*CONSEQUENCE ANALYSIS: ITS EFFECTS ON VERBAL
STATEMENTS ABOUT AN ENVIRONMENTAL PROJECT*

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Typically, citizens lack relevant information concerning possible consequences of proposed environmental projects. Despite federal requirements for citizen participation in decisions about proposed roadway projects, no systematic procedures exist for educating citizens as to the possible consequences of such projects. The effects of a consequence analysis procedure on community residents' verbal statements about the favorability of a proposed roadway project were assessed. The consequence analysis procedure involved asking residents to rate the desirability and magnitude of each of 48 possible consequences of the proposed roadway project. Following the intervention, overall ratings of favorability of the project changed for nine of ten residents. Community residents' ratings of the quality of participants' justifications of their position on the roadway issue provided evidence of generalization to this collateral behavior.

DESCRIPTORS: community education, environmental impact, consequence analysis procedure, citizen participation

Federal policy guidelines (National Environmental Policy Act, 1969) and planning professionals (Finsterbusch & Wolf, 1977) have noted the importance of assessing the possible impact of proposed environmental projects. Currently, decision makers are required to obtain citizen input for impact statements regarding proposed projects (Francis, 1975; Kennard, 1976). How-

ever, the lack of relevant information about the possible consequences of such projects is a major obstacle to constructive citizen input (McCoy, 1975).

A variety of means are used to educate citizens about proposed environment projects, including open hearings of the city council or commission, neighborhood association meetings, newspaper reports, and door-to-door canvassing of affected neighborhood residents. It would appear that such public information campaigns fail to communicate information about possible project consequences in a *systematic* manner. In addition, such efforts often rely more on persuasion than instruction, providing evidence to support only one side of the issue. As such, these methods have tended to mask relevant issues, rather than promote knowledgeable debate on controversial environmental change projects.

A practical and unbiased method for informing residents of possible consequences of a proposed project must address two prominent considerations. First, community residents need relevant information about the possible consequences of a project. For example, the specific location and physical characteristics of a project,

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as well as community variables likely to be affected, permit a more informed appraisal of overall favorability (Cohen, 1964; Rappaport, 1975; Schalz, Prince, & Miller, 1975). Second, residents need to analyze and compare evidence regarding the favorability or unfavorability of each possible consequence (Adair, 1971; Cohen, 1964; White, 1975). Such a consequence analysis procedure, incorporating information within a framework for analyzing the possible consequences of a project, might foster knowledgeable opinion about the proposed project. As such, this approach to attitude change is based on the assumption that people may change their verbal statements about a project as a function of new information about possible consequences of the project (Bandura, 1969).

The present study examines experimentally the effects of a consequence analysis procedure on residents' verbal statements about the favorability of a proposed roadway project. The roadway project had been a controversial issue within an east Lawrence, Kansas neighborhood for over two years, and, as a result, the community was divided into several factions. One community group was strongly in favor of construction of a roadway; another, strongly against construction; with the majority of residents very confused regarding the issue. Local newspapers carried daily reports of statements from the two opposing community groups.

Numerous public meetings regarding the roadway issue were convened in the community and votes were taken to determine whether the roadway should be built. The outcome of these votes in each case was in favor of construction until the last vote was taken. At this final meeting, community residents voted 2 to 1 against construction of the roadway. A short time thereafter, the city commission voted to table the proposal for construction of the roadway. It was following this point in time that the present study was conducted. The consequence analysis procedure was developed at the request of an association of neighborhood residents affected by the proposed roadway project. Generalization

to possible collateral behaviors of participants' votes regarding the project and to their justifications of this position were also assessed.

METHOD

Participants and Setting

Study participants were randomly selected from two randomly identified blocks within the neighborhood targeted (east Lawrence, Kansas) as the site for a proposed roadway project. Of 13 residents selected for the project, 10 agreed to participate in this study. Residents, all of whom were identified by pseudonym, were informed of the purposes of the study and their consent for participation was obtained. These five men and five women were 30 years of age or over, were either working class or retired, and had lived in the neighborhood for at least five years.

The study was conducted at the individual participants' homes. An experimenter provided pencils for making surveys and an audiotape recorder for recording a resident's justification for his or her position on the roadway issue.

Observation of Primary Target Behavior

Residents' verbal statements regarding the favorability of the proposed roadway project were measured using a community impact survey. Survey administrations, conducted three days apart, involved obtaining residents' written ratings of the favorability of impacts on each of a number of aspects of community life (e.g., recreation, housing, safety) likely to be affected by the project. Each survey question used a 7-point Likert-type scale (Likert, 1932) with 7 corresponding to "very favorable" and 1 "very unfavorable" for easy quantification of participants' verbal statements. An "overall favorability" survey question read: "*Overall*, the result of the Haskell Loop (roadway project) on the east Lawrence community would be . . . ? (Check one)

- () very favorable
- () favorable

- () slightly favorable
- () neither favorable nor unfavorable
- () slightly unfavorable
- () unfavorable
- () very unfavorable

Residents' verbal statements (as noted in the written numerical ratings) were tallied by an observer following each survey administration. A second independent observer also scored each of the statements at a different time than the primary observer. Interobserver agreement was measured by an item-by-item comparison of the scoring of residents' verbal statements. Total reliability was calculated by multiplying 100 times the number of agreements divided by the number of agreements plus disagreements. The mean percentage of interobserver agreement was 100%.

Consequence Analysis Procedure

The consequence analysis procedure, used as a treatment, involved presenting a written guide containing 48 possible consequences of the proposed roadway project.¹ Consequences were grouped according to nine impact categories: economic, housing, transportation, safety, neighborhood unity and communication, recreation, community resources and services, community well-being, and environmental quality. Each category contained, on the average, five specific consequences noted in the environmental impact literature or by protagonists on either side of the local issue. Table 1 displays the section of the consequence analysis guide for the environmental quality impact category.

Residents were asked to examine and rate each of these possible consequences as either "favorable" or "unfavorable" and "large" or "small." Each consequence identified a specific aspect of community life likely to be changed if the road-

way were built. As shown in Table 1, each of the 48 aspects of community life were put into question form without reference to an expected effect. The consequence analysis guide was delivered by an experimenter who departed immediately, returning in 24 hours to pick up the completed guide. The reported time required to answer all guide questions was a mean of 35 min.

Experimental Conditions

The effects of the consequence analysis procedure on residents' "overall favorability" rating for the proposed roadway project were analyzed by a multiple-baseline design across residents drawn from the two neighborhood blocks. The experimental conditions were as follows:

Baseline. Repeated ratings of "favorability" were obtained for each resident using the community impact survey.

Consequence analysis procedure for Block 1. Each of the five residents in Block 1 received and completed the consequence analysis guide following three survey administrations. Residents in Block 2 continued to receive only the survey.

Consequence analysis procedure for Block 2. Each of the five residents in Block 2 received and completed the consequence analysis guide following five survey administrations.

Follow-up for Blocks 1 and 2. Each of the residents in Blocks 1 and 2 received and completed the community impact survey one month following the previous survey administration.

Observation of Collateral Behavior

Two collateral behaviors that might be expected to co-vary with verbal statements about favorability were also observed: justification statements and votes (for or against the project). First, both before and after the intervention, the participants were asked to justify their positions for or against construction of the roadway. The quality of randomly ordered pre- and postintervention audiotaped justifications were rated by peers of the participants. These 14 low-

¹Copies of *Community impact analysis: A manual for assessing the possible effects of planned environmental change* by F. L. Sanford & S. B. Fawcett are available from the second author upon request at a cost of \$6.00 per copy.

Table 1
Consequence Analysis Guide for Environmental Quality Impact Category

A. POSSIBLE ENVIRONMENTAL QUALITY CHANGES:

1. What kind of change would the proposed Haskell Loop roadway project bring about on the *quality of air* within east Lawrence?

Would this change be . . . ? (Check one)

☐ favorable	☐ large
☐ unfavorable	☐ small

2. What kind of change would the Loop bring about on the *level of noise* within east Lawrence?

Would this change be . . . ? (Check one)

☐ favorable	☐ large
☐ unfavorable	☐ small

3. What kind of change would the Loop bring about on the *amount and quality of outdoor open space* within east Lawrence?

Would this change be . . . ? (Check one)

☐ favorable	☐ large
☐ unfavorable	☐ small

4. What kind of change would the Loop bring about on the *number and location of trees* within east Lawrence?

Would this change be . . . ? (Check one)

☐ favorable	☐ large
☐ unfavorable	☐ small

5. What kind of change would the Loop bring about on the *visual appeal* of east Lawrence?

Would this change be . . . ? (Check one)

☐ favorable	☐ large
☐ unfavorable	☐ small

6. What kind of change would the Loop bring about on the *existing residential character* of east Lawrence?

Would this change be . . . ? (Check one)

☐ favorable	☐ large
☐ unfavorable	☐ small
-

income community residents were selected from clients and representatives of a neighborhood service center in east Lawrence. They used Likert-type scales to assess the "overall quality," "knowledge," "persuasiveness," and "logic" of participants' justifications. Possible changes in the number of justifications were also assessed by two uninformed observers scoring all randomly ordered pre- and postintervention audiotaped justifications available from 8 of 10 participants. A justification was scored whenever a resident stated reasons which described any general or specific changes in the existing conditions of the neighborhood resulting from con-

struction of the roadway project.² The two observers agreed 92% of the time as to whether a justification had occurred.

Second, participants were asked to vote for or against the roadway following each survey administration. This measure of possible collateral behavior was obtained by asking residents:

If a vote were taken today on the issue of the Haskell Loop (roadway project), how would you vote?

²A detailed written response definition for justification behavior may be obtained from the second author.

- () Yes (favor Loop being built)
- () No (do not favor Loop being built)
- () Undecided

RESULTS

Primary Data

Figure 1 shows the effects of the consequence analysis procedure on residents' overall favorability ratings of the proposed roadway. Residents in Blocks 1 and 2 showed little change in ratings during baseline. Residents in Block 1 (represented in the top baseline of each pair) showed a mean favorability rating change of $-.7$ points after introduction of the consequence analysis procedure. For residents in Block 2, a change of -1.3 points was noted. Figure 1 shows that 9 of 10 residents did change their favorability rating following the intervention. All changes were in the direction of decreased favorability, with no resident showing a reversal in favorability ratings. The last data point, a follow-up survey administration one month after the previous administration, shows that the effects were maintained for all 10 residents.

Collateral Behavior Data

Data were obtained for justification behavior and voting for or against construction of the proposed roadway project. Community judges' ratings of evaluative dimensions of participants' justification statements showed a mean increase in "overall quality" from a preintervention mean of 3.4 (range, 1 to 5) to a postintervention mean of 5.2 (range, 2 to 7), an average increase of 1.8 points. Judges also rated the knowledge, persuasiveness, and logic evidenced in the justification statements using similar 7-point rating scales. Changes in ratings for the "knowledge" scale (1 = very unknowledgeable; 7 = very knowledgeable) were from a preintervention mean of 4.1 to a postintervention mean of 6.6; for the "persuasiveness" scale (1 = very unpersuasive; 7 = very persuasive), from 3.6 to 6.1; and for the "logic" scale (1 = very illogical; 7 = very logical), from 5.2 to 6.4. All postinter-

vention justifications were judged to be higher in overall quality than preintervention statements. The overall mean increase in the number of justifications stated changed from a preintervention mean of 3.1 (range, 0 to 5) to a postintervention mean of 4.4 (range, 2 to 7). This shows an overall mean increase, though not statistically significant, of 1.3 justifications per resident, with an increase observed for seven of eight participants for whom data was obtained.

Participants' votes on whether to build the proposed roadway changed for two of ten participants following the intervention: one (Harris) shifted from "undecided" to "no" and another (Adams) from "undecided" to "yes" following the intervention. Throughout the study, four residents (Black, Moore, Sanders, & White) maintained a "yes" vote; and four others (Halloway, Smith, Evans, & Goldberg), a "no" vote.

DISCUSSION

The effects of a consequence analysis procedure on community residents' verbal statements regarding the favorability of a proposed roadway project were assessed. The results showed favorability ratings for the proposed roadway changed an average of 1.0 points after the intervention was introduced, a change replicated with nine of ten participants. The staggered introduction of the consequence analysis procedure across the two community blocks showed residents' ratings of favorability changed markedly only after introduction of the guide, an effect maintained in a follow-up observation. The observed consistency in the direction of the effects might be related to the use of verbal statements as the primary dependent variable. These findings suggest that the consequence analysis procedure was responsible for producing the observed changes in verbal statements, though a causal relationship was not unequivocally established.

Community judges' ratings of evaluative dimensions of participants' justifications were cor-

Fig. 1. The overall favorability ratings of residents from Blocks 1 and 2. The vertical dotted lines indicate the point at which the consequence analysis procedure was introduced.

related with observed increases in the primary measure. The results showed rating increases following intervention for "overall quality," "knowledge," "persuasiveness," and "logic." Generalization of observed effects to this collateral behavior provide evidence of the social validity (Fawcett & Miller, 1975; Minkin, Braukmann, Minkin, Timbers, Timbers, Fixsen, Phillips, & Wolf, 1976; Wolf, 1978) of these findings. Changes in the number of justifications showed small, though not statistically significant, increases. Although increases in the number of justifications were small, all postintervention justifications were judged to be of higher quality by relevant consumers. Nevertheless, the causal mechanisms, and conditions under which effects with this collateral behavior may be replicated, are unclear.

In a second measure of collateral behavior, participants were asked to vote on whether to build the proposed roadway project following each survey administration. The results showed some inconsistencies between favorability ratings and voting: four participants maintained "yes" votes; four others, "no" votes; one of the two "undecided" voters shifted to "no"; and the other to "yes" following the intervention. Although demand characteristics may have accounted for favorability ratings changes in one direction, the fact that the experimenter was neither representing a particular side of the issue nor present during the completion of the consequence analysis procedure reduces the likelihood of this explanation. The influence of other expectancy factors, including the possibility that drawing attention to possible consequences was perceived as an implicit caution against likely unfavorable effects, was not ruled out in this study. Alternatively, voting behavior may be only a rough estimate of favorability ratings as suggested by the fact that nearly all ratings between 7 and 4 were accompanied by a "yes" vote; with those between 3 and 1, a "no" vote. Accordingly, perhaps corresponding changes in this collateral behavior would be anticipated for only those participants whose ratings were near

the middle of this scale. The casual mechanisms controlling voting behavior, and the relationship to verbal behavior, remain an important area for future research.

Practicality and consumer satisfaction are important additional criteria for evaluating applied social interventions (Wolf, 1978). A mean participant time of 35 min, requiring no administrator time, was required to complete the consequence analysis guide. Participants rated the "helpfulness" of the consequence analysis procedure in determining the favorability of the project as 6.6 on a 7-point Likert-type scale (where 7 = very helpful). In addition, ratings of the acceptability of the consequence analysis procedures were obtained from eight planning professionals including city planners, city commissioners, community development specialists, and urban planning academicians. These planning professionals were asked: "How *useful* is the consequence analysis procedure in educating citizens as to possible environmental impacts?"; "How *comprehensive* is the consequence analysis procedure in educating citizens as to (both favorable and unfavorable) possible impacts?"; "How *inclined* would you be to recommend the use of the consequence analysis procedure for educating citizens regarding other environmental projects?" The mean ratings were 6.3 for "usefulness"; 6.5 for "comprehensiveness"; and 6.2 for "inclination to recommend," suggesting that the consequence analysis procedure is inexpensive to use, satisfactory to participants, and acceptable to potential consumers.

Providing antecedent stimuli, including written descriptions of possible consequences, would appear to be a promising approach to promoting informed discussion of controversial community issues. However, the potential role of a consequence analysis procedure in a comprehensive citizen education program remains to be clarified. Future research might address such issues as who are the most appropriate consumers of such a procedure, what possible consequences should be selected for consideration, and how might citizens educated with this proce-

ture influence decisions affecting their communities. Other research, perhaps involving systematic programming for changes in relevant collateral behaviors (Baer, Wolf, & Risley, 1968), might help clarify the relationship between verbal behavior and other socially relevant behavior.

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