

REPRESENTATION, TESTING AND POLICY IMPLICATIONS OF PLANNING PROCESSES

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Various ways to represent planning processes to test and draw policy implications from them are presented. We argue that three kinds of variables should be included: context, process and outcome. Four different models which incorporate these three variables are proposed, and data from a large public sector planning study are fitted to these four models. The findings suggest that the process-outcome link is the key to understanding the effectiveness of planning processes.

INTRODUCTION

Managers frequently are exhorted to include various planning processes in their tool kit. Rarely, however, are managers given any evidence about the comparative effectiveness of these processes (Bryson, 1983). The most frequently cited tests simply measure the effect of the presence or absence of formal planning systems on profitability, rate of return, market share, or some other desired outcome (e.g. Harold, 1972; Malik and Karger, 1975; Thune and House, 1970). These tests usually indicate that the use of a formal planning system does help, but exactly how is unclear (Hofer and Schendel, 1978).

One difficulty in evaluating planning processes is knowing how to represent them for testing. Previous research on the nature of the planning process has followed one or more of four basic approaches. The first approach emphasizes context and outcomes, while ignoring process altogether (e.g. Porter, 1980). The implication is that one has only to match desired outcomes to context and the appropriate process will automatically follow. In fact, some research on

goal setting does suggest that individuals do adjust different strategies if goals are altered (Locke *et al.*, 1981).

The second and more traditional approach focuses on normative or descriptive sequences of phases or steps (e.g. Delbecq and Van de Ven, 1971; Etzioni, 1967; Lindblom, 1959; Mintzberg, Raisinghani and Theoret, 1976; Simon, 1947; Van de Ven, 1980b). The assumption is that following a certain problem-solving sequence will lead to desired outcomes.

A third approach focuses on specific tactics or tasks to be completed within one or more steps of a general problem-solving model. Examples would include such tactics or tasks as establishing a program coordinating committee, doing a cost-benefit analysis, or conducting a pilot test (e.g. Bryson *et al.*, 1979; Bryson and Delbecq, 1979; and Nutt, 1982). The assumption is that use of specific tactics or the performance of specific tasks will produce desired outcomes.

The final approach focuses on generic activities (e.g. communication, conflict resolution, or goal-setting activities) either within a sequence of phases (e.g. Van de Ven, 1980a) or across an entire problem-solving sequence (e.g. Bryson,

1979). This paper will utilize this last approach to the representation of planning processes.

Several theorists have suggested recently that the appropriate choice of a planning process is contingent upon any number of factors, such as the structure and complexity of the problem, the environmental context, and the desired outcomes (Beach and Mitchell, 1978; Bryson *et al.*, 1979; Bryson and Boal, 1983; Bryson and Delbecq, 1979; Nutt, 1976a; Payne, 1982; Rainey, Backoff and Levine, 1976; Kartez, 1984; Alexander, 1984). More research focused directly on planning processes is necessary, however, before it is possible to know which is the most effective process in which situations and why.

Evidence that good planners *do* behave contingently if given the chance was first obtained by Bryson and Delbecq (1979) through the use of a project planning simulation in which planners were asked to design a planning process in response to different situations, or contexts. Bryson and Delbecq were able to investigate the influence of the following contingencies: whether the project goal was easy or difficult, and whether the situation was easy or difficult politically and technically. Each contingency was found to have some influence on the design of planning processes. Political difficulties prompted the most dramatic contingent variations in planning processes, followed by goal and technical concerns. As an example, the planners responded to politically difficult circumstances by paying more attention to coalition-building, shared discussion and problem-solving, bargaining and negotiation, and so forth, than they did in the absence of political difficulties. In summarizing their research results, the authors noted:

The principal conclusion is that project planners do appear to behave contingently if given the choice. They do appear to change their strategies and tactics as the situation changes in the hope of increasing the likelihood of goal achievement. Specifically, there appear to be some things planners always do, never do, and do contingent upon the situation, given constraints on budget and staff time (Bryson and Delbecq, 1979: 177).

We believe that even the simplest *contingent* model of the planning process should include four basic elements: the *context* within which the planning occurs, the planning *process* itself, the result or *outcome* of the planning, and the

interconnections among these three elements. Among the very few studies that have considered all four constructs are McCaskey (1974), Nutt (1976b), Bryson and Delbecq (1979), Bryson and Boal (1983), and Van de Ven (1980a-c).

The remainder of this paper is divided into four parts. The first section will discuss four planning models that link context, process, and outcome variables. A brief example of each model will be presented, along with a brief outline of the policy implications of each model. The second section will discuss how the four models can be tested using cross-sectional data. Alternative research approaches will also be mentioned. The third section will use data from a study of Minnesota's Land Planning Act of 1976 to demonstrate the utility of the four models. Finally, we will outline some implications of the four models for practice and research.

CONTEXT, PROCESS, OUTCOMES, AND THEIR INTERRELATIONSHIPS

Four simple theoretical models of the interrelationships of context, process, and outcome will be discussed: the Intervening, Independent, Moderating, and Interaction Effects models (see Figure 1). More complex models involving indirect paths and feedback loops will not be discussed due to space limitations.

The Intervening Effects model has two versions. In one, context has no independent effect on outcomes. Instead, context affects process, and process in turn affects outcomes. For example (following Delbecq and Van de Ven, 1971; Nutt, 1976a; and Thompson, 1967) planning contexts that differ in the analyzability, variability, and interdependence of decision tasks or technology would cause planners to choose different group processes or patterns of communication as a means of producing desired outcomes.

In the other version of this model, process has no independent effect on outcomes. Instead, process affects context, and context in turn affects outcomes. An example would be the *process* of convening a large group of very different experts to create an innovative solution to a problem. It is then the *context* of an interdisciplinary team that results in a far different solution than might have occurred otherwise (Delbecq, Van de Ven and Gustafson, 1975).

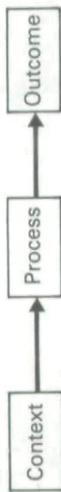
TESTS

POLICY IMPLICATIONS

MODELS

MODEL 1 — INTERVENING EFFECTS

a. Version 1



Process must be manipulated by manipulating its antecedents. Attention to context is key.

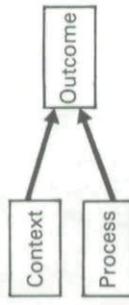
Correlation and partial correlation analysis

b. Version 2



Context must be manipulated by manipulating its antecedents. Attention to process is key.

MODEL 2 — INDEPENDENT EFFECTS

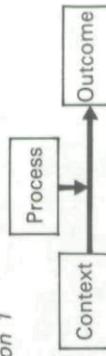


Manipulation of context and process are independent of one another, although policy makers probably have to worry about both. Policy makers probably have more leeway as they strive to affect outcomes than they do in the Intervening Effects Model. One should not expect large changes in outcomes following small changes in either context or process unless the relevant weights are very large.

Multiple regression analysis

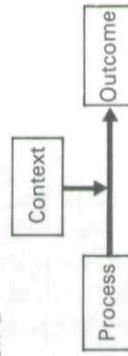
MODEL 3 — MODERATING EFFECTS

a. Version 1



You cannot know the effects of context on outcomes without also knowing something about process.

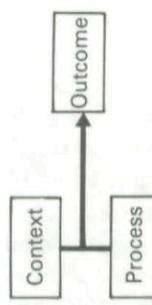
b. Version 2



You cannot know the effects of process on outcomes without also knowing something about context.

Moderated regression analysis

MODEL 4 — INTERACTION EFFECTS



There are no simple main effects. Manipulations of context are dependent on process and vice versa.

Moderated regression analysis

One conceivably could expect large changes in outcomes following only small changes in either context or process.

Figure 1. Theoretical models of relationships among context, process and outcome variables; policy implications of the models; and tests of the models.

In the Independent Effects model, context and process have statistically independent effects on outcomes. For example, consider a context variable such as group composition. No matter what process is used, planning projects that require the participation of heterogeneous groups with different norms and perhaps incompatible goals are likely to result in different outcomes compared to similar projects with homogeneous and cohesive participants (Huber, 1980; Janis and Mann, 1977; Seashore, 1954). Conversely, the use of certain group decision-making processes (e.g. the Nominal Group technique versus a traditional interacting group) will have an effect independent of group composition (Delbecq, Van de Ven and Gustafson, 1975).

The Moderating Effects model also has two versions. In the first the direct effects of context on outcomes are moderated by process. For example, scarce resources (context) directly affect the possible outcomes for groups competing for those resources (Pfeffer and Salancik, 1978). On the other hand, conflict resolution processes that moderate the competition for resources can influence the connection between scarce resources and outcomes (Follett, 1975).

In the second version, context moderates the direct effects of process on outcomes. For example, task complexity (context) has been shown to moderate the effects of different communication processes on task performance (Shaw, 1964).

In the pure Interaction Effects model there are no simple main effects. The only effect results from the interaction of process and context. For example, Vroom and Yetton (1973) suggest that problem attributes (e.g. problem structure) and decision-making style (e.g. autocratic, consultative, and group) interact to effect decision quality and acceptance.

Knowing which theoretical model best describes the relationships among context, process, and outcome variables should help answer several planning-related questions. First, can an intervention affect outcomes in a desired way? Second, can planners focus on either context or process variables alone, or must they worry about both? And third, where in a causal sequence should planners intervene? These questions cannot be answered in detail without reference to specific variables and settings. There are, however, general implications of the four models.

The basic implication of the Intervening Effects

model is that process (in version 1) or context (in version 2) must be manipulated by manipulating its antecedents. That is, in version 1 context directly determines the appropriate process which in turn determines outcomes. The implication for policy-makers is that they should manipulate context—and not worry so much about process—as they seek to affect outcomes.

This model is implicit in Porter's (1980) competitive strategy framework, in which market conditions (context) basically determine strategic response (process), which in turn should strongly influence outcomes. If the model is accurate, government policy-makers should try to manipulate market conditions in light of desired outcomes—for example, through anti-trust policies, environmental regulations, and tax schedules—and not worry much about corporate strategic responses. Following this model, corporate planners should simply make an accurate assessment of market conditions and the appropriate competitive response should become apparent.

The Independent Effects model, in contrast to the Intervening Effects model, implies that planning can affect outcomes by manipulating both context and process. As a result, policy-makers have more strategies at their disposal, but they probably do not have the option of ignoring either context or process. Moreover, it is unlikely that large changes in outcomes will result from small changes in either context or process variables unless the relevant causal links are very strong.

The policy implication of version 1 of the Moderating Effects model is that one must know something about process in order to predict the effects of context on outcomes. For version 2 one must know something about context in order to predict the effects of process on outcomes. In the Interaction Effects model, manipulations of context are dependent on process and vice-versa, since there are no simple main effects. Moreover, interaction effects may make it possible to produce large changes in outcome variables through small changes in either context or process.

TESTING THE DIFFERENT THEORETICAL MODELS

Tests of the first three theoretical models are straightforward. A test of the fourth model is

more difficult. In the research discussed below, we first were guided by the first version of the Intervening Effects model and by part of the Independent Effects model (see Figure 2). We assumed, in other words, that the generic process variables intervened between context and outcome variables in some cases, and that in other cases context variables had an independent effect on outcomes. We first tested our data based on these assumptions, and then pursued the exploratory task of fitting our data to other theoretical models.

In order to test the first version of the Intervening Effects model we used the following protocols: the first order partial correlations of context and outcome variables were compared to the bivariate correlations. If the zero-order correlations were significant, but the partials were non-significant, we then concluded that the process variables *do* intervene between the contextual and outcome variables. If the zero-order correlations were non-significant, but the partials were significant, then the process variables were acting as 'suppressor' or 'distorter' variables. (Suppressor variables, also known as 'distorter' variables, tend to mask the actual relationship between an independent and dependent variable. This usually occurs because the suppressor variable is positively correlated with one of the variables but negatively correlated with the other.) If the zero-order correlations and the partials were both significant or non-significant, we concluded that contextual and process variables had independent or no effects, respectively.

To test the second version of the Intervening Effects model, we would follow the same procedure, except that here we would partial out the effects of the context variables. In the example to be discussed below we have only analyzed the data in terms of the first version of the Intervening Effects model, because of our *a priori* theoretical assumptions about how the variables in our study might be related.

The above procedure suggests whether the Intervening or Independent Effects models is more descriptive of the data. However, the procedure is insufficient because the bivariate correlations do not reveal if both process and outcome variables explain variance independent of each other. To test for their joint effects it is necessary to use standard multiple regression analysis.

To test for the Moderating Effects model we used hierarchical moderated regression analysis (Saunders, 1956; Arnold, 1982). Moderated regression is similar to multiple regression except that cross-product terms for the independent variables thought to interact are entered into the equation after the main (independent variables') effects are determined. The moderating effect is examined by comparing the multiple correlation coefficient (R^2) of the equation without the cross-product term(s) to the equation with the cross-product term(s). The increment in R^2 is then tested for statistical significance. Since the test for both versions of the Moderating Effects model relies on the same statistical model, differentiation between the two models must be on theoretical grounds.

Unfortunately, there is no accepted standard procedure for differentiating the Moderating Effects model from the Interaction Effects model using data such as ours. The mononacity, reliability, and non-ratio nature of the data, among other things, contributed to the difficulty (e.g. Arnold, 1982; Busemeyer and Jones, 1983). In the results reported below we used the following procedure and reasoning. We compared the results of the hierarchical moderated regression analysis with a free entry stepwise regression analysis. We reasoned that if the interaction model best described the data then the following should occur. First, in the free entry stepwise analysis only the interaction term should enter in the equation. Second, in the hierarchical analysis the interaction effect term should always enter into the equation. Third, with all three terms in the equation (i.e. the two main effects and the interaction), only the beta weight for the interaction term should be statistically significant. In other words, only if all three occurred would we conclude that the Interaction Effects model best described the data.

The statistical tests discussed above are appropriate for cross-sectional data. Other researchers (e.g. Bryson and Delbecq, 1979; and Nutt, 1976b, 1977) have utilized experimental or quasiexperimental designs to examine the interaction between process and context variables in affecting outcomes. Nutt (1983) discusses the pros and cons of various research strategies (e.g. longitudinal, case, process reconstruction, and experimental strategies) for studying the planning process (cf. Bryson, 1983).

An Example: the Implementation of Minnesota's Metropolitan Land Planning Act of 1976

Our example is based upon data drawn from a study of the implementation of Minnesota's Metropolitan Land Planning Act (MLPA) of 1976, which was a pioneering attempt to manage urban growth and decline in a major metropolitan area.¹ Our study is one of the few empirical planning studies of its kind (Bolan and Nuttall, 1975; Gilbert and Specht, 1977; Van de Ven, 1980a, b; Van de Ven and Koenig, 1976).

Like policy-makers elsewhere in the country, Minnesota legislators recognized the urgent need to develop effective methods for expanding, maintaining or shrinking public services in response to urban population shifts and fiscal circumstances. Minnesota legislators, however, also realized that solving problems of growth management and control requires the appropriate design and management of public organizational structures and processes.

The legislature decided to adopt a design that worked well in the corporate world. The design permits centralized control over critical region-shaping systems, such as transportation networks and water and sewer systems; while allowing far more decentralized control over less critical region-shaping decision such as sites for specific industries or types of housing. The design is the public-sector, inter-organizational equivalent of many corporate planning systems, in which strategic decisions are made at the institutional level and less critical decisions are reserved for the managerial and technical core levels (e.g. Hofer and Schendel, 1978; Mintzberg, 1979; Steiner, Miner and Gray, 1982).

The generalizability of our example depends in part on how important the distinctions are between the public and private sectors. A variety of authors have argued that there are important differences between the public and private sectors (e.g. Rainey, Backoff and Levine, 1976; Lindblom, 1977; Ring and Perry, 1985). Unfortunately these assertions rarely have been tested empirically. When they have been, the distinctions

between public and private sectors often appear to be minor (e.g. Rainey, 1983). Furthermore, a variety of authors from both the public (e.g. Cleveland, 1973, 1985) and private sectors (e.g. Freeman, 1984) argue that the public and private sectors are becoming increasingly indistinguishable. We therefore conclude that while the question is still open, it is nonetheless useful to think about the applicability of our four models to both the public and private sectors.

The Metropolitan Council, the Metropolitan Development Guide, and the Metropolitan Land Planning Act

The Metropolitan Land Planning Act of 1976 was to be implemented by the Metropolitan Council (MC), a nationally unique, limited-purpose, government agency designed to guide and control growth in the Twin Cities metropolitan area. Established by the Minnesota Legislature in 1967, the council was patterned on the early General Motors model of organizational design. In that model, corporate policy decisions were reserved for the board of directors and corporate headquarters, while most operating decisions were left to the separate divisions (Sloan, 1963). In the case of the Metropolitan Council, regional decision-making was reserved for the council, while most operating decisions were left to the regional operating agencies (e.g. the Metropolitan Transit Commission, Waste Control Commission, or Airports Commission), or to units of local government (Harrigan and Johnson, 1978; Bryson, 1981). As a framework for both regional and local decision-making, the council produced a Metropolitan Development Guide.

The Metropolitan Land Planning Act of 1976 required the council to prepare a *metropolitan systems statement*—based on the development guide—for each of the 195 local units of government and 49 school districts in the metropolitan area. The statements were to be completed by 1 July 1977. The act further required that each local government use its metropolitan systems statement to develop a comprehensive plan by the end of July 1980 (a deadline that many units did not meet).

Each metropolitan systems statement was to be a compilation of information that the council deemed necessary for the preparation of a local

¹ Complete descriptions of the Metropolitan Council, its functions, responsibilities, and limitations, and of the Metropolitan Development Guide may be obtained from the authors, or from the Metropolitan Council, Public Information Office, 300 Metro Square Building, St Paul, Minnesota 55101.

comprehensive plan. Both the council and the local units had to agree to the statement.

Each unit's comprehensive plan had to conform to its systems statement and all applicable Metropolitan Council review criteria, almost all of which were drawn from the Metropolitan Development Guide. The local unit's comprehensive plan had to contain: a land-use plan, public facilities plan, housing implementation program, capital improvements program, and an integrated set of official controls (e.g. zoning ordinances, sewer regulations, and subdivision ordinances). The council could force local units to revise plans that did not meet review criteria.

Study design and methodology

The basic conceptualization that provided initial guidance and data for this study is presented in Figure 2. The lines in Figure 2 represent hypothesized bivariate relationships. (These will not be discussed in detail, but are presented only to aid the reader in the discussion to follow.)² In this partly Intervening and partly Independent Effects model, context variables affect process and outcome variables, and process variables affect outcome variables.

Procedures and Subjects

Data were collected for this study from two sources—the U.S. census and a lengthy questionnaire filled out by representatives of local government units in the Twin Cities region. (Each representative was the key Metropolitan Council liaison for his or her government unit.) We invited a representative from each of the 195 local units to complete the questionnaire. Of the 69 (35.2 percent) who agreed, 55 were employed by municipalities, six by counties, and eight by townships. They had 15 different job titles; the four most common being Planning Director (12), City Administrator (10), Clerk/Treasurer (8), and City Planner (8). They had worked for their organizations an average of 6.6 years (S.D. =

5.50), and 54 of them had at least bachelor's degrees, 38 of which were in a planning-related field. The larger, more professional units of government in the metropolitan area were somewhat overrepresented in our sample.

MEASURES

The questionnaire collected data on the major contextual process, and outcome variables related to local governments' preparation of comprehensive plans in response to the MLPA. Most variables were measured on a five-point Likert scale, with differing anchors. Whenever possible we tried to develop multiple indicators of a phenomenon. Factor analysis (not shown) sometimes indicated that these multiple indicators should be collapsed into scales, sometimes not. (The Appendix presents a more complete description, including operationalization, means, standard deviations, and where applicable, coefficient alphas. The questionnaire itself may be obtained from the authors.)

Contextual variables

Resources

The following resources were measured: (1) time allotted for completing plan (Ample Time); (2) level of financial resources for completing plan (Financial Resources); (3) adequacy of dollar resources for decision-making (Decision-Making Resources); (4) dependency on grant money for preparing plan (Planning Grant Dependency); (5) dependency on grant money for implementing plan (Implementation Grant Dependency); and (6) adequacy of full-time equivalent professionals to prepare plan (Adequate Personnel).

Demography

Two demographic characteristics were measured: population size (1980 Population), and population growth between 1970 and 1980 (Population Growth).

Number of groups

Respondents indicated whether or not each of 12 different groups had a formal or active role

² A full discussion of the logic behind, and test results of, the hypotheses underlying Figure 2 can be found in: Bryson, John M. and Kimberly B. Boal 'Strategic management in a metropolitan area: the implementation of Minnesota's Metropolitan Land Planning Act of 1976', Hubert H. Humphrey Institute of Public Affairs, University of Minnesota, Working Paper, 1982.

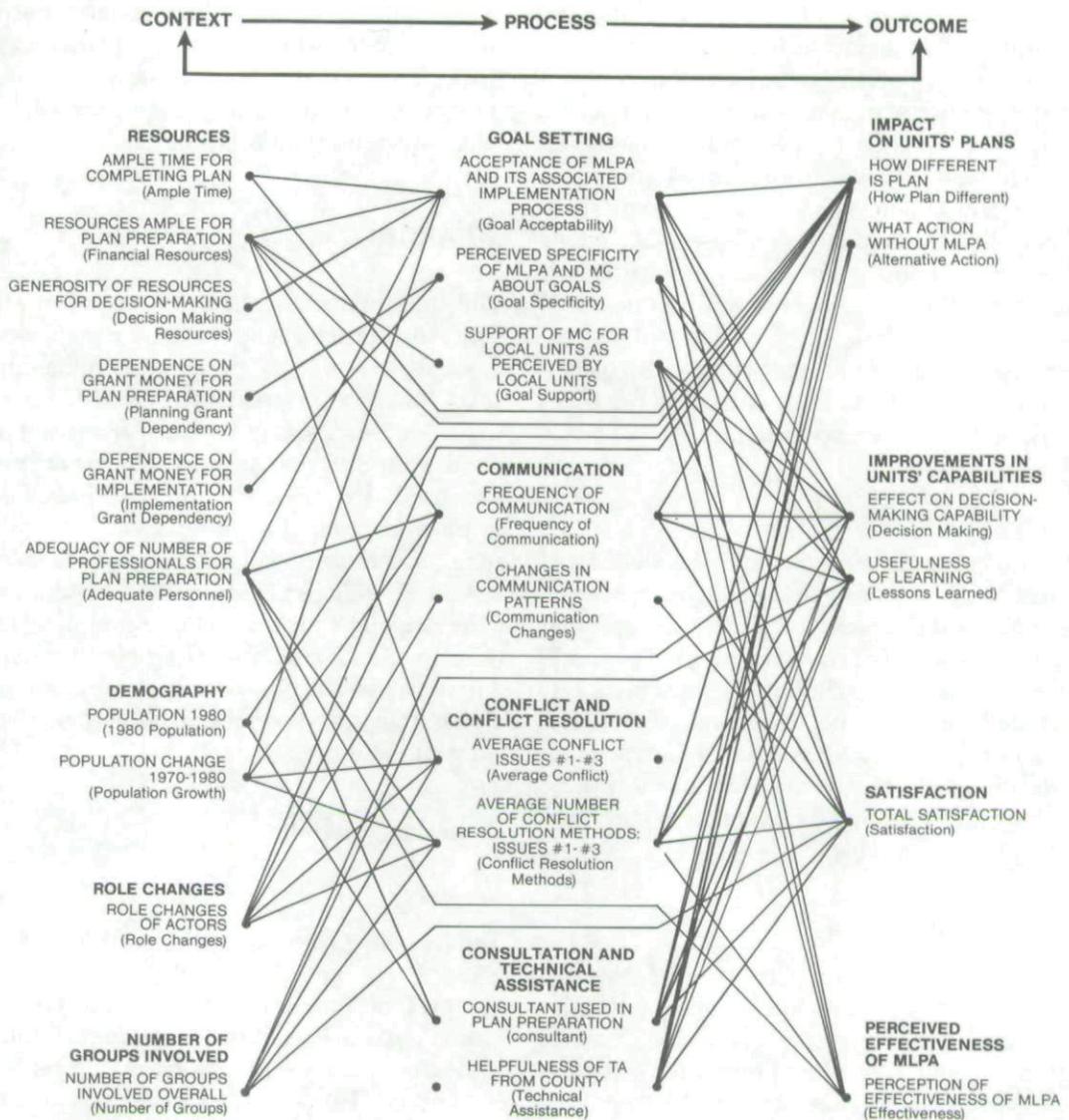


Figure 2. Hypothesized relationships among context, process, and outcome variables

in either plan preparation or implementation (Number of Groups).

Role changes

Also measured was the extent to which the roles played by the 12 groups represented a change from earlier relationships or merely a continuation of established practices (Role Changes).

Process Variables

For our study, process was conceptualized as *generic activities* across an entire problem-solving sequence. As noted in the introduction, this approach is only one of four that are typical of planning process studies. Four generic process activities were investigated: goal-setting, communications, conflict, and consultation and technical assistance.

Goal-setting

Three task-goal attributes were measured using multi-item scales. These attributes were Goal Acceptability, Goal Specificity, and Goal Support.

Communications

Two communication attributes were measured: frequency of communication between organizations (Frequency of Communications), and the extent to which communication patterns between these organizations had changed (Communication Changes).

Conflict

Two aspects of conflict were measured: average amount of conflict (Average Conflict) and the number and type of conflict resolution techniques used (Conflict Resolution Methods).

Consultation and technical assistance

Respondents were asked whether they used outside consultants (Consultant), and whether or not technical or consulting services provided by county governments were helpful (Technical Assistance).

Outcome variables

Impact of the MLPA of unit's plans

Two questions were asked: the first was: 'How different is the plan prepared under the MLPA from your earlier plan?' (How Plan Different) The second (Alternative Actions), was 'If the MLPA (1976) had not been enacted, what action would the community have taken in the last three years with regards to the comprehensive plan?'

Improvements in units' capabilities

Two questions assessed the act's impact on units' capabilities. The first, labeled Decision-Making, asked 'How did the project affect your unit of government's capability for making future decisions allocating resources for undertaking future endeavors?' The second, labeled Lessons Learned, asked 'To what extent will what was

learned from the comprehensive planning and implementation process be useful for understanding future comprehensive planning and implementation endeavors?'

Overall satisfaction

To assess overall satisfaction (Satisfaction), respondents were asked to what extent they felt their comprehensive plans would improve decision-making in general operations, land-use, public facilities, housing and capital improvements. They also were asked whether the official controls identified in the plan would actually achieve plan objectives.

Effectiveness of MLPA in solving problems

To assess the effectiveness (Effectiveness) of the MLPA, subjects were asked (a) How effective will the MLPA be in meeting regional needs and solving regional problems? and (b) How effective will the MLPA be in meeting local needs and solving local problems?

RESULTS

Table 1 shows the correlation matrix for all 25 variables utilized in this example. To guide us in examining the utility of the four models we decided to examine only those paths that resulted from the 52 hypotheses on which the original study was based (see Figure 2).³ The results of these hypotheses are shown graphically in Figure 3. One must be careful in drawing inferences when examining a large number of correlations, especially with a small sample size, since some will be significant or non-significant by chance. Also, the level at which all the significant correlations hold simultaneously is considerably less than $p < 0.05$. The alternative, of course, would be to examine only a few variables, thus reducing the likelihood of committing type I and II errors. We do not believe, however, that the current state of knowledge offers any reliable way of identifying the most 'crucial' variables.

Other qualifications are also necessary. In addition to possible sample bias, there was

³ See footnote 2.

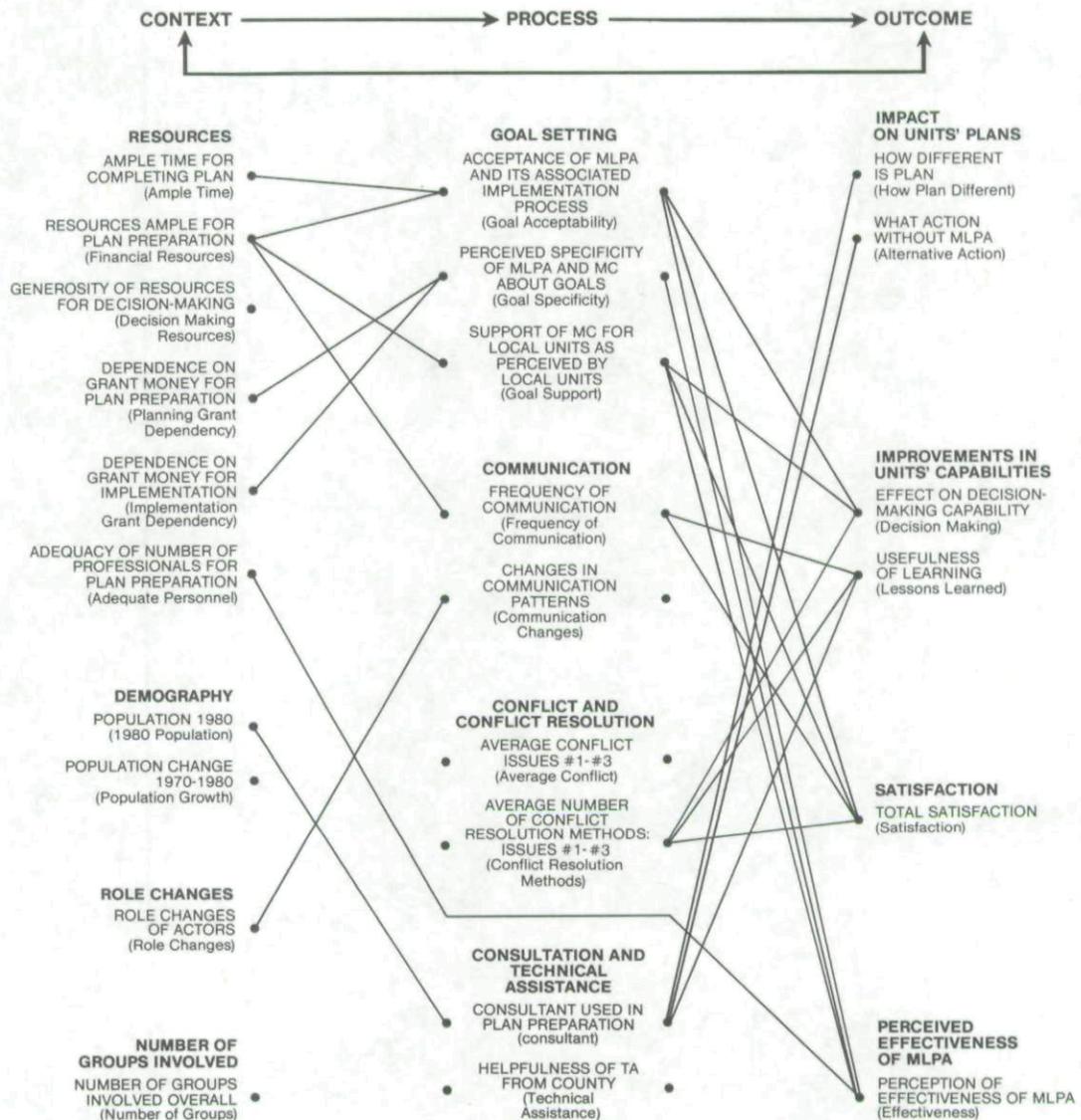


Figure 3. Statistically significant Pearson Product-Moment correlation among context, process, and outcome variables

considerable opportunity for bias in the responses due to differences in our respondents' positions and experience with their organizations, and to the possibility that they interpreted our questions differently. There also were no 'control' organizations.

In spite of these qualifications, we feel large exploratory studies such as this one have considerable potential for helping us to understand the dynamics of planning.

Of the 31 bivariate correlations testing the hypotheses relating context to process and outcome variables, seven were in the predicted

direction and were significant at $p < 0.05$ level. An additional 17 were in the predicted direction but were not statistically significant. Two correlations were statistically significant but not in the predicted direction. Five correlations were not in the predicted direction but were not statistically significant.

The seven supported hypotheses relating context and process variables are as follows:

- *The more ample the time and resources available to local units for plan preparation, the greater their acceptance of the MLPA*

and its associated implementation process. ($r = 0.23, p < 0.05$)

- The greater the resources available to local units for plan preparation, the less frequent the communications among the potentially affected organizations. ($r = 0.23, p < 0.05$)
- The greater the dependence of local units on grant money for plan preparation (Great Dependency) and for decision-making based on the plan (Money Dependency), the more specific the local units perceived the MLPA and MC to be about goals. ($r = 0.21, p < 0.05$)
- The more adequate the number of professionals available to local units for plan preparation, the greater the perceived effectiveness of the MLPA. ($r = 0.28, p < 0.05$)
- The greater a local unit's population in 1980, the less likely a consultant would be used to assist it with plan preparation. ($r = -0.47, p < 0.05$)
- The greater the role changes of actors as a result of the MLPA, the greater the changes in communication patterns. ($r = 0.80, p < 0.05$)

As noted, two hypotheses were statistically significant, but in the opposite direction. Unexpectedly, the more resources a unit had available for plan preparation, the less the acceptance of the MLPA and its associated implementation process ($R = 0.27, p < 0.05$) and the less the unit was likely to feel it was supported by the Metropolitan Council ($r = -0.28, p < 0.05$) Upon reflection, however, these results may not be surprising. The more resources a unit has, the more autonomous the unit is likely to feel, and, consequently, the less likely it will be to accept externally imposed goals and contacts (Pfeffer and Salancik, 1978).

Thirty-two bivariate correlations were examined in order to test hypotheses relating process and outcome variables. Fourteen were in the predicted direction and statistically significant at the $p < 0.05$ level. An additional 14 were in the predicted direction, but were not statistically significant. One statistically significant correlation was not in the predicted direction. Three additional correlations were not in the predicted direction, but were not statistically significant.

The 14 supported hypotheses relating process to outcome variables are as follows:

- The greater the goal acceptance by local units of the MLPA and its associated implementation process, the greater the perceived improvement in units' decision making capability, the greater their total satisfaction, and the greater their perceived effectiveness of the MLPA. ($r = 0.26, p < 0.05$; $r = 0.42, p < 0.05$; $r = 0.47, p < 0.05$)
- The more local units perceived the MLPA and MC to be specific about goals, the more the local units perceived the MLPA to be effective. ($r = 0.39, p < 0.05$)
- The more the local units felt they were supported by the MC, the more the local units felt their decision-making capabilities were improved, the more satisfied they were with the outcomes of the process, and the more they felt the MLPA was effective. ($r = 0.39, p < 0.05$; $r = 0.39, p < 0.05$; $r = 0.56, p < 0.05$)
- The more frequent the communication among affected units, the more they felt they had learned, and the greater their total satisfaction with the outcomes of the process. ($r = 0.36, p < 0.05$; $r = 0.34, p < 0.05$)
- The greater the average number of conflict resolution methods used by local units, the more they felt their decision-making capabilities were improved, the more they felt their learning was useful, and the more they were satisfied with the outcomes of the process. ($r = 0.32, p < 0.05$; $r = 0.30, p < 0.05$; $r = 0.31, p < 0.05$)
- The more a consultant was used by local units to help with plan preparation, the more the actions of the local units were different from what they would have been in the absence of the MLPA, and the more the local units felt their learning was useful. ($r = 0.39, p < 0.05$; $r = 0.23, p < 0.05$)

As noted, one statistically significant correlation was not in the predicted direction. We were surprised that the use of a consultant usually resulted in a plan little different from previous plans ($r = 0.31, p < 0.05$). Anecdotal evidence provides two possible explanations. First, many units hired a consultant simply to make sure their plans met the MLPA's requirements. Second, many consultants turned out standard, unexceptional plans that relied mainly on previous plans.

Intervening Effects model

After testing out a prior hypotheses, our next task was more exploratory—namely, the fitting of our data to the different theoretical models. Based on our original conceptualization (Figure 2), we expected one of the intervening models (i.e. context leads to process which in turn leads to outcomes) to be most representative of the data. Thus this was the first model we examined. To test our assumption we examined all potential paths between context and outcomes controlling for process effects.⁴ Of the 82 partial correlations examined, in only two situations was there an intervening effect. It is interesting to note that both situations involved the size of the community (1980 Population) and the use of an outside consultant (Consultant) which acted as intervening variables. In the first situation the results indicated that smaller communities used outside consultants, which in turn resulted in actions which were different than they would have been otherwise (Alternative). In the second case, because the use of a consultant (Consultant) was positively correlated with satisfaction (Satisfaction), the zero-order correlation between size and satisfaction was suppressed. The results indicate that both larger units and units who used consultants were more satisfied. Thus there is very little support overall for an Intervening Effects model, (We must note again, however, that we did not examine for the possibility that context intervenes between process and outcomes.)^{*}

Independent Effects model

The results from the bivariate and partial correlations indicated that the Independent Effects model might be the most representative of the data. However, the bivariate correlations did not examine the simultaneous effects of both context and process variables on outcomes. Therefore, to further test this model, we ran stepwise multiple regressions on the paths.

In all but one of the 42 applicable cases the results indicated support for a single main effects model linking process variables to outcome variables (refer to Figure 3 and bivariate corre-

lations).⁵ In only one case did a context variable (1980 Population) contribute independently along with a process variable, use of a consultant (Consultant), to an outcome variable (How Plan Different). Together these accounted for approximately 22 percent of the explained variance ($F = 6.93, p < 0.00; R^2 = 0.221$).

The amount of explained outcome variance that any single context or process variable can account for can easily be determined by squaring the correlation coefficient reported in Table 1. The reader will observe that the strongest relationships occur generally between the goal-setting variables and the outcome variables. The single strongest relationship was between goal support and effectiveness ($r = 0.56; R^2 = 0.31$).

Moderating Effects model

To test the possibility that contextual or process variables moderated the relationship between process or context and outcomes, we ran hierarchical moderated regressions. Results supported a moderating effects model in four cases. They are:

1. Ampleness of time available for plan preparation moderates the relationship between acceptance of the MLPA and satisfaction with outcomes of the planning process. In other words, units that accepted the goals of the MLPA were satisfied with the outcomes of the process; however, their level of satisfaction was greater the more they believed they had ample time for completing the plan.

($F_{3.53} = 3.29, p < 0.05; R^2 = 15.7$)

2. The use of a consultant moderated the relationship between the size of the community and action that community would have taken without enactment of the MLPA. That is, larger communities would have updated their plans in a manner consistent with the MLPA, even if the MLPA had not been passed. However, when they used an outside consultant they tended to opt for plans similar to those they already had. In

⁴ To save space we have omitted the partial correlations. They are reported in full in the paper cited in footnote 2.

⁵ Missing data, and thus a reduction in sample size, accounts for the differences in the number of significant bivariate correlations (46) vs. the number of significant multiple regressions (42).

other words, use of a consultant by larger communities tended to result in plans less in keeping with the intent of the MLPA than would have occurred otherwise.

($F_{3.54} = 6.01, p < 0.01; R^2 = 16.5$)

3. The ampleness of resources for plan preparation moderated the relationship between goal support from the Metropolitan Council as perceived by the local units and their perceived effectiveness of the MLPA in meeting local and regional needs. The result indicates that units that felt the MC was responsive to their needs perceived the MLPA as more effective. This was especially so when they also felt they had ample resources for plan preparation.

($F_{3.31} = 6.90; p < 0.01; R^2 = 0.400$)

4. The ampleness of resources for plan preparation also moderated the relationship between frequency of communications and the usefulness of what was learned. Thus, frequency of communication was associated with greater usefulness of learning, especially when units had ample resources for plan preparation.

($F_{3.48} = 4.01, p < 0.01; R^2 = 0.200$)

Interaction Effects model

Comparisons of the results between the stepwise multiple regressions and the hierarchical moderated regressions supported a 'pure' interaction effects model in two cases. They were:

1. The effect of the MLPA on the units' decision-making capability was jointly influenced by the frequency of communication and the ampleness of resources for plan preparation. We interpret this to mean that in the absence of either frequent communication with other units or ample resources for plan preparation, the MLPA had no effect on the units' decision-making capability.

($F_{1.50} = 4.51, p < 0.05; R^2 = 0.083$)

2. Units' decision-making capability was also jointly affected by the total number of groups involved and the number of conflict resolution techniques used. Thus, when many groups were involved in the planning process, decision-making capability was improved only when many conflict reso-

lution techniques were used to resolve differences among the groups.

($F_{1.49} = 8.06, p < 0.01; R^2 = 0.141$)

DISCUSSION

The purpose of this study was twofold: (1) to explore theoretically the interrelationship between context, process, and outcome variables; and (2) to examine empirically these relationships to see if they hold some promise for future research. Our findings indicate that on both theoretical and empirical grounds the four models we have developed make sense.

The basic empirical findings were quite surprising, given our initial conceptualization, namely, that the Intervening Effects model would predominate. While there were numerous links between context and process and between process and outcomes (i.e. bivariate correlations), the context variables generally were not causally linked to outcomes. Certain contexts seem to make the use of certain processes more probable. They are not determinant, however. Planners, it would appear, have considerable discretion in the use of planning processes.

This finding is significant, particularly in light of recent theorizing based in the ecological traditions of organizational research. The extreme version of the ecological approach argues that *environments* select successful organizations and that managers or planners can do little to affect outcomes. Managers or planners, in other words, are rigidly constrained by their contexts (Aldrich, 1979; McKelvey, 1982). Our research indicates that at least for our sample of organizations such was not the case. Managers and planners could do quite a lot to affect outcomes positively.

In fact, the strongest relationships observed in our study were direct process-outcome linkages. Particularly strong were the relationships between goal-setting and outcome variables. The implication is that efforts to improve goal acceptance, specificity, and support for subordinate units will pay off in increased impact on units' plans, improvements in units' capabilities, increased satisfaction of units, and greater perceived effectiveness of the overall inter-organizational planning system. This finding extends to the inter-organizational level the large body of research that demonstrates the impact of task-goal attributes on

performance at the micro-organizational level (see Locke *et al.*, 1981). Our results strongly support the assertion that these micro-relationships hold at the macro-level as well.

We also found that more frequent communications and greater conflict resolution efforts increased the likelihood of favorable outcomes. Thus planners may be well advised to pay attention to the development and application of communication and conflict resolution skills.

Context variables (except for size) were always important in conjunction with process variables. There may be several reasons for the relative unimportance of the contextual variables. First, people really may not have been causally influenced by context as they constructed processes to affect outcomes. Second, we may have focused on the wrong set of context, process and outcome variables. Third, context may not constrain process-outcome relationships very much. In comprehensive planning certain things—such as basic studies—need to be done regardless of context, and there may not have been much room left for variation in response to other factors.

Finally, our study illuminated how context and process can be manipulated differentially when hierarchical levels of government are involved in a planning process. In the situation we studied, the MLPA and MC set much of the context and process for local units of government. For example, the MLPA outlined the general process to be followed, along with general plan contents and actors to be consulted, while the MC prepared the systems statements for each unit. Local units therefore had limited discretion in manipulating context variables, and somewhat more discretion in controlling process variables. More numerous context-process-outcome relationships might have existed *in the absence* of the MLPA and the MC. But the MLPA and MC do exist, and given that fact we may not have been able to detect more context-process-outcome relationships because the MLPA and MC may have eliminated much of the variation in our variables. This explanation actually is the most intriguing, because it implies that the real power of the MLPA and MC comes from establishing the premises underlying decision making, rather than from prescribing specific actions or outcomes. March and Simon (1958), for example, argue that establishing the premises

underlying decision making is a far more powerful behavioral control than is prescribing specific actions or dictating specific decisions.

IMPLICATIONS FOR FUTURE RESEARCH

This study has two basic implications for future research. The first is the need for more longitudinal studies of the connections between context, process and outcome variables; the second is the need for theoretical re-examination of the planning process.

The present study is one of the few large cross-sectional studies analyzing the interrelationships of context, process and outcome variables in public sector interorganizational planning systems. In several instances, statistically significant relationship emerged. The need for longitudinal studies is obvious, however, if we are to understand fully how context and process are related and how they affect outcomes. Van de Ven's work (1980a-c) is virtually the only exemplary research of this sort. In addition to measuring process variables in a way similar to this study's measures, he was able to demonstrate the superiority of a specific normative sequence of steps (the Program Planning Model of Delbecq and Van de Ven, 1971) over a more random, unstructured process. Only longitudinal studies will reveal precisely which normative sequences or phases work best in which circumstances, and precisely how context, process and outcomes are related over time.

The need for a theoretical re-examination of the planning process is also implied in our study. The planning process typically is conceptualized in one of four ways: (1) as not worthy of attention, because the appropriate process is determined by an accurate specification of context and desired outcomes; (2) as a normative or descriptive sequence of phases or steps; (3) as specific tactics or tasks to be completed within each phase of a general problem-solving model; or (4) as generic activities either within phases or across a general problem-solving sequence. No matter how the process is conceptualized, however, what is not known is exactly how context, process and outcomes are related. In our study we originally conceived of the planning process principally as generic activities intervening

in a causal sequence from context to process to outcomes. We were surprised to find process variables usually had independent effects—and only occasionally intervening, moderating, or interaction effects—on outcome variables.

Our research is only a very preliminary effort to answer the question of how to conceptualize and test connections among context, process and outcome variables. Although our research has several implications for practice, obviously more work is needed. The reward, we believe, will be significant improvements in public and private planning practice.

APPENDIX: VARIABLES AND THEIR OPERATIONALIZATION

Contextual Variables

Resources: Five-point Likert scale where 1 indicates tight resources and 5 indicates ample resources

1. *Ample time:* How ample has the calendar time been for completing your comprehensive plan? ($x = 3.1$, $SD = 1.05$)
2. *Financial resources:* How generous is your level of financial resources for the preparation of the comprehensive plan? ($x = 2.55$, $SD = 0.80$)
3. *Decision-making resources:* How generous is/will be the amount expressed above (they were asked to indicate the approximate dollar amount of resources available to them each year for decision-making) for decision-making based on the comprehensive plan? ($x = 2.38$, $SD = 0.79$)
4. *Grant dependency:* What is your dependence on grant money for the preparation of the comprehensive plan? ($x = 3.42$, $SD = 1.28$)
5. *Money dependency:* What is/will be your dependence on grant money for implementation decision based on the comprehensive plan? ($x = 2.13$, $SD = 1.49$)
6. *Adequate personnel:* How adequate do you feel the above number of full-time equivalent (FTE) professional (they were asked to indicate the number), in addition to a consultant, was to prepare the comprehensive plan? ($x = 2.86$, $SD = 0.95$)

Demography: We report here only the ones relating to size and growth.

1. *1980 population:* Respondents were asked what their local units' population was in 1980 ($x = 44,110$, $SD = 133,086$).
2. *Population growth:* Census data were used to determine the percentage change in the population base between 1970 and 1980 ($x = 33.29$, $SD = 42.44$).

Number of groups: Respondents were asked to indicate whether or not each of twelve groups has/had either: (1) a formal (required) role in plan preparation; (2) plays, played, or will play an active role (whether required or not) in the plan preparation; (3) a formal (required) role in the plan implementation; or (4) plays, played, or will play an active role (whether required or not) in implementation. These were answered yes/no, and a summary index ($y = 1$, $N = 0$) was calculated ($x = 15.11$; $SD = 7.50$).

Role changes: Respondents were asked whether the roles played by the 12 groups (referred to above) represented a change from earlier relationships, or were they a continuation of established practices. The responses were coded (yes = 1, no = 0) and summed ($x = 2.21$; $SD = 3.02$). This is treated as an indicator of environmental stability.

Process Variables

Goal acceptability (Five items): Five-point Likert scale, where 1 indicates extremely unreasonable and 5 indicates extremely reasonable.

1. How reasonable are the systems statements required by the MLPA (1976) as a device for coordinating metropolitan and local decision-making?
2. How reasonable are the plan content requirements presented in the MLPA (1976)?
3. Given the intentions of the MLPA (1976), how reasonable is the financial burden that resulted?
4. How reasonable are Metropolitan Council expectations of communities regarding the comprehensive planning and implementation process?

5. How reasonable was the time schedule presented in the MLPA (1976)? ($x = 3.2$; $SD = 0.60$; $\alpha = 0.65$)

Goal specificity (Two items): Five-point Likert scale where 1 indicates very unclear and 5 indicates very clear.

1. How clear is the MLPA (1976) regarding the expectations and requirements of the Metropolitan Council and affected governmental units?
2. How clearly does the Metropolitan Council, as an organization, present their expectations? ($x = 2.92$; $SD = 0.63$; $\alpha = 0.53$)

Goal support (Four items): Five-point Likert scale where 5 indicates a high support or responsiveness.

1. How responsive is the Metropolitan Council, as an organization, to regional needs and problems?
2. Do you think the Metropolitan Council and its staff took the time required to become familiar with your community and its circumstances?
3. During the system statement and plan review process, did the Metropolitan Council and its staff give you sufficient opportunity to present and explain your jurisdiction's views and positions?
4. (Assuming the unit had submitted their plan for an informal review) How helpful was the review in developing your final Comprehensive Plan. ($x = 3.42$; $SD = 0.64$; $\alpha = 0.52$)

Frequency of communication: Five-point Likert scale where 1 indicates never, and 5 indicates very frequent. Respondents were asked: 'How frequent were communications related to the comprehensive planning and/or implementation process between your unit and each of the following types of organizations (nine were specified from 1 July, 1977 to 1 July, 1981? Consider face-to-face conversations, telephone conversations, letters, and reports.' ($x = 2.46$; $SD = 0.06$; $\alpha = 0.55$)

Communication changes (Nine items): respondents were asked whether 'the communication pattern noted (in the previous questions) rep-

resents a change from earlier relationships, or is it a continuation of established patterns?' Responses were coded (yes = 1; no = 0) and summed ($x = 2.77$; $SD = 2.46$).

Average conflicts: The respondents were first asked to identify three important areas of conflict. Then for each issue they were asked to indicate the degree to which the conflict on each issue involved the following:

- A: Philosophical conflict—over what should be done
- B: Conflict over location—over where something should be done
- C: Conflict over means—over how something should be done
- D: Conflict over timing—over when something should be done
- E: Conflict over extent—over how much of something should be done

Responses were on a five-point Likert scale ranging from not at all (1) to almost completely (5). The coefficient alphas, means, and standard deviations for each issue were:

Issue 1: $\alpha = 0.57$; $x = 2.95$; $SD = 0.82$

Issue 2: $\alpha = 0.67$; $x = 3.00$; $SD = 0.87$

Issue 3: $\alpha = 0.77$; $x = 2.96$; $SD = 0.98$

(It should be noted that the specific issues were not the same across respondents.) The three subscales were then summed and averaged into an overall scale of average conflict. The means and standard deviation for this scale are: $x = 3.01$; $SD = 64$.

Average conflict resolution methods used: This variable was operationalized by first having the subjects indicate how many of 20 possible conflict resolution methods were used to resolve the above three areas of conflict. The respective means and standard deviations for each issue are:

Issue 1: $x = 4.18$; $SD = 2.10$

Issue 2: $x = 3.72$; $SD = 2.30$

Issue 3: $x = 3.74$; $SD = 2.54$

These three subscales were then summed and averaged. ($x = 3.83$; $SD = 2.00$)

Consultant usage: Respondents were asked, 'Was a consultant hired to assist with the preparation

of your comprehensive plan?' Answers were coded (yes = 1; no = 0). ($x = 0.78$; $SD = 0.42$)

Technical assistance: Five-point Likert scale where 1 = hindered more than helpful, and 5 = extremely helpful. 'How helpful was the received technical assistance or consulting services supplied by the county?' ($x = 3.87$; $SD = 1.10$). Not all units requested or received technical assistance or consulting services. The number of respondents to this question was 23.

Outcome Variables

Impact on unit plans: Five- and four-point Likert scales respectively where a low number indicates little impact

1. *How plan different:* 'How different is the plan prepared under the MLPA from your earlier plan?' ($x = 3.20$; $SD = 1.20$). Fifteen respondents indicated they had no earlier plan.
2. *Alternative action:* 'If the MLPA (1976) had not been enacted, what action would the community have taken in the past 3 years with regard to the comprehensive plan?' ($x = 2.55$; $SD = 0.95$)

Improvements in unit's capabilities: Five-point Likert scale where 1 indicates little improvement or usefulness and 5 indicates great improvement or usefulness

1. *Decision-making:* 'How did the project affect your unit of government's capability for making future decisions allocating resources or undertaking other future endeavors?' ($x = 2.66$; $SD = 0.54$)
2. *Lessons learned:* 'To what extent will what was learned from the comprehensive planning and implementation process be useful for undertaking future comprehensive planning and implementation endeavors' ($x = 3.41$; $SD = 0.82$)

Satisfaction (Six items): Five-point Likert scale where 1 = extremely dissatisfied, and 5 = extremely satisfied. Respondents indicated how satisfied they were with the comprehensive plan's ability to improve decision-making in six areas: local unit's ability in general, land use, public facilities, low and moderate housing

implementation, capital improvements, and whether the official controls identified will actually achieve objectives. ($x = 3.49$; $SD = 0.69$; $\alpha = 0.83$)

Effectiveness (Two items): Five-point Likert scale where 1 = very ineffective, and 5 = very effective.

- A. How effective will the MPLA (1976) be in meeting regional needs and solving regional problems?
- B. How effective will the MLPA (1976) be in meeting local needs and solving local problems? ($x = 0.307$; $SD = 0.87$; $\alpha = 0.68$)

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