A POLITICAL PARTICIPATION MODEL OF CITIZEN NIMBY OPPOSITION

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Why citizens choose to oppose sitings of noxious facilities in their communities is examined in a 1991 survey of Oklahoma adults' risk judgments. Regression models of both actual and hypothetical NIMBY-motivated political participation are tested. The composite risk-judgment component proves significantly related to NIMBY participation in both actual and hypothetical siting scenarios, but not in the same way. An important finding is that the existence of hypothetical bias in greenfield communities can invalidate survey findings conducted as part of community relations planning.

Nowhere has citizen involvement in local politics been more influential than in decisions concerning the siting of facilities that are perceived to pose a high risk to the community. Proposals to locate locally unwanted land uses (LULUs) such as radioactive waste repositories, hazardous waste disposal facilities, solid waste landfills, prisons, dams, nuclear power plants, roads, and even day care centers and senior citizen housing, have met with fierce citizen opposition (Davis 1993, 103-8; Lester and

Bowman 1983; Tener 1996; Wheeler 1994). Oklahoma's experience with hazardous waste controversies mirrors that of other states. An upsurge of citizen activism has been largely successful in preventing new facility sitings (Lawler, Focht and Hatley 1994). The so-called "NIMBY (not in my backyard) syndrome," a pattern of intense public opposition to local siting or operation of technologies and facilities perceived to be risky, has been a major obstacle to the development of new facilities (Dorshimer 1996; Fruedenburg and Pastor 1992; Hunter and Leyden 1995; Rabe 1994).

Some writers use the term "NIMBY" pejoratively to imply that virtually all opposition to LULUs is motivated by selfish parochialism (O'Looney 1995; Tener 1996; Wildavsky and Dake 1990.) Yet NIMBY activities may have positive results in blocking ill-conceived or uneconomic projects and inducing government decision-makers to be more sensitive to local opinion (Eckstein 1997;Gerrard 1994; Lake 1993; Rabe 1994). Nevertheless, NIMBY-induced public policy gridlock creates an incentive for the illegal dumping of hazardous waste, escalates treatment and disposal costs, and forces existing, often substandard, facilities to remain open longer. It also is a factor in the increasing difficulty that state and local governments have in successfully siting new prisons to relieve the chronic overcrowding of existing facilities. An answer to the NIMBY problem must be found to the question "what motivates NIMBY political behavior?"

The NIMBY phenomenon has been variously attributed to "chemophobic" misperceptions of actual risk (Kunreuther, Fitzgerald, and Aarts 1993; Visocki and Breman 1993), to outrage at having self and loved ones placed in jeopardy, and to "rational" calculations of localized risk in relation to diffuse national benefits (Kraft and Clary 1991; Sellers 1993). One study finds that the mobilization of citizens in NIMBY controversies is facilitated by the high cost of not acting, the low perceived cost of protesting, and the high probability of success (Hadden, Veillette and Brandt 1983). Other explanations center on the political process, citizen trust, and responsiveness of institutions (Hunter and Leyden 1995; Leroy and Nadler 1993, 103; Rabe 1994).

This study develops and tests a new model of NIMBY-motivated political participation that integrates political participation and risk perception theories in an effort to better explain this unique form of political participation. Major theories of political participation stress the

importance of socioeconomic status (Verba and Nie 1972), resource mobilization (Jenkins 1983; McCarthy and Zald 1977; Tilly 1978), group identification (Smith 1985), grievance (Barnes and Kaase 1979; Muller and Jukam 1983), and a desire for individual or collective influence (Muller and Opp 1986). Yet these theories do not specifically address a dimension of motivation that appears to be prominent in NIMBY protests: the perception of unacceptable risk. Our study is designed to assess the ability of risk judgment variables to explain why citizens choose to oppose siting of risky facilities in their communities.

A RISK-BASED MODEL OF NIMBY-MOTIVATED POLITICAL PARTICIPATION

If citizens judge the risk posed to themselves and to their community by a government siting proposal as unacceptable, then, given sufficient resources, they will collectively act to oppose it. NIMBY-motivated political participation is caused by perceived risk, a sense of community, availability of social resources, as well as one's age, and race.

Following Verba and Nie (1972, 2), we define political participation as "those activities by private citizens that are more or less directly aimed at influencing the selection of governmental personnel and/or the actions they take." NIMBY-motivated participation is a type of political participation that aims at influencing decisions about the local siting of facilities that are generally considered "risky" or "noxious."

In their socioeconomic model of political participation, Verba and Nie (1972) identify two types of political activity: electoral (voting and campaigning) and non-electoral (communal and parochial). This study does not consider electoral political participation because NIMBY is rarely expressed in this arena. Non-electoral participation is aimed at directly influencing the decisions of government, and it is in this arena that NIMBY is manifested. Verba and Nie distinguish between two types of activist participants: communalists, who participate collectively in groups or who contact government alone but in the collective public interest; and parochialists, who engage in particularized citizen-initiated contacting for concerns limited to themselves or their family. Communalists and parochialists are both described in their model as non-conflictual, since they rarely take sides in a conflict.

Yet the NIMBY activist appears to be a unique form of participant not anticipated by Verba and Nie: a risk-averse activist. The NIMBY activist is best classified as an amalgam: a parochially-motivated communalist who participates in a conflictual setting. Mature NIMBY controversies tend to evolve by melding individual concerns into collective action (siting decisions ordinarily affect many citizens, spurring their collective effort to influence those decisions). In this respect, NIMBY participants resemble communalists. In other respects, NIMBY resembles parochial participation—they are often more motivated by concerns for the safety and welfare of themselves and their families than that of the community (Gunter and Finlay 1988). Unlike either communalists or parochialists, however, NIMBY activists are prone to conflictual participation: counter-participants are usually present. The unique nature of risk-averse activists is summarized in Table 1.

In our study, political participation includes both actual activities in opposition to real siting plans and hypothetical activities in opposition to fictitious siting plans described in scenarios. Both actual and hypothetical participation are included in this study partly as a measure of "hypothetical bias," which has been criticized in other studies of NIMBY

TABLE 1

Comparison of Ideal Types of Political Participants

Participant Type	Conflict Setting	Collective Action	Parochial Concern
Parochialist	No	No	Yes
Communalist	No	Yes	No
Risk Averse Activist	Yes	Yes	Yes

(Portney 1991). Hypotheticals lack the salience of real situations and thus may lead to different patterns of response. Since siting proponents will most likely target communities that have not previously experienced a siting controversy, hypothetical scenarios provide a means of assessing participatory attitudes in those communities most likely to be impacted by future siting decisions.

HYPOTHESIZED CAUSES OF NIMBY BEHAVIOR

The literature on risk perception and political participation is summarized below.

RISK JUDGMENT

Risk is a measure of the probability and severity of an adverse outcome (Regens, Dietz, and Rycroft 1983). This study defines risk judgment as citizens' subjective assessment of the acceptability of the imposition of potentially adverse consequences. Here, risk judgment is defined with a composite of: risk perception, risk (perception squared) coping, risk aversion, attitude strength, trust in government, and familiarity.

Risk Perception. Risk perception is the subjective process by which individuals estimate the extent of risk. The important role that citizen perceptions of risk play in NIMBY disputes has been supported by several studies (Armour 1991; Dear and Taylor 1982; Lake 1987; O'Hare 1977; Portney 1991). In these studies, cognitive psychologists have called attention to the influence of non-rational decision heuristics (rules of thumb) on subjective estimations of risk (Fischhoff et al. 1981; Kahneman, Slovic, and Tversky 1982; Slovic 1987). Risk perception factors and heuristics are important in understanding NIMBY behavior.

Coping. There is a limit to how much stress a citizen may productively tolerate. When a community stressor such as the risk of siting a hazardous waste facility is imposed on citizens of a community, those who perceive the risk as great may respond by switching to emotional or affective coping mechanisms, which may lead to disengagement from political participation (Bachrach and Zautra 1985; Brody 1988). Brody (1988) identifies a threshold that seems to separate

problem-oriented coping from emotion-oriented coping. At the threshold where increasingly perceived risk is too stressful to handle merely by political activity, the citizen will use the psychological defense mechanisms of emotional coping, such as minimization, escape, or denial. This will decrease political participation.

Risk Aversion. While not all NIMBY activists are necessarily risk avoiders, risk aversion is an important variable in siting controversies (O'Looney 1995, 297). Risk aversion is the psychological predisposition to avoid risk. Citizens may range from risk phobic, through risk tolerant, to risk seeking. The more risk averse an individual is toward a siting proposal, the more he or she would be politically motivated to oppose it.

Attitude Strength. In our NIMBY model, attitude strength conveys the intensity of citizen opposition to a government siting decision. Mohai (1985) shows that attitude strength correlates with political participation, though more weakly than do efficacy and resource availability. He views attitude strength as useful in discriminating between environmental and non-environmental activism. Likewise, our model includes a measure of risk attitude in order to discriminate between NIMBY-motivated participation and other types of participation.

Trust in Government. If citizens do not believe that governments can be trusted with protecting their communities and families from threats posed by risky facilities, they will be motivated to participate in NIMBY activity. Several studies confirm that NIMBY is heightened by low trust and confidence in governmental institutions (Flynn et al. 1992; Kasperson 1986; Kraft and Kraut 1985; Portney 1991; Slovic 1992). We hypothesize an inverse relationship between trust and NIMBY participation. Participation in NIMBY disputes will increase as trust in government to protect the community decreases.

Familiarity. Familiarity refers to the extent to which citizens become accustomed to risks through constant association or experience. Familiarity is one of the decision heuristics which cognitive psychologists find to be negatively related to risk, as acclimation lowers subjective levels of concern (Slovic, Fischhoff and Lichtenstein 1981).

SENSE OF COMMUNITY

Sense of community is a shared recognition of the value of the local society and one's contribution to it. Following Edelstein (1988), we expect that the more citizens believe their community has a stake in the outcome of the proposed siting, the more they will be motivated to oppose it. Besides including a composite measure of sense of community, our study also considers separately three components of sense of community: cohesiveness, rootedness, and social fabric.

Cohesiveness. Cohesiveness is the sense of solidarity resulting from group membership. Group membership is positively related to public participation (Verba and Nie 1972; Brown 1982; Peterson 1986). We expect group membership to increase the likelihood of NIMBY participation.

Rootedness. Rootedness refers to the depth of attachment to the community, measured by length of residence. Following McMillan and Chavis (1986), we hypothesize that rootedness exerts a strong positive influence on political participation.

Social Fabric. Social fabric denotes satisfaction with neighborhood quality. McMillan and Chavis (1986) found a strong positive correlation between social fabric and parochial participation, while Thomas (1982), Sharp (1984), and Hero (1986) found that the perception of neighborhood quality correlates negatively with parochial contacting behavior. We hypothesize a positive relationship between social fabric and NIMBY-motivated political participation.

POLITICAL RESOURCES

Political resources include any assets that directly increase actual or perceived influence in community decisions. Resource mobilization theory (Jenkins 1983; McCarthy and Zald 1977; Tilly 1978) stresses the importance of political resources as a precondition and motivator for collective action. Following Verba and Nie (1972), perceived personal political efficacy and history of political participation are included in our model.

Perceived Personal Political Efficacy. The more politically efficacious one feels, the greater the likelihood of political participation

(Hirlinger 1992; Peterson 1986; Sharp 1982; Verba and Nie 1972). We expect a positive relationship between perceived personal political efficacy and NIMBY participation, once risk perception and risk aversion are controlled.

History of Political Participation. To account for the effect of general political activism on NIMBY participation, our model includes political participation history. While "first time" participants, like housewife Lois Gibbs of Love Canal, can become prominent leaders of NIMBY movements (Levine 1982), a history of political participation, such as voting, campaigning, protesting, and contacting government officials, is positively related to NIMBY participation.

NON-POLITICAL RESOURCES: SOCIOECONOMIC STATUS

The standard socioeconomic model of Verba and Nie (1972) shows socioeconomic status (SES) as a determinant of political participation through intervening civic orientations. SES appears to be a particularly reliable predictor of non-parochial participation (Hero 1986; Jacob 1972; Mladenka 1977; Sharp 1984; Verba and Nie 1972; Zuckerman and West 1985). It is a less consistent predictor of parochial participation (Brown 1982; Eisinger 1972; Sharp 1982). Vedlitz, Dyer and Durand (1980) found a negative relationship, while Hirlinger (1992) found no relationship. Perhaps, these discrepancies are the fact that after a certain income level is achieved, further gains may not lead to increases in parochial participation (Jones et al. 1977).

DEMOGRAPHIC CHARACTERISTICS

Age. Several studies show older people are more likely to engage in parochial participation (Brown and Coulter 1983; Hero 1986; Verba and Nie 1972), although younger people are more concerned with the environment (Buttel and Flinn 1978, 1974). The published research is not consistent, however. Samdahl and Robertson (1989) found that older people tend to be more environmentally activist, while Mohai (1985) found no relationship between age and environmental activism. Since NIMBY activism may reflect self-interest rather than a generalized

environmental concern, we expect a positive relationship between age and NIMBY-motivated participation.

Race. Although whites seem to be more likely than non-whites to initiate parochial political contacts (Eisinger 1972; Hero 1986; Hirlinger 1992; Jacob 1972; Thomas 1982), Verba and Nie (1972) found that blacks are more likely to participate in communal political action than whites of the same socioeconomic status. The disproportionately greater incidence of sitings of risky facilities in minority neighborhoods (Bullard 1990; Dick 1990) creates a potential for minority environmental activism. We expect non-whites of a given SES to be more likely than whites to be NIMBY activists.

NIMBY-MOTIVATED POLITICAL PARTICIPATION MODEL

Several related questions were used to tap the same general concept. Composite measures were developed for these items by converting the raw scores to z scores and summing the z scores of the different composited items. These composite measures were developed for NIMBY-motivated political participation, risk perception, trust in government, sense of community, personal political efficacy, history of political participation and socio-economic status.

NIMBY-motivated political participation, is measured in two ways: actual NIMBY participation and hypothetical participation. For actual participation, a composite measure was developed by summing the number of types of participation in which the respondents had engaged for each of three kinds of issues: a hazardous waste facility siting, a hazardous waste cleanup, and a prison siting. The five types of participation provided on the telephone survey instrument were: contacting a government official; signing a petition; speaking at a public hearing; joining a community organization; and participating in a public demonstration. The range of values for this variable is "0," no participation to "15," maximum participation. Of the 729 respondents who completed the survey, 132 indicated that they had experienced at least one of these potentially risky proposals.

Hypothetical NIMBY participation was similarly constructed. If respondents indicated that they had not experienced any of these

scenarios, they were asked what they would do in equivalent hypothetical scenarios. Scores for this measure could also vary from "0" to "15," with higher scores indicating greater levels of participation. In all, 597 respondents indicated that they had not experienced at least one of these three risky proposals.

Risk perception was measured by asking the survey respondents how much danger they believed each of the siting or cleanup scenarios posed to them and their families. A composite risk perception measure was developed by summing response values to three items concerning hazardous waste facility siting, hazardous substance cleanup that involved the on-site use of treatment technologies, and prison siting. A square of the risk perception term was used to capture the non-linear, parabolic (second degree) relationship postulated between risk perception and NIMBY-motivated political participation.

To assess risk aversion, three questions concerning respondents' willingness to engage in risky activity were included. A composite risk aversion score was computed by summing the values to these questions for each of the siting or cleanup scenarios.

In order to capture the variety of reasons that a citizen may elect to oppose hazardous waste and prison facility sitings and cleanup proposals that involved the use of on-site treatment technologies, our study includes a general measure of NIMBY attitude strength. Attitude strength was measured by asking respondents how strongly they had opposed or supported an actual siting or cleanup proposal for a hazardous waste facility and a prison facility siting. These responses were standardized and summed separately for actual and hypothetical NIMBY scenarios. Higher values represent greater opposition to the siting or cleanup proposals.

Trust in government was measured by asking respondents how much trust they had in federal, state and local governments to protect the public interest. An overall trust score was developed by summing the z-score transformations of the responses to the three governmental trust questions. Higher values in the composite score measure greater levels of trust in governmental institutions.

Two sets of items were included in the questionnaire to measure familiarity: one regarding present or past employment by a hazardous waste or prison facility, and another asking whether the respondent had ever lived within one-half mile of such facilities. Familiarity was treated

as a dichotomous variable in the regression equation: an affirmative answer to either question in any of the three scenarios resulted in a score of "1" and a negative answer to both questions was scored as "0."

Cohesion was measured by summing the number of groups to which respondents said they belonged, from three alternatives provided: service club, fraternal organization, and neighborhood organization. Rootedness was measured by the number of years that a respondent has lived in the community. Social fabric was measured by responses to a question concerning perception of neighborhood quality ranging from poor to excellent. A composite sense of community measure was developed by summing the z-score transformations of the responses. Higher values of the composite measure represent a greater sense of community.

Perceived efficacy was measured by asking respondents how much influence they believe they have over hazardous waste and prison facilities siting decisions and whether they would need an intermediary to exert influence on federal, state, and local units of government. A composite measure of efficacy was developed by summing the z-score transformations of the responses to these five items. The higher the composite score, the greater is the respondent's perceived efficacy.

History of political participation was measured by responses to questions concerning voting, campaigning, contacting, and protesting. A composite measure of this variable was constructed by summing z-score transformations of the responses to these questions. The more activities that a respondent engaged in, the greater the score assigned to the measure.

In this study, SES is a composite measure of income, educational level, and occupational prestige based on the Duncan socioeconomic index. This measure was developed by summing the z-score transformations of responses to these questions.

Age and race were addressed specifically in questionnaire items. Responses about race were categorized as a dichotomous variable in which non-whites were coded as "0" and whites as "1."

DATA AND METHODS

A 50-item pretested questionnaire was administered by telephone during October and November, 1991, by professionally trained interviewers. The survey population was defined as the adult resident population of Oklahoma. A stratified-by-county random sample of 801 residents was obtained by selecting non-commercial telephone numbers by random digit dialing from pre-selected exchanges. The survey was then administered to the first respondent in the household over 18 years of age who was a resident of the state. Usable data was obtained from 729 completed questionnaires, a 91 percent response rate.

ANALYSIS AND FINDINGS

The hypothesized risk based model of NIMBY-motivated political participation was tested using multiple linear regression. The results for both actual NIMBY and hypothetical NIMBY participation are shown in Table 2.

We computed correlation coefficients among all possible pairs of variables in the NIMBY model. We used intercorrelations of 0.5 or higher as the test for multicolinearity. All interrelationships among independent variables included in our model were well below this threshold.

POLITICAL PARTICIPATION IN AN ACTUAL NIMBY DISPUTE

The equation for actual NIMBY participation is based on data from the 132 respondents who indicated that they had experienced a NIMBY dispute. The regression model explains 29 percent of the variation in actual NIMBY participation. Of the 13 variables tested, four reach statistical significance in actual NIMBY controversies, as shown in Table 2. The regression analysis supports the expectation that risk perception is an important influence on citizens' decisions to participate in NIMBY political activity. Those who perceive the facility as risky to themselves, family, or community are more likely to participate

TABLE 2

Multiple Regression Equations Predicting Actual and Hypothetical NIMBY-Motivated Political Participation[1]

Independent Variable	Actual NIMBY Participation (N = 132)		Hypothetical NIMBY Participation (N = 597)	
Risk Judgment				
Perceived Risk	0.99*	(0.72)	-0.01	(-0.03)
Perceived Risk Squared	-0.95*	(-0.06)	0.30	(0.06)
Risk Aversion	-0.09	(-0.06)	0.00	(0.01)
Trust in Government	-0.10	(-0.04)	-0.06	(-0.08)
Attitude Strength	0.06	(0.08)	0.08*	(0.19)
Familiarity	0.11	(0.30)	-0.12**	(-1.15)
Sense of Community	0.14	(0.10)	0.06	(0.14)
Political Resources				
Perceived Efficacy	0.27**	(0.09)	0.12**	(0.13)
Participation History	0.30**	(0.28)	0.12*	(0.36)
Non-Political Resources				
Socioeconomic Status (SES)	-0.18	(-0.11)	0.10*	(0.18)
SES^2	-0.07	(-0.02)	-0.02	(-0.01)
Demographic Characteristics				
Age	-1.97	(-0.01)	-0.16**	(-3.40)
Race	0.20	(0.07)	-0.07	(-0.99)
Constant	-0.63		8.77	
R^2	0.29		0.20	
Adj. R^2	0.21		0.18	
F	3.64		10.92	

[1]Equations show partial standardized regression coefficients, with unstandardized regression coefficients in parentheses.

*p < .05, **p < .01

SOURCE: Author's calculations from 1991 survey of Oklahoma adults.

than those who do not perceive an unacceptable risk, even when other factors are controlled.

Evidence of a threshold between problem-focused and emotion-focused coping is also verified. The positive relationship between NIMBY participation and risk perception, coupled with thenegative relationship between NIMBY participation and risk perception squared, support the expectation that citizens in actual NIMBY disputes will participate more as risk increases, but only up to a point. Beyond that point participation declines with further increases in perceived risk. This point, we surmise, represents the transition to affective coping styles.

The only other two variables to reach statistical significance are two social resource measures. Both perceived personal political efficacy and political participation history prove to exert a strong positive influence on actual NIMBY participation. Since NIMBY participation requires substantial initiative, citizens are more likely to participate if they believe they have a good chance of being successful and if they have been actively involved in the political process in the past. This finding supports the expectation that NIMBY is a resource-driven phenomenon. While the lack of significance of the other variables might be the result of inadequate measures, it is also possible that these variables are not important in actual NIMBY controversies.

POLITICAL PARTICIPATION IN A HYPOTHETICAL NIMBY DISPUTE

Our model explains twenty percent of the variation of the hypothetical NIMBY participation variable. The regression results in Table 2 show a pattern for hypothetical NIMBY participation, which is quite different from that portrayed in actual NIMBY controversies. Only political resources prove to be significant predictors in both cases. In stark contrast to the actual NIMBY case, risk perception fails to exhibit any significant relationship, but attitude strength and facility familiarity are significant. The familiarity measure exhibits a strong negative relationship, as predicted, supporting the hypothesis that familiarity fosters acclimation.

Contrary to the findings for actual NIMBY participation, SES is important in predicting hypothetical NIMBY participation. However,

perception and decrease the potentially buffering influence of familiarity. Previous political success will increase citizens' perceived efficacy and add to the community's repertoire of political participation skills. This finding confirms the adage that it is foolish to attempt to site a risky facility in a community that has already defeated prior risky proposals.

Fourth, this study indicates that attitudes toward siting do change. Contrary to the findings of Portney (1991), our results suggest that attitude strength (antipathy toward siting) becomes less important as risk perception becomes more salient. Thus, the door is not closed to the possibility that solutions can be found to the NIMBY policy gridlock.

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