 1973.

Orr, Robert H., "The Additive and Interactive Effects of Powerlessness and Anomie in Predicting Opposition to Pollution Control," paper presented at the annual meeting of the Rural Sociological Society, College Park, Maryland, August, 1973.

Osgood, C. E., G. Succi, and P. Tannenbaum, The Measurement of Meaning. Urbana, Illinois: University of Illinois Press, 1957.

Robinson, John P., Jerrold G. Rush, and Kendra B. Head, Measures of Political Attitudes. Ann Arbor, Michigan: Institute for Social Research, University of Michigan, 1969.

Rogers, Everett M., with F. Floyd Shoemaker, Communication of Innovations: A Cross-Cultural Approach. New York: Free Press, 1971.

van den Ban, A. W., "A Revision of the Two-Step Flow of Communication Hypothesis," pp. 263-274 in Lee Richardson (Ed.), Dimensions of Communication. New York: Appleton-Century-Crofts, 1969.

APPENDIX A

We would like you to help us do a scientific study of attitudes toward pollution issues. Please be frank and honest as you fill out the answers to the questions. Your answers are completely confidential. No one will see them except scientists at the University of Illinois. The interviewer is present only to explain instructions and answer your questions about the meaning of items on the questionnaire. You will fill the questionnaire out yourself. When you have finished, please put the questionnaire in the accompanying brown envelope and seal it.

THANK YOU!

Interviewer_____ Date_____

1. Code_____

2. Age_____

3. Sex:
   _____Male
   _____Female

4. Marital Status: Check one
   _____Single
   _____Married
   _____Divorced
   _____Widowed

5. Address_____

6. Occupation (be specific)_____

7. Name of company for which you work_____

8. Spouse's occupation (be specific)_____

9. Name of company for which s(he) works_____

10. How many children do you have living at home?_____

11. What is the highest year of school you have completed?_____

12. What is the highest year of school your spouse has completed?_____

13. How many years have you lived in Momence?_____

14. Which of the following areas do you personally feel is the most severe pollution problem in Momence? CHOOSE ONE

   _____Air
   _____Sewage
   _____City Water Supply
   _____Noise
   _____Garbage
   _____Fertilizer and Pesticides
   _____Recreation Areas Spoiled
   _____Other (Please specify)_____

15. How much do you personally feel that industry contributes to the pollution problem in Momence?

_____none
_____a little
_____a fair amount
_____a considerable amount
_____a great deal

16. Name the industry which you feel is the worst offender in Momence, if there is one.

_____

17. How much does this town benefit from having the industry you just named located here?

_____none
_____a little
_____a fair amount
_____a considerable amount
_____a great deal
_____nonapplicable

18. How serious do you personally feel pollution problems are in this community?

_____no problem
_____somewhat of a problem
_____a serious problem
_____a very serious problem

19. In your judgment, how serious do the majority of the <u>other</u> people in Momence consider pollution problems are?

_____no problem
_____somewhat of a problem
_____a serious problem
_____a very serious problem

20. How do you personally feel toward proposals for change (any kind)?

_____very favorable
_____favorable
_____indifferent
_____unfavorable
_____very unfavorable

21. In your judgment, how do the majority of the <u>other</u> people in Momence usually feel toward proposals for change?

_____very favorable
_____favorable
_____indifferent
_____unfavorable
_____very unfavorable

22. How do you personally feel toward pollution control?

_____very favorable
_____favorable
_____indifferent
_____unfavorable
_____very unfavorable

23. In your judgment, how do the majority of the <u>other</u> people in Momence feel toward pollution control?

_____very favorable
_____favorable
_____indifferent
_____unfavorable
_____very unfavorable

24. If one particular industry were found to be the major cause of pollution in Momence, what do you personally think would be the best <u>one</u> of these solutions?

_____force the industry to leave town.
_____have the city provide facilities at the taxpayers' expense.
_____give government at all levels more power to enforce standards with fines and jail sentences.
_____negotiate an agreement between the industry and the community.

25. If you personally had to decide to either allow the present level of pollution in this community or to close down a polluting industry, which would you favor?

_____closing the industry.

_____allowing current levels of pollution.

26. In your judgment, which would the majority of the other people in Momence be in favor of?

_____closing the industry.

_____allowing current levels of pollution.

27. If a polluting industry were to be closed, it would mean a loss of jobs for some people.

How much loss of employment would you accept in order to solve a pollution problem?

_____ 300 jobs
_____ 250 "
_____ 200 "
_____ 150 "
_____ 100 "
_____ 50 "
_____ None

28. In your judgment, how much loss of employment would the majority of the other people in Momence accept in order to solve a local pollution problem?

_____ 300 jobs
_____ 250 "
_____ 200 "
_____ 150 "
_____ 100 "
_____ 50 "
_____ None

29. If this community decided to use tax money to build new facilities to solve an industrial pollution problem, how much tax money do you personally think should be spent to keep the polluting industry in the community?

_____ None
_____ $ 250,000
_____ 500,000
_____ 750,000
_____ 1,000,000
_____ 1,250,000
_____ 1,500,000
_____ 1,750,000
_____ 2,000,000

30. In your judgment, how much tax money would the majority of the <u>other</u> people in Momence be willing to spend to keep the industry in town?

_____ None
_____ $ 250,000
_____ 500,000
_____ 750,000
_____ 1,000,000
_____ 1,250,000
_____ 1,500,000
_____ 1,750,000
_____ 2,000,000

AS YOU MAY KNOW, THE STATE OF ILLINOIS IS REQUIRING MOMENCE TO UPGRADE ITS SEWAGE TREATMENT FACILITY.

31. How much do you think the addition to the Momence sewage treatment plant would cost?

_____ None
_____ $ 250,000
_____ 500,000
_____ 750,000
_____ 1,000,000
_____ 1,250,000
_____ 1,500,000
_____ 1,750,000
_____ 2,000,000

32. How much of the total cost of the sewage treatment addition do you think that taxpayers in Momence would have to pay?

_____ None
_____ $ 250,000
_____ 500,000
_____ 750,000
_____ 1,000,000
_____ 1,250,000
_____ 1,500,000
_____ 1,750,000
_____ 2,000,000

33. Which industry in Momence presently pays the most money per year for use of the sewage treatment plant?

_____ Carter-Wallace (drugs)
_____ Strongheart (dog food factory)
_____ Crystal Dairy
_____ Baker and Taylor
_____ Momence Pork Packers (Agar)

34. How much money do you think that this company has paid to the city this past year (1970) for use of these facilities?

_____ $10,000	_____ $60,000
_____ 20,000	_____ 70,000
_____ 30,000	_____ 80,000
_____ 40,000	_____ 90,000
_____ 50,000	

35. How much have you heard about Momence pollution problems on the radio?

_____ none
_____ little
_____ a fair amount
_____ much

36. How much have you read about Momence pollution problems in the Momence Progress Reporter?

_____ none
_____ little
_____ a fair amount
_____ much

37. Have you ever attended any meetings at which Momence pollution problems were discussed as part of the program?

_____ Yes
_____ No

38. How often do you talk to the mayor and aldermen of Momence?

_____ none
_____ little
_____ a fair amount
_____ often

39. How much do you talk to the mayor and aldermen about pollution problems?

_____ none
_____ little
_____ a fair amount
_____ much

40. How much have you discussed Momence pollution problems with your spouse?

_____ none
_____ little
_____ a fair amount
_____ much
_____ nonapplicable

41. How much have you discussed Momence pollution problems with your children?

_____ none
_____ little
_____ a fair amount
_____ much
_____ nonapplicable

42. Outside of your immediate family, how much have you heard about Momence pollution problems from friends, acquaintances, or relatives?

_____ none
_____ little
_____ a fair amount
_____ much

43. From which source do you personally gain the most information in shaping your own opinion on <u>local</u> issues such as pollution?

<u>CHOOSE ONE</u>

_____ radio
_____ newspaper
_____ town leaders
_____ public meetings
_____ friends and acquaintances
_____ spouse
_____ children
_____ other (specify) _____

44. Which of these sources would you say is the most reliable for issues such as pollution?

CHOOSE ONE

_____ radio
_____ newspaper
_____ town leaders
_____ public meetings
_____ friends and acquaintances
_____ spouse
_____ children
_____ other (specify) _____

This section of the questionnaire requires that you make many specific decisions. It is natural for you to feel some anxiety because some of the items are very similar to one another. We would like for you to make your choices rapidly without thinking about any particular item too much.

Following is a description of a type of person. Please read carefully.

This type of person is in a threatened position. Forces in the world threaten his way of life and his personal safety. For this type of person, the world is a hard and dangerous place in which his interests are often harmed.

Choose one type of person in each pair below which, in general, is MOST LIKE the type of person described above. Even if it is hard to choose, you MUST PICK ONE IN EACH PAIR. There is no right or wrong answer. We want to know how you personally feel. None of the pairs is repeated. Work as rapidly as you can.

housewife___or___professional

yourself___or___professional

high school student___or___blue collar worker

businessman___or___housewife

community leader___or___blue collar worker

working mother___or___housewife

yourself___or___community leader

white collar worker (clerical)___or___housewife

yourself___or___high school student

community leader___or___white collar worker (clerical)

blue collar worker ___or___white collar worker (clerical)

working mother___or___businessman

housewife___or___community leader

professional___or___blue collar worker

high school student___or___businessman

professional___or___working mother

blue collar worker___or___housewife

high school student___or___community leader

housewife___or___yourself

businessman___or___community leader

yourself___or___blue collar worker

high school student___or___housewife

working mother___or___white collar worker (clerical)

professional___or___businessman

working mother___or___yourself

blue collar worker___or___working mother

high school student___or___professional

white collar worker (clerical)___or___businessman

professional___or___community leader

white collar worker (clerical)___or___high school student

yourself___or___white collar worker (clerical)

working mother___or___community leader

businessman___or___blue collar worker

high school student___or___working mother

professional___or___white collar worker (clerical)

businessman___or___yourself

Following is a description of a type of person. Please read carefully.

This type of person lives in a situation that is very predictable. He knows pretty much what the future will bring, whether it be good OR bad. He knows what to expect from others and they know what to expect from him. Unexpected circumstances seldom change his life.

Choose one type of person in each pair below which, in general, is MOST LIKE the type of person described above. Even if it is hard to choose, you MUST PICK ONE IN EACH PAIR. There is no right or wrong answer. We want to know how you personally feel. None of the pairs is repeated. Work as rapidly as you can.

working mother___or___white collar worker (clerical)

professional___or___businessman

working mother___or___yourself

blue collar worker___or___working mother

high school student___or___professional

white collar worker (clerical)___or___businessman

professional___or___community leader

white collar worker (clerical)___or___high school student

yourself___or___white collar worker (clerical)

working mother___or___community leader

businessman___or___blue collar worker

high school student___or___working mother

professional___or___white collar worker (clerical)

businessman___or___yourself

housewife___or___professional

yourself___or___professional

high school student___or___blue collar worker

businessman___or___housewife

community leader___or___blue collar worker

working mother___or___housewife

yourself___or___community leader

white collar worker (clerical)___or___housewife

yourself___or___high school student

community leader___or___white collar worker (clerical)

blue collar worker___or___white collar worker (clerical)

working mother___or___businessman

housewife___or___community leader

professional___or___blue collar worker

high school student___or___businessman

professional___or___working mother

blue collar worker___or___housewife

high school student___or___community leader

housewife___or___yourself

businessman___or___community leader

yourself___or___blue collar worker

high school student___or___housewife

Following is a description of a type of person. Please read carefully.

This type of person is very independent--socially and economically. He has few commitments and obligations. He seldom gets himself in so deep that he loses his power of choice.

Choose one type of person in each pair below which, in general, is MOST LIKE the type of person described above. Even if it is hard to choose, you MUST PICK ONE IN EACH PAIR. There is no right or wrong answer. We want to know how you personally feel. None of the pairs is repeated. Work as rapidly as you can.

professional___or___working mother

blue collar worker___or___housewife

high school student___or___community leader

housewife___or___yourself

businessman___or___community leader

yourself___or___blue collar worker

high school student___or___housewife

housewife___or___professional

yourself___or___professional

high school student___or___blue collar worker

businessman___or___housewife

community leader___or___blue collar worker

working mother___or___housewife

yourself___or___community leader

white collar worker (clerical)___or__housewife

yourself__or__high school student

community leader___or__white collar worker (clerical)

blue collar worker___or__white collar worker (clerical)

working mother___or__businessman

housewife___or__community leader

professional___or__blue collar worker

high school student___or__businessman

working mother___or__white collar worker (clerical)

professional___or__businessman

working mother___or__yourself

blue collar worker___or__working mother

high school student___or__professional

white collar worker (clerical)___or__businessman

professional___or__community leader

white collar worker (clerical)___or__high school student

yourself__or__white collar worker (clerical)

working mother___or__community leader

businessman___or__blue collar worker

high school student___or__working mother

professional___or__white collar worker (clerical)

businessman___or__yourself

Read each statement and place a check mark in the column which is closest to how YOU PERSONALLY FEEL, NOT how you think you SHOULD FEEL.

	Agree very much	Agree some-what	Agree a little	Disagree a little	Disagree some-what	Disagree very much
People who are against churches and religions should not be allowed to teach in college.	____	____	____	____	____	____
Rich persons should be taxed heavily over and above income taxes.	____	____	____	____	____	____
Everyone would be better off if scientists took no part in politics.	____	____	____	____	____	____
People should be quicker to throw out old ideas and to adopt new ones.	____	____	____	____	____	____
To make sure that all people get proper care, medicine should be removed from the control of private doctors.	____	____	____	____	____	____
The most important thing in any society is the protection of private property.	____	____	____	____	____	____
The well-being of a nation depends mainly on its industry and business.	____	____	____	____	____	____
There are too many professors in our colleges who are radical in their social and political beliefs.	____	____	____	____	____	____
The United Nations should be wholeheartedly supported by all of us.	____	____	____	____	____	____
We do not have true democracy in the U.S.	____	____	____	____	____	____
Business and industry are given too many special privileges.	____	____	____	____	____	____

Read the following statements and indicate how strongly you agree or disagree by checking a blank on the answer line.

	Agree very much	Agree some-what	Agree a little	Disagree a little	Disagree some-what	Disagree very much
Needed changes are taking place.	____	____	____	____	____	____
Things look pretty grim for me right now.	____	____	____	____	____	____
In general, things are improving.	____	____	____	____	____	____
A person always knows what to expect in this community.	____	____	____	____	____	____
People are pretty predictable.	____	____	____	____	____	____
Our government is working against my interests.	____	____	____	____	____	____
Change is well planned here.	____	____	____	____	____	____
A person should store up food in case of an emergency.	____	____	____	____	____	____
The radical conspiracy in this country is dangerous.	____	____	____	____	____	____
A person can plan for the future.	____	____	____	____	____	____
A person doesn't know who he can trust these days.	____	____	____	____	____	____
Recently, things have become so tense that big war looks inevitable.	____	____	____	____	____	____
If things keep on, our country will fall apart.	____	____	____	____	____	____
A person really can't predict what's going to happen in the economy.	____	____	____	____	____	____
Things are becoming worse and worse.	____	____	____	____	____	____

One of the purposes of this study is to measure the meanings of certain things to various people by asking them to judge these things against a series of scales. Please make your judgments on the basis of what these things mean to you. On each of the following pages you will find a different thing to be judged and beneath it a set of scales. Suppose the thing to be judged is "GRAND CANYON."

If you feel that "GRAND CANYON" is very closely related to one end of the scale, you should place your check mark as follows:

weak ___X___:_____:_____:_____:_____:_____:_____: strong

or

weak _____:_____:_____:_____:_____:_____:___X___: strong

If you feel that "GRAND CANYON" is quite closely related to one or the other end of the scale (but not extremely), you should place your check mark as follows:

ugly _____:___X___:_____:_____:_____:_____:_____: beautiful

or

ugly _____:_____:_____:_____:_____:___X___:_____: beautiful

If "GRAND CANYON" seems only slightly related to one side as opposed to the other side (but is not really neutral), then you should check as follows:

easy _____:_____:___X___:_____:_____:_____:_____: difficult

or

easy _____:_____:_____:_____:___X___:_____:_____: difficult

The direction toward which you check depends upon which of the two ends of the scale seem most like the thing you are judging. If you feel that the thing is neutral on the scale, with both sides of the scale equally related to the thing, or if the scale is not related at all (irrelevant), then you should place your check mark in the middle space, as follows:

certain_____:_____:_____:___X___:_____:_____:_____: uncertain

IMPORTANT: Place your check marks in the middle of spaces, not on the edges

not this

this X

_____:_____:_____:___X___:_____:_____:_____:

Please do not look back and forth through the items. Do not try to remember how you checked similar items earlier. Make each item a separate and independent judgment. Work at fairly high speed, do not worry or puzzle over individual items. It is your first impressions, the immediate feelings about the items, that we want. On the other hand, please do not be careless, because we want your true impressions.

WATER POLLUTION

complex ___:___:___:___:___:___:___ simple

liberal ___:___:___:___:___:___:___ conservative

weak ___:___:___:___:___:___:___ strong

scientific ___:___:___:___:___:___:___ unscientific

active ___:___:___:___:___:___:___ passive

urban ___:___:___:___:___:___:___ rural

personal ___:___:___:___:___:___:___ impersonal

fair ___:___:___:___:___:___:___ unfair

unpredictable ___:___:___:___:___:___:___ predictable

small ___:___:___:___:___:___:___ large

bad ___:___:___:___:___:___:___ good

reassuring ___:___:___:___:___:___:___ threatening

unimportant ___:___:___:___:___:___:___ important

dependent ___:___:___:___:___:___:___ independent

safe ___:___:___:___:___:___:___ risky

AIR POLLUTION

small ___:___:___:___:___:___:___ large

simple ___:___:___:___:___:___:___ complex

bad ___:___:___:___:___:___:___ good

strong ___:___:___:___:___:___:___ weak

independent ___:___:___:___:___:___:___ dependent

unpredictable ___:___:___:___:___:___:___ predictable

threatening ___:___:___:___:___:___:___ reassuring

risky ___:___:___:___:___:___:___ safe

unscientific ___:___:___:___:___:___:___ scientific

urban ___:___:___:___:___:___:___ rural

liberal ___:___:___:___:___:___:___ conservative

active ___:___:___:___:___:___:___ passive

impersonal ___:___:___:___:___:___:___ personal

unimportant ___:___:___:___:___:___:___ important

unfair ___:___:___:___:___:___:___ fair

SEWAGE TREATMENT

active ___:___:___:___:___:___:___ passive

impersonal ___:___:___:___:___:___:___ personal

important ___:___:___:___:___:___:___ unimportant

unfair ___:___:___:___:___:___:___ fair

weak ___:___:___:___:___:___:___ strong

reassuring ___:___:___:___:___:___:___ threatening

small ___:___:___:___:___:___:___ large

predictable ___:___:___:___:___:___:___ unpredictable

dependent ___:___:___:___:___:___:___ independent

risky ___:___:___:___:___:___:___ safe

scientific ___:___:___:___:___:___:___ unscientific

urban ___:___:___:___:___:___:___ rural

conservative ___:___:___:___:___:___:___ liberal

simple ___:___:___:___:___:___:___ complex

bad ___:___:___:___:___:___:___ good

FEDERAL FUNDING FOR LOCAL ANTI-POLLUTION PROGRAMS

rural	___:___:___:___:___:___:___	urban
simple	___:___:___:___:___:___:___	complex
fair	___:___:___:___:___:___:___	unfair
unscientific	___:___:___:___:___:___:___	scientific
important	___:___:___:___:___:___:___	unimportant
risky	___:___:___:___:___:___:___	safe
good	___:___:___:___:___:___:___	bad
weak	___:___:___:___:___:___:___	strong
independent	___:___:___:___:___:___:___	dependent
threatening	___:___:___:___:___:___:___	reassuring
predictable	___:___:___:___:___:___:___	unpredictable
passive	___:___:___:___:___:___:___	active
conservative	___:___:___:___:___:___:___	liberal
small	___:___:___:___:___:___:___	large
impersonal	___:___:___:___:___:___:___	personal

A LOCAL ANTI-POLLUTION BOND REFERENDUM

liberal ___:___:___:___:___:___:___ conservative

safe ___:___:___:___:___:___:___ risky

good ___:___:___:___:___:___:___ bad

personal ___:___:___:___:___:___:___ impersonal

reassuring ___:___:___:___:___:___:___ threatening

dependent ___:___:___:___:___:___:___ independent

strong ___:___:___:___:___:___:___ weak

unfair ___:___:___:___:___:___:___ fair

unpredictable ___:___:___:___:___:___:___ predictable

unimportant ___:___:___:___:___:___:___ important

unscientific ___:___:___:___:___:___:___ scientific

urban ___:___:___:___:___:___:___ rural

simple ___:___:___:___:___:___:___ complex

small ___:___:___:___:___:___:___ large

active ___:___:___:___:___:___:___ passive

45. Which category comes nearest to your yearly total family income, before taxes?

_____ $ 2,500
_____ 5,000
_____ 7,500
_____ 10,000
_____ 12,500
_____ 15,000
_____ over 15,000

46. Are you a registered voter?

_____ Yes
_____ No

47. To what party do you belong? _____

48. Did you vote in the November, 1970 national election?

_____ Yes
_____ No

49. Did you vote in the April, 1971 Momence alderman election?

_____Yes
_____No

50. Did you vote on the last school bond referendum?

_____ Yes
_____ No

THANK YOU!!