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Community relations dealing with a not in my back yard (NIMBY) context

An experimental application of situational theory of publics and social exchange theory

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Abstract

Purpose – This paper investigates whether building a nuclear power plant in a community would inherently bring local conflict phenomena such as "not in my back yard (NIMBY)", focusing especially on the interactive effect between different types of local publics and their exposure to either a supportive or opposing message about a hypothetical local governmental plan to build a nuclear power plant on community participation intentions.

Design/methodology/approach – Applying the two theoretical frameworks (situational theory of publics and social exchange theory) to NIMBY, this study used a quantitative approach by using 471 participants in a 4 (publics: active, aware, aroused or inactive) × 2 (advocacy message type: supportive or opposing message) experimental design.

Findings – The results showed that regardless of message types, active publics were more likely to participate in community activities than any other public, but this group strongly opposed the harmful facility, while inactive publics continued to be inactive. However, aware and aroused publics were significantly influenced by messages.

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Originality/value – The rationale and findings of this research are original, as they have not been published previously, and are not being simultaneously submitted elsewhere. This research should contribute to the broad body of knowledge and practices in community-based conflict issues in terms of risk management. It is believed that the discussion and implications of the findings should raise interesting areas for further research.

Keywords Advocacy, Social exchange theory, Situational theory of publics, Community participation intentions, Community-based conflict issues, NIMBY, Community relations, Community publics

Paper type Research paper

Since several nuclear power plant disasters, such as Three Mile Island (1979), Chernobyl (1986) and, more recently, Fukushima Daiichi in Japan (2011) have occurred and received a significant amount of media attention, the risk perception of nuclear power plants' short- and long-term effects on public health has continued to grow around the world (Heath *et al.*, 1998). As a result, finding a place to build a potentially harmful facility, such as a nuclear power plant, is not easy. Many people do not want to live near such a facility because they believe that the facility and its operation will result in serious community-based health and well-being issues, such as groundwater contamination, hazardous air pollution, traffic, noise and crime. The response that some people have is called *not in my back yard (NIMBY*) syndrome (Takahasi and Dear, 1997). The term *NIMBY* refers to the community residents' protectionist attitudes of facing unwelcome facilities in their community (Heath *et al.*, 1998).

Scholarly attention concerning *NIMBY* has been given to community relations as a means for communication concepts, such as negotiation, conflict management, risk management, trust-building and collaboration (Hallahan, 2004; Heath *et al.*, 2009, 1998; Ledingham and Bruning, 2001; Lesly, 1992; Plowman *et al.*, 2001; Sandman, 1986, 2012; Sauer, 2003; Simmons, 2008; Wilson, 2001). Takahasi and Dear (1997) elucidated that we need to place less emphasis on analyzing social- or macro-level factors, such as politics and economy, to understand *NIMBY* and more emphasis on addressing individual level explanations, which determines who supports or opposes a plan to build a potentially harmful facility within a community, to elucidate what prompts people to join community activities to support or oppose the plan. They additionally called for more scientifically based research methods to determine the basis for the result of community activities such as community participation. This article responds to their call by examining how different types of publics within a community intend to participate in community activities as a means of responding to an advocate message. This advocate message is either a supportive or an opposing message about building a new local governmental plan for a nuclear power plant. Using a hypothetical scenario that will allow us to explore public reactions as though they are encountering a real situation, we expect the governmental plan will offer a *NIMBY* context that activates certain behavioral reactions such as community participation from community public.

Community participation has long been recognized as a core activity in community relations because it might help to bring about increased democratization of the decision-making process (Chang and Jacobson, 2010; Grabill and Simmons, 1998; Hallahan, 2004; Ledingham and Bruning, 2001; Sandman, 1986, 2012; Simmons, 2008) and because it

might offer hope for solving a range of community planning and implementation problems (Healey, 1997; Sager, 1994; Sandman, 1986, 2012; Wilson, 2001). There are, however, increasing concerns among community groups that current community plan-making processes are often dominated by powerful politicians, senior bureaucrats and professional planners who are principally concerned with pre-determined standards, time-frames and economic imperatives (Beierle and Cayford, 2002; Sandman, 1986; Simmons, 2008). Different publics within a community are encouraged to participate with little or no consideration of each one's needs and expectations. As a result, government projects within communities are less likely to achieve their objectives (Sandman, 1986).

There are several reasons to conduct this study. First, compared to the past, *NIMBY* is now more prevalent around the world (Schively, 2007). This social phenomenon has spread to many countries, particularly when residents seek to shelter their community from potentially harmful facilities (Burns and Slovic, 2012; Heath *et al.*, 1995; Savadori *et al.*, 2004); most recently, researchers in Ontario, Canada, looked at two communities feeling the impact of wind turbines and the siting process, social and health implications and distribution of benefits (Walker *et al.*, 2014). Although there has been increased interest in community relations to address public health problems during the past decade, less attention has been directed toward community participation in a *NIMBY* situation.

A second goal of this study is to apply situational theory of publics and social exchange theory (SET) to a *NIMBY* situation. Both theories are useful frameworks for this study. Specifically, situational theory of publics provides a typology of public segmentation, while the theory additionally explains how differently various publics weigh importance of an issue in a decision situation (Aldoory *et al.*, 2010; Grunig, 1997; Kim and Grunig, 2011; Lee and Rodriguez, 2008). SET, similarly, proposes that human interaction in a society is the result of an exchange process of maximizing benefits and minimizing costs or risks (Kelley and Thibaut, 1978); in *NIMBY*, according to Alhakami and Slovic (1994), publics tend to have a dichotomous perception toward hazard: either benefits or costs/risks. Given this connection, we assume that communication messages highlighting either benefits or costs of an issue will influence groups of publics in a different way throughout a social exchange process.

Overall, by applying the two theoretical frameworks, this study explores an interactive effect between different types of publics and their exposure to either a supportive or an opposing message about a hypothetical local governmental plan to build a nuclear power plant on community participation intentions. This effort is important for local communication practitioners who face *NIMBY* in a location-siting process because this study may provide them crucial tips to design more effective community-involved communication projects. More importantly, this study will later argue that proactive, collaborative and conflict-managerial strategies will be beneficial and necessary to convert *NIMBY* groups to "yes, in my front yard (*YIMFY*)" groups (Andsager, 2000; Beierle and Cayford, 2002).

Review of literature

Not in my backyard *as a context*

NIMBY is defined as the negative social reactions of local publics to building plans for unwanted facilities in their communities (Schively, 2007). Because the term first emerged in the early 1980s, *NIMBY* has remained highly relevant to conflict

management practices and research. This relevance is highlighted especially because communication practitioners are often at the frontlines in terms of addressing *NIMBY* responses while being faced with the challenges of responding to public opposition, promoting inclusive participation processes, participating in project reviews and gathering evidence, in some cases, to challenge development proposals (Grabill and Simmons, 1998; Rabe, 1994; Schively, 2007; Simmons, 2008).

In general, there are three attributes that constitute *NIMBY* as a context:

(1) the types of unwanted facilities;

(2) the participants who become involved in *NIMBY* responses; and

(3) the manner in which the *NIMBY* has been characterized.

First, unwanted facilities generally fall into two different types – human or public service facilities primarily associated with quality of life or property value impacts, and those facilities that also have potentially harmful environmental or health impacts.

Second, publics in *NIMBY* also vary and represent a complex set of motivations. Opposition may be localized or may attract external interest based on the issues at hand. For those people living near a potentially harmful facility, risks are perceived as high and thus provide a motivation for opposition (Alhakami and Slovic, 1994; Grabill and Simmons, 1998; Sandman, 1986; Simmons, 2008). In those instances when opponents from outside of the immediately affected area are motivated to participate in *NIMBY* reactions (e.g. demonstrations), they typically represent broader interests relative to economic, social, environmental and/or political issues.

A third issue relative to *NIMBY* is the varied manner in which *NIMBY* responds to potentially harmful facilities have been characterized. Both negative and positive characterizations of *NIMBY* persist. In general, negative characterizations of *NIMBY* responses point to self-interest as the key motivation in challenging facility locations. *NIMBY* responses are considered by many people to be motivated solely by self-interest or an interest in protecting one's own "turf" (Schively, 2007). In contrast to those who see *NIMBY* opposition groups as undermining the democratic system out of self-interest, some researchers see these groups as exemplifying democracy, effectively facing challenges despite seemingly little potential for influence; for instance, positive characterizations of *NIMBY* responses point to the inherent value of grassroots citizen opposition (Sandman, 1986).

In summary, *NIMBY* exists as a context that congeals a common community reaction whenever a local industrial project building an unwanted facility is to be developed in a community. As a result, communication practitioners should communicate with the related publics regarding this reaction (Sandman, 1986, 2012; Simmons, 2008). This study focuses on an *NIMBY* context regarding a potentially harmful facility – a hypothetical nuclear plant plan in a community – while regarding *NIMBY* as a democratic reaction of local publics. While communication literature's attention concerning *NIMBY* has been given to conflict management (Devine-Wright, 2009; Heath and Palenchar, 2000; Lam and Woo, 2009), this study concentrates on the behavioral reaction of local publics to *NIMBY* in terms of community participation.

Community participation as a core activity in community relations

The concept of community relations refers to an organization's planned activities within a community to establish and maintain an environment that benefits both parties (Burke, 1999). The underlying principal of community relations is understood as the moment when an organization accepts its civic responsibility and takes an active interest in the well-being of its community; at this point, the organization then gains a number of long-term benefits, in terms of community support, loyalty and goodwill (Hallahan, 2004; Ledingham and Bruning, 2001; Sandman, 1986, 2012; Wilson, 2001). In community-based projects, representatives of multiple community sectors collaborate to solve a problem using resources from both within the community and from external resources (Beierle and Cayford, 2002; Hallahan, 2004; Sandman, 1986, 2012). The best of these projects, at least in the field of communication, are based on behavioral science. The organization typically seeks to address community- or group-level determinants of behavior through the use of multiple interventions designed to work in an orchestrated fashion (e.g. advertising campaigns, community outreach efforts and organizational collaborations). Thus, community relations is the activation of the community to contribute to the overall goal of increased awareness and concern about community issues, and local support for specific community programs (Burke, 1999; Chang and Jacobson, 2010; Hallahan, 2004; Ledingham and Bruning, 2001).

In a context of *NIMBY*, community relations activities often include developing community coalitions to address defined problems or needs regarding a proposed (unwanted) facility, increasing the awareness and concern of the community about the need or problem and obtaining opposition to or support for activities or programs that address the needs or reduce the problems (Chang and Jacobson, 2010; Hallahan, 2004; Ledingham and Bruning, 2001).

Public segmentation literature has emphasized that recognizing the characteristics of community residents is an important step in community relations, as they engage in community participation (Grunig, 1989; Lesly, 1992). In a situation of *NIMBY*, the better we understand the publics' characteristic factors, the more effective technical communication practitioners will be at anticipating their reactions to *NIMBY* and selecting strategic responses to those reactions. Characteristics most often discussed are an assessment of the publics' knowledge, involvement and power to influence the decisions of the involved organizations such as local government (Heath and Abel, 1996; Heath and Palenchar, 2000; Palenchar and Heath, 2002). Based on the three components (i.e. problem recognition, constraint recognition and involvement), Grunig (1997) developed the situational theory of publics to explain and predict why some publics are active and others are passive in community participation.

A typology of publics in community relations: situational theory of publics

In communication literature, situational theory of publics uses the term *publics* to refer to stakeholders in a shared scenario. As defined by Dewey (1927) and Grunig (1997), publics are groups of people facing a similar situation, who recognize a problem and then organize to solve the problem. Publics are recognizable based on their shared behaviors, and the communication behavior of publics can be understood by measuring how members perceive situations in which they are affected by organizational consequences.

Situational theory of publics suggests a typology of publics that predicts:

- how individuals perceive a situation; and
- how, based on their perception, they will engage in certain communication behaviors, such as information-seeking, information-processing and participatory intentions.

Grunig (1997) further proposed a set of three components of the theory to determine the communicative effectiveness with different publics. The first component is problem recognition. This concept suggests that people do not even think about a situation unless they perceive something needs to be done about a problem related to it. The second component is constraint recognition, which occurs when "people perceive that there are obstacles in a situation that limit their ability to do anything about the situation" (Grunig, 1997, p. 10). Constraint recognition discourages communication behavior, even if communicants have high problem recognition. The final component is involvement. The level of involvement notes the degree to which an individual is considered personally and emotionally connected to and involved in a problem (Grunig, 1997). Involvement, then, increases the likelihood of individuals attending to and comprehending certain contextual situations such as *NIMBY*. Overall, the level of involvement is often used to predict whether a person will be active or passive in their communication behavior in a situation.

These individuals are divided into four kinds of publics – *active, aware*, *latent* and *nonpublics* – who have varying levels of problem recognition, constraint recognition and involvement for certain issues or problems. *Active* publics are likely to have high levels of involvement and problem recognition, and lower levels of constraint recognition. Because these individuals recognize how the problem affects them and think they can do something about it, Grunig (1997) theorized that this type of public will actively seek information and act on that information. *Aware* publics will process information received and might act, but they are limited by either lower levels of involvement and problem recognition or higher levels of constraint recognition. *Latent* publics are not fully aware of their connection to, or involvement with, an issue and the related organization. As such, this type of public could become active or aware as information changes its cognitions about the issue. Finally, *nonpublics* do not care about an issue and have a minimal level of involvement with the issue.

Hallahan (2000) added to the theory of publics by renaming latent publics and nonpublics into *aroused* and *inactive* publics. *Aroused* publics have low levels of knowledge and low levels of constraint recognition, but their level of involvement is high, which encourages them to begin seeking information. *Inactive* publics are defined as groups with low levels of knowledge and involvement regarding an organization and its operations; this type of public, as such, may not yet recognize the consequences of an organization's behavior or may be apathetic toward the organization.

Overall, based on the three components (problem recognition, constraint recognition and involvement) of situational theory of publics, previous studies note a total of eight possible types of publics as represented in Table I (Lee and Rodriguez, 2008; Major, 1993; Rawlins, 2006). In the current study, however, only four publics (active, aware, aroused and inactive) are considered as distinctive groups of publics in *NIMBY*. The choice to focus on only active, aware, aroused and inactive publics is because the remaining publics conceptually are considered mixed publics (e.g. active/aware, aware/active, aroused/inactive or inactive/aroused), meaning they are not mutually exclusive, and thus, they are not

considered "primary publics" in community-based communication programs (Rawlins, 2006).

In summary, whether certain community residents will become active publics or another type of public can be predicted by whether they recognize the problem, whether the problem involves them and whether they think they can do anything about the problem (Heath and Douglas, 1991). For example, when a plan to build a potentially harmful facility in a community is announced, active publics in the community will be more active than aware, aroused and inactive publics in terms of community participation intentions because the active group's urgency is greater toward the plan than that of other publics (Sandman, 1986). Thus, *H1* is proposed:

H1. There are significant differences among the four publics in community participation intentions in *NIMBY*. There is a main effect of public segmentation on community participation intentions.

Information processing for action taking: social exchange theory

One line of reasoning from previous research suggests that the kinds of information people obtain about an issue may influence positive or negative evaluations on the issue, thereby allowing them to integrate the evaluation into attitudinal and behavioral intentions (Andsager, 2000; Ajzen and Fishbein, 1980). Heath *et al.* (1995) found that individuals exhibit idiosyncratic differences in behavior intentions, depending on the different messages to which they were exposed. In later research, Heath *et al.* (1998) stated that people are less likely to approve of hazardous technologies when benefits are not apparent or when a technology benefits others more than the persons making the evaluation. On the other hand, people seem to have a positive attitude toward a technology if they believe it provides a benefit, such as creating jobs and facilitating economic growth.

Given the above information, SET is a useful conceptual framework when explaining a relationship between community publics' opinions to a potentially harmful facility after exposure to a supportive or opposing message about the facility and their behavior intentions toward community participation. The central tenet of SET is that a basic form of human interaction involves the exchange of social and material resources, and publics always want to maximize the value of their exchange outcome (Kelley and Thibaut, 1978). In other words, people enter into relationships by analyzing costs versus benefits. Considering this socioeconomic approach to relationships, people have little incentive to

Variables	High involvement	Low involvement
High problem recognition Low constraint recognition	Active public	Active/ Aware public
High problem recognition High constraint recognition	Aware/ Active public	Aware public
Low problem recognition Low constraint recognition	Aroused public	Aroused/ Inactive public
Low problem recognition High constraint recognition	Inactive/ Aroused public	Inactive public

Note: This table is modified from Grunig (1997), Hallahan (2000), Major (1993) and Rawlins (2006)

Table I.
Eight kinds of publics defined by the three components of the situation theory

change (or incur "switching costs") unless the perceived benefits significantly exceed the perceived costs. Unless the problem is particularly important, or people are prompted to act by external factors, inertia can lead to indifference and inactivity, or what might be termed *routine behaviors* (Grunig, 1997).

When considering a potentially harmful facility, publics seek to determine the possible community benefits of that facility in comparison to the personal benefits of the facility. In *NIMBY* scenarios, certain groups of publics are concerned about a potentially harmful facility because of conflicting needs between the issue and themselves (Alhakami and Slovic, 1994; Burns and Slovic, 2012; Heath *et al.*, 1995); as such, they consider and weigh these competing needs when considering the potentially harmful facility. For example, community publics who can see the damage that the facility may cause to the community in the form of environmental issues (e.g. health hazards) and social issues (e.g. traffic) are less likely to be enthusiastic about the facility. The reason for their lacking enthusiasm is supported by previous studies that have reported the ways in which traffic congestion and disruption of daily lives diminish the quality of life for residents near potentially harmful facilities (Miller, 2010).

In contrast, despite numerous risks from a potentially harmful facility, supporting-involved publics represent a potential base of support for the facility because of the economic, sociocultural and psychological benefits they may potentially gain from the facility (Heath *et al.*, 1995; Miller, 2010). For instance, impact studies have argued that having the facility can generate jobs, income, tax revenue and business opportunities (Gursoy *et al.*, 2002). The literature has also identified the benefits arising from the sociocultural and psychological benefits of the facility within a community. These benefits include community pride, a sense of heritage and other cultural assets (Gursoy *et al.*, 2002). Miller and Sinclair (2009) found that although certain individuals in the community were well aware of industry risks, these risks were accepted as a tradeoff for employment opportunities and psychological benefits, such as pride in their profession and their community.

Overall, SET implies that messages highlighting positive benefits (e.g. economic benefits) of a potentially harmful facility would make community publics more favorable to the facility and more likely to participate in community activities to support the facility. On the other hand, messages concerning negative benefits (e.g. harmful health issues) of the facility will bring about participatory activities that oppose the facility. Thus, *H2* is proposed:

H2. Publics exposed to positive messages about a potentially harmful facility are more likely to participate in community activities to support the facility than others who are exposed to negative messages. There is a main effect of advocacy messages on community participation intentions.

The relationship among problem recognition, constraint recognition, involvement and advocacy messages, however, is likely to be interactive and dynamic, rather than purely linear; as such, one can imagine that all of the variables combine to foster communication to ascertain whether the problem is serious enough to mobilize them to participate in community activities by either supporting or opposing the facility (Heath *et al.*, 1995). Thus, an interaction effect among these variables is hypothesized (*H3*); sub-sequential hypotheses are followed by different types of community publics (*H3.1* to *H3.4*).

Active publics are often directly involved in local issues; this group might serve as missionaries for the cause or as representatives for a social movement, special interest group or political party in interaction with an organization (Grunig, 1997; Hallahan, 2000). Active publics are composed of individuals who share high involvement and low constraint recognition. As their risk perception toward a potentially harmful facility is very high, they are predisposed to actively participate in community activities and to oppose the facility, regardless of message positions (Sandman, 1986):

H3.1. Active publics show high community participation intentions opposing the facility, no matter if they are exposed to a negative message or a positive one.

Compared to an active public, aware publics may not actively participate in community activities because of their high constraint recognition and low involvement. However, as aware publics are highly perceptive about risks of the harmful facility, this type of public can be influenced by message positions:

H3.2. Aware publics show community participation intentions opposing the facility after exposure to negative messages, or supporting the facility after exposure to positive ones.

Aroused publics show comparatively low levels of knowledge about the harmful facility and its impacts on the community. They are, however, potential active publics because they possess a low level of constraint recognition and a high level of involvement in community issues (Hallahan, 2000). Thus, the aroused public can be prompted by different message positions:

H3.3. Aroused publics show community participation intentions opposing the facility after exposure to negative messages, or supporting the facility after exposure to positive ones.

Inactive publics are conceptualized here as groups composed of individuals who possess low levels of risk perception about the facility and low levels of involvement in its operations (Hallahan, 2000). Yet, they have high levels of constraint recognition while taking a fatalistic position that nothing can be done to alter the situation (Grunig, 1997; Sandman, 1986). Thus, this type of public pays minimal attention to the issue and is least likely to participate in community actions either supporting or opposing the facility, even after exposure to a message (Sandman, 1986):

H3.4. Inactive publics show minimal community participation intentions, regardless of exposure to negative or positive messages.

Methods

A 4 (publics: active, aware, aroused or inactive) $\times$ 2 (advocacy: supportive or opposing messages) experimental design was used to investigate the hypotheses of this study. Aldoory *et al.* (2010) similarly used a quantitative 2 $\times$ 2 experimental design combined with situational theory of publics to look at a risk and crisis communication situation. Quantitative approaches are often adopted in risk and crisis communication literature. For instance, according to the meta-analysis of risk and crisis communication research done by Ha and Boynton (2014), 59.4 per cent ($N = 104$) of research from 1999-2011 about risk and crisis communication was quantitative in nature compared to qualitative methods, which accounted for 34.3 per cent ($N = 60$). Moreover, Ha and Boynton found

that there were 34 experimental studies (19.4 per cent) in risk and crisis communication research.

Participants

We used a purposive sampling technique for the data set of this study. We contacted ten local chambers of commerce in three large states (two Southwestern states and one Midwestern state) to know if data collection was available during their upcoming local meetings. Although we initially acknowledged that it could be argued that the level of community involvement of the meeting participants might be unnaturally higher than that of other residents, we continued to select local chambers of commerce for the data collection; the chambers of commerce chosen hosted a variety of local meetings such as business and town meetings, general public forums and social meetings which were open for all community members (e.g. business men, local suppliers, general publics, college students, homeless people, etc.). The three states were selected because they are located nearby a coast, river or bay. As the most common types of current nuclear power plants use water for cooling, the majority of the new plants have been settled around those areas (World Nuclear Association, 2011). Thus, we expected that a hypothetically planned nuclear plant would seem realistic to the participants. With permission from seven chambers, we visited 23 local meetings where a variety of community residents attended to share and discuss certain local issues. A total of 821 subjects initially participated in this study.

Procedure

Immediately following the end of each meeting, a trained experimenter explained the purpose of the research, the benefits of participating and the need for volunteers. Willing participants then completed a questionnaire measuring participant demographics and the three components of an independent variable (a public type): the general risk perception of nuclear power plants; the constraints they feel against governmental decisions on local issues in general; and the level of community involvement. Although the levels of the three components were determined by self-report, participants were randomly assigned to read either a supportive or an opposing advocacy article about a new local government plan for a nuclear power plant. Because we wanted to make the situation as realistic as possible and to prevent possible treatment diffusion effect (also called "contamination effect") (Merrigan and Huston, 2015, p. 305), we neither mentioned that the power plant was hypothetical nor did we hold a debriefing session. We did, however, provide the community participants contact information for the researchers and encouraged them to contact us if they had any questions about the situation or the newspaper articles. After exposure to either article, participants were then given another set of questionnaires to evaluate the article's credibility and tone (positive or negative), and to indicate their participation intentions in several community activities either supporting or opposing the plan.

Independent variables: public types and advocacy articles

For this study, the three components used to identify publics were incorporated and each was operationalized and measured with multiple-item scales. In detail, a series of item scales drawn from previous studies were used to determine each participant's recognitions and involvement. This study used a nine-point Likert scale to optimize the measure of population variances in the variables, where 1 indicated *strongly disagree* and 9 indicated *strongly agree*.

Principal component analysis (PCA), with Varimax rotation for validity, and tests for the construct items of the independent variables and reliability with Cronbach's α for each component were performed. Table II shows acceptable values for all variables for the Kaiser's Measure of Sampling Adequacy (MSA), as the overall Kaiser-Meyer-Olkin (KMO) value was good at 0.82, and Bartlett's test of sphericity had a satisfactory value ($X^2 = 4878.2$, $p < 0.01$).

Problem recognition. Problem recognition was operationalized by the level of risk perception to a nuclear power plant in general. For analysis, a risk perception index was constructed by combining six items from previous studies (Heath and Abel, 1996; Heath *et al.*, 1995; Miller, 2010), including holistic concern:

(1) health risks (e.g. due to nuclear/radioactive waste);

(2) environmental risks (e.g. air and water pollutions);

(3) safety issues (e.g. unknown hazardous chemicals);

(4) increased crimes (e.g. due to new hired mass employees from outside of the community);

(5) traffics (e.g. due to dump trucks); and

(6) decreased local land/house prices (e.g. due to the possible risks mentioned).

Construct of IVs	Items	M	SD	1	2	3	α
Problem recognition	Health risks	7.2	1.9	0.91			0.87
	Environmental risks	7.3	1.8	0.91			
	Safety issues	7.3	1.9	0.92			
	Increased crimes	5.9	2.4	0.76			
	Traffics	6.1	2.2	0.79			
	Decreased local land prices	6.6	2.0	0.84			
Constraint recognition	I do not have any power in the community decision	4.54	2.211		0.81		0.88
	I cannot do anything about a community risk situation	4.81	2.2		0.89		
	There are constraints that limit my ability to participate in community	4.81	2.2		0.88		
	I do not understand a community risk situation enough to do anything	4.94	2.4		0.91		
	I do not have the ability to make a difference in the outcome of any community decision	5.37	2.3		0.94		
Involvement	Interested in community issues	5.6	2.1			0.70	0.92
	Participate in community activities	4.8	2.3			0.94	
	Volunteer for community activities	4.5	2.4			0.90	
	Involved in community	4.7	2.3			0.94	
	Pitch in when something needs to be done in the community	4.5	2.3			0.89	

Table II.
PCA and Cronbach's α results of three independent variables

Notes: Extraction method: principal component analysis; rotation method: Varimax with Kaiser Normalization; Kaiser-Meyer-Olkin (KMO) = 0.82, Bartlett's test of sphericity $X^2 = 4{,}878.2$, $p < 0.01$

Cronbach's α for the aggregated scale was 0.87. Participants showed a somewhat high level of problem recognition (M = 5.9, SD = 1.7). Based on the mean score, a total of 406 participants were categorized as low problem cognition, because their average point was below 5.89; the rest (N = 415) were coded as high recognition, because their average involvement point was above 5.91. None of the participants had the exact mean score of 5.9, which would indicate the average problem recognition.

Constraint recognition. Constraint recognition was operationalized by the level of obstacle perception when dealing with community issues that limit publics' ability to participate in community activities in general. Based on research by Grunig (1997) and Kim and Grunig (2011), the constraint recognition scale was created with the following five response items:

(1) I do not have any power in the community decision.

(2) I cannot do anything about a community risk situation.

(3) There are constraints or obstacles that limit my ability to participate in community.

(4) I do not understand a community risk situation enough to do anything about it.

(5) I do not have the ability to make a difference in the outcome of any community decision.

Cronbach's α was 0.88. Participants showed a moderate level of constraint recognition (M = 5.4, SD = 1.5). Based on the mean score, a total of 410 participants were categorized as low constraint recognition, because their average point was below 5.39; the rest (N = 411) were coded as high recognition, because their average involvement point was above 5.41. None of the participants had the exact mean score of 5.4.

Involvement. Involvement was operationalized by participants' involvement concerning the community. Based on previous studies (Heath and Douglas, 1991; Heath *et al.*, 1995), public involvement was measured by the following five items:

(1) interest in community issues;

(2) participate in community activities;

(3) volunteer for community activities;

(4) involvement in community; and

(5) pitching in when something needs to be done in the community.

Cronbach's α was 0.92. Participants showed a somewhat low level of community involvement (M = 4.8, SD = 1.9). Based on the mean score, a total of 408 participants were categorized as low involvement because their average point was below 4.79; the remainder (N = 413) were coded as high recognition because their average involvement point was above 4.81. None of the participants had the exact mean score of 4.8.

Results for the PCA and the reliability tests with Cronbach's α are presented in Table II.

Stimulus materials

Two advocacy messages (supportive and opposing) for the hypothetical power plant were created by a local journalist. Each of the two messages consisted of a

one-page news article. This study, then, used a news article as an advocacy stimulus for two reasons. First, news articles would be one of the strategies communication managers (e.g. public relations agencies and practitioners) use to advocate their position on an issue and eventually persuade the readers. For example, compared to the past, news media and journalists rely more heavily on press releases provided by public relations agencies and practitioners who write news articles because news media do not have enough staff writers to cover every issue and event. Specifically, Wilcox and Cameron (2012) pointed out that approximately 60 to 75 per cent of news stories/articles are from public relations sources. News articles, therefore, can be used as an indirect method to distribute advocacy messages to the readers. Second, the public considers news articles as credible and unbiased sources of information; as such, news articles used as indirect advocacy messages are more influential than direct advocacy messages, such as press releases, advertisements and websites (Lehman-Wilzig and Seletzky, 2012).

To avoid any measure errors due to false manipulation of the frame of each news article, each article consisted of five paragraphs concerning the plant, and to eliminate unintended sources of variance, both articles used similar descriptive illustrations and headlines. The length of each article was approximately the same: 354 words were used in the supportive article, and 348 were used in the opposing article. To control for the effect of a visual heuristic, no pictures were included and the layout was exactly the same across both message types.

Supportive article. In this study, a supportive article for the plant was operationalized as one containing supportive messages, with mainly economic benefits that community residents may receive from building the plant. The message used here contained three logical elements of a supporting argument: supportive claim assertion, evidence and authority (Boller *et al.*, 1990). An example of a supportive claim is:

> A (state) government plans to apply for planning consent to bring a new nuclear power plant to (city) that would bring thousands of jobs and billions of dollars to the local economy.

Evidence is a fact to support a claim, often using some scientific terms, such as statistics (Boller *et al.*, 1990). Statements of evidence used were: "The nuclear facility will generate up to 2,300 MW of generation capacity"; and "The nuclear power plant could also bring $5.5 billion into the local economy". Authority is a rational statement that connects the evidence with an asserted claim and is oftentimes delivered by an authorized person(s) (Boller *et al.*, 1990). A statement such as, "'The economic boost delivered by the new plant would be a pleasant addition as local businesses would benefit from the supply chain opportunities' said (the city) Mayor (name)", was used as an authority-based argument in the supportive article.

Opposing article. Based on the criteria used for the supportive article, the opposing article also contained the aspects of claim of opposition, evidence and authority. The following statements were used in the opposing article:

> The announcement was immediately met with opposition from several residents, and skepticism by some city council members, who have expressed concerned over the potential health risks a nuclear plant could bring to the region (opposing claim).

> The reassurances don't satisfy anti-nuclear residents, who cite Japan's struggle to contain the worst radiation release since Chernobyl as the best example of inherent dangers of nuclear

power and difficulty of dealing with unexpected disaster such as human error, natural disasters and even terrorist acts (evidence); "'Working with (the city), we would take precautionary steps to contain damage should a potential catastrophic leak occur for whatever reason', said the leader" (authority).

Of the total 821 initial participants, 350 were later excluded as mixed publics (e.g. active/aware, aware/active, etc.). The reasons for the elimination, as mentioned earlier, were that mixed publics are not mutually exclusive, and so they were not considered "primary publics" in community-based communication programs (Rawlins, 2006). As a result, data from a total of 471 participants were used in this study; 152 participants were regarded as active publics, while 116 were identified as aware, 102 as aroused and 101 as inactive publics. The age of the participants varied, ranging from 26 to 69 (M = 37.3, SD = 4.5). The participants reflected the seven cities' populations, in terms of proportion by gender. Of those numbers, 259 participants (55 per cent) were male, while the remainder ($N = 212$, 45 per cent) were female. The participants varied in term of race (45 per cent Caucasian, 28 per cent African-American, 18 per cent South American, 6 per cent Asian and 3 per cent others) and annual income (M = $38,300, range: $15,000-120,000). A total of 227 participants (48.2 per cent) read the supportive article, while the rest ($N = 244$, 51.8 per cent) read the opposing article. Overall, while randomly reading either a supporting or an opposing advocacy article, approximately 50-80 subjects were assigned to each of the cells in the 4×2 design.

Manipulation checks

For the manipulation checks of the two different articles, three independent *t*-tests were conducted. First, to investigate the effects of message quality and persuasiveness, a three-item scale ("credible", "believable" and "realistic") from a previous study (Austin *et al.*, 1999) was used with a nine-point semantic differential scale. The scale was reliable ($\alpha = 0.94$). The *t*-test confirmed that participants indicated that both articles sounded credible ($M_{Supportive} = 6.74$, $M_{opposition} = 6.60$, $t(469) = -1.1$, *n.s.*). Second, two additional questions were used to ask the participants to identify whether the message they read was supportive or opposing the plant. The result of the first *t*-test showed that there was a significant difference between the participants reading the supportive article (M = 8.1, SD = 2.1) and the others who read the opposing article (M = 3.6, SD = 1.9) in response to the question, "this article articulates positive aspects of the new plan" ($t(469) = 37.6$, $p < 0.01$). Accordingly, the second *t*-test showed that there was a significant difference between the participants reading the opposing message (M = 6.8, SD = 1.7) and those reading the supportive article (M = 3.3, SD = 2.0) in response to the question, "this article articulates negative aspects of the new plan" ($t(469) = 117.3$, $p < 0.01$). Overall, the *t*-tests for the manipulation check strongly supported that the two different articles were created as credible sources and were well manipulated.

Dependent variable

Conceptually, according to the theory of reasoned action (Ajzen and Fishbein, 1980), behavioral intention can be defined as a decision to act in a particular way or an individual's motivation in the sense of his or her conscious plan to exert effort to carry out a behavior. In other words, behavioral intent leads to a behavior consistent with that specific intent. The behaviors that result due to individuals' behavioral intentions can be

termed voluntary, which include behaviors that people perform because they decide to perform them. Along with the theory's assumption that an individual's behavior can be determined by the person's intent to perform (or to not perform) that behavior, the main dependent variable of interest in this current study is community participation intentions, in terms of support for or opposition to a local governmental plan to build a new nuclear plant in a community. Due to the nature of this study, measuring community participation intentions would be more practical and appropriate given the hypothetical scenario regarding a new nuclear plant plan, rather than using an actual case.

The participation intentions were operationalized as the extent of an individual's intent to participate in his/her political and social community activities, regarding the plant plan. The participation variable was a composite measurement that combined six questionnaire items, which determined the extent to which respondents engage in community actions. Using a nine-point semantic differential (bi-polar opposite) scale ranging from *greatly oppose* (1) to *greatly support* (9), respondents were asked to rate their intentions regarding the following participatory activities as, I:

(1) oppose/support the new local nuclear plant plan;

(2) intend to raise money to oppose/support community action projects (e.g. demonstration);

(3) intend to be involved to oppose/support the nuclear issues;

(4) intend to cooperate with any local activist groups to oppose/support the plan;

(5) am driven to participate in community activities to oppose/support the plan; and

(6) intend to vote against/for the plan.

The scale was reliable ($\alpha = 0.93$).

Results

It was hypothesized that there would be a main effect of the different types of publics (*H1*), the different advocacy messages (*H2*), and an interaction between them (*H3.1* to *H3.4*), when given consideration to the community participation intentions in *NIMBY*. To test *H1*, a one-way ANOVA was first run, and the test indicated a significant difference in the community participation intentions among the four different types of publics ($F(3, 467) = 100.7$, $p < 0.01$). Explicitly, active publics showed the highest level of the participatory intentions to community activities against the facility ($M = 2.7$, $SD = 1.0$), while the other publics seemed in-between support for and opposition to the facility (Tables III and IV). Thus, *H1* was supported.

Regarding *H2*, an independent *t*-test was run to compare the level of intentions between publics who were exposed to the supportive article and those who were exposed to the opposing article. The *t*-test demonstrated that there was a significant difference of intentions between the supportive message readers ($M = 4.8$, $SD = 1.7$) and the opposing message readers ($M = 3.5$, $SD = 1.0$) ($t(469) = 9.6$, $p < 0.01$). The supportive message readers showed a higher level of intention to support the facility than the opposing message readers across all types of publics (Table III); thus, (*H2*) was supported.

Finally, a univariate ANOVA was conducted. As shown in Table III, the ANOVA confirmed a direct effect of the different types of publics upon community participation

Publics	Articles	*N*	M	SD	*t*(df), *p**	*F*(df), *p***
Inactive	Supportive	54	4.6	1.4	−0.4 (99), n.s.	100.7 (3, 467), $p < 0.01$
	Opposing	47	4.7	0.3		
	Total	101	4.7	1.1		
Aware	Supportive	57	5.7	0.3	24.8 (114), $p < 0.01$	
	Opposing	59	4.2	0.3		
	Total	116	4.9	0.8		
Aroused	Supportive	47	6.6	0.9	34.8 (100), $p < 0.01$	
	Opposing	55	3.2	0.5		
	Total	102	4.8	1.9		
Active	Supportive	69	2.9	1.1	1.9 (150), n.s.	
	Opposing	83	2.6	0.8		
	Total	152	2.7	1.0		
Total	Supportive	227	4.8	1.7	9.6 (469), $p < 0.01$	
	Opposing	244	3.5	1.0		
	Total	471	4.1	1.5		

Notes: * *t*-test comes from an independent *t*-test for each public in the comparison of supportive and opposing messages; ** *F* test comes from an one-way ANOVA of the four publics on the participation intentions

Table III.
The main effects of public types and advocacy on community participation intentions

Source	df	*F*	Partial eta-squared (η_p^2)	*p*
Publics	3, 463	223.2	0.59	<0.01
Messages	1, 463	276	0.37	<0.01
Publics × Messages	3, 463	100	0.39	<0.01

Note: $R^2 = 0.72$ (adjusted $R^2 = 0.72$)

Table IV.
The interactive effects of publics and advocacy on community participation intentions

intentions (*H1*). The direct effect was significant ($F(3, 463) = 223.2$, $p < 0.01$), and its partial eta-squared (η^2) was 0.59. In addition, the direct effect of the different articles (*H2*) was also significant ($F(1, 463) = 276$, $p < 0.01$, $\eta^2 = 0.37$). This study now turns to the interaction between public types and message contents, and the interaction effect upon community participation intentions (*H3*). The interaction effect of the independent variables on the intentions was significant ($F(3, 463) = 100$, $p < 0.01$, $\eta^2 = 0.39$). These findings supported the main argument of this study, which suggests that in *NIMBY*, publics interact with different message contents in the realm of community participation.

To show a visual understanding of the interaction effects, the mean scores of community participation intentions after exposure to either article are plotted in Figure 1 where the X axis indicates the dichotomy of the two articles (Left: supportive message; Right: opposing message), and the Y axis represents a semantic differential (bi-polar opposite) scale ranging from highly opposing (1) to highly supportive (9). The plot clearly depicts the interaction effect, pointing out that publics showed different participatory intentions after exposure to either article.

Because the messages were observed to have an interaction effect with the types of publics upon community participation, several independent *t*-tests were conducted to

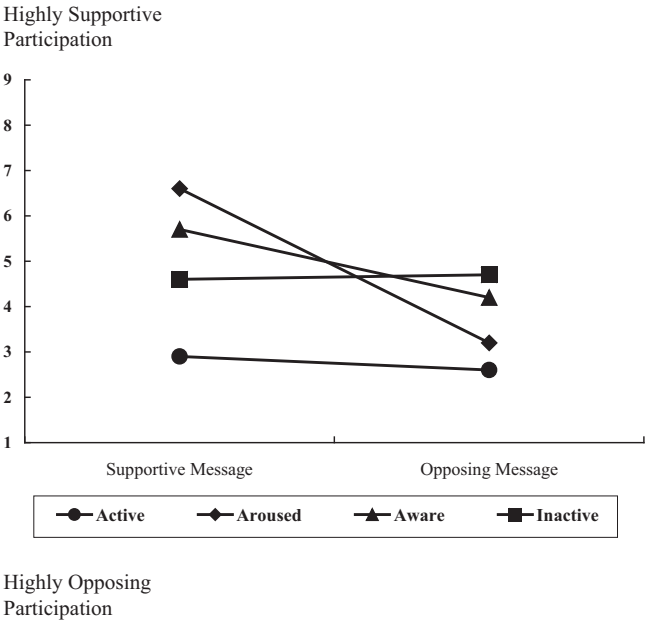


Figure 1.
The interaction between publics and advocacy on community participation intentions

compare the mean of each public (*H3.1* to *H3.4*). The mean scores of all eight cells are shown in Table III. Regarding *H3.1*, a *t*-test demonstrated that among active publics, there was no significant difference upon community participation intentions between people who were exposed to the supporting article (M = 2.9, SD = 1.1) and those who were exposed to the opposing article (M = 2.6, SD = 0.8) ($t(150) = 1.9$, *n.s.*). In other words, active publics were highly willing to participate in community activities that strongly oppose the plant, regardless of the article positions. Thus, *H3.1* was supported (Table III).

As demonstrated in Table III, regarding *H3.2* about aware publics, a *t*-test supported the significant difference between people who were exposed to the supporting article (M = 5.7, SD = 0.3) and those who were exposed to the opposing article (M = 4.2, SD = 0.3) ($t(114) = 24.8$, $p < 0.01$). In other words, aware publics were willing to participate in community activities to strongly support or oppose the plant, depending on the article's position. Thus, *H3.2* was supported.

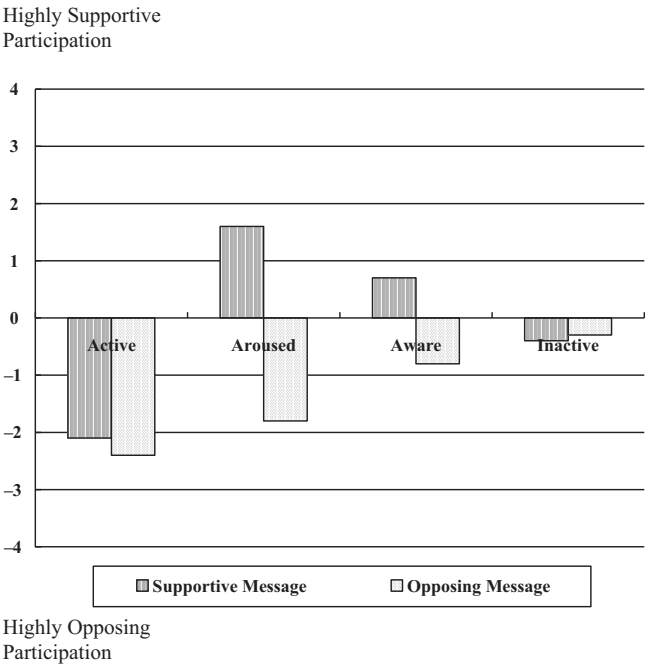
Regarding *H3.3* about aroused publics, a *t*-test demonstrated a significant difference in participation between people who were exposed to the supporting article (M = 6.6, SD = 0.9) and those who were exposed to the opposing article (M = 3.2, SD = 0.5) ($t(100) = 34.8$, $p < 0.01$). In other words, aroused publics were more likely than aware publics to participate in community activities that strongly support or oppose the plant, depending on the article's position (Table III). Thus, *H3.3* was supported.

However, no significant difference was observed in the community participation intentions among inactive publics. Specifically, inactive publics showed a lack of participation intentions to support or oppose the plant, regardless of the article position ($t(99) = -0.4$, *n.s.*). Thus, *H3.4* was supported.

To get a visual understanding of the aforementioned findings, each public's mean scores of community participation intentions after exposure to either article are re-drawn in Figure 2.

Discussion

This study contributes in several ways to our understanding of community participation in *NIMBY*. First, the study confirms and extends situational theory of publics by demonstrating individual differences in community participation intentions. Consistent with previous findings using this theory (Heath *et al.*, 1995; Kim and Grunig, 2011; Lee and Rodriguez, 2008; Major, 1993), the current study demonstrates that each type of public showed a different level of participatory intentions and a direction (support or oppose) toward a governmental plan to build a new nuclear plant. For example, active publics who recognized the plan as a serious community problem (high problem recognition), who perceived less obstacles that limit their ability to solve this problem (low constraint recognition) and who had high levels of community involvement were more likely to participate in community activities than other publics. On the other hand, inactive publics were the least likely to participate in community activities because this group paid minimal attention to community issues regarding the plan and was less involved in the community, *per se*.



Notes: "4" indicates the highest level of community participation intentions to support a harmful facility, while "−4" shows the highest level of community participation intentions to oppose the facility

Figure 2. The impacts of advocacy on community participation intentions among different publics

Second, we observe a direct impact of advocacy messages on community participation while utilizing the SET logic. This study reveals the association of the positive impact of a potentially harmful facility delivered by a supportive article and the participatory intentions supporting that facility. This study confirms the results of previous research findings that community publics who saw a potentially harmful facility as a positive impact in the community were more likely to support the facility (Heath *et al.*, 1995; Miller, 2010; Stafford and Hartman, 2000). In contrast, people who received a negative article about the facility were more likely to oppose the facility. The overall findings suggest that strategically designing advocacy messages through a variety of news media would be needed not only to inform publics about a new siting process but also to shape their opinions on and behavioral intentions toward the process. Coombs and Holladay (2009, p. 5) suggested that communication managers of organizations should "deliver their messages in a variety of media as a means of reaching more people" because circulating the latest information to publics in a timely manner resulted in fewer negative reactions about an unwanted facility (Sandman, 1986, 2012; Savadori *et al.*, 2004; Schultz *et al.*, 2011; Simmons, 2008).

Third, this study reveals, however, that exposure to a supportive article about a potentially harmful facility did not necessarily influence every individual to support building it. One possible explanation for the lack of influence is a consequence of cognitive dissonance. Cognitive dissonance theory (Festinger, 1957) suggests that people are powerfully motivated to maintain cognitive consistency and to hold to their inner beliefs and attitudes. For instance, if a respondent had a high-risk perception toward the facility, he/she was less likely to perceive positive impacts, even after exposure to the positive article; thus, these individuals continued to be strongly opposed to the facility because of its negative impact (Sandman, 1986). With reference to Festinger's theory of cognitive dissonance, some publics (e.g. active publics) reading a supporting article may, then, entirely disbelieve and discredit the message presented in a supporting article, to attempt to reduce tension and to achieve cognitive consonance. In this study, active publics' high level of intentions would show as participation against the new plant. One explanation for the current findings is that active publics already had a high level of risk perception toward the facility, and/or environmental damage was seen as a priority issue on the community agenda (Simmons, 2008). As a result, this public would be likely to exhibit high community participation against the facility, rather than to be supportive of it.

This study finds that aroused publics were more persuaded than any other public in *NIMBY*, because they possessed low problem recognition, low constraint recognition and a high level of involvement, consequently causing them to be more likely to participate in community activities depending on a message position. Aware publics were also an important public in *NIMBY*. Although this group seemed relatively less involved (compared to the aroused public), the high level of risk perception might play a role in triggering an increase in participatory intentions, depending on a message position.

Overall, the findings of this study show that the behavioral orientation of community publics toward a potentially harmful facility is a complex and dynamic phenomenon, in which a variety of factors such as risk perception, involvement,

constraint and message contents exert a differential influence on community publics (Alhakami and Slovic, 1994; Burns and Slovic, 2012; Hallahan, 2004; Heath *et al.*, 1995; Savadori *et al.*, 2004; Stafford and Hartman, 2000; Takahasi and Dear, 1997). Publics often rely on their own perceptions, and their intentions vary. Thus, social exchange within an *NIMBY* situation when the situation is technical and risk-involved in nature should be regularly examined as a subjective indicator when local governments or private businesses need to know how publics in an area react to a high-risk facility.

Practical implications

The findings of this study suggest some key implications that local governments should consider when dealing with different types of community publics and when planning to construct a potentially harmful facility in a community. Local government and community publics are interdependent but seek to pursue incompatible goals. When an issue is characterized negatively by both the local government and its community publics, the issue is inherently conflict-laden (Hallahan, 2004; Ledingham and Bruning, 2001; Plowman *et al.*, 2001; Wilson, 2001); for example, there would be a high level of uncertainty and conflict if a local government were to announce a potentially harmful facility plan (Sandman, 1986; Simmons, 2008). In a *NIMBY* context, to reduce uncertainty and conflict, publics should be involved in each stage of the development process, planning, implementing and monitoring in terms of power-sharing because they are the ones most affected by the facility (Chang and Jacobson, 2010; Devine-Wright, 2009; Grabill and Simmons, 1998; Lam and Woo, 2009; Simmons, 2008; Stafford and Hartman, 2000).

First, based on the two dimensions of potential threat (high to low) and potential collaboration (high to low), Savage *et al.* (1991) classified publics into four types (supportive, marginal, nonsupportive and mixed blessing). The findings of this study imply that in *NIMBY*, active publics can be regarded as nonsupportive publics, as this group continues to oppose a potentially harmful facility regardless of a message position. A nonsupportive public is a group of people that considers potential threat as high, but potential collaboration as low. Because an active, nonsupportive public is the most distressing for a local government, its communication managers need to institute conflict management strategies when dealing with this public. One frequently cited conflict management strategy for dealing with active publics in *NIMBY* includes the use of compensation to increase acceptance of unwanted facilities and to reimburse affected publics for potential losses. In economic terms, monetary compensation works if the amount of compensation is large enough to offset the negative externalities of the facilities (Frey and Oberholzer-Gee, 1996). Research suggests, however, that compensation may not be effective to deal with every *NIMBY* situation due to different types of facilities. For example, in the case of a human service facility siting, research revealed that varied levels of compensation worked as a means of gaining support for the facility siting (Kunreuther *et al.*, 1990). On the other hand, an emphasis on compensation for a potentially harmful facility contributes to the distrust that often plagues the facility-siting processes (Kasperson *et al.*, 1992; Sandman, 1986). Monetary compensation is often perceived by active publics as a bribe, especially if siting procedures are perceived as unfair (Frey and Oberholzer-Gee, 1996). The prospect of monetary compensation makes this type of public hesitant to accept potentially harmful

facilities because acceptance of such remedies appears contrary to the public good (Sandman, 1986). Overall, in *NIMBY*, the use of compensation associated with a potentially harmful facility siting program has been no more successful than any other methods used to ease the facility siting (Kasperson *et al.*, 1992; Schively, 2007).

An alternative step toward conflict management from risk communication literature when dealing with active publics should be to create trust and a sense of belonging between a local government and its active publics (Hallahan, 2004; Heath *et al.*, 1998, 2009; Ledingham and Bruning, 2001; Lesly, 1992; Sandman, 1986, 2012; Sauer, 2003). It should require strategies for building long-term relationships based on mutual trust that result in the behaviors supporting both parties. According to Svendsen (1998), trust is a core condition that is necessary for both an organization and its active publics to move toward greater interdependence and ultimately to reach "collaborative mind". Collaborative mind is the stage when the organization ceases to focus on the aspirations of active publics and attends to the collective will and mission of both the organization and the publics as one cohesive group. Specifically, lack of trust in government has been identified as one of the key aspects of the siting process that stimulates opposition to high-risk facilities (Hunter and Leyden, 1995; Ibitayo and Pijawka, 1999). Furthermore, the perceptions of the experts involved in a siting process can be a significant source of distrust (Sandman, 1986, 2012; Simmons, 2008). Although expert evaluations are intended to be objective, active publics in facility-siting processes typically do not perceive them as if they are (O'Hare *et al.*, 1983). Savadori *et al.* (2004) and Kunreuther and Patrick (1991) made similar findings relative to risks associated with hazardous waste cleanup. They suggested that the public would seek "zero risk", whereas experts recognize the technical limitations and highly prohibitive cost of achieving this ideal. In general, transparency of information is emphasized as an effective means of communicating about the facility's risks and impacts (Grabill and Simmons, 1998; Sauer, 2003; Schively, 2007; Simmons, 2008). When risk communication is effective, it has the potential to increase the public's trust and the assumed credibility of the developer, government officials and active publics (Heath *et al.*, 2009; Ledingham and Bruning, 2001; Sandman, 1986, 2012).

Incorporating consensus-building efforts into *NIMBY* is another frequently cited strategy to promote interaction between active publics and local governments. Kearney and Smith (1994) advocated full citizen participation and a period of prolonged political debate as a means of reducing the distrust that often exists between the two parties in siting processes. Deliberative and democratic siting processes have the potential to enable varied interests to recognize and consider the legitimacy of differing frames of reference and promote a feeling of self-determination between the two (Kearney and Smith, 1994; Sandman, 1986, 2012). Simmons (2008) argued that a notion of power-sharing would be key in a consensus-building process to reduce frustration, animosity and financial and time costs associated with making decisions about risks. In the context of a nuclear waste facility siting, Frey and Oberholzer-Gee (1996) found that proactive negotiation was perceived by the public as the fairest and most acceptable mechanism for siting these facilities, as compared to compensation, lotteries and referenda. Sauer (2003) and Simmons (2008) suggested rhetorical civic discourse would strengthen the connection between technical communication and the public sphere instead of a "decide-announce-defend" approach to a siting process of hazardous facilities.

In general, scholars have found evidence that informal processes are more effective in promoting consensus (Burns and Slovic, 2012; Savadori *et al.*, 2004). Kasperson *et al.* (1992) suggested that lengthy debates and dialogues between active publics and local governments can be most effectively stimulated in informal settings wherein varied interests can discuss their perspectives on siting issues. When effective discussions occur, there is an increased likelihood that acceptable solutions to the challenges of the siting process can be achieved (Rabe, 1994). It should be noted that the implementation of consensus-building can be challenging because local governments typically avoid these discussions in an effort to preempt potential challenges from opposition groups (Rabe, 1994; Sandman, 1986, 2012; Simmons, 2008). Mandated consensus-building or negotiation efforts have also been challenged by scientific complexities and infighting among community publics. Therefore, the organization that has reached this consensus-building stage has a common vision and ground and, most importantly, the capacity to provide active publics with the most innovative and creative solutions. Ideally, the organization could find a win–win solution to a community conflict, such as *NIMBY*, as a result of trust- and consensus-building with active publics (Heath *et al.*, 1998; Plowman *et al.*, 2001).

Second, in *NIMBY*, aware publics who hold a low level of community involvement can be considered a supportive public. Savage *et al.* (1991, p. 66) suggested that as this public is low on potential threat but high on potential for collaboration, an involvement strategy is needed. For example, a local government should involve aware publics when making decisions about relevant community issues concerning a potentially harmful facility, particularly by "increasing the decision-making participation of this group". Involving aware publics in the decision-making process is important because the organization can maximally encourage this public's collaborative potential. Although it takes constant effort, the organization can involve aware publics by implementing participative management strategies, decentralizing authority to leaders of community members or increasing the decision-making participation of the members (Grabill and Simmons, 1998; Hallahan, 2004; Ledingham and Bruning, 2001; Savage *et al.*, 1991).

Another strategy that might be used to deal with aware publics is to empower those who are affected by a potentially harmful facility to exercise greater control over the facility and its potential impacts. The "empowerment of risk bearers" is essential in promoting trust and addressing opposition to the facility (Kasperson *et al.*, 1992; Sandman, 1986, 2012; Simmons, 2008). Although empowerment applies most directly to those with risk and environmental impacts, public monitoring might also be used to assess property value, traffic, noise or other impacts. One tactic is to allow this type of public, who are potentially impacted by the facility, to use their own experts and develop technical programs to monitor risks themselves (Burns and Slovic, 2012; Kasperson *et al.*, 1992; Sauer, 2003). The use of community advisory boards is another potential remedy. Dear (1992) suggested that advisory boards can effectively legitimize the activities of a potentially harmful facility, incorporate needed technical and advocacy skills and defuse opposition. Good neighbor agreements, negotiated between affected neighborhoods and/or interest groups, are another method that has been implemented to empower risk bearers (Dear, 1992).

Third, aroused publics are a mixed-blessing public. A mixed-blessing public plays a major role because an organization often faces this group, whose potential to threaten or to collaborate are equally high. The importance of managing this type of public is that

this group could become either highly supportive or highly opposing. For the mixed-blessing public, effective collaboration may well determine the long-term relationship. If this type of public is not properly managed using a collaborative strategy, it can easily become a nonsupportive public (Stafford and Hartman, 2000; Wilson, 2001). As aroused publics have lack of information regarding a new potentially harmful facility, the first stage in the collaborative communication process involves exchanging information and developing structures, roles and responsibilities that work for everyone (Palenchar and Heath, 2002; Sager, 1994; Stafford and Hartman, 2000). For example, a local government could collaborate with aroused publics in a collaborative manner, such as hosting a community forum designed to listen to their opinions, share information with them and meet productively at middle ground. In particular, when this type of public is extraordinarily involved in the outcomes of the decision-making process, the relationship between the interdependence and collaboration of local governments and aroused publics should increase (Takahasi and Dear, 1997). Another strategy that can be used to aim at this type of public is the recognition, establishment and use of institutional structures to promote consistency and certainty during a siting process (Burns and Slovic, 2012; Dear, 1992; Sauer, 2003; Schively, 2007). It is assumed that institutional change has the potential to address uncertainties in the siting process that affect the public, developers and decision-makers (Grabill and Simmons, 1998; Simmons, 2008). Ethical modifications to regulatory and developmental review processes have the potential to promote greater consistency in outcomes and may contribute to social trust (Sandman, 1986, 2012). If such an effort were effective, the organization would succeed in moving this type of publics from nonsupportive to supportive in enhancing their potential for collaboration.

Last, inactive publics can be regarded as a marginal public. This public does not need to be communicated with directly, but it should be monitored to determine if its orientation toward an organization might change. A marginal public is neither highly threatening nor collaborative. Monitoring helps manage the marginal public, whose potential for both threat and collaboration is low (Hallahan, 2004; Stafford and Hartman, 2000; Takahasi and Dear, 1997). By recognizing that this type of public's interests are narrow and issue specific (Sandman, 1986, 2012), communication practitioners can minimize the organization's expenditures and resources. When making strategic decisions, those practitioners should monitor the interests of the typically inactive publics. Only when community issues involved in the decisions are likely to be salient to inactive publics should the organization act to increase this publics' support or to deflect its opposition; effort, otherwise, may be wasted (Savage *et al.*, 1991; Svendsen, 1998).

Overall, long-term planning as a key element of effective community relations in *NIMBY* can both mitigate negative impacts and reinforce positive ones. To build a better community, local governments need to involve various public groups in the planning process. It has been found that this process is multisectoral and very complex (Grabill and Simmons, 1998; Simmons, 2008); thus, local governments should play an integral role in determining and implementing current and future policies. Numerous studies have reported that community participation programs in risk communication are minimal, passive, partial, static and short-lived (Devine-Wright, 2009; Lam and Woo, 2009; Takahasi and Dear, 1997). In this regard, governments need to create ways to empower community publics, rather than merely serve them. Planners, developers and political leaders need to realize that the full participation of community publics does not interfere with the planning process, but

enhances it. Involving publics in sharpening a community's visions, goals and policies can raise the quality of resident life. With this in mind, this process requires informing, educating and training various community publics (Grabill and Simmons, 1998; Sauer, 2003; Simmons, 2008), government officials and local businesses to increase public understanding and create the necessary technical expertise (Heath *et al.*, 1998). If the government fails to effectively communicate with its community publics, the success of adapting a potentially harmful facility cannot be guaranteed.

There are several limitations of this study, which in turn provide some possibilities for further research. First, this study did not consider an important outcome variable of situational theory of publics, which is information seeking and processing. Previous studies showed a strong link between the publics' communication behavior, particularly the intensity with which they seek information, and their behavioral intentions (Heath *et al.*, 1995; Kim and Grunig, 2011; Lee and Rodriguez, 2008; Major, 1993). According to the situational theory of publics (Grunig, 1997), publics who are highly involved in an issue are more likely than minimally involved publics to communicate because they can externalize (generate) more arguments on the topic, have a greater proportion of arguments supporting their position, seek issue-associated information and express more opinions (either supportive or contrary) on the topic. This relationship in influencing community participation should be further investigated in future research.

Second, although advocacy delivered by media plays an important role as the public's information source, interpersonal communication, such as conversations with friends and family, is a competitively powerful information source, which influences participatory behaviors (Heath *et al.*, 1995, 1998). Future research should include interpersonal sources as another form of advocacy, and this may be best analyzed by using appropriate methods designed to investigate those sources in depth (Baxter and Eyles, 1999).

Third, in this project, our aim was to see the reaction of participants in a hypothetical situation; therefore, while we believe an experimental study was the right choice for this study, experimental research will not let researchers explain a phenomenon as a whole. A more grounded approach to this study would allow researchers to collect data and to seek repeated ideas, concepts or elements to categorize the data (Baxter and Eyles, 1999). As such, future research should consider a qualitative method or a combination of quantitative and qualitative approaches to investigate public participation in a *NIMBY* situation.

Last, this current study examined community publics' participatory intentions to either support or oppose a hypothetical scenario due to the practical reasons mentioned earlier. A future study may measure if the intentions lead to actual behaviors in a real *NIMBY* situation. Accordingly, this study was conducted in single and mid-sized urban–rural mixed settings. The generalizability of the findings of this study to other environments and to people from other socioeconomic backgrounds is limited. Moreover, given that the nuclear power plant is hypothetical in this project, the results may only be generalizable to other, similarly dangerous developments. Thus, further investigation is needed to test:

- the proposed framework in different settings (e.g. mega urban and different cultural settings) and also at different levels of risk, considering the settings' socio-demographical characteristics (e.g. gender and ethnicity) and its level of economic dependency on a nuclear power plant; and
- a variety of development types with varying levels of dangerousness.

Conclusion

This study's findings clearly illustrate the need for both the classification and strategic assessment of different publics in community relations regarding *NIMBY*. To overcome a conflict that could threaten a local government, communication practitioners must effectively communicate with its various publics. This perspective suggests that collective management strategies should require consensus from a variety of key publics. Although a conflict is generated by differences between organizations and publics, the conflict can be the source of creative ideas that add value to the partnership between them. Allowing and encouraging a process of constructive conflict and respectful debate can result in a more productive and creative group process. In sum, to gain support from various publics, local governments must better communicate with their publics while planning to build a potentially harmful facility. In addition, the organizations should attempt to minimally satisfy the needs of active (nonsupportive) and inactive (marginal) publics and to maximally satisfy the needs of aware (supportive) and aroused (mixed blessing) publics, enhancing their support for the organizations.

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