TWO-WAY CABLE TELEVISION AND CITIZEN PARTICIPATION:
POSSIBLE MECHANISMS OF MANIPULATION

by

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ABSTRACT

The purpose of this thesis is to analyze possible consequences of utilizing two-way cable television technology as a means of increasing citizen participation in government. Specifically, effects on the political process are investigated in terms of the problem of audience manipulation. After an examination of the technical configurations likely to be employed in large-scale cable participation systems, the results of a series of laboratory simulations are presented. These simulations point out several of the characteristics of cable systems that may eventually serve as a basis for manipulatory effects. Three specific mechanisms by which such effects may be generated are evaluated by comparing the results of the simulations to relevant material from the existing social-psychological literature. It is concluded that the three mechanisms of 'bandwagon', 'agenda', and 'network' effects, could all become possible factors in any eventual development of manipulation problems in two-way cable participation systems. Research designed to specifically investigate the presence of such effects within the context of actual programming is recommended.

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TABLE OF CONTENTS

CHAPTER ONE: The Problem: Anticipating the Effects of New Technology............... 6

I. The General Task of Technological Forecasting........................................... 8

II. Forecasting the Effects of Cable Technology............................................. 12

III. Plan of Study................................................................. 15

CHAPTER TWO: Background: General Knowledge of Relevant Social Institutions........ 17

I. Citizen Participation in a Democracy........... 19

II. The Issue of Manipulation.................. 21

CHAPTER THREE: Observation: Simulation of Two-Way Cable Programming............. 27

I. Focusing on Probable Technology............... 27

II. Investigating Probable Characteristics of Cable Systems.......................... 35

CHAPTER FOUR: Discussion: Implications for the Issue of Manipulation.............. 65

I. Continuous Feedback: Bandwagon Effects... 65

II. Branched Patterns of Discussion: Agenda Effects................................. 74

III. The Structure of Communications: Network Effects.............................. 85

CHAPTER FIVE: Conclusions.................................................. 101

I. Suggestions for Future Research............. 103

II. Manipulation Effects and the Process of Technology Assessment................ 106
APPENDIX:  I. References................................. 111
II. Sample Questionnaire Used in Simulations.... 114
Within recent years a great deal of enthusiasm has been generated over the prospect of two-way cable television. The technology for interactive cable is currently available, and pilot systems have already been introduced. The question of how such systems are to be used, however, still remains largely unanswered. One possible application which has received particular attention is the use of cable technology as a means to increase citizen participation in governmental decision-making. When we appreciate the fact that cable technology offers the potential to involve large portions of the population, it seems apparent that the consequences of any such citizen participation programs will almost certainly have profound impacts on society.

This realization has been the source of claims concerning the great benefits to be had from the implementation of such programs as well as of ominous predictions of deeply harmful consequences for society. The problem which this thesis addresses is how to discover characteristics of the emerging technology which possibly hold some implication for eventual harmful effects. Specifically, we wish to focus upon the potential inherent in the technology for covert manipulation of the audience.
By manipulation we mean the alteration of group behavior such that outcomes other than those which would have otherwise emerged during the course of cable participation programming might occur. Such alteration of behavior may of course be conscious and intentional. However, a more likely possibility is that it may arise unintentionally as a result of systemic factors inherent in the technology of the communication process. With time, such factors might come to be exploited intuitively by those skilled in the utilization of cable technology for public participation.

It is hoped that by identifying possible problem areas, future empirical research might eventually verify the existence or nonexistence of characteristics having manipulatory potential in actual citizen participation programs conducted over two-way cable. The particular methodology employed in this analysis has been adapted for the task of predicting qualitative impacts of technology upon social systems. For this reason it is necessary to briefly examine the prior problem of technological forecasting in general.
I. The General Task of Technological Forecasting

Contemporary society has become aware of the necessity to analyze new and existing technologies in terms of possible effects upon the environments in which they are introduced. The complete social setting within which any technological innovation is implemented consists of several interrelated spheres such as the biological, economic, and political. The rapid pace of technological advance within the last few decades has provided innumerable instances of technologies developed for the purpose of solving a particular problem in one sector, only to give rise to new problems involving several sectors.

In order to analyze such problems it becomes necessary to make a distinction between the first- and second-order effects of technological change upon the physical and social environment. In the past, the evaluation of new technological developments in terms of possible social consequences was often solely concerned with the effectiveness of the technology as a solution to some immediate problem which had arisen in society. Assessment of technology on this level, however, does not extend beyond an analysis of first-order consequences. But as Raymond Bauer states, the realities of the contemporary world have forced us to the recognition of the fact that "...even if we did things that we regarded as inherently desirable, they might produce second- and third-order consequences that were undesirable, and of greater ultimate magnitude than the direct consequences of the original action."[1]
Bauer's framework for the assessment of technological development is based upon the assumption that society is sufficiently complex to insure that any action will inevitably result in some second-order effects. These effects are not necessarily bad, however; they may be desirable or undesirable. They can also be intended or unintended, anticipated or unanticipated. In view of this state of affairs, Bauer asserts that

"...the major task in control over our destiny is to make as many second-order consequences as possible intended, anticipated, and desirable; and reduce to a practical minimum those that are unintended, unanticipated, and undesirable."[1]

Methods of Anticipation

The major difficulty encountered in this task is undoubtedly the anticipation of second-order effects. Within the past few years, interest in the field of technology assessment has generated an extensive literature dealing with formal methodology for technological forecasting. Much of this material, however, deals only with the future behavior of technology itself. Typical of the predictive aids to be found is a model of the process of technological innovation developed by James Bright. In this model the growth of technological capability is described as a fundamentally exponential process.[2] Although such theoretical tools are useful for helping us to understand the nature of technological growth, they tell us little about what the eventual impacts of new technology may actually be.
This is a point which Bauer makes in his treatment of the problem of qualitative prediction. According to his analysis the "...actual anticipation of a specific future state that may follow from a given technological change is a work of imagination." The tools which we bring to bear on the problem are of two kinds. They either provide a base of factual information from which the imagination can draw, or they act as direct stimuli to the imaginative process.

In an essay appearing in 1964, Daniel Bell discusses twelve modes of prediction commonly encountered in the social sciences. Three of these techniques often serve as major sources of generalized knowledge of social institutions. The 'structural certainties' of a stable social system describe "... an order of events that are legally preserved and traditionally reinforced". They enable us to make behavioral predictions based upon fixed and explicit patterns of conduct. Patterns of conduct which are implicit, on the other hand, are referred to as the 'operational code'. This code sets forth the underlying rules of the game by which political actors consciously or unconsciously adapt to new situations. The third mode of analysis focuses on the 'structural requisites' of a social system. These requirements constitute the minimal set of concerns which the system must satisfy in order to continue functioning. Predictions made from this perspective have their greatest utility in the delineation of the limits of change.
This sort of knowledge of institutional behavior undoubtedly serves as a framework upon which predictions of technological impacts can be built. Yet, as Bauer maintains, qualitative prediction remains a work of the imagination requiring an imaginative stimulus. Several of Bell's modes of prediction fall under this category as well. Bell refers to 'social physics' as the use of explicit models developed for the purpose of illustrating hypothetical 'social laws'. Another predictive technique utilizes the formulation of 'alternative futures'. In the course of this type of speculation, a structured set of conditions is used as a guide for the writing of several possible scenarios of future behavior. Additional predictive aids cited include game theory, decision theory, and the use of simulation. Bauer, however, considers the use of analogy to be the most pervasive stimulus to the imagination.
II. Forecasting the Effects of Cable Technology

Bauer's analysis of the problem of prediction is based upon the assumption that second-order effects of technological change must always exist. In the case of cable technology used to increase citizen participation, this assumption seems justified based solely on a realization of the large number of people that would be affected. However, all mass communication systems are similar in this respect, and it is for this reason that some insight into our problem may be gained by examining the social ramifications of communications technologies already in existence.

An obvious case to single out for consideration would be one which addresses the specific issue of participant manipulation. In their study of 1964 presidential elections, Kurt and Gladys Lang[4] attempt to answer the question of whether or not the broadcasting of early election returns in areas where the polls were still open had any real effects upon voter behavior. A major conclusion of the study was that the broadcasts had no net effect on the actual outcome of the election. However, the investigators did discover that individual attitudinal reactions on the part of voters did occur. Since the potential for the outcome to have been altered by such ancillary effects was a function of the historical circumstances peculiar to that election, it is not clear whether further election outcomes would remain similarly unaltered. Commenting, therefore, on
the importance of indirect effects, Lang and Lang state that:

"Direct effects—or the lack of them—do not exhaust the whole range of effects attributable to communications. Maintaining stability in the face of influences toward change involves some kind of adjustment, and communication research has gradually learned to include these other effects within its range of interest."[4]p.ix

According to Bauer's classification of technological impacts, the direct effects mentioned above would be considered second-order. However, the attitudinal changes which may possibly influence the psychological process by which stability of voting intention is maintained could be referred to as third-order effects. In fact, the Lang study makes the conclusion that new election regulations are necessary to insure against possible harmful effects of early returns broadcasts. The conclusion is based upon the existence of the indirect and possibly long-range higher order effects rather than upon a demonstration of any direct effects.[4]p.168

The Lang study was based upon empirical data gathered on the attitudinal reactions of voters. Although we may be fairly assured that citizen participation via bidirectional cable has the potential for causing similar higher-order effects, we are not able to draw our conclusions on the basis of actual observation. In our case the problem is more difficult as the technology in question has not yet come into actual use. Although pilot two-way systems have already been developed by private interests such as the Mitre Corporation and Hughes Aircraft Company[5]p.49-50, little has been done
to develop non-commercial services such as citizen participation.

In a report prepared for the Rand Corporation in 1971, Walter S. Baer attributed this situation to a 'chicken-and-egg' effect. That is, that the capital outlay required for the installation of the necessary hardware will not be made until a sufficient market for such services has been demonstrated. However, no demand for the services can be generated until they actually become available to the public. The end-result is that:

"Those interested in the community uses of interactive cable television have two alternative courses of action. The first is to wait until commercial services have brought two-way terminals into enough homes to make non-commercial uses attractive on a marginal cost basis... The other course of action is to seek public support today for a few experiments to develop and test non-commercial use of interactive television."[6]p.87

In order to meet this need, the National Science Foundation decided to solicit proposals for experimental programs in the application of two-way cable to non-commercial public services in urban areas. In 1974, grants were made to seven universities and non-profit research organizations for developing their proposals in detail by working with local governments and cable communications operating companies. Several of these proposals, including those of the Urban Institute,[7] the University of Southern California,[8] the University of Denver[9], New York University[10], and Lehigh University[11], dealt explicitly with programs designed to increase citizen participation in government.
III. Plan of Study

None of these proposals extend their investigations much beyond a concern for the first order effects of the technology. That is, for the basic capability of two-way cable systems to provide such services. These studies are therefore of only limited utility in an analysis of higher order effects such as those discussed in the Lang study. In view of this fact, our analysis must of necessity remain a work of imagination. The methodology we employ will therefore have to conform to that described by Bauer in which two fundamental types of tools are used to anticipate second-order effects.

Political analysis based upon general knowledge of relevant social institutions can afford insight into the possible forms that higher-order effects may assume. This first stage of analysis is the focus of the second chapter of this thesis. In order to obtain more detailed knowledge of possible manipulatory effects, however, new sources of information are needed to stimulate the imaginative process. What is needed, therefore, are actual observations which can be analyzed for indications of factors likely to lead to manipulatory effects. For this purpose, the results of simulations carried out during the course of the M.I.T. Community Dialog project were utilized. Chapter Three begins with an investigation of the probable future configurations of cable participation systems and then proceeds to compare these characteristics with those of the Community Dialog system. Relevant results from the simulations are then reported.
These simulations were designed as rough investigations of the characteristics of cable participation systems in general rather than of the problem of manipulation in particular. However, three of the observations made during the course of the Community Dialog simulations can serve as important inputs to an analysis of manipulatory effects. It remains to evaluate the implications of those observations within the context of the relevant social-psychological literature. Such a discussion is presented in Chapter Four which outlines three possible mechanisms of manipulation. The major issue addressed in this chapter is the question of whether or not it is valid to grant that such effects might in fact occur. Finally, Chapter Five restates these conclusions and presents suggestions for further research.
CHAPTER TWO

BACKGROUND: GENERAL KNOWLEDGE OF RELEVANT SOCIAL INSTITUTIONS

Much of the analysis which has already appeared in the political science literature can provide valuable insights into the nature of the possible impacts of cable technology on society. Any review of this literature, however, should begin with a discussion of the motivation behind citizen participation applications of the cable.

A primary stimulus to the development of cable participation has been the alarming trend of growing alienation present in American society. The results of a Harris poll conducted during the late sixties and early seventies [12] indicate that in 1972, 53% of the respondents agreed with the statement: "What you think doesn't count much." In addition, fifty percent felt that the people running the country really didn't care about them. Several factors have been suggested to account for this - among them, the idea that the alienation of citizens is directly related to the increasingly complex nature of government. [7] Government is no longer only responsible for providing basic services. It must now administer programs which interface in complex ways with important social issues; and it must do this with little knowledge of the correct way to proceed.

Insufficient communication between policy makers and citizens often results in decisions which are unresponsive to the needs of the community. This tends to cause further alienation which in turn
leads to decreased communication producing a vicious circle.

Another contributing factor which has been cited lies in the nature of existing communications. In the age of mass-media, the flow of communication is usually one-way. This results in a situation in which

"...the citizen watches T.V., reads newspapers, and listens to radio, but he has no way of talking back. He hears, but he is not heard. At least that is the way he feels."[12]p.1

Since existing channels of communication appear to be inadequate, the solution may be to provide additional feedback links from the citizen to decision-makers. In doing so, the individual may gain a sense of participation while decision-makers would be provided with better information on the attitudes of their constituents.

The advocates of two-way cable list several advantages which seem to favor it as a new means of citizen feedback. The first advantage is that cable can reach a large potential audience in their homes (or at least at neighborhood terminal locations). It is also an economically feasible medium for programming addressed to small specialized audiences because of its large channel capacity. In addition, cable is, after all, a visual medium and can therefore convey more information than most other means of communication.
I. Citizen Participation In A Democracy

Some of the most important conclusions to be made concerning the possible consequences of cable technology have been derived from a general knowledge of the role of citizen participation in the functioning of a democratic society. Some of the benefits which increased citizen participation might bring have just been stated. However, as Ithiel de Sola Pool points out in his article on citizen feedback [13], we must pay a price for these benefits. The objective for any new system for increased citizen participation must therefore be weighed in terms of a series of trade-offs.

This fact is especially clear with respect to the issue of referenda. Adherents of the vision of a direct democracy have proposed the use of two-way cable for instant referenda in which the people themselves vote on the issues. However, most authorities agree that increasing citizen participation to this extent would be unfeasible due to the nature of the legislative process. The typical legislator is faced with a massive complex of bills and issues which require his full attention. Even so, most legislators are forced to specialize in just one area in order to be able to act effectively. In other areas they must simply take the advice of trusted colleagues. It therefore does not seem possible that any citizen participating during his leisure time would be able to competently decide upon issues.
Increasing citizen participation to the point of direct democracy, however, is an extreme in a wide range of possibilities. What can be said about the impact of less extreme increases on a political structure such as our own; that is, one based on a balance of pluralism and consensus? One possibility which Pool points out in his article is that high-level decisions may become harder rather than easier to make. As more and more people are brought into the decision-making process, discussion becomes more time consuming and often ends in stalemate.

However, the trade-off in this case involves more than just the relative efficiency of decision-making processes. Stalemates are generated when a population becomes more politicized and citizens become increasingly committed to particular points of view. It soon becomes apparent that if "...citizens are brought by effective personal participation to the point of caring very deeply about political outcomes, then there had better not be too many important political decisions; for every time one is made there are losers as well as winners." And we know that for any highly politicized minority

"... the more vital the sphere of politics, the more disillusioned they will be at society's failure to accept their version of the truth. Thus the price for having a politically active citizenry in a free society is a sufficient devaluation of political decisions so that losing is not intolerable to the losers."
It is for this reason that society tries to reduce the necessity for consensus in the decision-making process as much as possible. National government passes the responsibility for many decisions down to more localized levels such as the city and the state. In this way different segments of the population may make different decisions and thereby avoid nationwide conflict. The general conclusion to be drawn is that the objectives of any system designed to increase citizen participation must be limited enough in scope so that the necessary political balance can be maintained.

II. The Issue of Manipulation

General knowledge of factors which determine the fundamental role of citizen participation within a democracy must certainly be a prerequisite for the analysis of cable participation programs. However, it is unlikely that observing anything less than an actual large-scale, real-world system would provide any practical information on how to maintain a proper pluralistic balance. There are other consequences of cable participation programs, however, which may be more amenable to analytical treatment on a practical level. The issue which is of greatest concern in this paper is that of manipulation. Pool summarizes the problem with respect to two-way cable when he states that

"...better communication technologies that create more efficient, more extensive, and more intensive interaction between public figures and their constituents may reduce the sense of alienation by
making the public figures better able to respond to their constituents and to influence them. There is no electronic difference between these two processes. They are both enhanced by efficient two-way communication. The spector of electronic manipulation is simply the other side of the same coin of the hope of electronic democracy." [13] p.242

Knowledge From Past Experience

Past experience with experimental citizen participation programs which did not utilize cable technology indicate that several possibilities for overt manipulation by government officials do in fact exist. One study which was completed in 1974 reported on the operation of the Televote system which was designed to aid rapid two-way communication between decision-makers and their constituents. [14] The system was demonstrated during the course of a seven month experiment in the San Jose Unified School District.

In this experiment, votes on various issues were taken among a large number of citizens who voluntarily registered to participate. For a particular poll, school district officials would define the issues and state the reasons behind the various policy choices. This information and a questionnaire had a corresponding numerical code which the participants could dial on their telephones once they had made their choices. A computer registered and tallied all the votes entered in this manner, and the results were relayed to school officials within two days. The polling results and any impacts they may have had on public planning were later publicized to reinforce participation in the program.
One opportunity for manipulation to which officials might possibly avail themselves is itself related to a question concerning the first-order effects of the technology. Specifically, did the system perform the function for which it was intended; that is, to provide current information on citizen views to public officials so that their decisions would be more responsive to the needs of the community. The summary of the report indicates that few conclusions can be drawn with respect to this question:

"...A long-range aim of a televote system is to make public decisions more responsive to the desires of the constituency served. Whether any progress was made in this direction in this brief demonstration is difficult to say...but the fact that the televotes often gave school officials new information at least provided them better opportunities to be responsive." [14] p.20.

It is apparent that no conclusion on whether decisions actually were more responsive seems to have been drawn. However, the results included in the report do appear to indicate a few general trends. A total of thirteen votes were taken over the seven month period of the experiment. Seven of these votes were on issues related to official planning efforts already under way. The officials themselves took the leading role in defining the questions for these votes, and it is clear that the voting results had an impact on the final decision in four of these cases. External circumstances seem to have prevented the results from having a similar impact in the three remaining cases. The other six votes taken during the course of the project were not initiated by officials, but by students, staff, or citizens. Of these the report states,
"...It may be too early to make final judgements about the eventual effects of such televote results, but as yet there seems to be no tangible impact on district policy or decisions as a result of those televotes not initiated in connection with official planning for a specific decision."[14]p.19

Although it appears from this that officials weighed public opinion only on a selective basis, the citizen response to the televote system was quite favorable. The program also seems to have effected a change in attitude among some sections of the population towards school officials. This is especially apparent in the responses to a survey question which asked participants how interested they thought the local school district was in their opinions. The question was asked of suburban residents in a pre-experiment survey and again a year later after the experiment had been completed. The number of those who chose either 'very interested' or somewhat interested' rose from 47% on the pretest to about 62% after the experiment. A control group had a 52% response both years.[14]p.31

It seems clear that many of those who had participated found some degree of satisfaction in doing so even though it is not clear whether decision-makers were in fact more responsive to citizen needs. The question then becomes whether the real effect of the technology is the "...psychic satisfaction that it gives to the participating citizen or the achievement of better governmental performance."[13]p.237

It is therefore conceivable that politicians could actually use the medium for the reduction of community pressures rather than as a means of becoming more responsive to them.
The results of the experiment also seem to indicate a second potential source for the overt manipulation of citizens. We have already noted that the results of the project indicate that officials only responded to votes on issues which they had taken the leading role in defining. In commenting on this fact, the report suggests that:

"...giving officials more freedom to define issues as they see fit would increase use of results. Such a change would require special attention to whether all sides of an issue were stated fairly. Planners might be tempted to propagandize rather than to encourage citizens to weight all relevant factors and make a judgement in the public interest." [14] p. 19

State of Current Knowledge

All these possibilities have been suggested by past experience and a general knowledge of political systems. But to what extent are the manipulation problem and similar consequences of the technology treated in proposed programs of experimentation? Among the experimental proposals submitted to the National Science Foundation, that of the Urban Institute [7] is indicative of a growing concern for possible undesirable effects of cable participation. Unfortunately, the Urban Institute program does not seem to deal with the problems of manipulation and privacy beyond the stage of ensuring that they don't arise during the course of that particular experiment. [7] p. II-15

It would seem, then, that the base of factual and analytical knowledge just reviewed can provide us with general guidelines for determining constraints on future cable participation systems.
However, it also seems clear that such knowledge does not provide us with the more detailed information needed to speculate on the actual mechanisms of higher-order manipulatory effects.
CHAPTER THREE

OBSERVATION: SIMULATION OF TWO-WAY CABLE PROGRAMMING

In order to discover the characteristics of two-way cable participation systems that might result in possible manipulatory effects, it is first necessary to reach some conclusion on the probable future configurations of such systems. Once the general technological configuration has been agreed upon, laboratory simulations can be carried out using experimental subjects. The results of these simulations may then serve as part of our basis for speculation on the higher-order effects of technology.

I. Focusing on Probably Technology

Possible system configurations will obviously be dependent on the particular functions individual participation programs are intended to serve. Some of the possible applications which have been proposed for two-way cable systems include:

1. choosing policy alternatives
2. identification of issues, problems, and areas of discontent
3. interest group recruitment

The first possibility amounts to using the technology for instant referenda, and we may now exclude it from consideration for reasons previously discussed. As shall be seen shortly, the
fourth application has the greatest potential for involving large segments of the population, while the second and third possibilities seem to be relatively smaller in scale.

Perhaps the most natural way to implement the fourth application would be to use the cable to extend existing opportunities for feedback. The traditional forum for expression of public response on issues is the hearing. Although public hearings often precede the making of a decision, they are clearly inadequate as channels of real feedback. Due to the inconvenience of attending these hearings and the general lack of knowledge concerning them on the part of the public, attendance is often limited to a few experienced advocates of the various contending positions. It may be possible to correct the inaccessibility of public hearings by televising them and offering the possibility for instantaneous feedback. A true extension of the public hearing, however, would require a full video return channel capability.

Such systems can only be employed on a limited basis, however, and the potential audience would most likely be restricted to neighborhood terminal locations. In order to involve a larger participant audience, the upstream communication link would have to be limited to carrying audio signals utilizing microphones or ordinary telephone lines, or simple digital signals produced by terminal keyboards or some less complex combination of response switches.
Small-Scale Applications

The possible configurations of two-way cable systems to be employed in the extension of public hearings encompasses the full range of technical options available; namely, those which utilize visual, aural, or digital signals for upstream transmissions from the audience to the point of program origination. Configurations which offer full two-way visual and aural capability are thought to be best suited for performing the second and third functions listed above, those of issue identification and interest group involvement. Both these applications require group-to-group teleconferenceing capability. One teleconferenceing system which has already been implemented is that of the Metropolitan Regional Commission of New York[17] although it transmits by means of microwave relay rather than cable. However, several of the experimental proposals submitted to the National Science Foundation do outline programs which utilize the cable. New York University's design employs neighborhood communication centers for the elderly[10]p.125, while the University of Southern California's proposal discusses video conference facilities for the interaction of citizen groups and planners.[8]p.62

In a Masters thesis submitted to the Department of Political Science at M.I.T., Michel Guite' describes attempts to enlarge the potential audience of such meetings by substituting digital or purely aural channels for visual ones.[15]p.44 Guite' contends, however, that these methods are largely unsatisfactory for several
reasons; the first being that "...button-pushing isn't highly satisfying way to participate in group-discussion when the influence of one button pushed is almost imperceptible." [15]p. 45

And yet, button pushing seems to be the only way to involve large numbers of people, for as Guite' points out, even with the use of simple aural channels, participation is still restricted to the number of people whose comments can be broadcast during the program. [15]p. 45 The conclusion to be drawn is that the face-to-face requirements for satisfactory group discussion necessarily restrict cable programming initiated for the purposes of interest group activity and group identification of issues to relatively small audiences.

Large-Scale Applications

The primary focus of interest in this paper, however, is the higher-order effects such as those discovered in the Lang study which may possibly affect large parts of the population simultaneously. This is not to say that important media effects are not present in the case of smaller-scale communication. The Joint Unit for Planning Research at University College, London has in fact carried out important studies of teleconferencing networks which include topics relating to the decision-making process, interpersonal conflict, and reaction to strangers. [18]

Of the four proposed applications for two-way cable, the one which seems most likely to involve large numbers of participants
is that of feedback to decision-makers. Of the already existing channels of citizen feedback, the one which has received the widest acceptance seems to be the public opinion poll. Interactive cable seems especially suited for this application as it is a visual medium with an instantaneous response which lends itself easily to the polling process. Participants can receive adequate information before making their decisions, and the questions can be modified in light of feedback already received during the course of the polling. It has been predicted, however, that public opinion polling by cable will not come to receive serious consideration because of the fact that a self-selected sample, such as a television audience, is not statistically representative. [19]p.80

Two basic approaches have been taken in response to this problem. In the televote experiment described in the previous chapter, the total number of participants was 6000 or about 4% of the eligible population drawn from the San Jose Unified School District. The average number of people participating in any single poll was 700 [14]p.46 Even though a large number of people voted, the criticism concerning the representativeness of the sample is certainly still valid. For the purposes of scientific survey analysis, therefore, the results have to be viewed critically. However, one response to this is that a valuable function was still performed in that the amount of citizen feedback to planners had increased considerably. Therefore, although a self-selected polling sample is not representative, most existing alternatives are even less so.
Another response to the problem is to simply employ scientific polling techniques. This is the approach taken in several of the NSF proposals that include polling applications of two-way cable as part of their programs. The proposal prepared by the Urban Institute for instance, contains an extensive polling project to be carried out in Peoria, Illinois. It describes a series of eleven polling experiments to be conducted in 150 randomly selected households. These homes are to be equipped with terminals capable of conveying a one-digit response to questions presented during special television programs. As in the televote experiment the questions are designed to supply information to the local government which would enable it to make more responsive decisions.

As several of the NSF proposals point out, opinion polls conducted over two-way systems would not be limited to traditional formats currently in use. In the Lehigh University proposal, for instance, electronic feedback provides the means by which participants can voice preferences for topics of future polls. As Guite points out, participant modification of the polling process could be extended beyond this point through the use of interactive questionnaires. With such an arrangement, questions could be modified within the course of the same poll. The utilization of instantaneous feedback therefore enables televised polling to become an essentially dynamic process in nature.
It is conceivable then, that when combined with video background materials, this sort of dynamic process could result in a responsive exploration of issues which might approximate that found in group meetings. The goal in attempting such programming would be to obtain a feedback channel offering greater flexibility and potential for participation than the conventional opinion poll, but which would still not be required to handle the face-to-face communications necessary to true group meetings. Thus, while still unsuitable for the smaller scale citizen participation applications discussed earlier, two-way cable employing digital upstream transmission does seem optimal as a means for providing large-scale feedback to decision-makers.

**Systems Utilizing Limited-Response Digital Transmission**

Once digital upstream transmission has been recognized as the most likely choice for large-scale cable participation networks, it becomes a relatively easy matter to predict the technological features of such systems. Michel Guite¹, for instance, has proposed a design for a useful two-way system to be installed in a community with a potential of several thousand subscribers.¹⁵p.50 The configuration which he recommends for the home terminal consists of a ten-button response pad, converter to translate between cable and home equipment, and a frame-grabber. This recommendation was based upon an estimated cost for the system ($350) being weighed against potential benefits of additional equipment.
The ten-button response pad included in the design provides enough flexibility to permit an interactive polling process. It is for this reason that Guite' prefers it to less expensive four-button response units which don't offer that capability. Increasing the information capacity of the unit beyond ten buttons, on the other hand, does not seem justifiable either. Although he feels that a full alpha-numeric keyboard would permit open-ended response leading to greater satisfaction in communication, Guite' indicates that the extra expense involved would be prohibitive.

The conclusion of a most likely terminal configuration consisting of a limited arrangement of response switches is also reasonable from perspectives other than the cost-benefit approach taken by Guite'. This is especially clear in light of the fact that the type of response capability available for community services will most probably be determined by the response capability already available for commercial services. Commercial equipment manufactured for per-program pay TV systems closely resembles that required for public opinion polling, and it is therefore not surprising that most of the NSF projects have obtained their systems from this source.

The Urban Institute's proposal, for instance, gives a detailed account of its search for equipment suitable for adaptation to community services. The University of Denver project uses a modified version of the Hughes SRS system console which consists of a channel selector and small response button pad. The Lehigh Univer-
sity system is similar and is part of the Twin County Trans-Video pay TV system configuration. [11] p. 36
II. Investigating Probable Characteristics of Cable Systems

The necessity to limit the response capability of home terminals used in large-scale polling applications is also clear from another viewpoint. Guite' excluded full alpha-numeric keyboard terminals from consideration on the basis of cost. However, in the context of live interactive programming, they are clearly unsuitable for reasons he already stated in connection with verbal participation in group meetings; namely, that participation would be restricted to the number of people whose comments could be broadcast during the program.\[15]\textit{p.45} Clearly, for any type of polling process involving large numbers of people, the vast amount of information contained in the open-ended responses of alpha-numeric keyboards would be impossible to process adequately, even with the aid of the computer.

The Community Dialog Project

It is evident from the above discussion that our final choice for a most likely system configuration should include a home terminal which uses a limited arrangement of response switches for upstream transmission. Having decided upon this configuration, however, what can be said about characteristics of the system which may hold some implication for the problem of manipulation? Speculation on the possible mechanisms of manipulatory effects must still be based upon some knowledge of how the system will actually function. An attempt to gain such knowledge has been made in our case through the use of simulation.
Figure 1.
Community Dialog Project Equipment

Display

Controller

Handheld
Response
Switch
In order to carry out such simulations, use has been made of the work of the MIT Community Dialog Project. The focus of the Community Dialog Project is on the use of an electronic polling device as an aid to discussion in face-to-face group meetings. The hardware employed in this system is shown in Figure 1. The technology is similar to that of our hypothetical home terminal in that each member of the group is supplied with a handheld response unit which can enable him to vote in one of several possible categories. These individual switches are wired to a small special-purpose computer which displays the results of the vote. By using this system, each member of the group is able to

"...make an anonymous coded response to questions posed by the moderator or another participant, and to observe instantaneously a tally of how many people voted in what category. The purpose is to get a rapid appraisal of where there is consensus and where there is controversy, to allow participants to reveal their ignorance, to deal with controversial questions without intimidation, and generally to make the discussion more responsive to real interests and needs of the group."[20]p.1

The instantaneous feedback obtained during the course of such a discussion enables the moderator to direct the flow of dialog in response to the desires of the group. In this way a meeting can very quickly focus upon issues which are of importance to all the participants. The intended function of electronic feedback in group meetings is to serve as an aid to discussion rather than as a means of obtaining finalized votes on specific issues.

Using the Community Dialog voting apparatus to simulate the
the operation of our hypothetical two-way cable system seems reasonable simply on the basis of the fact that participants use the technology to respond in a limited way; they must vote in one of ten available categories. There are, in fact, obvious differences between home users of cable technology and the participants in an actual group meeting who are not limited in their response to the operation of switches.

Nevertheless, some of the characteristics of these wired group meetings may still be of interest. In addition, it is possible to use the technology under conditions which account for these differences and therefore simulate the operation of interactive cable systems. One final motivation for building upon the Community Dialog studies is the fact that the type of dialog achieved with electronic feedback does constitute a loose approximation of the dynamic polling process which was described earlier with reference to large-scale citizen participation applications of two-way cable.

**Previous Observations**

Two of the characteristics of interactive cable technology upon which we shall base our speculations of possible manipulatory effects are directly evident in the face-to-face group meetings of the Community Dialog Project. These two characteristics are the instantaneous nature of the feedback and the distinctive branched tree pattern which dialogs conducted in this manner are constrained to assume. Both these features are fundamental to the technique by which the technology is used.
The general technique employed has been developed over the course of the more than two hundred group meeting which have been conducted using the electronic feedback device. In essence, it consists of a series of several steps and is continually repeated during the course of the discussion. Initially, the moderator poses a question, typically writing it on a blackboard, and lists a number of alternative responses, each coded with a number from 0 to 9. In the second step, each member of the group votes for one of the alternatives by making the appropriate selection on his voting switch. The vote tally is displayed, and the group then proceeds to discuss the result. After this initial reaction the question may be rephrased, or a new question may be asked and the cycle repeats.

The ability to instantaneously display voting results is essential to the interactive process of question and response. In addition, by focusing discussion upon a series of explicit questions linked by group reaction to preceding votes, a branched discussion pattern emerges. This pattern has been described in an MIT Doctoral thesis written by Noam Lemelshtrich. Due to the fact that instantaneous feedback and branched discussion appear to be characteristic of all interactive question-and-response type dialogs, it seems safe to assume that they would also be part of any dynamic polling process carried out over two-way cable.
Although these two characteristics will prove to be of funda-
mental importance in our discussion of possible manipulatory effects,
further information is still needed. Also, it is necessary that
this new information be obtained under experimental conditions
specifically designed to simulate interactive television.

In the face-to-face meeting of the Community Dialog Project,
electronic feedback is used to encourage natural discussion among
the participants. However, in our televised approximation to the
group, digital feedback from the audience completely replaces natural
discussion. A major question therefore arises as to whether such a
limited response capability eliminates the possibility of ever achieving
a dynamic sort of dialog over a televised medium. Other differences
between face-to-face meetings and interactive television exist as
well, and it is for this reason that other simulations were undertaken
to discover functional characteristics peculiar to the medium of
two-way cable television.

Simulation

Two sets of experimental simulations were carried out in November
and December of 1974 with the cooperation of the Center for Advanced
Engineering Study at MIT. The programming application under study
in each of these simulations was that of interactive polling used
to approximate the type of participation attained with group meetings.
Although the group meeting setting can never really be fully extended
to the case of large-scale programming applications, it was hoped that
a dynamic polling process could prove flexible enough to allow for more audience-directed participation than could otherwise be obtained. The underlying purpose of these simulations was to discover the problems involved in actually implementing such systems so that the functional characteristics revealed in these problems could be studied in greater detail. It was for this reason that the simulations were carried out in two stages; the first concentrated on problem discovery, while the second explored the characteristics of these problems.

**First-Stage Simulations**

One of the most important features of any communication medium must be the potential quality of interaction it makes available. Evaluations of the quality of interaction made during the Community Dialog feedback experiments were based largely upon subjective criteria. Participants were provided with questionnaires which enabled them to indicate the degree of satisfaction they found in the group meetings. Studies of these results and of other observations have indicated that the feedback technology interacts strongly with the behavioral dynamics of the group.[20]p.14-19

In the Community Dialog meetings, the purpose of the electronic feedback was to augment natural discussion. All the face-to-face interactions which are present during normal group meetings were also present during the Community Dialog meetings. However, this situation is drastically altered in the case of interactive television. If the meeting consists of interactive program received in individual
homes, most of the members of the 'group' are physically isolated from one another. The elimination of all interaction between group members (other than that made possible by simply observing the collective feedback) should have a considerable impact on the dynamics of the group.

An additional interaction which is eliminated in the case of two-way cable is the one which occurs between the moderator and the group. In the case of interactive television, the participants can no longer feel that they are being observed by the group leader. Of perhaps even greater importance is the fact that the moderator no longer receives information about the group's non-verbal behavior. The only feedback he is able to receive is that which appears on the electronic display. As a result of these considerations, it was initially decided that any simulation of interactive programming would have to reproduce conditions of isolation between group members and between the group and the moderator.

During the experiment, each subject was seated before a television monitor on which he viewed the program. The participants were also supplied with handheld switches that enabled them to feedback their responses. Because of physical limitations, no more than eight subjects could be supplied with monitors at any one time. In addition, the monitors had to be located quite close to each other so that it became necessary to separate the subjects with only simple plywood partitions. The monitors and the partitions rested on two tables with four subjects
being seated at each table. The television program originated from the next room so that the moderator would be physically isolated from the audience. The device which displayed the voting results was operated by the moderator and was visible to the audience over the television. A representation of this configuration is shown below in Figure 1.

Figure 2. Physical Configuration of First-Stage Simulations
The programming format used in the first simulation was similar to the meeting format used in the Community Dialog Project. As in the Community Dialog meetings, this experiment employed one moderator who asked questions of the audience and operated the electronic display. Throughout the entire length of the program, the camera focused upon the moderator and the display simultaneously. The topic of the meeting was student residential life at MIT, and it consisted of a series of prepared questions to which the audience responded by using their voting switches.

In the non-television feedback sessions, simply drawing up a list of questions was usually all the preparation a moderator needed to make before a meeting. The questions served as a framework for discussion drawn from the audience. As a result, any extensive preparation would often prove too inflexible. In fact, the primary reason for using the feedback technology in these meetings was to stimulate and direct group discussion rather than to obtain voting statistics for a list of questions.

The clearest result of the televised experiment, however, was that such discussion never occurred. Obviously, it had been expected that the audience of a televised meeting would be incapable of actually vocalizing their feelings using the electronic devices as their only means of feedback. But the assumptions prior to performing the experiment was that by interpreting the responses to his questions, the moderator could formulate new questions which would reveal the desires of the audience and thus enable an evolving dialog to take
place. However, the televised meeting contained little discussion and was for the most part completely static. The audience responded to the questions one at a time in a manner similar to the way in which they would have responded to an ordinary poll.

The Community Dialog experiments indicate that the skill of the moderator is often an important factor in achieving satisfactory dialog,[20]p. 13 The moderator in this experiment, however, did have a great deal of experience in running group feedback sessions. The apparent conclusion is that the methods which had previously been used in trying to draw discussion from the audience had failed in the case of the televised meeting.

Most of the experimental subjects for this simulation were students from an undergraduate course dealing with television and media. The use of electronic feedback in group meetings had been demonstrated during a class session prior to performing the experiment. For this reason, most of the subjects were already familiar with the type of group discussion carried out in the Community Dialog experiments. When asked to evaluate the televised meeting, therefore, several of the replies mentioned the lack of dialog in the simulated cable program. For instance, in response to the question which appeared on the follow-up questionnaire.

1) Did you feel a sense of participation in the 'discussion'? one of the subjects wrote:
"Yes, but about as much as a questionnaire, even though there was more immediacy."

And when asked to compare the televised meeting to the face-to-face electronic feedback session, another respondent replied that in the face-to-face meeting... "you could reclassification of a question."

But in the televised meeting, however... "I felt a good deal of frustration about clarification, and also because I couldn't explain my answers."

Several of the questionnaire responses described the problem as being one of 'frustration'. The audience's limited ability to respond apparently led to a breakdown in communication. This is indeed the problem which had been anticipated prior to performing the experiment. Although the feedback devices used by the audience were the same as those used in the Community Dialog meetings, the ability to respond was severely restricted in the case of the televised meetings in which the moderator was unable to call upon members of the audience to explain their vote or to pose new questions. In addition, televised meetings eliminate all the non-verbal cues which often enable a moderator to remain touch with his audience. It is therefore apparent that it is the limited response capability of electronic feedback which poses the fundamental problem for its application to interactive television.
Second-Stage Simulations

a. Preliminary Sessions:

Although the results of the first simulation reveal the existence of frustration in communication, they do not give us much information on the specific characteristics of the group meeting which actually play a role in the communication breakdown. Only general conclusions concerning the effect of the limited response capability of electronic feedback could be drawn from the questionnaire responses. However, if we wish to achieve satisfactory dialog without resorting to additional channels of communication, we must discover features of moderation technique and program software which might prove useful in solving the problem.

In order to obtain results which would be more concrete than those of the first simulation, some type of controlled experimental method had to be employed. This required a familiarity with specific factors of interest prior to the formulation of the experiment design. For this reason, a series of weekly preliminary sessions were held during which televised group meetings were simulated and then analyzed. During the preliminary sessions the experimenters themselves acted as moderator and audience. By using closed-circuit television equipment and the electronic voting apparatus, group members had the opportunity to test a variety of programming and moderation techniques before deciding upon the variables to be investigated in the final experiment.
During the first of these weekly sessions, the group discussed the subjective criteria by which any particular technique was to be judged. It was decided to assess the quality of any interactive process by evaluating the three general characteristics of participation, nature of feedback, and efficiency. A subject's sense of participation should reflect the extent to which he/she is actively involved as well as the impression he/she develops of the importance of their own feedback. The latter factor provides a measure of the perceived responsiveness of the moderator. The second major characteristic, the nature of the feedback, denotes the extent to which the qualities of subtlety and richness of information may be found in communication. Finally, the third characteristic, efficiency, signifies the amount of time and effort which must be spent on any particular programming technique. This factor has implication for the continuity of the program and for its consequent ability to maintain audience interest.

During the preliminary session, the techniques employed in each trial were analyzed in the context of the above general criteria. Most of these trials consisted of televised group meetings moderated by a single person in a manner similar to that of the first stage experiments. By occasionally interrupting the proceedings, the experimenters were able to analyze the ways in which the moderator interpreted or misinterpreted the feedback. The conclusion immediately drawn was that the results of these first initial trials were identical to those of the first stage simulation. That is, the inflexibility of the
response system had led to a breakdown in communication.

This breakdown most often occurred in relation to the moderator's inability to correctly interpret audience responses. For example, members of the audience would sometimes vote for category numbers which had not been associated with any of the alternative choices for that vote. The moderator would often take these votes to mean that a portion of the audience simply couldn't decide on an answer to his question. In actuality, however, voting for an undefined category was usually the only means available for signalling any one of a number of possible messages. Aside from signifying 'don't know', these votes for undefined numbers were also seen to have meant 'question unclear', 'other', 'insufficient information', 'object to question', and 'combination of these'.

Providing an extra category such as 'other' often does little to end the confusion as the moderator is still unable to discover what the audience is trying to say. This is illustrated in the record of one of these sessions:

Moderator: Do you think that grading at MIT should be based on:
1. letter grades (2 votes)
2. pass-fail (1 vote)
3. other (2 votes)

Moderator: What do those who voted for 'other' want?
1. combination of grades and pass-fail (3 votes)
2. no grades at all (0 votes)
3. other (2 votes)

Moderator: Should we have a combination consisting of:
1. only freshman year pass-fail (0 votes)
2. courses outside major pass-fail (1 vote)
3. certain number of courses pass-fail (2 votes)
4. other (2 votes)
This exchange is typical as the moderator never does find out what the two individuals who voted 'other' in answer to the first question had in mind. It appears that none of his guesses may have been correct as two votes still appear in the 'other' category. However, the answers to the second question do indicate that those who voted for the choices of letter grades and pass-fail in the first question may actually have wanted a combination of the two. Being unable to discover what the two 'other' votes signified, the moderator decided to concentrate on the three individuals who wanted a combination of letter grades and pass-fail. From the results of this third vote, it is clear that he had indeed lost the other two members of the audience as two votes continue to appear in the 'other' category.

Typical of the comments made by several of the individuals who acted as moderator was the statement: "The information is there, but I just don't know how to get at it." One common opinion as to the reason for this was the idea of the moderator being too close to his own questions. It was felt that having framed the questions from his own point of view, the moderator would often misinterpret feedback from others. This led to the idea of using two moderators, one of whom should not have been involved in the formulation of the questions. It was hoped that by doing this, the discussion could be directed in the context of a wider perspective enabling better interpretation of feedback. In several cases, such as in the following discussion of
public transportation, this procedure seemed to work:

First Moderator: How often do you use the MTA?
1. often
2. sometimes (majority vote)
3. never

Second Moderator: How much difference would it make if the Red Line stopped at 77 Massachusetts Ave.?
1. big difference
2. some difference
3. no difference (majority vote)

(Discussion between first and second moderators and a new line of questioning follow).

In this exchange, the second moderator wanted to find out why most of the audience only used public transportation occasionally. The responses to the second and third questions indicate that improved service and lower cost would not increase use appreciably. During the discussion which followed, the two moderators concluded that the reason for the low usage of public transportation was the geographic characteristics of this particular audience. That is, the audience was composed of students who lived on or very near to the campus. They therefore had little need for public transportation. At that point the moderator decided to discard several additional prepared questions concerning individual use of public transportation. If only the first moderator had been present, it is likely that he would have continued down his list of prepared questions without realizing that they were not suited to this particular audience.
Comments made by the moderators and by members of the audience during the follow-up discussion confirmed this conclusion. There was general agreement that having one unprepared moderator increased the ability of the moderators to correctly interpret the feedback. The two moderator technique was also judged to be valuable on the basis of other considerations as well. One important conclusion was that it resulted in an increased sense of participation on the part of the audience. A major element of this effect seemed to be the fact that having two moderators in front of the camera enabled the audience to see a discussion which they could feel a part of. With a single moderator, the discussion was usually reduced to little more than a poll.

However, it was also observed that too much discussion between moderators had the effect of shutting out the audience. It often appeared that prolonged discussion between moderators resulted in their reaching a common conclusion which caused them to be as unreceptive to the feedback as the single moderator had been. The tendency for the moderators to become overly involved in their own discussion led the group of experimenters to hypothesize that having a full panel discussion before the camera could result in even greater isolation of the audience.

But for the most part, the group agreed that the technique of using two moderators was an extremely valuable one. By providing more objectivity and increased ability to formulate questions, it
enabled more responsiveness to the audience. By introducing actual
discussion into the televised program, it added an element of
entertainment so that the audience was able to maintain greater interest.

The number of moderators was not the only variable investigated
during these preliminary sessions. In addition, several new program-
ing techniques which consisted of variations in the question format
were introduced. The complaint which was most often made during the
first stage experiments was that the multiple-choice question format
was too restrictive. The basic problem of frustration arises when
members of the audience cannot agree with any of the available response
choices. They then tend to vote for an undefined category number or
for an 'other' category if one is provided. If a significant number of
participants vote in this way, the moderator must try to discover the
audience's problem.

When trying to formulate a strategy capable of accomplishing this,
the first idea which came to mind was that of a simple game of 'twenty
questions'. It was felt that by developing some optimum technique for
progressing through a binary tree of yes-no type questions, the moder-
ator would have a procedure which could eventually tell him what his
audience was thinking. However, this idea was ruled out during the
first of the weekly preliminary sessions. It was felt that any
procedure which required a long series of questions in order to
clarify one particular point of discussion would simply be too time-
consuming.
As an alternative, a 'frustration question' format was developed. It consisted of a prepared list of alternative responses which the audience was confronted with as soon as communication began to break down over some particular point of discussion. This list included such choices as 'insufficient information', 'object to question', 'don't know', etc. Although such a format cannot completely solve the problem, it was hoped that its use would introduce a greater degree of flexibility. Another attempt to increase flexibility was made by developing a graduated choice scale. In using such a scale, the audience would be instructed to rank their opinions on a scale of 1 to 5 with 3 being the null position. Thus, if the extremes of the scale were defined as 'agree' and 'disagree', for instance, subjects would have a range of five possible choices: 'agree', 'agree somewhat', 'no opinion', 'disagree somewhat' and 'disagree'.

**Experiment Design**

In order to discover the relative merits of various programming and moderation techniques, the experiment had to be designed so that the effects of any particular technique could be isolated. For this reason, the experiment was divided into three separate sections, each consisting of a program segment which was approximately twenty minutes in length. The first segment consisted of a televised group meeting which was moderated by a single person. The second segment had two moderators, and the third was a panel discussion in which there were four persons appearing before the camera. During each of the program
segments, three types of question formats were employed. The resulting arrangement of variables is summarized in Figure 2. One audience was to be shown each of the three program segments in the above order. The three types of question format were incorporated into each session.

<table>
<thead>
<tr>
<th>Program Format</th>
<th>1 Single Moderator (20 min)</th>
<th>2 Double Moderator (20 min)</th>
<th>3 Panel Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question Format</td>
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<tr>
<td>Standard</td>
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<td>Scale</td>
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<tr>
<td>Frustration Technique</td>
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</tbody>
</table>

Figure 3: Experiment Design Scheme

The degree of control which can actually be obtained by using this scheme is not as great as it might appear. It must be remembered that the nine specified variables were purposely incorporated into the experiment design as a result of the deliberations which took place following the preliminary sessions. Therefore, the design does not take into account the effects of any variables which may not have been uncovered during those sessions. But in view of the fact that the experimental goal is still one of general problem exploration, this deficiency seems acceptable. If there were any other major factors at work during the experiment, general observations and questionnaires
responses could hopefully reveal their existence in a manner similar to the way in which the original variables were discovered.

Aside from an analysis of program content and participant behavior made on the basis of videotape recordings, additional data was obtained in the form of questionnaires. It has already been stated that during the preliminary sessions, the various techniques were evaluated on the basis of three different subjective criteria. A questionnaire was designed so that the opinions of the audience could be indicated in the context of these criteria. The same set of questions was asked of the subjects immediately after the conclusion of each program segment so that the relative merits of each technique could be evaluated by comparing responses. In addition, a set of more general questions was asked after the entire experiment had been completed. A copy of the questionnaire appears in the appendix.

An additional factor which had to be considered in the experiment design was that of program content. The acceptability of the program material to the audience is a variable of obvious importance. If subjects were to become bored with a particular program segment, cross comparisons between the results of that segment and the results of other segments would become difficult if not impossible to make. Attention was therefore given to the proper choice of topics for each of the three program segments. The topics chose were 'grades at MIT' for the single moderator segment, 'students and the right to privacy' for the double moderator segment, and 'world hunger' for the panel segment. All three segments were limited to twenty minutes in length,
Another consideration for experiment design was the question of whether to isolate the subjects physically from one another. During the first stage experiment subjects had been separated by plywood partitions in order to simulate the actual conditions of interactive programming received in the home. But when partitions were used each subject had to be supplied with his own television monitor, and the limitation on the number of monitors available for the experiment held the maximum number of subjects down to eight. When this was considered in light of the fact that the small number of subjects was a major deficiency in the first simulation, it was decided that the partitions should be dispensed with. Instead, a larger audience was gathered in front of a single television monitor. As before, each member of the audience was supplied with his own hand-held response switch. Subjects were instructed not to talk with each other in an attempt to minimize the influence of one subject on the behavior of another.

c. Results

The second stage television feedback simulation was performed early in December 1974. An audience of thirteen students was seated before a single television monitor to watch a program which originated from another room. In each of the three program segments, the moderator or moderators appeared before the camera with the electronic display of voting results. A videotape recording of all three program segments was made so that general experimental observations could be made at a later time. Observations made from the tape as well as
additional observations of the audience were combined with the
questionnaire responses to form the body of experimental data.
Upon analysis, this data was found to exhibit several clear trends.

The most distinct of these trends occurred in relation to
the number of moderators. As expected, the single moderator case
drew favorable comment with regard to being the best prepared and
best organized segment. However, the questionnaire responses also
show that it was considered to be the most responsive of the three
segments. This is surprising in light of the fact that in the
opinion of the experimenters, the videotaped record of the segment
tends to bear out the prior conception of single moderator performance
which developed during the preliminary sessions. The tape shows that
the moderator often had to ignore votes which appeared in undefined
categories, confirming an impression of the single moderator being
less responsive.

In the case of the double moderator segment, favorable comments
were received concerning the smooth flow of discussion during the
program. The audience also seems to have felt that the two moderators
were better able to frame questions and alternative responses. The
same conclusion was reached by the experimenters on the basis of
viewing the videotape. No other distinct trends were observed in the
double moderator case.

The audience's characterization of the panel discussion, however,
is quite explicit. This segment ranked last in almost all the response
categories which appeared on the questionnaire.
Of all these results, the unfavorable impression of the panel discussion is perhaps the most easily interpreted. One of the most important variables to be considered in the interpretation of any result appears to be moderator performance. However, this factor does not seem to explain the poor rating of the panel segment. In the opinion of those who viewed the videotape, the quality of moderator performance appeared to be approximately the same for all three program segments. No obvious failure on the part of any individual moderator was indicated.

Two external factors, though, do seem to have played a role in the audience's evaluation of the panel segment. Firstly, the program itself was not performed as originally planned. The intention was to have a panel consisting of one moderator and at least two 'experts' of opposing viewpoints. It was hoped that the audience could then participate in the debate so that a high level of interest could be maintained during the program. However, the experts never materialized, and their places were taken by several students who had no particular stand on the issues. As a result, much of the potential interest in the discussion was lost. A factor of perhaps even greater significance was that the panel discussion was the last of the three segments to be televised. Observers who were present in the viewing room have indicated that the audience was extremely restless by the time the panel discussion began. It is clear that the audience had become impatient as a result of the length of the experiment.
The audience characterization of the single moderator segment as the most responsive of the three is a puzzling result. Because of the single and double moderator trials performed during the preliminary sessions, it was expected that the double moderator segment would be the more responsive of the two. In the experimenter's opinion, an evaluation of the videotape tends to confirm this expectation. However, a majority of the questionnaire responses contradict it.

One possible way to interpret these two conflicting sets of evidence might be that several good characteristics of the single moderator segment such as its high level of organization may have fostered a favorable overall impression of the program. This impression may have in turn had an effect upon the way in which the audience perceived other characteristics of the segment such as its degree of responsiveness. Another factor which may explain the conflicting results is that the topic of the single moderator segment was grading policy. Although the topic of the double moderator segment was equally interesting, the subject of grades may have had a more immediate appeal to the student audience.

It is also possible that an external factor may have played a role in the audience's preference. A great deal of difficulty had been encountered in trying to obtain suitable subjects for both the first and second stage experiments. Most of the subjects for second stage experiments were students who had been contacted by members of
the group that conducted the experiment. As it turned out, a large number of these students were later found to be unsuitable as experimental subjects. Unfortunately, they were found to have been biased in favor of the single moderator segment even prior to their having viewed the program. It therefore comes as no surprise that their responses favored it.

The second set of variables to be studied consisted of several types of question formats. These included a gradated choice scale and a special 'frustration question' as well as the standard multiple-choice format used in previous experiments. On the basis of the questionnaire responses, it appears that of the three, the gradated scale seemed the most satisfactory to the audience. However, the significance of this result is limited due to the fact that although the questionnaire is comparative in context, the techniques themselves differ in purpose. For instance, the gradated scale is of no use in trying to eliminate a particular source of frustration. It is also unsuitable for many situations in which a multiple-choice format must be used. Yet it is clear that when used in conjunction with the multiple-choice format, the gradated scale provides for a good deal more flexibility than multiple-choice alone.

It was also found that the multiple-choice format rated highest in frustration during the single moderator and panel segments. This conforms to the expectation developed during the preliminary sessions. During the double moderator segment, however, the multiple-choice
format was exceeded in frustration by the 'frustration question' format. There seem to be several reasons for this result. First is the fact that the three techniques were not employed equally in all program segments. In particular, the frustration category technique was mainly used in the double moderator segment.

Another factor may be that the set of alternative responses set aside for use in a frustration situation did not include a choice for those who had not been frustrated originally. This resulted in some confusion. The inevitable consequences of prolonging such confusion over a relatively long portion of the program were irritation and even more frustration on the part of the audience.

In order to be of any real use, the frustration question format must receive extensive revision. But even allowing for eventual improvement of the technique, it does appear to exhibit one deficiency which seem uncorrectable. As the process of probing one particular point of discussion begins to occupy more and more time, portions of the audience become increasingly disinterested. And since the frustration technique must of necessity take up a disproportionate amount of time, it seems to be an inherently inefficient procedure.

In order to justify spending relatively large amounts of time in trying to discover a particular problem bothering one segment of the audience, the technique being used must have some value in itself. That is, the procedure should be of interest to the entire audience. The conclusion was reached on the basis of comments and audience
observation. It therefore seems that actual live discussion, of interest to the audience in itself, should be utilized rather than a list of more unanswered questions.

Thus we find that in order to supply the additional information about the audience's feeling of need to deal with problems of frustration, at least one channel of natural language communication must be included in any overall system configuration. Such supplementary channels are common to many communication systems already in use. The in-studio audience and the telephone call-in are examples used in contemporary broadcasting. Regardless of the form of such supplementary channels, we are forced to conclude that they will most probably have to become an integral part of any future large-scale, limited-response communication system such as digital-return cable.
CHAPTER FOUR
DISCUSSION: IMPLICATIONS FOR THE ISSUE OF MANIPULATION

As a result of the investigations carried out in the preceding chapter, we are aware of three characteristics of large-scale cable participation systems. From the work of the Community Dialog Project, we know that the first two characteristics, instantaneous feedback and branched discussion patterns, are likely to be fundamental features of such systems. In addition, special simulations have indicated that supplementary communication channels must be available if these systems are to be utilized to their full potential. The purpose of this chapter is to speculate on the possibility of each of these characteristics serving as a source of manipulatory effects.

I. Continuous Feedback: The 'Bandwagon' Problem

Ideally, dynamic polling conducted within the context of interactive cable programming should create an opportunity for responsive exploration of citizen views on a larger scale than would otherwise be possible. Although cable participation sessions can only approximate a group meeting type of format, the exploratory nature of their content requires an iterative pattern of question and response. Thus a fundamental distinction between cable programming and conventional polling is the fact that in a televised group session, key questions are bound to be repeated or voted on again later in modified form, while in a static poll the respondent casts his vote on an issue only once.
A fundamental requirement for the development of a dynamic polling process is that the audience be provided with instantaneous feedback of its response to questions. This feedback is obviously essential if the moderator is to elicit audience reaction to the results of previous votes. However, because the outcome of a session is usually the result of an entire series of questions rather than of one single vote, this feedback also has the effect of providing members of the audience with prior knowledge of group preferences. We can therefore draw a parallel between this situation and that of announcing predictions of early returns during elections. This parallel could serve as the basis for a fear of manipulatory effects. Herbert Simon describes the nature of such effects and states that they are based on the supposition that

"...the voting behavior of at least some persons is a function of their expectations of the election outcome; published poll data are assumed to influence these expectations, hence to affect the voting behavior of these persons. If persons are more likely to vote for a candidate when they expect him to win than when they expect him to lose, we have a 'bandwagon effect'.[22]p.245

In view of the traditionally held belief that bandwagon effects stem from a desire to be on the winning side, [4] p. 144 the parallel between elections for public office and group votes on issues seems a reasonable one to make. However, the suspicion that bandwagon effects may play a role in televised citizen participation sessions is also supported by the experience of the Community Dialog Project. [20]p.35
Within the context of demonstrations performed over the course of the Community Dialog Project, the moderator would ask his audience to choose among alternative answers to some factual question. (The question typically asked was "How long is the Nile River?") After displaying the voting results, the moderator would proceed to elicit comments from individual members of the audience. The vote would then be repeated and the results displayed a second time. After several iterations of this process, it was often found that the group's votes would gradually converge upon one particular choice (usually the wrong one). The explanation for this phenomenon appears to be that the instantaneous display of group preferences provided the basis for a bandwagon effect.

The Fleitas Experiment

Before concluding that bandwagon effects do indeed play a significant role in group feedback sessions, we must first refer to attempts already undertaken to verify the existence of bandwagon effects in elections. The experimental study which appears to approximate our situation most closely is that done by Danial Fleitas.[23]

In Fleitas' experiment, several large groups of college students voted for one of two imaginary candidates under conditions of minimum information. A minimal-information election is one characterized by "... a relative or total lack or relevant information with which voters can evaluate the candidates."[23]p.434 A condition of minimal information also characterized the Community Dialog sessions
in which participants had to vote for factual alternatives of which most had to real prior knowledge. For this reason the two cases do in fact appear analogous.

As it turns out, however, Fleitas was not able to demonstrate any effect on voting behavior similar to that occurring in the Community Dialog meetings. Three groups of voters participated in a series of four successive ballots in a simulated mayoralty election. The experiment was designed to isolate the effects of facked balloting results and qualitative bandwagon/underdog messages on votes. In his conclusion, Fleitas states that the experiment

"clearly demonstrated that mere poll results are insufficient to impel would-be bandwagon or underdog identifiers to switch their votes. Rather, the voting behavior that results from these identifications does not occur until sensitized or cued by a strong qualitative stimulus."[23]p.438

In light of this conclusion, we are now forced to question the value of the Community Dialog demonstration. If bandwagon effects cannot be attributed to poll results in the analogous case of minimal-information elections, what are we to conclude in the case of issue votes in which voters may have considerable prior knowledge?

Although the situation is unclear, though, there still appears to be a possible explanation for the differing results of the Fleitas experiment and the Community Dialog demonstrations. Fleitas found manipulatory effects to be linked to the qualitative messages he determined to his experimental subjects. This fact makes it reasonable to suspect that the bandwagon effect observed in Community Dialog meeting did not stem so much from the instantaneous display of vote tallies alone as from the discussion which followed each vote.
The fact that the occurrence of bandwagon effects seemed highly dependent upon moderator technique appears to bear out this theory.

The Lang Study

Such explanations remain conjecture, however, and it would therefore do well to examine other attempts to verify the existence of bandwagon effects. One report which has already been described is that of the Lang study on the effects of broadcasting early returns. This study refers to bandwagon effects as part of the 'political folklore' often cited by individuals as reason for their opposition to broadcasts of early returns. The study concludes, however, that

"...the impact of early returns on behavior was minimal. Very few examples of bandwagon and underdog effects, of either the direct or indirect variety, were encountered. The few we were able to document had little to do with what respondents had heard about the presidential race prior to voting."[4]p.109

The report discusses possible reasons for this result and attributes the relationship between early returns and voter reaction to what is referred to as the 'law of minimal consequence'. [4]p.4 According to this theory, voter intentions crystallize gradually over a period of time preceding the election. Because the effects of mass communication are essentially cumulative in nature, the voter can only absorb new knowledge, such as early returns broadcasts, in terms of the overall information structure already built up in his mind. Thus
"...on election day, when the returns begin to come in, few members of the electorate are still open to influence... Had there been any significant bandwagon effect...it would already have had its impact on vote intentions before election day."[4]p.4,5

At this point, a distinction between the dynamic polling procedure employed in cable participation sessions and the election process investigated in the Lang study should be made. Votes taken during Community Dialog sessions are not completely analogous to election votes for two reasons. The first is that because questions are often repeated, issue votes are not irrevocable as election votes are. Secondly, in issue exploration sessions, final outcomes are the result of an extended series of votes rather than of one single vote.

It is this feature which may in fact account for the bandwagon effect encountered in the Community Dialog meetings in a way consistent with the Lang theory of minimal consequences. Throughout the Community Dialog sessions, no really dramatic shift in group preferences was observed as the result of any individual vote. Instead, the effect manifested itself as a gradual shift occurring over the course of the entire series of votes. This suggests that sudden manipulatory effects similar to those discounted in the Lang study were not needed for the outcome of the sessions to change. Instead, the bandwagon effect had made its impact felt during the gradual process of attitude formation. The conclusions on vote stability made by the Lang report for the case of election outcomes may have to be altered considerably
in the case of interactive polling due to the introduction of the dynamic element characteristic of such processes.

The Asch Experiments

In addition to theories such as the 'law of minimal consequences', researchers have posed other explanations for the inability to observe bandwagon effects. Both Lang [4]p.147 and Fleitas [23]p.436 cite the results of past social-psychological studies of conformity as a reason for discounting the existence of such effects. In this, they are both referring to the Asch experiments of the late 1950's. [24][25] These experiments focused upon disagreements generated between individuals and groups over matters of simple fact. In an introduction to one of these studies, Asch states that he was concerned with

"...public independence and lack of independence in the face of arbitrary group opposition. The aim was to observe the impact of these conditions when the question at issue was that of resisting or bowing to a prevailing group direction."[24]p.2

To the individual subject, the experiment was ostensibly designed to measure visual perception. A group of college students would each be asked in turn to judge the lengths of several lines displayed before them. However, only one of these students was actually a subject, the others having been told by the experimenters which answers to give. In one experiment, all of these students were instructed to give the same wrong answer so that the reaction of the subject to unanimous opposition could be observed. Asch found
that in these cases, fully one third of the minority answers were distorted toward the majority.\textsuperscript{24}p.69 Moreover, the effects of group pressure appeared to be greatly reduced in other experiments in which the subject was opposed by less than a unanimous majority.\textsuperscript{25} Due to the fact that unanimous majorities are not characteristic of most elections, Land and Fleitas maintain that group influence would probably not have a significant effect in those situations.

Although it certainly seems reasonable to draw such a conclusion from the results of the Asch investigations, it should be kept in mind that those experiments were performed under idealized conditions which don't necessarily conform to those characterizing most elections. Asch himself explicitly listed these conditions and discussed the limitations which they impose on any interpretation of his results.\textsuperscript{24}p.66 One factor relates to the object of controversy itself. In the Asch experiments, the object of judgement was clear and unambiguous; this is hardly case in most disagreements that concern issues or candidates. As ambiguity increases, voting takes on the character of minimal-information elections so that we would expect the effects of group pressure to increase accordingly.

The experiments can be distinguished from voting situations on the basis of other conditions as well. Unlike most participants in group controversy, the experimental subjects of the Asch studies had independent access to the facts in question. In addition, there was no possibility of restructuring facts as in most social disagreements,
so that the conflict situation occurring in the experiment was irreconcilable. In fact, the character of the controversy itself was unique due to the fact that it was not understandable.

All of these conditions point out the difficulty encountered in trying to apply the results of social experiments to actual situations. This is not to say that the lessons of the Asch experiments cannot be applied to the issue of bandwagon effects. However, the significance of differences in the conditions governing the two situations is not yet clear. For example, a key factor in the Asch study was that subjects were forced to declare their choices publicly before the group. In the Community Dialog meetings, on the other hand, all votes were taken anonymously. If anything, we would expect the condition of anonymity to all but wipe out any effects of group pressure. And yet, it was during these very meetings that such effects were observed.

It therefore seems that few if any real conclusions can be drawn regarding bandwagon effects in interactive polling situations. Although the existence of such effects have not been proved, they cannot be entirely discounted either. The role of instantaneous feedback in supplying audiences with prior knowledge of group preferences therefore remains suspect as a possible source of manipulatory effects.
II. Branched Patterns of Discussion: Agenda Effects

The second characteristic of interactive polling processes that was mentioned in the preceding chapter was that of branched discussion patterns. Due to the fact that the dialog in cable participation sessions must follow a series of questions with explicit audience responses, a formal order is imposed on the discussion. This order can often be represented as a branched discussion tree of the type shown in Figure 4. Although audiences are usually able to determine the direction of such discussions to some extent, it is the moderator who maintains the greatest degree of control over the evolving structure. It is this fact which leads us to investigate the possible role of these patterns in the manipulation of group outcomes.

One feature of the discussion tree over which the moderator retains complete control is the sequence in which topics are taken up for voting. Although the sequence in figure 4 appears to be the most logical one, it is not hard to conceive of situations in which any number of alternative agendas would be acceptable. Common experience with various types of group meetings has shown that the form of the agenda can often be crucial to the outcome of a discussion. In a book entitled How Nations Negotiate, F.C. Ikle analyzes the importance of agendas in international diplomacy.
Figure 4. Example of Branched Discussion Tree

Taken from (20) Fig. 4, this diagram represents the structure of a discussion on education. The discussion took place during a 90 minute television program conducted as part of the MIT Community Dialog Project.

<table>
<thead>
<tr>
<th>GOALS</th>
<th>OBJECTIVES</th>
<th>OBSTACLES</th>
<th>ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepare for Jobs</td>
<td>Communications</td>
<td>Lack of Readiness</td>
<td>Work with parents to Enrich Pre-schoolers</td>
</tr>
<tr>
<td>Well Roundedness</td>
<td>Student as Actor</td>
<td>Lack of Alternatives</td>
<td>School-Home Communications</td>
</tr>
<tr>
<td>Self-Fulfillment</td>
<td>Inquirry Process</td>
<td>Home</td>
<td>More Drama</td>
</tr>
<tr>
<td>Learning to Learn</td>
<td>Master Variety of Learning Skills</td>
<td>Motivation</td>
<td>In-Service Teacher Training</td>
</tr>
<tr>
<td>Cope with Change</td>
<td>Student Set Attainable Goal</td>
<td>Lack of Perception</td>
<td>Improve Student-Teacher Ratio</td>
</tr>
<tr>
<td>Self-Reliance</td>
<td>Know How to Use Resources</td>
<td>Training</td>
<td>Flexibility of Group Size</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inability to Read</td>
<td>Self-Instruction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Access to Resources</td>
<td>Use Parents &amp; Others as Instructors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inflexibility of Curriculum</td>
<td>Teacher Outside Involvement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Understanding Thought Process</td>
<td>Consider Teacher Tenure and Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teachers</td>
<td>Altering Environment for Teacher</td>
</tr>
</tbody>
</table>
"...Agreement on the agenda has two implications. First, it means that prior to, or at the beginning of a conference the parties agree on the subjects they will discuss. Second, the agreed agenda constitutes a procedural agreement as to the sequence in which the subjects will be negotiated. Both of these implications affect the outcome of negotiations: the subjects that are discussed obviously determine the issues that may be settled, and the particular sequence in which separable issues are negotiated may favor one side and handicap the other."[26]

The issue of the agenda determining the topics to be discussed appears to be relatively straightforward. In fact, this problem has already been mentioned with regard to audience manipulation in the discussion of the televote project appearing in Chapter Two. Analyzing how the sequence of topics affects outcomes, however, seems to be a more complex problem. Although the influence of agenda seems to be a fact intuitively, to what extent has there been empirical validation or theoretical understanding of this intuition?

**Empirical Research: The Work of Charles Plott**

Charles Plott of Cal Tech has addressed this problem in the context of group meeting having the task of choosing one alternative from among many. There are several conclusions made in Plott's paper; among them, the claims that,

"...first, the agenda or groupings in which alternatives are considered for adoption or elimination can be a major parameter in determining what the group will actually choose. Second, the nature of the influence is sufficiently systematic to yield to an analytical model."[27]p.2
The paper reports on several stages of an effort to develop a formal theory of how the agenda of a meeting can affect its outcome. The work began when Plott was offered an opportunity to draw up the agenda for a special meeting of a flying club to which he belonged. The purpose of the meeting was to decide on the composition of a new fleet of airplanes which the club was to buy for the use of its members. On the basis of a crude theory, it appeared that several equally acceptable agendas would each favor a different outcome.

In the way of an experiment, Plott decided to devise an agenda which would favor the outcome he desired personally. The experiment turned out to be a success with the result that work soon began on a formal mathematical model. Finally, laboratory experiments were undertaken for the purpose of validating the model. This attempt met with only partial success, however, with the result that Plott comes to conclude that "... even though our general theory may be right, the specific means of expressing or modelling it that we have developed is probably wrong.

A brief explanation of the flying club example would be highly instructive for the purposes of understanding both the general nature of the theory and its implications. The club was faced with a choice of several types of aircraft from which to compose its new fleet of six or seven planes. The four models being considered were:

1. Beechcraft Bonanza A36 (abbreviated: A)
2. Beechcraft Bonanza F33A (abbreviated: F)
3. Refurbished Beechcraft Bonanza E33A (abbreviated: E)
4. Cessna 210 (abbreviated: C)
From among these alternatives, Plott drew up his own list of preferences:

1st choice: 7 planes, EEEEEECC or EEEFFCC
2nd choice: 6 planes, EEEEEC or EEEFFC
3rd choice: 7 planes, EEEEEEA or EEEFFFA

In order to design an agenda which would bring about the outcome he desired, Plott first needed information on the preferences of the group as a whole. These preferences were estimated as follows:

<table>
<thead>
<tr>
<th></th>
<th>35%</th>
<th>35%</th>
<th>10%</th>
<th>3%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st choice</td>
<td>6 or more E's and F's*</td>
<td>6 or more E's and F's*</td>
<td>mostly A's</td>
<td>mostly C's</td>
</tr>
<tr>
<td>2nd choice</td>
<td>several E's and F's with a few C's (*))</td>
<td>several E's and F's with a few A's</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd choice</td>
<td>several E's and F's with a few A's</td>
<td>several E's and F's with a few C's (*))</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

where (*) indicates Plott's own preference.

This breakdown was based on the assumption that most of the group would prefer to continue flying Beechcraft (the type of aircraft which made up the old fleet), but would also want less expensive alternatives such as Cessnas (C) and Beechcraft E's. A small but influential portion of the group preferred the more expensive A's, while the governing board of the club wanted Cessnas, apparently because of their relationship to the local Cessna dealership. As can be seen
from the above chart of preferences, it seemed highly unlikely that in the absence of any manipulation Plott's choices could be voted in.

Essentially, Plott's theory states that the agenda can influence the way in which the initial set of alternative choices is partitioned by a sequence of votes into successively smaller subsets. This influence can be felt in two ways. First, because of the fact that group preferences are revealed by voting and the contents of each vote are determined by the agenda, it is possible to limit the information available to individuals on the patterns of group preference. Thus there is little chance for the preferences of others to influence individual voting behavior adversely. The second way in which the agenda determines outcomes is by determining the set of strategies available to the individual at any point in time. [27]p.14

A final element needed to implement this theory is a knowledge of the decision rules by which individuals choose between sets of alternatives. One hypothesis is that people vote for the set containing their most preferred alternative, while another holds that they tend to vote against the set containing their least preferred alternative. In devising the agenda for the flying club meeting, Plott assumed that club members would follow only the first rule.

The fundamental task encountered in the designing of the agenda was to order the five questions correctly. The sequence finally chosen as well as the resultant pattern imposed on the discussion are presented in Figure 5. The first question voted on concerned the
makeup of the primary fleet. The reason for putting this question first was because if given the opportunity, most of the group would have voted for a fleet made up entirely of inexpensive planes. The next question concerned the desired number of planes to be bought. Many members wanted six E's and F's and no A's or C's. By pitting these members against those who wanted seven plane fleets, Plott insured that there would still be an opportunity for choosing some A's or C's later in the agenda.

The next question asked the group to decide whether they wanted any planes of a type other than that already chosen for the primary fleet. Since more members preferred a secondary fleet, the meeting moved on to the decision of whether that secondar fleet should have one or two planes. Due to the fact that the successful vote on a mixed fleet had already ensured a margin large enough to vote in at least two A's or C's, this question was also decided in Plott's favor. Finally, the type of aircraft in the secondary fleet was also choosen according to plan because the already high cost of a seven-plane fleet had compelled the group to select C's over the more expensive A's. In the end, therefore, the agenda has achieved its intended purpose.

One of the most interesting things to be learned from the meeting, however, centered around the behavior exhibited by the chairman. The meeting chairman was himself determined to see to it that the final choice included at least some A's. He therefore made several attempts to change the agenda during the meeting in order to achieve
Figure 5. STRUCTURE OF FLYING CLUB MEETING

Question 1: Type of Primary Fleet.
Question 2: How many planes total?
Question 3: Planes of Type other than in Primary Fleet?
Question 4: How many planes in secondary Fleet?
Question 5: Type of planes in secondary Fleet?

*indicates Plott's preference
→ indicates path actually taken in meeting

(Diagram adapted from (27) p.10, Fig. 3)
Figure 6. Chairman's 2nd Attempt to Change Agenda

Figure 7: Chairman's 3rd Attempt to Change Agenda

**QUESTION 1:**
Type of Primary Fleet: A's or C's in Secondary Fleet?

**QUESTION CHANGE:**
A's or C's in Secondary Fleet?

**QUESTION 3:**
Planes of Type other than that in Primary Fleet?

**QUESTION CHANGE:**
Do we want at least one A?

* indicates Plott's preference
+ indicates Chairman's preference
→ indicates path of discussion if change were to be made in agenda
this goal. Plott, however, managed to get each attempt ruled out of order. The first such attempt came as a call for a vote at the beginning of the meeting on whether or not an all Beechcraft fleet should be chosen. Had this vote actually been taken, it would almost certainly have passed ensuring the inclusion of at least one A in the final outcome.

The other attempts to change the agenda were equally skillful. Before the size of the fleet was to be decided upon, the chairman called for a vote on whether A's or C's should make up a secondary fleet. At this point the group would have chosen A's with the result that the ultimate choice would have been a seven-plane fleet that included one A. This situation is illustrated in Figure 6. Before a vote was to be taken on the number of planes in the secondary fleet, a final attempt was made to change the agenda. In this case the chairman asked whether there should be at least one A. At this point the vote would again have been affirmative as shown in Figure 7. Plott finally observes that

"...the remarkable thing about the chairman's behavior is that agenda rigging is not easy business— for us at least. There are thousands of competing agendas. Yet he seems to know which ones were to his advantage. Not once did he make a mistake, at least according to our theory. Could he have instinctively understood the thing that we had so laboriously arrived at?"

While it is true that future cable participation sessions may not always be direct real-world analogs to meetings such as the one
described above, the implications for cable meetings are nonetheless clear. If it is indeed true that the sequence in which questions are asked can affect outcomes to the extent that intuitive knowledge of the process is available, then the agenda of a meeting must certainly be considered as a possible source of significant manipulatory effects.
III. The Structure of Communications: Network Effects

A major result of the simulations reported earlier in Chapter Three is the finding that additional channels of information must be utilized if large scale dynamic polling processes are to be feasible. The simulations clearly indicate that if cable participation programs come to rely solely on the limited response capability of pushbutton home terminals, breakdowns in communication become inevitable. There are several ways to circumvent this problem, however. One method with which we are already quite familiar is the use of telephone call-ins during the broadcast. In addition, live interaction between the moderator and a studio audience may also serve to clarify the desires and frustrations of the audience. Finally, several of the proposed NSF experiments suggest the possibility of neighborhood communication centers where full video upstream transmission capability would be available on a limited scale.

If we consider combinations of these supplementary channels, the number of possible physical configurations for future cable participation systems seems quite large. It therefore seems reasonable to ask whether variations in the communication structure of these configurations might possibly affect audience behavior. One area of research contained within the social-psychological literature does in fact suggest the existence of a relationship between networks of communication and group behavior.[28] These investigations have taken the form of laboratory
studies in which the number and pattern of communication channels linking the members of small groups have been taken as independent variables. The hypothesized relationships have included a number of dependent variables such as task performance, morale, satisfaction, and influence, any of which may have some possible implication for the problem of manipulation.

The relevance of small group studies to large-scale participation programs becomes clearer upon examining several probable configurations for such systems. Several of the communication structures which characterize alternative cable participation systems are illustrated in Figure 8. Figure 8-a represents the situation in which the system consists of only a moderator transmitting from the point of program origination at the cable's head-end and the members of the home audience. Full audio and visual communication channels and face-to-face communications are depicted in the diagram as solid lines, while digital transmission is indicated by dashed lines. Figures 8-b and 8-c illustrate networks resulting from the introduction of studio audiences and neighborhood terminal locations; obviously, any number of other arrangements are possible as well.

The three patterns shown in Figure 8 are examples of what will be referred to as 'full-communication' networks. That is, they imply that all participants have unlimited access to broadcast time, and that any communication initiated by a participant is transmitted directly over the cable. In other words, the program moderator has
Figure 8. Several Alternative 'Full-Communication' Networks

8-a
Moderator

Home Audience

8-b
Moderator

Studio Audience

Home Audience

8-c
Studio Audience

Moderator

Neighborhood Terminal Location

Home Audience

Audio-Visual Channel

Digital Channel

Single Moderator

Audience Segment in which all participants separated

Audience in which members not separated
little or no control over the communication of other participants; he can neither restrict the use of channels nor intercept messages in order to relay them himself.

Such a characterization of communication structure is undoubtedly unrealistic. However, by describing alternative physical configurations in terms of 'full-communication' networks, the differences in potential patterns of communication are emphasized. If the nodes of these networks are thought of as individual members of small groups, Figure 8 can then be considered to represent different patterns of small group communication.

The differences in patterns of communication that possibly hold some implication for cable systems go beyond differences of physical configuration alone. If the assumption of 'full-communication' is altered, a large number of variations in communication structure become possible for any one physical configuration. In such 'restricted-communication' variations, the flow of communication in any of the original channels is controlled by the moderator who acts as a gatekeeper. Such control is usually considered necessary to the success of group participation meetings. However, if exerted beyond the level required for such success, manipulation problems inevitably arise.

In order to illustrate this, Figure 9 depicts several 'restricted-communication' variations of the full network appearing in Figure 8-c. In 9-b for instance, the moderator relays all communication himself with the result that the separate segments of the audience can no
Figure 9. 'Restricted-Communication' Variations For A 'Full' Network

9-a. Full Network

9-b. Moderator acts as gatekeeper

9-c. Segment of Audience isolated
longer contact each other directly. The moderator is even able to selectively isolate particular sections of the audience as in Figure 9-c by shutting off out-going communication. This situation is especially likely when audience segments are not representative of a cross-section of opinion, but instead possess distinctive viewpoints. The major concerns of the group psychology studies, however, are with the more subtle effects of network structure on group behavior.

**Early Network Studies**

The earliest discussion of such effects appears in the work of Alex Bavelas. Although most patterns of communication emerge as the result of social processes, Bavelas chose to focus upon fixed patterns. Such patterns may be imposed by a larger organization (as Bavelas himself had in mind) or by the actual technology of communication as in the case of cable participation systems. In a paper appearing in 1950, Bavelas raises the question of

"...how a fixed communication pattern may affect the work and life of a group...It may be that among several communication patterns, all logically adequate for the successful completion of a specified task, one gives significantly better performance than another. What effects can pattern, as such, have upon the emergence of leadership, the development of organization, and the degree of resistance to group disruption?" [29] p. 726

Bavelas hypothesized that the mechanisms of such effects might be grounded in the geometric properties of patterns of communication. Specifically, he felt that differences between patterns might account
for differences in the behavior and performance of groups, while geometric differences within patterns might account for differences between individual members of the group.

The geometric concept which serves as the basis for these differences is the notion of 'distance'. If the internal distance between two members of the group is defined as the number of links that separate them, then the sum of these distances for all positions in the net can be used as a measure of the pattern's dispersion. This measure of dispersion could then serve as a basis for comparison between patterns. Bavelas also states that comparisons between positions in the same pattern can be made on the basis of the 'relative centrality' of each position. This quantity is defined as the ratio of the sum of internal distances for all positions to the sum of distances from any particular position. [29]p.72

Among the first of the experimental studies to investigate Bavelas' geometric hypotheses was that conducted in 1951 by Harold H. Leavitt. [30] Using an experimental procedure which was to later serve as the model for many future investigations, Leavitt employed a characteristic type of group task. Each member of the group was supplied with a list of symbols, only one of which appeared on the other members' lists. The group was then faced with the problem of discovering the common symbol. The subjects communicated by passing written messages to each other through slots in the partitions that separated them. By selectively closing some of these slots,
Leavitt was able to form four communication nets, diagrams of which appear in Figure 10. These nets, as well as the individual positions within the nets served as the independent variables of the experiment, while task performance measures, questionnaires, and content analysis were used to study the dependent variables of interest.

Based on the results of these experiments, Leavitt concludes that differences in behavior can in fact be attributed to factors relating to the structure of communication in groups. In addition, the chief correlate of these differences does appear to be an operational notion of centrality. In conclusion, he suggests that centrality affects behavior by imposing limitations on the independent action of individuals within the net. This leads to the prediction that

"...Where one position is low in centrality relative to other members of the group, that position will be a follower position, dependent on the leader, accepting his dictates, falling into a role that allows little opportunity for prestige, activity, or self-expression." [30] p. 50

Investigating Influence Relationships

Although of obvious interest, Leavitt's conclusions are essentially very general in nature. As a result, his study was eventually followed by almost twenty years of additional study by other experimenters. During this period, interest has shifted from variables intended as measures of performance to psychological indicators of influence, leadership, and group morale. The work of Goldberg [31] and of Shaw, Rothschild, and Strickland [31] are of particular interest as they
Figure 10. Communication Nets Used in Leavitt Study

Chain

Circle

'Y'

Wheel
investigate the patterns of influence relationships within communication networks.

Citing Leavitt's conclusions on the role of centrality in networks, Goldberg hypothesized that the more central the position held by a group member, the less that individual would be influenced as the group reached its decision. In addition, Goldberg also believed that the greater the centrality of a position, the more likely it would be that the person occupying it would be perceived as a leader by other members of the group. The networks employed in the experiment were the 'chain', 'wheel', and 'Y' patterns of the Leavitt study. It had been Goldberg's intention to show that his hypothesized relationships could be demonstrated for all three networks.

Designed to yield an operational measure of group influence, the experimental task required that each individual judge the number of dots appearing on a card held up before him. By passing messages to each other, group members had to reach a common conclusion on the number of dots that had appeared. The initial guess of each individual minus his final guess served as a measure of the extent of group influence. In addition, information on leadership attributes was obtained by polling each of the subjects individually.

Goldberg's results confirm the relation reported by Leavitt between position centrality and leadership perception. This confirmation seems particularly strong in light of the fact that the group task used by Goldberg differed considerably from the one used by Leavitt. However,
the experiment does not appear to confirm the hypothesis concerning centrality and influence. Goldberg himself, though, sums up his results in the following way:

"...Our results can be considered an indication of the importance of situational factors operating in influence and leadership phenomena. We have shown that one's position in a communication network has a bearing on the extent to which one is influenced by one's group in decision making. However, the hypothesis we proposed was confirmed only in the case of one type of network, the fork.[31]p.121

Rather than reject the hypothesis for the reason that only partially confirming evidence had been obtained, Goldberg assumes that some additional variables must have intervened in the case of the 'chain' and 'wheel' patterns. He therefore concludes that more experimentation is necessary in order to explore such a possibility in a greater variety of networks.[31]p.121

The conceptual perspective of Shaw, Rothschild, and Strickland differs slightly from that of Goldberg in that they focus upon the relation between net position and the ability to maintain a deviant opinion. Employing a group task and influence measure that resemble those used by Goldberg, the Shaw study attempts to verify the existence of one of two theoretical possibilities. If it can be observed that those in central positions change their opinions in the face of opposition more readily than those in peripheral positions, then it would be reasonable to assume that those in central positions are more vulnerable to group pressure. If on the other hand, the center were
to change less readily, then it would be likely that those individuals use their positions in the net to convince others.

Shaw, Rothschild and Strickland divided their investigation into two separate experiments. In each experiment, only one network was used; a four-man 'Y' pattern. In the first experiment, all four positions were filled by subjects who were permitted to change their opinions. The experimental results show that when all other positions disagreed, the center position changed opinions as often as any of the peripheral positions. However, when the group was evenly divided, the half made up of the center and one peripheral position changed opinions less frequently than the other two positions did.

Shaw considers this second result to correspond to Goldberg's finding that more central members of the group are influenced less as a decision is approached. However, he also raises the question of whether this lack of change on the part of the center position is due to the fact that:

1) only two opponents remain,
2) a supporter is present, or
3) there is non-unanimous opposition.

An answer to this question in the context of communication nets is certainly relevant to the previous discussion of the Asch experiments. This fact seems to suggest the possibility of interaction between the influence characteristics of communication nets and the phenomenon of bandwagon effects.
Shaw's second experiment was intended to shed light on the reason behind the center position's relative lack of opinion change. In this experiment, only one member of the group was actually an experimental subject; the other three were plants instructed by the experimenters as in the Asch experiments. Aside from position in the net, the degree of group support was also used as an independent variable. Among the conclusions which the investigators draw are that:

"...(a) The central S more than the peripheral S tries to change the opinion of those who disagree, but if he fails, he himself changes more, presumably because of his greater vulnerability to direct pressure, (b) the presence of one supporter strengthens the resistance of an S relatively more than the mere reduction of size of opposition and more than the simple fact that the opposition is not unanimous."[32]p.330

Net Studies in Persepctive

The confirmation of Goldberg's conclusions and the finding that the presence of a supporter (which in the case of cable participation systems might be represented by one of the several audience segments) strengthens the influence of the central position lends credance to the idea that communication structure can serve as a possible source of manipulatory effects. However, the implications of both these studies are not this clear-cut. The fact of the matter is that Goldberg found confirming evidence only for the case of the 'Y' network. As a result, he was forced to postulate the existence of some intervening variable to explain the negative result obtained in the cases of other
patterns. While Shaw does claim to have confirmed Goldberg's positive result, the confirmation was also made only for the case of the 'Y' network. Other networks in which additional intervening variables might play a role were simply not investigated.

When viewed as a body, all the communication network studies seem to display a similar sort of ambiguity. In an article reviewing the first decade of research in this area, Glanzer and Claser[28] state that the two fundamental questions originally posed by Bavelas concern the effects of communication structure on group efficiency and morale respectively. After examining the results of the experimental studies, however, the occurrence of ambiguous and even contradictory conclusions lead them to state that:

"..There is no simple answer to the first question. The effect of structure depends in part on the requirements of the task. Contrary to Leavitt's original generalization, in a number of studies the highly centralized structures are less efficient than other structures."[28]p.18

In 1968, Robert L. Burgess conducted a series of experiments with the intention of discovering variables capable of resolving the contradictions of earlier studies.[33] Hypothesizing that motivation and learning behavior play important roles in group performance, Burgess increased the number of consecutive trials in his experiment to approximately 1000. (This is in comparison to the 25-60 trials typical of previous experiments.) In addition, he also introduced reinforcement as another independent variable.
The results of the experiments reveal a learning curve in which differences in efficiency between nets disappear in a progression with time. Burgess therefore concludes that

"...previously asserted 'differences' in solution rates between communication structures, in which there were no physical limitations favoring one network over the other, were a function of experimental artifacts. Had previous experimenters included reinforcement contingent upon performance, and had they observed their experimental groups over sufficient time periods, the collection of a vast array of contradictory findings could have been avoided."[33]p.335

In light of this result, are we not to conclude that communication structure cannot really serve as a source of manipulatory effects after all? At this point in time, the answer must remain unknown. Burgess's results don't force us to reject such a relationship outright for the reason that his conclusions only concern the issue of efficiency and not that of influence. In addition, it appears that any reluctance to draw general conclusions from the earlier studies would be well applied in this case as well. This is because important differences exist between the experimental situations described in these studies and the probable reality of future cable participation systems.

The greatest of these differences lies in the nature of the group task itself. It would certainly be difficult to generalize results based on the performance of 'Leavitt-type' tasks to the case of complex decision processes. Task complexity has in fact been made a variable of interest in several studies. Aside from
being examined in the Shaw, Rothschild, and Strickland article, this variable was also the focus of an experiment conducted by Shaw in 1954. In addition, it is also an issue of concern in an article written by Heise and Miller. The Heise and Miller study also pointed out other differences which happen to exist between the common experimental context and our proposed reality of two-way cable systems. Specifically, they investigate the effects of channel noise and one-way channels on the performance of different networks. Finally, Macy, Christie and Luce have studied the role of semantic noise on group performance as well.

In order to draw any solid conclusions on the role of communication structure in the generation of manipulatory effects, it is therefore necessary to conduct experiments within the actual context of cable participation systems. Previous studies may suggest the possibility of manipulatory effects, but because of the differences and ambiguities contained in them, they can in no way serve as a guide for the prediction of those effects.
CHAPTER FIVE

CONCLUSIONS

The mechanisms by which manipulatory effects may arise in future citizen participation programs are almost certainly dependent on the cable technology used to implement them. The preceding discussion has focused upon several of these characteristics as potential sources of manipulatory effects.

Observations made during the course of the MIT Community Dialog Project have served as a basis of conjecture for some of the relevant aspects of cable technology. In particular, these judgements are based upon an investigation of the likely configurations of future large-scale cable participation systems. This investigation indicated that such systems would most probably utilize digital signals for upstream transmission in a manner similar to the operation of the Community Dialog apparatus.

Although not designed for the purpose of investigating the manipulation problem specifically, these simulations were nonetheless able to serve as useful inputs to this study as they pointed out the existence of three characteristics of probable large-scale cable participation systems. These three characteristics, continuous feedback, formalized patterns of discussion, and the necessity of supplementary channels of communication, were in turn analyzed with respect to their potential as sources of manipulatory effects.
After examining literature pertinent to the task of establishing whether or not the suggested manipulatory effects may in fact exist, it was concluded that each of the above three characteristics remains suspect as the basis for several possible mechanisms of manipulation. Within the context of dynamic polling processes used to approximate group discussion, it has been seen that continuous feedback of group preferences may give rise to 'bandwagon effects'. In addition, formalized patterns of discussion can result in a situation in which the structure of the agenda used in such meetings may have a significant influence on group outcomes. Finally, it has also been suggested that the structures of communication imposed by cable systems as a result of the necessity to include various arrangements of supplementary channels might generate characteristic sets of influence relationships.

But just how likely are these possibilities? Even after the brief examination of the literature likely to pertain to each of these three cases, the question still remains unanswered. With regard to the possibility of bandwagon effects and to the implications of different communication networks, the evidence appears to be contradictory. And, although the influence of agendas on the determination of group outcomes has been demonstrated, it is not clear that cable participation sessions would in fact be real-world analogs of the experimental situation.
Thus the most that can be done in a paper such as this is to speculate on the possibilities of manipulatory effects rather than on the probabilities of their actual occurrence. The phenomena of interest are sufficiently complex to prohibit widespread generalization and extension of existing experimental results. It should therefore be apparent that only experimentation conducted within the specific context of two-way cable participation systems can be of assistance in assessing the actual likelihood of various manipulatory effects.

I. Suggestions for Further Research

In carrying out such research, there are several issues of experimental concern which should be kept in mind. Various factors that might contribute to the existence of bandwagon effects have already been mentioned in the preceding chapter. Among these are qualitative audience stimuli, the dynamic qualities of the discussion, the structure of communication, and the degree to which audiences possess prior knowledge of the issues. Ideally, therefore, experimental designs should control for the inclusion of these variables. The design of Fleitas' experiment in which a series of successive votes was taken among several different groups of similar participants seems particularly suited for this purpose.

Due to the fact that no study has as yet disputed Plott's results, the problems involved in investigating the role of agenda effects in determining outcomes are not as numerous. However, the fundamental
question that we do have in this case concerns the correspondence of cable participation sessions to the experimental situation of successively partitioning an initial set of choices into alternative subsets. Future experiments should therefore concentrate on the problem of determining the range of applications for which Plott's general conclusions seem to hold true.

If anything, the third potential source of manipultory effects, namely, the network characteristics of the communication system, poses even greater problems for the implementation of practical experimentation. The role of communication networks in the development of influence relationships remains unclear despite almost two decades of research. Factors such as the nature of the group task and the characteristics of the communication channels must obviously become part of any experimental configuration.

However, in addition to these factors there is one general issue which, although relevant to any investigation of manipulatory effects, is of special concern in the case of communication net experiments. Simply stated, we are faced with the question of how to measure relationships of influence. On the most fundamental level, one encounters the theoretical problem of trying to define power and influence relationships. It is generally argued that power relationships are causal; for A to have power over B, A must cause B's behavior. However, in accepting this argument, we must also accept the difficulties involved in detecting causal relationships. [37]p.410,[38]
Besides basic theoretical issues, we are also faced with practical problems of measurement. James G. March discusses several advantages and disadvantages of the different techniques used to measure influence.[39] The first method which he discusses is that of attributed influence; that is, simply asking subjects to rank each other in terms of perceived influence. While directly asking subjects about how they were influenced does distinguish real from pseudo-influence, it does have a number of other shortcomings. Specifically, this method necessarily involves some degree of distortion, and in addition, provides no basis for comparison between ranking systems.

The second method which March discusses involves the use of before-and-after measures of opinion change. This is the technique employed in the Goldberg and Shaw studies. While this method, unlike measures of attributed influence, is external to the individual, it does require that answers be given on a continuous scale. A problem then arises as to the meaning of such units. In addition, overt measures often fail to distinguish between real and apparent influence.

Finally, one other approach would be to count attempts at influence using the techniques of interaction analysis. Interaction analysis breaks down all observable behavior and communication into a number of well-defined categories. During experimental sessions, trained observers record the occurrences of each type of event. One of the problems with this approach is the equality assumption on the impact
of message units. Another is the fact that when analysis is
directed towards interaction, it often tends to ignore unobservable
events.

In light of the advantages and disadvantages associated with
each of the methods used to measure influence, it seems reasonable
to conclude that a combination of techniques should be incorporated
within the framework of future experimental studies.

II. Manipulation Effects and the Process of Technology Assessment

Undoubtedly, the results of experiments and simulations conducted
within the specific context of citizen participation applications of
two-way cable can be of great benefit in the prediction of higher-
order technological effects. Even so, however, we should realize
that the boundless complexity of social and political realities
makes absolute confidence in the extrapolation of such results
an impossibility. The only method by which unequivocal knowledge
of these effects might ever be obtained is the actual observation
of functioning systems.

This fact does not lessen the significance of speculative studies,
however, for they are an essential part of the overall process of
technology assessment. By anticipating possible problem areas,
they permit us to focus attention directly on the aspects of
technological systems most likely to be of importance. In his article
on prediction, Bell states that:
"... the correct identification of relevant problems is obviously the first step in the conjecture about the future; it is easier to make because it tends to be an extrapolation of the present."

Because such extrapolations are dependent upon present reality, it seems reasonable to conclude that the process of problem identification does not remain constant over time. Different problems can obviously be identified before and after implementation of any particular item of technology. However, the process of technological innovation does not consist of these two stages alone. James Bright describes the innovation process in terms of eight stages occurring within the technological environment, each of which may be dependent on factors deriving from non-technical environments.

Present reality changes with each successive step of the innovation process, and for this reason, problems can continually be perceived in new ways. Thus, prediction of the higher-order effects of technology must of necessity be a gradual process of speculation, simulation, and experimentation in which complete knowledge crystallizes only in the final stage of the innovation process.

With respect to the introduction of cable participation systems, we now find ourselves between stages four and five in Bright's outline of the process of technological innovation. That is, we are at the stage of technological development in which laboratory demonstrations have already been completed, but full-scale field trials have only just begun. It seems clear that it will be
some time before the technology comes into actual widespread use within society. It is therefore also true unfortunately that we still have some way to go before any practical knowledge of the problems of manipulation can be obtained. But this fact should not make us particularly uneasy, however; for as the Lang study notes:

"...Any innovation in communication—the admission of the press to legislative debates, the broadcasting of political party conventions, the televising of presidential press conferences, etc. —has invariably invoked alarm. Some change always accompanies such innovation, but the potential danger to political institutions is, in retrospect, almost always found to have been exaggerated. The process by which individuals react and the ramifications of their reactions for the workings of institutions is always more complex, and hence the effects far more subtle than the alarmist can anticipate. Indeed, the high pitched sense of alarm may itself be one of the firmest guarantees against sudden disjunctive change." [4] p. 163.

Although knowledge of the changes brought about by technology can only be obtained gradually, such changes are usually too complex to result in far reaching impacts on society in only very short periods of time. Thus, we have the possibility of anticipating problems in time to direct observation to the more critical aspects of technological innovations. In this way, it may be possible to design around problem areas as they are encountered.

The conclusion of this thesis is that three specific mechanisms by which manipulatory effects may be generated are in fact distinct possibilities for future large-scale two-way cable participation systems. Based on currently available information, there does not
appear to be any way of determining the likelihood of these event-
ualities. However, we do have the ability to design experiments
which can determine the existence of these mechanisms within the
context of the actual systems as they come into use. Hopefully,
the results of such investigations will enable us to deal with
what might have otherwise remained important but unforseen higher-
order effects of the technology.
I. REFERENCES


7. The Urban Institute; *Design Study for Urban Telecommunications Experiments*, proposal to the N.S.F., 1975.

8. University of Southern California; *Implementing Two Urban Telecommunications Experiments Designed to Deliver Municipal Services*, proposal to the N.S.F., 1975.


II. TELEVISION FEEDBACK EXPERIMENT QUESTIONNAIRE
(Second Stage)

SEGMENT(1): Single Moderator

1. Indicate the degree of participation which you felt during this segment:
   circle: no participation 1 2 3 4 5 much participation

2. Did you often feel a lack of communication during the segment?
   circle: never 1 2 3 4 5 often

3. Was the pace of the discussion too fast or too slow?
   circle: too slow 1 2 3 4 5 too fast

4. Did the discussion hold your interest?
   circle: no 1 2 3 4 5 yes

5. Do you feel that the direction of the discussion was responsive to the audience's interests?
   circle: not responsive 1 2 3 4 5 responsive

6. Check off any question format techniques which you found particularly satisfying:
   yes-no____, multiple choice____, scale of choice____,
   frustration category____.

7. Check off any question format technique which you found particularly frustrating:
   yes-no____, multiple choice____, scale of choice____,
   frustration category____.

SEGMENT(2): Two Moderators

1. Indicate the degree of participation which you felt during this segment:
   circle: no participation 1 2 3 4 5 much participation

2. Did you often feel a lack of communication during the segment?
   circle: never 1 2 3 4 5 often
3. Was the pace of the discussion too fast or too slow?
   circle: too slow 1 2 3 4 5 too fast

4. Did the discussion hold your interest?
   circle: no 1 2 3 4 5 yes

5. Do you feel that the direction of the discussion was responsive to the audience's interests?
   circle: not responsive 1 2 3 4 5 responsive

6. Check off any question format techniques which you found particularly satisfying:
   yes-no___, multiple choice___, scale of choice___, frustration category___

7. Check off any question format techniques which you found particularly frustrating:
   yes-no___, multiple choice___, scale of choice___, frustration category___

SEGMENT(3): Panel Discussion

1. Indicate the degree of participation which you felt during this segment:
   circle: no participation 1 2 3 4 5 much participation

2. Did you often feel a lack of communication during the segment?
   circle: never 1 2 3 4 5 often

3. Was the pace of the discussion too fast or too slow?
   circle: too slow 1 2 3 4 5 too fast

4. Did the discussion hold your interest?
   circle: no 1 2 3 4 5 yes

5. Do you feel that the direction of the discussion was responsive to the audience's interests?
   circle: not responsive 1 2 3 4 5 responsive
6. Check off any question format technique which you found particularly satisfying:
   yes-no___, multiple choice___, scale of choice___,
   frustration category___

7. Check off any question format techniques which you found particularly frustrating:
   yes-no___, multiple choice___, scale of choice___,
   frustration category____.
TELEVISION FEEDBACK QUESTIONNAIRE - SUMMARY

1. Rank the single moderator, double moderator, and panel segments in terms of your sense of participation. Explain.

2. Rank the single moderator, double moderator, and panel segments in terms of the quality of communication you felt. Explain.

3. Rank the single moderator, double moderator, and panel segments in terms of their ability to hold your interest. Explain.

4. Did group feedback make the discussions more satisfying for you? Explain.

5. Did the group's feedback influence your response in any way? Explain.

6. Do you think your responses have differed had this been a large face-to-face meeting? Explain.

7. Did you like this technique? Please make any comments or suggestions which you might have. (Use reverse side).