

TOWARD DEEPER AND BROADER UNDERSTANDING OF SOCIAL JUDGMENTS IN
RISK COMMUNICATION: THE ROLE OF ATTITUDE STRENGTH
AND PERCEIVED STANDING

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Hwanseok Song

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TOWARD DEEPER AND BROADER UNDERSTANDING OF SOCIAL JUDGMENTS IN
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Hwanseok Song, Ph. D.

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This dissertation advances knowledge on social judgments in risk communication by revealing the strength-related attributes of trust and exploring the concept of perceived standing using survey findings from a local environmental conflict context. Trust requires strength to endure bad news cycles and positively influence people's thinking and behavior. Research in risk communication, however, has rarely examined how to attain these outcomes indicative of the strength of trust. In Chapters 2 through 4, I challenge influential theories in risk communication which assume that trust is an inherently simple heuristics-based judgment to argue that trust judgments can vary in the level of cognitive effort and the amount of supporting knowledge. After discussing how the localness of the environmental issue I selected for this research helps foster strong forms of trust, I present findings from a two-wave survey revealing the strength-related attributes of trust. Hypothesis tests yielded strong evidence showing that engagement in communication processes relevant to the issue (i.e., direct communication with risk managers, use of local news media, interpersonal discussion about the issue) helped build objective knowledge, perceived knowledge, elaboration, and certainty in trust toward the judgment targets. In addition, these strength-related attributes significantly predicted the strength-defining

consequences of trust (i.e., persistence, resistance, impact on information processing and behavioral intentions), accounting for unique variance beyond what was explained by trust alone.

Focusing on a different type of social judgment, Chapter 5 discusses how people judge others' right to have representation in and influence on the focal issue, judgments which I refer to as perceived standing. This chapter explores the possible attitudinal and motivational antecedents driving these judgments. In the survey, participants expressed perceptions about the standing of members from other relatively distant communities. Reflecting peoples' motivation to have more allies and fewer opponents in the issue, attitudes toward the project and beliefs about the project's risks and benefits predicted perceived standing. However, perceived similarity with the targets, place attachment, and perceptions of oneself being underrepresented in the issue also affected perceived standing, accounting for unique variance. The final Chapter 6 discusses implications of these findings and directions for future research.

BIOGRAPHICAL SKETCH

Hwanseok Song was born in Seoul, South Korea and grew up in multiple cities including Seoul, Jeongeup, and Naju in South Korea and Toronto, Ontario. He completed his undergraduate degree in German Language and Literature and Political Science at Yonsei University in Seoul, South Korea. He completed his Master of Arts degree in Communication at Johns Hopkins University in Baltimore, MD. During the course of his undergraduate studies, he served as an auxiliary fire fighter at Gunsan Fire Station in fulfillment of his mandatory military service, an experience which sowed the early seeds of his interest in risk communication. To embark on his professional career in academia, Hwanseok will join Purdue University's Brian Lamb School of Communication as an assistant professor in August, 2018.

To My Mother and Father.

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CHAPTER 1

INTRODUCTION

Social judgments are fundamental to how people carry out their daily lives in the society. As a species, humans possess a distinctive capability to monitor, judge, and predict the behavior of other individuals (Buss, 1999). We go beyond superficial observations of others' apparent behaviors and make complicated inferences about their internal states including motivations and intentions. From dating to job interviews to political campaigns, our social lives are studded with occasions where we must decide whether to rely on someone for outcomes we desire. Even when we have only limited information about these strangers' internal properties, we still have cognitive mechanisms to form implicit or explicit impressions about them (Forgas, Williams, & von Hippel, 2003). These judgments, in turn, guide our decision on whether to accept the risk of further interacting and cooperating with the target.

Social judgments also play a critical role in how we respond to various health and environmental risks that grow in salience with the development of science and technology in the modern society (Beck, 1992; Giddens, 1990). Giddens (1990) notes that even in the modern world where faceless systems of professional expertise organize the social environment, lay individuals still interact with their experts or representatives and update the trust they hold in these faceless institutions. By observing whether behaviors of judges, doctors, or flight attendants, for example, meet expected standards of professionalism, people may reinforce or withdraw their trust in the judicial, medical, or industrial systems they represent. Freudenburg (1993) also argued that people's responses to contemporary risks hinge on judgments of *recreancy*, defined as the failure of institutions to carry out their responsibilities to merit the trust they enjoy. His research found that "recreancy variables" involving judgments of trust toward

science, businesses, and the federal government were strong predictors of people's concern in the context of nuclear waste management. According to the theorem of recreancy, today's citizens are heavily dependent not only on technologies but also on their social relations with experts managing those technologies over whom they have little control. Even though people can count on such technology to work properly most of the time, people may alarmedly respond to risks with higher concern in the face of events signaling failure or misconduct of those experts (Alario & Freudenburg, 2003). In a similar vein, Earle and Cvetkovich (1995) argued that because processing information about modern technological risks can be too complex and cognitively demanding for laypeople, they rely instead on judgments of 'social trust' in risk managing authorities to form attitudes about the complex risks.

Consistent with these perspectives underscoring the importance of understanding how people judge experts and authorities, empirical research in risk communication has paid considerable attention to the antecedents and consequences of trust in risk managers. For example, many authors have sought to identify how trust is built or lost or what the underlying dimensions of trust are (Earle, Siegrist, & Gutscher, 2007; Frewer, Howard, Hedderley, & Shepherd, 1996; Johnson, 1999; Peters, Covello, & McCallum, 1997; Poortinga & Pidgeon, 2003; Siegrist, Connor, & Keller, 2012; Slovic, 1993; White & Eiser, 2006). Other researchers have worked to reveal how trust relates to other outcomes in risk management such as risk perceptions (Siegrist, 2000; Trumbo & McComas, 2003) or acceptance of risks (Poortinga & Pidgeon, 2005; Siegrist, Earle, & Gutscher, 2003; Tuler & Kasperson, 2014). Yet other studies have reviewed and explored methodological approaches to study trust in risk managers (Earle, 2010; McComas & Trumbo, 2001). A common subject of interest running through this body of

literature is the predominant focus on how people judge risk-managing entities such as governmental agencies, scientific authorities, and experts.

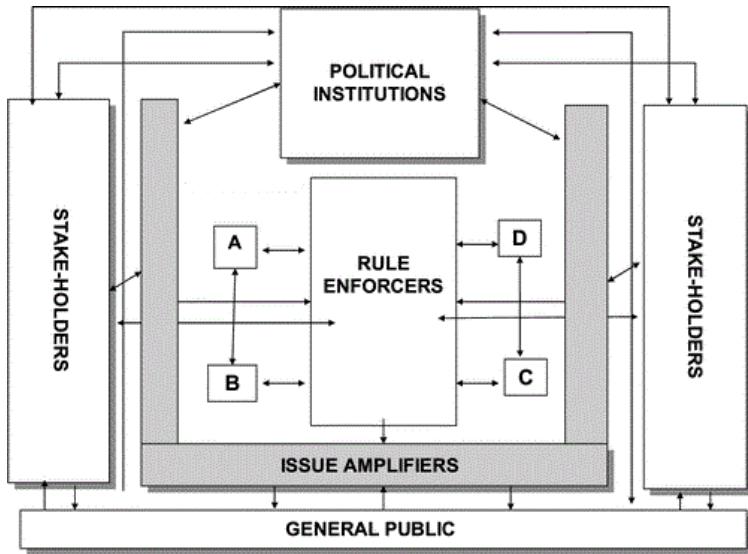


Figure 1.1 Graphical representation of Renn's (1993) social arena metaphor. Reprinted from Georgakopoulos and Thomson (2008).

However, social judgments relevant to risk management may involve agents other than risk managers as targets. Consider, for example, the metaphor of the “social arena” Renn (1993) used to portray the array of social interactions taking place in public risk debates. At the center of this social arena are principal actors who negotiate and compete to influence public policy in their favor. A rule enforcement agency ensures that these actors abide by formal rules while coordinating the negotiation process. Actions of the actors and rule enforcer are observed by issue amplifiers who further communicate their observations and interpretations to the larger set of stakeholders not directly involved in the arena, as well as the general public. Depending on how much public support actors can mobilize through this mediated communication, it may attract other stakeholders or social groups to enter the arena or express their support or opposition to particular positions which will help certain actors to influence public policy. To

increase their influence on issue amplifiers, other stakeholders, and the general public, the involved actors must draw on their reputation as a resource to generate trust from the public. Similarly, the social amplification of risk framework (Kasperson et al., 1988) recognizes that information about of risk events become amplified or attenuated through “stations of amplification” (p. 181) including scientists, risk-managing institutions, news media, activist organizations, opinion leaders, personal networks, and public agencies, interacting with each other. According to these perspectives, risk communication research on trust has predominantly focused on the general public’s social judgments about the principal actors or rule enforcers. However, social judgments may also occur among other pairs of social agents in the arena. For example, principal actors and stakeholders may judge the news organizations’ intention to cover events in their favor whereas reporters representing news outlets may judge the veracity of a governmental agency’s press secretary. The public may also be judge how stakeholder groups seek their interests in this issue while different stakeholder groups watch each other to see how their potential allies or competitors are seeking to influence the issue. Considering this larger fabric of social interactions involving various types of agents, there seems little reason to limit the scope of social scientific inquiry to the public’s judgments about risk-managing authorities.

This dissertation seeks to both deepen and broaden the understanding of social judgments in risk communication research through two major strands of inquiry investigated in a study conducted in a local context. It first seeks to deepen theoretical understanding of trust using the concept of attitude strength. According to research, attitudes vary not only in terms of valence or extremity but also other strength-related properties such as the certainty with which an attitude is held, or the level of knowledge one possesses to support the attitude. Considering judgments of

trust as a type of an attitude, I examine whether these strength-related properties of trust can help improve predictions of outcomes that are important to risk-managing authorities.

The second line of inquiry intends to broaden the scope of social judgment research management by focusing on judgments between different groups of stakeholders, a topic that has received relatively scant attention from risk communication research. Specifically, I examine how groups of stakeholders involved in the issue judge other groups' rights to be formally represented in the deliberative process. Stakeholders in local environmental disputes often attempt to rhetorically establish distinctions between "community members" and "outsiders" to approve or disapprove of other stakeholders' rights to influence the issue's outcomes. In this dissertation, I explore how different groups of local residents directly affected by an environmental issue respond to stakeholders from other geographical areas expressing interest in having a voice in this issue.

Outline of Chapters

This dissertation includes six chapters pursuing the two strands of inquiry. In Chapter 2, I lay out the theoretical background connecting the literature of attitude strength with research on trust in risk managers. Theory of trust in risk management has tended to consider trust as an inherently simple judgment invariantly based on simple heuristics. In other words, according to previous perspectives, when people come to trust or distrust a risk-managing authority, they would rely on often superficial cues such as affect or perceived value similarity instead of undertaking the cognitive work to scrutinize the target's true intentions and competence with sufficient evidence and reasoning. In this chapter, I discuss insights from the attitude strength literature and trust research in other disciplines to show that, with sufficient motivation and capacity, people can be more thoughtful in how they judge risk managers' trust, which is

predicted to be stronger in terms of certainty, supporting knowledge, and undertaken elaboration. I further argue that such strong forms of the public's trust will better predict consequences that are important to risk managers such as resistance against information discrediting the risk manager or behavioral intentions to comply with the risk manager's decision.

Chapter 3 describes the context used to test the hypotheses related to the first strand of inquiry described above, as well as the qualitative interviews I conducted with key informants in this issue which gave rise to the second strand of inquiry. The chapter first explains why a local-level environmental dispute was a fit context to test hypotheses about attitude strength attributes of trust. Then, I describe the focal subject of the conflict concerning the siting of a large gas storage using empty salt caverns under Seneca Lake in the Finger Lakes region in upstate New York. Prior to launching the survey that would test key hypotheses using this context, I conducted semi-structured interviews with legislators, business owners, and activists deeply involved in the project to verify my assumptions and knowledge about this issue. While these interviews mostly confirmed and deepened my understanding of the events related to this issue, they also inductively gave rise to a new strand of inquiry when I realized that stakeholder groups were often checking, supporting, or competing with each other to obtain voice in the deliberation process. The chapter outlines this procedure of these qualitative interviews as well as the findings from which the second strand of inquiry emerged.

Chapter 4 features the study specifying and testing the hypotheses derived from the theoretical discussion in Chapter 2. Using the Seneca Lake gas storage issue as the context, this chapter's study seeks to answer the overarching question of whether attitude strength attributes of trust such as certainty, knowledge, and elaboration can help better predict positive consequences of trust beyond what trust by itself already accounts for. Residents from counties

surrounding Seneca Lake took part in a two-wave survey with experimental elements designed to test hypotheses predicting effects of attitude strength variables on various trust-related consequences including persistence, resistance, and impact on information processing and behavioral intentions. In addition, I explore how different types of communication processes (e.g., direct communication with risk managers, receiving news from media, discussion with close others) predict these attitude strength attributes of trust. Implications of the main findings are discussed, revealing the utility of measuring and modeling these attitude strength attributes in assessments of risk managers' trust.

Chapter 5 explores how people in environmental conflicts make judgments about others' standing in the issue, addressing the inquiry that emerged from the qualitative interviews as described in Chapter 3. For example, whereas interest groups from distant regions may seek to influence the siting decision of a high-risk facility in a local area, residents in the area siting the facility may seek to ostracize these groups by denying their right to sit at the discussion table. However, even when risk management decisions are made within a local, regional, or national administrative unit, risks and benefits stemming from the decision are not necessarily confined within the administrative boundaries, attracting attention from the "outsiders" and motivating them to influence the outcome of the decision and course of the issue. In the case of the current study, I learned from my interviews that proponents of the gas storage project were referring to residents from farther counties as "outsiders" whereas opponents were using the same label to characterize the Texas-based energy company seeking to establish the gas storage in the region. In this study, I explore how acceptance or rejection of geographically distant communities (i.e., residents from counties in the Finger Lakes region but not adjacent to Seneca Lake) seeking representation in the issue is related to other variables that may predict this outcome. These

variables include personal attitude toward the project, perceptions of risk and benefit, perceptions of similarity with the judgment target, place attachment to the lake and the larger region, and one's own feeling of underrepresentation in the issue.

Chapter 6, the final chapter of this dissertation, begins by summarizing the findings from the previous chapters. In addition, I discuss in detail the implications of these findings for research and practice in risk communication, elaborating on how these findings should change the way we think about trust and public participation in contexts of risk management. Finally, I identify areas that require attention from future research related to the topics of strength-related attributes of trust and perceived standing.

CHAPTER 2

ON THE ATTITUDE STRENGTH OF TRUST: A THEORETICAL REVIEW

Over the last two decades, risk communication research has paid extensive attention to the role of trust, focusing on the relationship between authorities managing environmental and technological risks and the public. Many authors have considered trust as a positive construct, indicative of the legitimacy of risk managers' operations (Earle & Cvetkovich, 1995; Morrison, 2014). Empirical studies have also found that trust in risk managers alleviates risk perceptions (Siegrist, 2000; Siegrist, Cvetkovich, & Roth, 2000; Trumbo & McComas, 2003), increases acceptance of risks (Poortinga & Pidgeon, 2005; Siegrist et al., 2003; Tuler & Kasperson, 2014), and facilitates cooperation with risk managers (Siegrist et al., 2003). A smaller number of studies have highlighted the negative effects of trust by showing how it dampens critical input in public engagement processes (Parkins, 2010; Parkins et al., 2017). Overall, these studies have sought to reveal the causes of trust or distrust toward risk-managing authorities and the consequences of these judgments.

Findings from these studies represent a broad, implicit consensus in the field that valence of the judgment (i.e., trust vs. distrust) is a critical quality of trust. However, it also appears that another important aspect of trust has received relatively scant attention from researchers and needs to be further illuminated. Specifically, this chapter argues that properties related to the *strength* of trust judgments is an underexplored topic in risk communication research. When authorities expend effort to build trust with the public, they typically expect that such trust will sustain support and respect from the public even when unfortunate mistakes are made or unpopular decisions are communicated. However, if trust is easily destroyed by such events, it cannot serve these functions regardless of its initial valence. Similarly, trust by itself is of limited

usefulness unless it can further affect attitudes on a focal issue or induce meaningful behaviors.

To be useful, trust not only has to be positive but also high in strength (*i.e.*, enduring and impactful). Research in attitude strength has found that people hold attitudes with varying degrees of strength-related attributes such as certainty, knowledge, and elaboration, which in turn predict how enduring and impactful these attitudes will be. Research studying the effects of trust in risk communication has rarely considered the implication of these attitude-strength attributes even though they may help clarify why trust is highly consequential in some cases but minimally so in others.

The current chapter describes in detail the theoretical reasoning underlying the inception of the empirical study described in Chapters 3 and 4. It seeks to synthesize theories and empirical findings from multiple disciplines which, taken together, suggest that researchers can better understand how trust judgments become enduring and impactful by investigating the strength-related attributes of trust such as certainty, knowledge, and elaboration. In the following sections, I first review how risk communication research has conceptually associated trust with heuristic processing and how this keeps research from considering trust as a possibly enduring and impactful attitude. Next, the chapter discusses theoretical perspectives from other fields that contradict the conceptualization of trust as an exclusive product of heuristic processing, thus illuminating the possibility of trust as a strong attitude. Then, I consider how different communication processes can lead to varying degrees of strength in trust judgments. Finally, I discuss illustrative examples of strong forms of trust featured in previous case studies.

Trust in risk communication and its limitations

Conceptualization of trust in risk communication. Among multiple conceptualizations of trust employed in risk communication research, two stand out as particularly influential

(Frewer, Scholderer, & Bredahl, 2003). One of these traditions has built on the notion of social trust (Earle & Cvetkovich, 1995), which is defined as the “willingness to make oneself vulnerable to another based on a judgment of similarity of intentions or values” (Siegrist, Gutscher, & Earle, 2005, p. 147). According to this perspective, people draw on moral information about the risk manager to make a quick judgment about how similar their values are to the risk manager’s and use this as a criterion for whether or not to cooperate with the risk manager. In addition, this social trust may also influence confidence, a judgment regarding the quality of the risk manager’s performance such as expertise. Confidence, in turn, also affects one’s willingness to cooperate with risk managers.

In comparison, another group of studies (Frewer et al., 1996; McComas & Trumbo, 2001; Trumbo & McComas, 2003) has built on the notion of source credibility, which has been credited to the seminal work of Hovland, Janis, and Kelley (1953). Communication scholars have extensively studied the role of this concept in contexts where sources with varying characteristics are considered as conveyors of some persuasive message. The typical finding is that source credibility is positively associated with the persuasiveness of the message (Petty & Cacioppo, 1984).

Interestingly, both conceptualizations of trust associate the construct with simple heuristic processes of decision-making. Dual-processing theories of persuasion such as the heuristic-systematic model (Chaiken, 1980; Eagly & Chaiken, 1993) or the elaboration likelihood model (Petty & Cacioppo, 1986) maintain that there are primarily two mental processes by which people form attitudes about various objects. Whereas one of these processes operates relatively quickly in automatic fashion, often without the individual’s awareness, the other process takes place more slowly with intensive and conscious cognitive efforts, integrating

more information to reach an elaborate and complex judgment (Evans, 2008). In this chapter, the first of these two processes is interchangeably referred to as the heuristic, peripheral route, or a cognitively effortless process while the second is referred to as the systematic, central route, or a cognitively effortful process.

In one of the earliest theoretical articulations of trust and credibility in the risk communication field, Renn and Levine (1991), drawing on Petty and Cacioppo's ELM, argued that source credibility plays a significant role in not only peripheral route processing but also central route processing. They contended that source credibility is implicated in central route processing when people become aware of certain types of information and select the relevant parts of information for cognitive activity. In other words, trust and credibility serve as filters that select arguments that are worthwhile of attention and increased cognitive effort. In addition, in contexts of risk communication where laypeople often lack personal experience and expertise to evaluate the merits of individual arguments, people can use source information to verify and assign comparative weights to different arguments in which case peripheral route processing appears nearly identical to central route processing.

However, subsequent conceptualizations of trust employed in the field have tended to explain trust and credibility primarily in terms of heuristic processes. Theories of social trust have maintained that trust functions as a “complexity-reduction mechanism” in risk management because judgments about technological risks are often “too big or complex... to successfully complete alone” (Earle & Cvetkovich, 1995, pp. 3–4). That is, people use ‘social trust’ in risk managing authorities as a heuristic to make judgments about complex risks. Thus, it follows that “the judgment of trust must be simple” and “rely on heuristic processes” due to its inherent function of cognitive complexity reduction (Earle, 2010, p. 542). Similarly, scholars have

considered source credibility as a typical example of heuristic cues used by individuals when they lack the motivation or capacity to engage in full-fledged systematic processing (Briñol & Petty, 2009; Petty & Cacioppo, 1984). Although an individual making a judgment about an issue may find information about the source informative, to use heuristic processing means that the individual is neglecting key information such as the message argument to save cognitive effort (Hertwig & Herzog, 2009). In a similar vein, drawing on dual-processing theories such as the heuristic-systematic model (Eagly & Chaiken, 1993), risk communication studies have often asked one's willingness to rely on expert judgments as a measure of heuristic information processing as opposed to systematic processing (Griffin, Neuwirth, Giese, & Dunwoody, 2002; Trumbo, 1999; Trumbo & McComas, 2003).

Is trust an inherently weak attitude? When characterizing trust as a heuristic process, it seems important to clarify what this precisely means. Research drawing on the concepts of social trust and source credibility commonly suggest that trust allows individuals to short-circuit complex judgments about risk, effectively avoiding calculations involving probabilities and uncertainties in which experts tend to engage. However, the argument that trust makes risk judgments simple should not be confounded with the postulate that the judgment of trust itself is also simple. Whereas source credibility studies rarely make clear statements about how judgments about trust are made and turn into reliable heuristics in the first place, social trust studies, as the quotation from Earle (2010) above shows, explicitly contend that trust judgments are formed primarily through heuristic processes. According to Earle (2010), individuals' perceived similarity with risk managers in terms of values and intentions, as well as affect, can be used as heuristics to judge their trustworthiness. However, the theory does not clearly explain the process by which people perceive similarity with the risk manager (e.g., whether value

similarity perceptions require consciously identifiable representations of values and intentions of the risk manager in the perceiver's memory).

Although research has well demonstrated that individuals use trust as a heuristic to reduce the complexity of judgments about risk (Siegrist et al., 2005; Trumbo & McComas, 2003), the notion that trust itself is also formed primarily through effortless cognitive processes remains a question requiring empirical support. If trust judgments are intrinsically simple and effortless, this implies that people typically fail to weigh evidence informative of the risk manager's motivation such as the meaning of their conduct and decisions, conflicts of interest, or accountability to regulatory oversight. Nevertheless, research has found ample evidence that people in fact do consider factors far more substantial than value similarity or affect when judging the risk manager's trustworthiness. For example, people can still retain a grain of skepticism (e.g., judgments of bias) alongside a global impression of the risk managers' trustworthiness comprising judgments of multiple underlying constructs (e.g., competence, integrity, care) (Pidgeon, Poortinga, & Walls, 2007; Poortinga & Pidgeon, 2003). White and Eiser (2006) found that risk management events signaling precautionary approaches and transparency on part of the risk managers accounted for changes in participants' trust in them. Moreover, Johnson and White (2010) showed that whereas overall trust in risk managers had often been evaluated with performance criteria in one domain (e.g., public health), such overall trust can be predicted by considering performance criteria in multiple domains (e.g., environment, economic impact, and cost control, in addition to public health).

Another problem of conceptualizing trust as a judgment inherently based on cognitively effortless processes is that this theoretically limits the possibility to consider trust as a construct having important consequences on further individual judgements and behaviors. According to

the literature on attitude strength, attitudes low in certainty or shaped without much knowledge or elaboration are likely to be weak (Gross, Holtz, & Miller, 1995; Petty, Haugtvedt, & Smith, 1995; Wood, Rhodes, & Biek, 1995). Attitude strength is defined by the extent to which an attitude exhibits four types of qualities: 1) it remains unchanged over extended period of time (persistence); 2) it withstands counter-attitudinal attacks (resistance); 3) it influences information processing and judgments by making it easier for certain information to come to mind or some decisions to be made, often leading to bias (impact on information processing); and 4) it guides attitude-consistent behavior (impact on behavior) (Krosnick & Petty, 1995). Thus, by definition, weak attitudes are vulnerable to decay and counter-persuasion and exhibit little impact on subsequent cognitive or behavioral states. If it is true that people employ only minimal cognitive effort in making trust judgments, it follows that risk managers have little reason to be concerned about managing their trustworthiness because it is unlikely to have meaningful influence over how people will respond to their operations. In contrast, according to the attitude strength literature, trust judgments rooted in substantial knowledge and elaboration and held with confidence are more likely to be enduring and impactful. These are vital qualities for risk managers who seek from the public sustained and vocal support during crisis situations or important decision-making processes.

Beyond Trust as a Simple Heuristics-Based Judgment

Theories of cognitively effortful social judgments. The idea that people often invest considerable cognitive effort to form judgments about certain social targets is not an entirely novel idea in person perception studies of social judgment. Research in social cognition has theorized how individuals form impressions about others with varying levels of sophistication depending on their motivation. Brewer (1988) argued that primarily two processes guide how

people integrate new information about others into their long-term memory. The first is a top-down process in which people impose their prior beliefs and attitudes about social categories onto the social targets to understand them. The second is a bottom-up process called personalization in which the individual being judged, rather than some imposed category, becomes the basis of organizing relevant information about the social target. Because people are usually inclined to save cognitive effort, Brewer (1988) argues that when first encountering a social target, they will automatically and unconsciously place the target on some well-established dimensions of social categories such as gender, age, or skin color. However, to the extent that the perceiver deems the target relevant to his or her immediate goals or feels invested in an issue the target represents, the perceiver will engage in individuated bottom-up processes of social judgment. In a similar vein, Fiske and Neuberg (1990) proposed a theory to explain how people form impressions about others by algebraically calculating weighted averages of their individual attributes on the one hand but also using mental representations of prototypes and stereotypes in holistic fashion on the other. Their Continuum Model of impression formation suggests that people can choose from a continuum of processing strategies to make social judgments, the simplest of which is an initial categorization occurring immediately and automatically upon encountering the target. Depending on the personal importance of the social target and how incongruent the target is with categorical prototypes held by the perceiver, more elaborate categorization strategies may be utilized. Finally, the opposite end of this continuum represents a highly individuated process in which people integrate the target's attributes one by one in piecemeal fashion. Consistent with more general theories of dual processing of information, these theories of impression formation commonly suggest that the amount of cognitive effort

people invest in making social judgments increases as the perceiver's motivation to make a better judgment increases.

In addition, some theories of trust have adopted the view that trust is a dynamic concept that grows deeper over time as the relationship develops and knowledge about each other increases. Expanding on previous theories explaining the development of romantic relationships (Boon & Holmes, 1991) and business ties (Shapiro, Sheppard, & Cheraskin, 1992), Lewicki and Bunker (1995) proposed a three-stage model that explicates how trust forms and develops over time in long-term interpersonal relationships. According to these authors, when two parties enter into a new relationship, their trust is *calculus-based*, which means that it is grounded in the fears of losses due to discontinuing the relationship as well as the prospects of gains for sustaining the relationship. Trust is maintained to the extent that both parties believe each other's net benefit of sustaining their relationship outweighs that of defecting from it. The authors posit that trust at this early stage is fundamentally fragile, likely to be destroyed by a single event violating the partner's trust. The second stage of trust development is *knowledge-based* in the sense that the parties have an extensive history of interactive experiences and observations from which the partner's preferences, intentions, and problem-solving approaches may be inferred. Trust at this stage is more resilient to occasional instances of violation because the knowledge about the partner keeps one from attributing the violation to the partner's malicious intents. Finally, *identification-based* trust develops when the two parties sufficiently understand and identify with each other's goals. At this phase, the parties internalize their partners' goals to a level comparable to their own and are thus willing to act for each other.

Several aspects of this model of trust offer an alternative perspective from which to reconsider trust in risk communication. First, the three-stage model suggests that trust is linked to

the development of the relationship and becomes more elaborate as the relationship develops. Although a number of studies in risk communication have explored how risk managers may gain or lose trust as a result of their performances (Cvetkovich, Siegrist, Murray, & Tragesser, 2002; Poortinga & Pidgeon, 2004; White & Eiser, 2006), the field has rarely explored how the quality of trust changes as the relationship between the risk manager and public develops. Second, it suggests that trust grows in depth with increased knowledge about the relationship partner. This is a fundamentally different perspective from one which holds that trust is based on value similarity cues (Earle & Cvetkovich, 1995) because it implies that people can gain informative knowledge about and make sense of the target's motivations, intentions, and conduct from repeated interactions. Third, the model suggests that trust becomes increasingly robust against violations in the advanced stages when the relationship reaches maturity. Comparatively, risk communication studies have rarely considered how the historical experiences in the relationship between risk managers and the public affect the strength of trust. Taken together, while the social cognitive perspectives of Brewer (1988) and Fiske and Neuberg (1990) suggest that risk communication studies can consider how judgments of trust in risk managers can be cognitively effortful, Lewicki and Bunker's (1995) theory of trust shows how trust can grow robust as a function of accumulated knowledge generated through interactions with the risk manager.

The role of knowledge, elaboration, and certainty in stronger forms of trust. To apply Lewicki and Bunker's (1995) view of trust in interpersonal relationships to risk communication contexts, it would be helpful to first expand their theory in more generalizable terms by considering it in the broader literature of attitude strength (Krosnick & Petty, 1995). Judgments about the trustworthiness of others can be considered as a type of an attitude in that they are evaluative judgments about an attitude object, in this case, the risk manager (Eagly &

Chaiken, 1993). In this regard, Lewicki and Bunker's three-stage model can be interpreted as a process theory of how trust grows in attitude strength over time in ongoing relationships.

The literature of attitude strength offers further specific insights about the strength-related attributes of trust and the benefits of having strong forms of trust. Research suggests that there are multiple conceptually distinct properties of attitudes that are differently related to the four defining consequences of attitude strength (Krosnick & Petty, 1995). Krosnick and Smith (1994) listed 10 of these *attitude strength attributes*. For example, attitude *extremity*, defined as the degree to which the attitude deviates from neutrality, is a feature of the attitude itself that can be captured through typical measurements of attitude on Likert-type scales. In comparison, attitude *importance*, the degree of psychological importance attached to an attitude, is a subjective meta-cognitive belief about the attitude (Krosnick & Petty, 1995). Although early research on attitude strength had explored whether these strength-related properties can be reduced to a small number of factors or considered as manifestations of a few latent variables (Pomerantz, Chaiken, & Tordesillas, 1995), these attempts yielded highly inconsistent results (Krosnick, Boninger, Chuang, Berent, & Carnot, 1993; Lavine, Huff, Wagner, & Sweeney, 1998). Accordingly, researchers came to accept dealing with the complexity of attitudes' internal structure as inevitable and began studying the antecedents and consequences of each strength-related attribute separately (Bizer, Visser, Berent, & Krosnick, 2004; Visser, Bizer, & Krosnick, 2006).

For Lewicki and Bunker (1995), it appears that knowledge, elaboration, and certainty were among the most critical of these strength-related attributes of attitudes. *Knowledge* is defined as the information stored in memory related to an attitude object, whereas *elaboration* refers to the degree of thinking one has done about an attitude object (Wegener, Downing, Krosnick, & Petty, 1995). Attitude *certainty* refers to the subjective sense of conviction about

one's attitude (Gross et al., 1995) or the extent to which one is confident or sure of one's attitude (Tormala & Rucker, 2007). In this sense, certainty, knowledge, and elaboration tap different dimensions of attitudes that are not typically captured by simple measurements of attitude alone. While certainty is a subjective metacognitive belief about the attitude, knowledge is an attribute of attitude strength related to the structure of attitudes and elaboration is a property of the processes through which attitudes are formed, changed, and maintained (Bizer et al., 2004).

Knowledge plays a key role in Lewicki and Bunker's theory where they explain how calculus-based trust (CBT) develops into the advanced stages of knowledge-based (KBT) and identification-based trust (IBT). According to Lewicki, Tomlinson, and Gillespie (2006), the shift from CBT to KBT occurs "as parties gain more knowledge about the other and engage in activities that generate this knowledge. Repeated and varied interactions generate these data" (p. 1011). Also, the movement from KBT to IBT takes place when the two parties use their knowledge base and strong positive affect to build identification with each other. Consistent with Lewicki and Bunker's view of trust, research in attitude strength has demonstrated that attitude-relevant knowledge reinforces resistance to counter-persuasion. Using experiments, Wood (1982) found that participants who were able to access a larger number of conservation-supporting beliefs and behaviors from memory changed their attitudes less after reading a script arguing against environmental preservation than did those who were able to retrieve fewer beliefs and behaviors. By the same mechanism, it is very likely that many relevant beliefs accessible in memory will also render attitudes persistent over time. Furthermore, increase in knowledge has also been found to increase attitude-consistent behavior (Davidson, 1995) and biased information processing, especially if the perceiver's reaction is accompanied with intense affect (i.e., fear) toward the issue (Biek, Wood, & Chaiken, 1996). Thus, in judgments of trust

where risk managers are attitude objects, it is reasonable to expect a positive relationship between knowledge and the four defining consequences of attitude strength: persistence, resistance, impact on information processing, and impact on behavior.

Although less explicitly discussed than knowledge, Lewicki and Bunker's three-stage model also assigns a significant role to elaboration in the formation of stronger forms of trust. When trust-building is in progress, information obtained from direct interaction or observation needs to be further processed to make interpretations about their meaning and inferences about trustworthiness. Likewise, effortful cognitive activities figure prominently in the decline of trust when one attempts to make sense of the partner's action violating trust. While emotional responses also influence the decline of trust, the individual also needs to determine cognitively how important the violation is and how responsibility should be attributed (Lewicki & Bunker, 1996). These postulates are in line with research in dual processing theories which have discussed various consequences of effortful thinking (i.e., elaboration) that are directly related to the defining qualities of attitude strength. Namely, attitudes changed through more intensive elaboration were more likely to persist over time, resist counter-persuasion, and cause attitude-consistent behavior (Blankenship & Wegener, 2008; Petty & Cacioppo, 1986; Petty, Cacioppo, & Schumann, 1983; Petty & Wegener, 1999). Effortful thinking can also activate and invite dominance of a previously established attitude-schema, profoundly influencing information processing (Petty & Cacioppo, 1986; Petty & Wegener, 1999). In sum, similar to the role of knowledge, findings from these studies strongly suggest that elaboration about risk managing authorities will be positively related to the endurance and impactfulness of trust judgments.

Finally, according to Lewicki and Bunker's view of trust, certainty will also play a significant role in trust development as knowledge about the target increases. The body of

knowledge that form the basis of KBT results from repeated direct interactions. According to attitude strength studies, the directness and repetitiveness of these interactions are important predictors of attitude certainty (Tormala & Rucker, 2007). For example, Fazio and Zanna (1978) experimentally manipulated direct experience by having participants either work through problem tasks in person or merely read about them. They found that participants' attitude toward those tasks were held with higher confidence in the direct experience condition than in the indirect experience condition. In turn, when participants were offered a chance to sign up for a future study involving these tasks as a measure of behavior, those with higher confidence in their attitudes displayed higher attitude-behavior consistency. In addition, repeated expression of an attitude has been found to increase certainty of the attitude in previous studies (Holland, Verplanken, & van Knippenberg, 2003; Petrocelli, Tormala, & Rucker, 2007). Because individuals may have to revisit their attitude toward an interaction partner for each encounter, it is likely that repetition of interactions will further solidify one's certainty in the level of trust toward that partner. In turn, certainty in attitudes such as trust is likely to bear consequences in terms of attitude-behavior correspondence, resistance to counterpersuasive appeals, persistence over time, and information processing (see Tormala & Rucker, 2007 for a review).

Further research suggests that certainty might mediate the effects of knowledge and elaboration on strength-defining consequences. For example, Smith, Fabrigar, MacDougall, and Wiesenthal (2008) conducted an experiment in which they manipulated the amount of knowledge or the degree of elaboration on a given topic, assessing the effects on certainty. They found that when the amount of attitude-relevant knowledge was manipulated by giving participants either six pieces of information or 18 pieces of information on a topic, participants who received more information became more certain in their attitudes. This increase in certainty

was mediated by the increase in subjective knowledge about the topic and decrease in perceived ambivalence in the topical area. They also manipulated the amount of elaboration by giving one group of participants a distraction task and applying time pressure (i.e., low elaboration) while reading the persuasive message. The other group did not receive this additional task while reading the same message. They found that this experimental manipulation increased certainty, an effect mediated by increased subjective knowledge and perceived amount of thinking related to the subject. These findings demonstrating the effect of knowledge and elaboration on certainty, are consistent with earlier correlational evidence that had found that certainty was correlated with the other two constructs across multiple attitude objects (Krosnick et al., 1993).

Antecedents of Strong Trust

Through what processes, then, can people gain accumulate knowledge, undertake elaborative thinking, and become certain about their judgments of risk managers? Evidence from communication research suggests that different modes of communication may have varying effects on how people learn and process information about risk managers. This section focuses on three typical types of communication processes through which the public may learn about their risk managers—direct interaction, news media use, and interpersonal discussion. It is assumed that each process will have differential effects on the strength of trust judgments. Figure 2.1 displays the conceptual model depicting how these communication processes may affect knowledge, elaboration, and certainty which may subsequently impact consequences indicative of attitude strength.

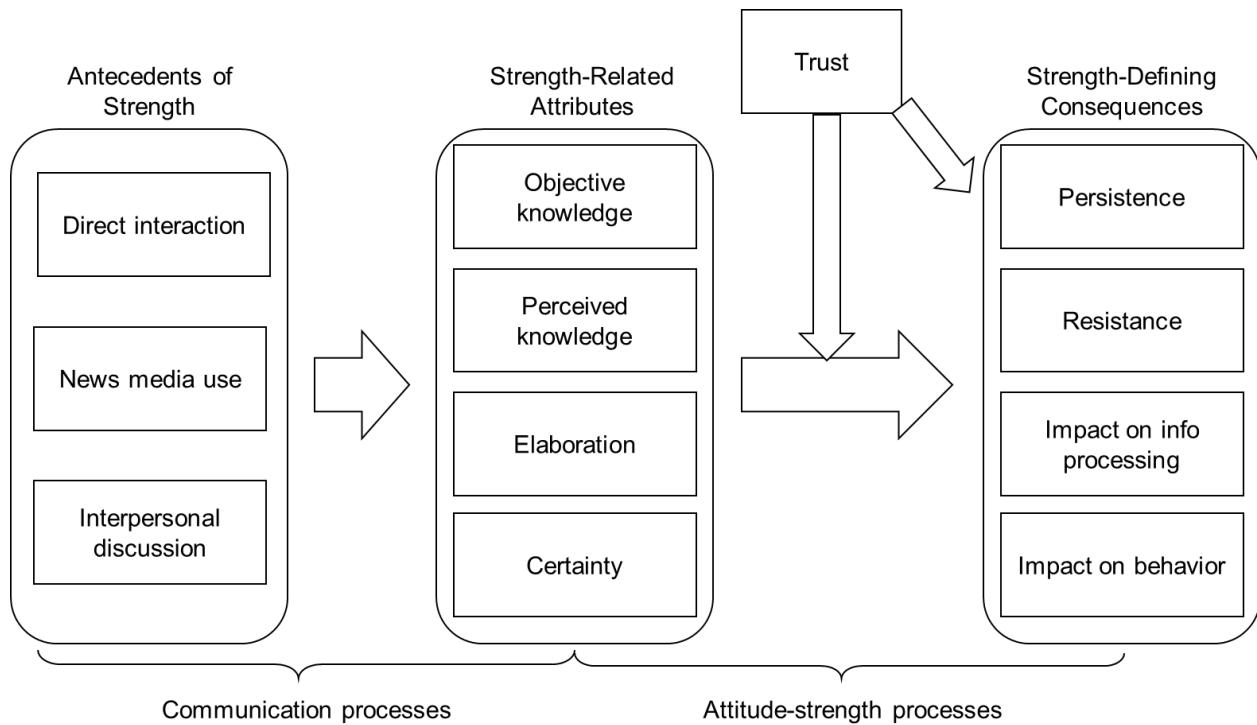


Figure 2.1 Conceptual model of psychological processes concerning the strength-related attributes of trust. Communication variables predict attitude strength attributes which, in turn, predict consequences indicative of attitude strength.

Direct interaction. In addition to studies discussed above suggesting how direct experience with an attitude object engenders strong attitudes (Fazio & Zanna, 1978; Tormala & Rucker, 2007), communication studies have regarded direct, face-to-face interactions with a special status in that they enable exchange of rich information between involved parties. Compared to conversation mediated through telecommunication technologies or written text, face-to-face interaction affords immediate feedback and multiple nonverbal cues such as body language and tone of voice (Daft & Lengel, 1986; Lengel & Daft, 1984). This richness of information reduces ambiguities and uncertainty in communication by adding contextual information. Face-to-face interaction also entails focused attention between the two parties, which makes them sensitive to various cognitive and emotional cues informing judgments about

each other (Boden & Molotch, 1994). For these reasons, individuals may detect subtle cues signaling unarticulated intentions and motives from the risk managers they directly interact with. For example, a risk manager may release internal analysis documents during a public hearing following requests, but his or her reluctance to do so, signaled by an interjection (e.g., “umm...”) in speech, may be visible only to those present in the event. Condescending smirks dismissing non-expert opinions may not be described in printed news stories, especially when the journalist is consciously refraining from adding personal interpretations that can be hard to validate. Cues like these indicative of the risk managers’ motivations may further require elaborative thinking to generate appropriate interpretations. Due to these unique qualities, direct communication processes are most likely to build trust judgments high in strength.

It should be noted that some risk communication scholars have criticized taking interpersonal approaches to trust in risk management contexts. For example, Earle and Cvetkovich (1995) emphasized the importance of distinguishing social trust from interpersonal trust, contending that interpersonal trust is an inappropriate concept to describe the public’s trust in institutions that have come to play increasingly complex societal roles in modern society. While it is very likely that interpersonal interactions between risk managers and the larger public are generally rare, such events may occur more frequently under smaller local-level contexts. In local contexts, sources of risks (e.g., waste disposal site, hazardous plant) are often fixed in location for extended periods and geographically proximal to the local residents and stakeholders. This physical co-presence not only increases opportunities for face-to-face encounters with facility managers but may also increase the motivation to carefully think about the risk managers because the outcome of their activities loom personally relevant. A number of

case studies described below clearly illustrate how direct interaction between residents and risk managers may occur, leading to cognitively elaborate judgments of trust.

News media use. In cases where direct interaction with risk managers is less feasible, the major bulk of information about their conduct is likely circulated through news media. News stories covering contentious issues related to risk are ripe with quotations from and observations of authorities and experts involved in the process. Even though information from mass-communicated news may not offer as rich cues as face-to-face interactions, people can still make inferences about the risk managers' intentions based on portrayals of risk managers in news.

Studies of mass communication have consistently found that usage of news media, especially printed media such as newspapers or magazines, is a strong predictor of knowledge in public affairs (Jennings, 1996; Robinson & Levy, 1996; H. H. Smith, 1986; Tichenor, Donohue, & Olien, 1970). Furthermore, community members paying more attention to local news media have also been found to have more extreme attitudes toward local issues (Scheufele, Shanahan, & Kim, 2002). McLeod et al. (1996) reported results from a survey showing that use of local news media including both newspapers and television was a strong predictor of interest, knowledge, and participation in local politics. Research has also found that news media use facilitates elaboration about political figures. Birch and Allen (2015) investigated how people judged politicians using criteria varying in complexity ranging from the relatively simple rule of legality (i.e., conformity with existing laws and institutional rules) to the more nuanced norm of avoiding conflicts of interest. While the legality cue was the most informative cue for judging politicians for all participants, for those frequently reading newspapers meeting high journalistic standards, the conflict-of-interest cue also considerably affected judgments.

In risk communication research, a number of studies have explored how local news media cover information about risk managing authorities and how the community responds to such information. In seven communities where suspected existence of local cancer clusters was under investigation, Besley, McComas, and Trumbo (Besley, McComas, & Trumbo, 2008) conducted a content analysis of local newspapers, coding articles for content related to the fairness of public health authorities. On average, about 16 percent of the articles covering the cancer cluster issues featured explicit descriptions of whether officials were fair, biased, or trustworthy (i.e., relational fairness). In 26 percent of the articles, stories discussed whether citizens had a say in the investigation process (i.e., voice; procedural fairness). Another study found that exposure to local newspapers and television could influence specific beliefs about the fairness of local university scientists (Besley, McComas, & Waks, 2006). In a survey conducted in two counties in upstate New York, participants' exposure to local newspapers was positively related to beliefs that scientists conducting research in their local areas were procedurally and interpersonally fair, controlling for variables including demographics, exposure to national newspapers, and television viewing. Taken together, although the impact of news media use on the strength of trust may be weaker than that of direct face-to-face communication, research strongly suggests that the relationship between news media use and knowledge of risk managers will be positive.

Interpersonal discussion. People's everyday lives are embedded in various networks of social relationships. Interpersonal discussions taking place between people can not only further transmit certain information to a wider audience but also facilitate thinking about such information. Researchers have argued that interpersonal communication and subsequent elaboration on issues can stimulate the formation of strong attitudes. Valentino and Sears (1998)

found that political socialization effects, where attitudes in politics acquired during adolescence carry over into adulthood, were primarily driven by high levels of interpersonal communication about relevant political events. Socialization effects of this kind are emblematic of attitude strength consequences such as persistence and resistance. In comparison, Zaller and Feldman (1992) suggested that increased thinking induced by discussions can help strengthen attitudes by sensitizing individuals to conflicting and ambivalent considerations underlying an attitude and motivating individuals to establish consistency across those cognitions.

In a study focusing on discussion networks in local communities, McLeod et al. (1999) tested how characteristics of these networks affected people's participation in deliberative public forums. These authors also examined how variables such as the frequency of engaging in thinking, recalling, and following up on political information (i.e., reflection) mediated the main effect of discussion network characteristics on participation. The study found that reflection, a variable closely resembling elaborative thinking about an issue, increased as interpersonal discussion of local politics increased. Reflection, in turn, predicted behavioral outcomes including participation in deliberative public forums.

In addition to the amount of elaboration, knowledge may also be affected by interpersonal discussion. Eveland (2004) tested three processes by which political discussion affects political knowledge. First, interpersonal discussion can be simply another occasion to receive information about politics in addition to the use of news media (i.e., exposure). Second, anticipating upcoming discussions can increase knowledge by motivating individuals to invest in thoughtful processing of information to prepare for the conversation (i.e., anticipatory elaboration). Finally, people may be forced to use effortful information processing during the process of discussion, which in turn leads to increased political knowledge (i.e., discussion-

generated elaboration). The study results, based on data from a presidential election, supported anticipatory elaboration and discussion-generated elaboration processes but not the exposure explanation, suggesting that the increase of knowledge following discussion was primarily due to the mediating effects of elaboration involved in each process. In sum, research evidence strongly suggests that interpersonal discussion will directly enhance elaboration, which can result in accumulation of knowledge.

Examples of Strong Trust

A number of case studies in natural resources and risk management contexts illustrate how strong forms of trust can emerge through frequent and deep communication. Using qualitative interviews, these studies reveal in detail the contents of reasoning as stakeholders (e.g., local residents) judge the trustworthiness of their local risk managers. They also show how strong trust can withstand trust-violating episodes and impact further information processing. In a case study conducted among communities neighboring the Midewin National Tallgrass Prairie in Illinois, Davenport, Leahy, Anderson, and Jakes (2007) documented how residents described their trust toward the U.S. Forest Service, which had been managing the area for about a decade. Rather than superficial impressions of similarity, community members made specific references to the responsiveness, honesty, fairness, and work ethics of the employees. One participant vividly described how understanding the employees' intentions over time helped her develop trust from an initial state of mistrust.

Previously, there was an apprehension about what everybody was up to. And if you finished a meeting with them, it was—did they tell you everything or did they not tell you something on purpose? So I think what's happened over a period of time is that you kind of learn people, where they are going and what their objectives are. With the new

supervisor there, ... she's pretty candid and she comes out and says what she feels. So I think over time the trust factor comes into play... I think it's our trust in knowing what they are doing... knowing some of the players for longer periods of time, understanding their personalities. (p. 360)

In another example, Leahy and Anderson (2008) interviewed residents and leaders at a watershed community in Illinois to understand how they interpreted their relationship with the U.S. Army Corps of Engineers personnel in the area who were tasked with multiple water management activities. When asked for reasons why they trust or distrust the Corps personnel, many participants drew on specific episodes often personally experienced. For example, some participants suggested that although they initially distrusted the local Corps personnel because of their low trust in the federal government, they eventually rescaled their trust after finding the Corps' help useful. Another interviewee described an experience where the outcome of the Corps' work was not satisfactory but he chose to maintain trust based on the impression of sincerity in the Corps' motivations:

You've got a lake manager in there now that is at least willing to listen to you... sometimes they can't do anything about it, but they do listen and that means a lot (p. 105).

This example well fits the description of knowledge-based trust high in resistance in Lewicki and Bunker's (1996) three-stage model in that trust has been salvaged despite violations because the perceiver had specific knowledge about the other's intention acquired from direct interaction.

In comparison, interviews reported by Lachapelle and McCool (2012) show how distrust can also be shaped through specific experiences and observations. One participant discussed the

U.S. Forest Service employees' alarmist approach exaggerating risks of catastrophic fires as the source his distrust:

Thinning doesn't have anything to do with fuel reduction from a scientific point of view... it destroyed whatever kind of trust that we had established before then (p. 328).

This participant's account further shows how this distrust negatively colored his understanding of subsequent Forest Service policies:

This fear is being exploited in order to give access to the timber companies... The real intention is to get out the cut, take those big trees (p. 328).

As an alternative source of distrust, another participant referred to a specific event where the law enforcement removed members of an environmental organization from a press conference held by the U.S. Forest Service:

You have a Supervisor that is referring to the environmentalists as obstructionists... (Our) free voice has been suppressed and it's a terrible handicap for the agency as it faces these crises and this loss of public support (p. 328).

The mixed-method study reported by Irwin, Dale, and Smith (1996) also provides insights into how certainty of trust judgments toward local risk-managing agencies and organizations may vary in a local context. In two local communities where chemical plants were a source of concern for many residents, participants were asked to rate the trustworthiness of various entities that may serve as sources of information about the local chemical industry. One particular feature of their survey questionnaire was the "don't know" option, which was offered alongside the scale ranging from "very trustworthy" to "very untrustworthy." Whereas nearly half of the participants selected this "don't know" option for targets such as the local Members of the Parliament, less than 15 percent of the participants selected this option when they were rating

the local chemical companies or the Fire Service. The chemical companies were distrusted by the majority whereas the Fire Service was overwhelmingly trusted. Thus, if one considers the selection of the “don’t know” option as a reverse-coded measure of attitude certainty, it can be interpreted that although people’s trust in chemical companies and the Fire Service considerably differed in terms of valence, the certainty in their trust judgments was similarly high for both targets. Excerpts of qualitative interviews with the participants suggest that judgments about these entities which received a lower proportion of “don’t know responses” (indicative of higher certainty) were more specific, detailed, and less qualified by conditional reservations.

Overall, examples of qualitative and mixed-method studies discussed in this section illustrate strong forms of trust bolstered by certainty, knowledge, and elaboration while showing how personal experiences communicating with risk managers or observing their conduct can shape stronger forms of trust or distrust. To use the terminology employed in person perception literature (Brewer, 1988; Fiske & Neuberg, 1990), participants in these interviews were drawing on specific individuating information to articulate their attitudes toward their risk managers instead of relying merely on vague categorical information (e.g., what risk managers in general are expected to do).

A Note about “Critical Trust”

It is important to note here that these examples of *strong* trust are distinct from what some researchers refer to as *critical trust*, defined as a “practical form of reliance on a person or institution combined with some healthy skepticism” (Poortinga & Pidgeon, 2003, p. 971). Accordingly, empirical studies have operationalized critical trust by identifying cases where participants show high agreement with statements indicating both general trust (e.g., “My government is doing a good job”) and skepticism (e.g., My government distorts facts in its

favor’’). Researchers drawing on this framework have generally considered this kind of reserved trust as a better predictor of participation in deliberative processes in risk management (Parkins, 2010; Parkins et al., 2017; Pidgeon et al., 2007). Thus, whereas *critical trust* concerns the degree of *ambivalence* with which one holds the trust judgment, the strength of trust discussed in this dissertation focuses on other aspects of trust judgments (i.e., knowledge, elaboration, certainty). Thompson, Zanna, and Griffin (1995), who have considered ambivalence as a property related to attitude strength, argue that ambivalence is conceptually independent from most other attitude strength attributes. They found that ambivalence was not strongly related to the amount of knowledge, and that one may hold ambivalent attitudes about both important and not important issues to oneself. In addition, studies that sought out to clarify the relationship between attitudinal ambivalence and attitudinal impact on behavior have come up with inconsistent findings (Conner et al., 2002; Jonas, Diehl, & Brömer, 1997). Thus, although the concept of critical trust studied in previous risk communication literature is distinct from the notion of strength of trust discussed in this dissertation, future research may investigate the relationship between ambivalence and attitude strength attributes investigated here as they relate to trust in risk managers. In addition, future studies may advance research on critical trust by employing conceptual frameworks and empirical approaches used in attitudinal ambivalence literature to model and test the effects of attitudinal ambivalence.

Toward a Strength-Focused Approach to Trust in Risk Communication

The richness of content underlying judgments of risk managers’ trustworthiness may vary across contexts as well as individuals. For instance, a survey participant asked about the trustworthiness of scientists promoting a novel and complicated technology is very likely to construct a response on the spot anchored in factors external to the focal issue (e.g.,

questionnaire demand characteristics, individual's propensity to trust, trust in scientists in general). The same individual, however, may provide a more thoughtful response retrieved from contents stored in long-term memory if the target of judgment is someone highly relevant and well-known to the individual (e.g., manager of a local chemical plant). In general, risk communication research has disregarded this variance of strength-related properties of trust, largely assuming that judgments of trust require minimal cognitive effort. Nevertheless, theoretical perspectives reviewed in this chapter—dual processing in impression formation, attitude strength, and development of trust—suggest that trust can be stronger when supported by rich knowledge, intensive elaboration, and high certainty. Such trust will exhibit higher persistence over time, resistance to counter-persuasive information, and impact on subsequent information processing and behavior.

It is important to study the strength-related attributes of trust for both theoretical and practical reasons. First, strength-related attributes are central to what makes trust desirable and useful. Trust weak in strength is likely to decay and collapse easily, especially when risk managers might need it most in contentious decision-making processes. In addition, an attitude-strength approach to trust can provide communication practitioners with alternative measures to evaluate and predict the effect of their public engagement efforts that may have not been captured by conventional scales of trust. Related to this point, studying strong forms of trust highlights the relational aspects between the public and risk-managing authorities. Much risk communication research regards the public as receivers of a persuasive message designed to promote an attitude or a behavior. With a strength-focused approach, the heavy focus of scholarly attention on persuasive message effects can broaden in scope to better involve other

communicative elements such as procedural fairness in deliberation, openness in information handling, and interpersonal treatment.

During the initial phase of exploring the strength-related attributes of trust in risk communication, future studies may need to pay broad attention to both theoretical and methodological issues. As argued in this article, research can investigate whether differential communication variables can predict strength of trust or distrust in risk managers. In addition to different communication modalities (Figure 2.1), other communication variables (e.g., message variables, risk managers' personal characteristics, context of communication) may affect strength-related attributes of trust. To expand reliable research in this area, research also needs better understanding of the internal structure of attitude-strength attributes as they relate to trust judgments. For example, what is the relationship between trust-related knowledge, elaboration, and other metacognitive beliefs such as one's certainty or perceived importance of his or her trust judgments? Is the effect of objective knowledge on attitude strength mediated by one's subjective perception of knowledge? Previous research in attitude strength suggests that various attributes of attitude strength may be related to each other in complex ways that vary from context to context (Visser et al., 2006). Related to this issue, research is also needed to optimize measures of trust and its strength-related attributes. For example, which of the many strength-related attributes are most relevant to trust judgements? How can empirical studies operationalize resistance to counterpersuasion or information processing in risk management?

In sum, the strength-related attributes of trust have received little attention in risk communication research although it appears to be an essential quality of the construct. This chapter has argued that studying individuals' knowledge contents, elaboration processes, and perceptions of certainty underlying trust judgments can be a first step to illuminate how risk

managers build trusting relationships with the public. Empirical work testing theoretical propositions and clarifying methodology has great potential to help risk communication scholars and practitioners better understand how the elusive concept of trust works and why it matters.

CHAPTER 3

TAPPING STRONG FORMS OF TRUST AT THE LOCAL LEVEL: CONTEXT DESCRIPTION AND PRELIMINARY FIELDWORK

Testing the relevance of strength-related attributes of trust in risk communication involves testing both its antecedents and consequences. As discussed in the previous chapter, attitude strength attributes such as certainty, knowledge, and elaboration may be predicted by different modes of communication including direct interaction with the judgment target, attending to mediated information about the target (e.g., news) and discussing the target with other people. In turn, the level of strength in trust judgments can be expected to determine strength-defining consequences such as persistence of trust over time, resistance to information challenging one's judgment of the target, and the size of the impact on information processing and behaviors relevant to the target.

To test these relationships, a fit context for data collection meeting several conditions was necessary. First of all, the focal risk management issue and geographical range of the context needed to afford a reasonable amount of variance for all variables featured in the hypothesized model. Second, there needed to be clearly identifiable targets of trust judgments that can be recognized by participants sampled from the general public population. Third, the ruling or decision on the focal issue in the context needed to be one of pending status so that participants' judgments toward the risk managing agency would not be overridden by motivated reasoning (Kunda, 1990) based on the outcome of the agency's decision. That is, to validly measure people's acceptance of a risk manager's decision independent of its final ruling on the issue, the ruling on the issue had to be inconclusive at the time of data collection. Finally, the context preferably had to be one geographically proximate enough so that it would be physically and

financially feasible for the researcher to conduct the study, especially when it involves face-to-face interactions with participants.

As this chapter will describe, I selected a liquefied petroleum gas (LPG) storage project in a local community in upstate New York as the context meeting these criteria. In this chapter, I first discuss why a local context, rather than an issue of a larger (e.g., national) scale, would provide a more desirable setting to study strong forms of trust. Next, I explain the selected context discussing how the risk management issue of this context met the four criteria listed above. Then, I describe a qualitative study involving semi-structured interviews with key informants designed to explore and verify the assumptions I make about this context. Findings of these interviews reveal possible contents of knowledge that could support strong forms of trust as well as sources of information about this issue. In addition, I discuss how actors involved in the issue make judgments of “outsiders” and their right to have a voice in the decision-making process as a theme that organically emerged from these interviews which I further pursued to answer empirically with the study presented in Chapter 5.

The Local as a Venue of Strong Forms of Trust

Testing the role of attitude strength attributes such as knowledge, elaboration, and certainty in trust judgments requires sufficient variance for each of these attributes in a given context. For example, if a survey were to use a sample of U.S. citizens and ask their perceptions about governmental agencies in other countries handling the risks of infectious diseases, it would be unrealistic to expect most responses to be rooted in concrete knowledge about the target. Even domestically, judgements about U.S. federal agencies would be high in attitude strength only in exceptional cases where the perceiver intakes high amounts of mediated information about the target, because direct interaction with such federal employees is a relatively rare event in most

areas. However, strong trust may be more readily observable in social contexts that make information about risk managers more accessible and stimulate thoughtful processing of such information. As I will argue in this section, local level communities where members and risk managers share a geographic area for daily activities afford multiple features that enable processes strengthening trust judgments.

To first address a possible source of confusion, the argument here is trust toward local risk managers will be *stronger* compared to risk managers at the national level, not *more positive*. Admittedly, it is possible that there is a general correlation between the valence of trust and the strength of trust. As Lewicki and Bunker (1996) suggest, it is possible that, in some cases, negative interaction experiences where trust is betrayed will lead to termination of the relationship in its early stage, preventing distrust to grow in strength through repeated confirmation. In the long run, this may leave mostly *positive* trust relationships in the pool of *strong* trust relationships. However, in a local context where parties who distrust each other may nevertheless have to encounter and interact due to physical proximity (e.g., sharing an administrative unit), distrust may also grow stronger over unavoidable yet repeated interactions. Indeed, perspectives considering community as a homogenous and harmonious space coalesced with positive interpersonal relationships have been criticized as unrealistic (Young, 1990). Such idealistic views of community are also undesirable because they silence differences within the community that contribute to pluralistic decision-making (Delanty, 2009; Young, 1995). Thus, I make here no assumptions about whether judgments of high or low strength will tend to be either positive (trust) or negative (distrust). Instead, I focus my argument to reveal local processes that can foster strong trust judgments, regardless of their valence.

Communication research suggests that public opinions about local issues tend to be driven less by predispositions based on party affiliation or ideology and more by systematic processing of information and interpersonal discussion, compared to opinions about national issues (Metag, 2016). This suggests that local-level issues tend to feature some conditions that are likely to foster strong forms of trust. Next, four processes in the local community will be reviewed to explore how people may gain information about risk managers and become motivated to engage in elaborative processing. Both cognitive as well as communicative processes come into play. Whereas some processes are primarily driven by the small scale of the local environment, which places community members and the authority into physical proximity with each other, other processes consider the role of mass media.

Direct Interaction with Risk Managers

One of the most prominent effects of local environments is that they bring people together into physical co-presence (Gieryn, 2000). At the local level, community members are more likely to come into direct interaction with each other either through planned meetings or accidental encounters. In addition to the directness of such interactive experiences which are more likely to afford extensive knowledge about the target (Wood et al., 1995), these direct interactions are also more likely to repeat over time across multiple occasions at the local level. As a result, knowledge about local level risk-managing authorities are more likely to be rooted in close face-to-face interactions with the public than knowledge about national level authorities.

Communication studies have assigned a privileged role to direct face-to-face interactions especially in terms of the ample amount of information exchanged between the two parties. Compared to conversation mediated through telecommunication technologies or written text, face-to-face interaction is considered “rich” in the amount of information exchanged due to the

availability of immediate feedback and multiple nonverbal cues such as body language and tone of voice (Daft & Lengel, 1986; Lengel & Daft, 1984). This richness of information reduces ambiguities in communication by adding contextual information. Face-to-face interaction also entails focused attention between the two parties which makes them sensitive to various cognitive and emotional cues informing judgments about each other (Boden & Molotch, 1994). For these reasons, community members interacting directly with their risk managers may find it easier to access and read into the subtle cues signaling unarticulated intentions and motives of the risk managers than do others who learn about them only through mediated processes.

Case studies discussed in Chapter 2 show how community members make judgments about local authorities using information learned from direct observation. For example, interviews reported by Leahy and Anderson (2008) show how participants drew on very specific and direct observations afforded by direct interactions when they judged their risk managers. The interview quoted in Chapter 2 indicates that trust was based on the manager's willingness to attend to the residents' opinions despite the manager's lack of ability to effectively address voiced concerns. Another interviewee in the study commented that the Corps employees were initially relying on "book knowledge" but were "improving" by synthesizing their skills with those of the locals who have "hands-on experience." Similarly, when community members at the Midewin National Tallgrass Prairie described their judgments toward the U.S. Department of Agriculture staff members, their accounts were based on vivid direct experiences (Davenport et al., 2007). One participant explained that the staff was very "friendly and eager to help and give you information on whatever you know" (p. 359). Others have commented on the employees' responsiveness, characterizing communication experiences as "a real dialogue." Comments also

tapped dimensions such as work ethics or the staff member's dedication to do what they believe in as the basis of their trust.

In these case studies, participants also alluded to what scholars might conceptualize as elements of procedural fairness (Colquitt, 2001). For example, comments quoted by Leahy and Anderson (2008), revealed how some community members were satisfied with the Corps employees regardless of their management outcome because they felt the engineers sincerely attended to their voices. The ability to voice one's position in a public participation process regardless of the final outcome is considered one of the most central dimensions to the concept of procedural justice (Lind & Tyler, 1988). In addition, some comments from both Leahy and Anderson (2008) and Davenport et al. (2007) expressed satisfaction related to the perception that the managers were providing the whole available information in timely fashion, which well corresponds to the definition of informational fairness (Colquitt, 2001). These findings are largely consistent with literature showing that fairness-related experiences become important cues when people seek to assess an authority's trustworthiness (van den Bos & Lind, 2002; van den Bos, Wilke, & Lind, 1998).

Enhanced Sense of Personal Relevance

In local communities, sites for potentially hazardous activities are more closely located to people, posing relatively direct and immediate threats. Because hazardous facilities also tend to offer concrete opportunities for benefits such as jobs or tax revenue, community members may feel that decisions about these issues are of high personal relevance compared to risks at a more distant source. In turn, this sense of relevance can instill a motivation to maximize the accuracy when one judges whether to accept the operation of the hazardous facility. Thus, to infer from social cognitive theories (Brewer, 1988; Chen & Chaiken, 1999; Fiske & Neuberg, 1990), risk

managers at the local level may face an audience highly motivated to scrutinize their motivations and capacities. In comparison, while risk managers at the national level may also occasionally face similar levels of scrutiny from field experts, interest groups, or small segments of the public, a relatively high proportion of the population is likely to perceive the risks they manage as distal and abstract, unlikely to affect them personally.

With sufficiently high motivations, local residents may directly participate in scientific investigations (Fischer, 2000; National Research Council, 1996). In cases such as the 1986 leukemia epidemic in Woburn, Massachusetts, local community members have directly undertaken endeavors to reveal scientific information and evidence otherwise not provided by risk-managing authorities or experts (Brown, 1987). However, it may not be feasible for most lay residents in local communities to take the technical complexities of risk management issues to their own hands. In such cases, community members who are highly motivated to make accurate judgments may instead invest their cognitive efforts in scrutinizing the local risk managers and searching for experts who may share their concerns often from outside the community. Once they feel confident about the accuracy of their assessment of the risk manager, they can then rely on the risk manager's advice as a heuristic for their larger decisions such as whether or not to accept a source of risk.

Few studies have investigated how individuals in local communities make more sophisticated judgments about their risk managers as perceived personal relevance of the issue increases. Nevertheless, psychological research conducted in lab environments has demonstrated how people's social judgments run deeper as a function of perceived outcome dependence on the interaction partner. In an experiment conducted by Erber and Fiske (1984), participants worked on collaborative tasks where they received information about the task partner, which included

comments both consistent and inconsistent with their first impression about that partner. This first impression was induced earlier by the researchers through a separate stimulus. Whereas half of the participants were led to believe that an extra-reward for producing a good result in the task depended solely on their own performance, the other half worked under “outcome-dependent” rules where the partner’s good performance was also necessary to win the reward. It was found that participants in the outcome-dependent condition spent more time attending to the information inconsistent with their initially induced impressions about the partner, meaning that they undertook more cognitive work to adjust their first impressions rather than ignoring inconsistencies. Neuberg and Fiske (1987) further replicated this phenomenon and found that the effect of outcome-dependency on effortful processing about a collaborative partner was mediated by the motivation to make accurate judgments of the partner.

Information from Local Media

People can gain information about their local authorities through not only direct observation but also local media channels. Research has found that attention to local media, especially newspapers, is an antecedent of involvement in community affairs (Rothenbuhler, Mullen, DeLaurell, & Ryu, 1996). In addition, local media identifies and provides information about important issues and events in the community, which may be less accessible through direct observation or purely personal ties. For example, community members paying more attention to local media have also been found to have more extreme attitudes toward local issues (Scheufele et al., 2002). Furthermore, local media can also deliver information about collective activities such as meetings and rallies in the area related to the issue, mobilizing the public to take action and influence local problems (Lemert, Mitzman, Seither, Cook, & Hackett, 1977). Consistent with these findings, McLeod et al. (1996) reported results from a survey showing that use of

local media including both newspapers and television was a strong predictor of interest, knowledge, and participation in local politics, explaining up to 29 percent, 11 percent, and 15 percent of the variance in these variables, respectively.

News media play a vital role in determining which issues receive attention and scrutiny from the public. The media make salient certain issues over others by allocating them more air time and print space or placing them prominently on pages or timeslots that best receive attention. This process, referred to as the *agenda-setting* function of the media has been found to exercise considerable influence on public discourse (Kim, Scheufele, & Shanahan, 2002; McCombs & Shaw, 1972). Palmgreen and Clarke (1977) compared the agenda setting effects of media between the national and local level in a study combining content analysis and survey methods. They found that the local issues salient to the public were considerably influenced by those receiving focused attention from the local media, although this effect was more attenuated compared to the national level. The authors surmised that the impact of other sources of information such as interpersonal channels and personal observation at the local level might have affected the differences in agenda-setting effects between the local and national level. In comparison, Kim, Scheufele, and Shanhan (2002) argued that local media influences how people think about issues by not merely making some issues more salient than others, but also making certain attributes of a given issue more prominent in the audience's mind.

Research has also highlighted what people might learn about public authorities from the media. At the most basic level, coverage from mass media can increase an audience's knowledge by raising simple awareness of issues or recognition of public figures at a given time. In addition, the public may also learn about the traits and issue positions of political figures (Drew & Weaver, 2006; Weaver, 1996).

In risk communication research, a number of studies have explored how local media cover information about risk managing authorities and how the community responds to such information. In seven communities where suspected existence of local cancer clusters were under investigation, Besley, McComas, and Trumbo (2008) conducted a content analysis of local newspapers, coding articles for content related to the fairness of public health authorities. On average, about 16% of the articles covering the cancer cluster issues featured explicit descriptions of whether officials were fair, biased, or trustworthy (*i.e.*, relational fairness). In 26% of the articles, stories discussed whether citizens had a say in the investigation process (*i.e.*, voice; procedural fairness). Another study found that exposure to local newspapers and television could influence specific beliefs about the fairness of local university scientists (Besley et al., 2006). In a survey conducted in two counties in upstate New York, participants' exposure to local newspapers was positively related to beliefs that scientists conducting research in their local areas were procedurally and interpersonally fair, controlling for variables including demographics, exposure to national newspapers, and television viewing.

Enhanced Elaboration through Interpersonal Discussion Processes

The physical co-presence in the local environment not only affords more opportunities to observe and interact with risk managers but also enables face-to-face discussions between community members. Researchers have argued that interpersonal communication and subsequent elaborative thinking about issues can stimulate the crystallization of strong attitudes through socialization processes (Valentino & Sears, 1998) or by establishing consistency across conflicting and ambivalent cognitions related to an attitude (Zaller & Feldman, 1992).

Interpersonal discussion taking place between community members can further enhance elaborative processing of information related to local political issues including risk management.

Eveland (2004) proposed a typology of three processes by which political discussion affects political knowledge. First, interpersonal discussion can be simply another occasion to receive information about politics in addition to the use of news media (*i.e.*, exposure explanation). Second, anticipating upcoming discussions can increase knowledge by motivating individuals to invest in thoughtful processing of information to prepare for the conversation (*i.e.*, anticipatory elaboration). Finally, people may be forced to use effortful information processing *during* the process of discussion, which in turn leads to increased political knowledge (*i.e.*, discussion-generated elaboration). Eveland (2004) tested these three processes using two surveys conducted during the 1996 presidential election. Although results revealed little support for the exposure explanation, it was found that anticipatory elaboration and discussion-generated elaboration processes mediated the effects of discussion on political knowledge.

The mediating effect of elaboration was also observed in contexts focused on local issues. In a study designed to test how characteristics of discussion networks affect people's participation in deliberative public forums in the local area, McLeod et al. (1999) also examined how variables such as the frequency of engaging in thinking, recalling, and following up on political information (*i.e.*, reflection) mediated the main effect. This reflection variable may also be considered as a measure of elaborative thinking, which may be critical for strong forms of trust to shape. Although the researchers' analysis did not distinguish between anticipatory and discussion-generated elaboration processes, in accordance with Eveland (2004), they found that reflection increased as interpersonal discussion of local politics increased. Reflection, in turn, predicted participation in deliberative public forums.

Taken together, four processes reviewed in this section show how local communities can foster stronger attitudes through increased knowledge and elaborative thinking. Because risk

managers operating in local communities can be attitude objects in these environments, people's judgments of their trustworthiness are likely to be stronger and, thus, more durable and impactful than those of national risk managers. In addition, local contexts are also likely to provide opportunities to observe a wider range of communication processes, especially those such as direct interaction which are likely to carry information supporting strong forms of trust. Thus, I determined that a local level issue would be a fit venue to test the causes and effects of strength-related attributes of trust judgments. The next section of this chapter describes the local context selected for the empirical study of this dissertation.

The Context: The Seneca Lake Gas Storage

Brief History of Gas Storage Siting Events

Seneca Lake is the largest (67 square miles) and second longest (38 miles) lake in the Finger Lakes region of upstate New York. The shoreline of the lake is shared across four New York State counties—Schuyler, Yates, Ontario, and Seneca—with a combined population of 187,628 as of 2015 (New York State Department of Health, 2016). Since the passing of the New York Farm Winery Law in 1976, the Finger Lakes region has steadily grown into a region with a booming wine industry consisting of one hundred wineries (Cazentre, 2017), 35 of which are members of the Seneca Lake Wine Trail. The scenic lake also attracts many tourists and seasonal residents during the summer season.

The following subsections describe the history of the debate concerning Crestwood's application to gain the permit for the gas storage with events organized around four key categories of actors involved: the project applicant, the opposition movement, local communities, and the risk manager. Table 3.1 lists a chronologically organized summary of these events.

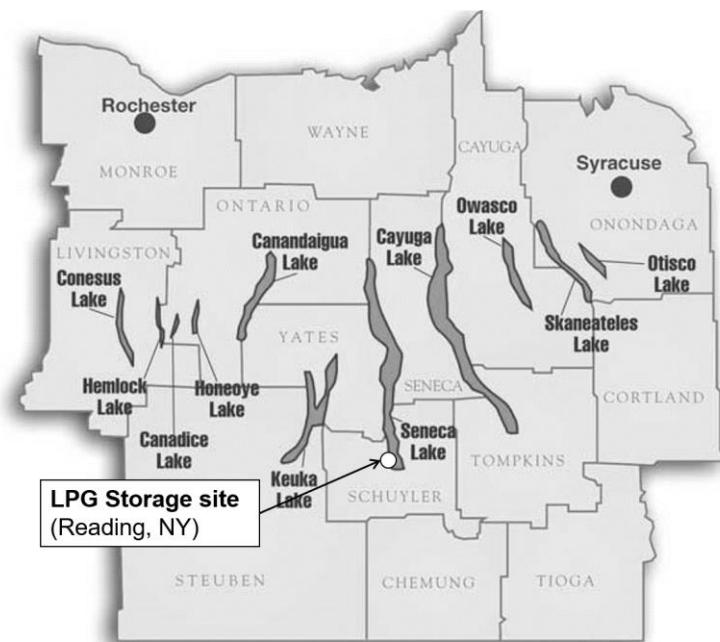


Figure 3.1 Map of the Finger Lakes Region and location of the gas storage site proposed by Finger Lakes LPG Storage LLC. Map credit: Life in the Finger Lakes magazine.

The project applicant. In August 2009, Inergy Liquid Propane (Inergy), an energy company based in Kansas City, Missouri with operations in the areas of marketing, sales, and distribution of propane gas, applied for permission to store LPG at a US Salt property under the name of its subsidiary Finger Lakes LPG Storage LLC (FLLPG). The proposed property was one located in the town of Reading in Schuyler County close to the southern end of Seneca Lake (see Figure 3.1). Inergy's proposal was to construct and operate a new LPG storage facility utilizing existing caverns created by US Salt's salt production operations. According to the proposal, 2.1 million barrels of LPG would be stored in these caverns seasonally. The proposal also included construction of a new rail and truck LPG transfer facility in addition to connection to a preexisting interstate pipeline to load and unload LPG products. In April 2011, Inergy held a public meeting at the community center in Watkins Glen explaining their proposal to about 200 in the audience. According to a report (Haeffner, 2011), although opponents were visibly

protesting outside the venue, the discord was less visible inside because Inergy's representative did not take questions while at the podium. In June 2013, Crestwood Equity Partners (Crestwood), a Texas-based firm owning and operating midstream oil and gas assets in various U.S. regions, acquired Inergy and has continued to pursue permission for the proposed LPG storage. In August 2016, Crestwood scaled back the scope of the proposed gas storage by removing the rail and track transportation components, eliminating the plan to store butane (a type of LPG), and reducing the storage of propane (another type of LPG) by 30% (Alessi, 2016). In May 2017, Crestwood also rescinded its original plan to store natural gas at the project site, a component under federal jurisdiction that been reviewed and approved by the Federal Energy Regulatory Commission, leaving propane gas as the only type of product to be stored in the proposed facility (Murray, 2017).

The opposition movement. The announcement of the project has invited strong and vocal opposition from local businesses, residents, and environmentalists in the area. As early as in April 2011, an organization named Gas Free Seneca (GFS) was reported as hosting a public forum titled "Seneca at a crossroads: Large sale LPG storage vs. wineries and tourism. Can the two co-exist?" (Shaw, 2011a). GFS had since grown in membership and influence applying for full party status at the issues conference held in 2015. In its petition at the issues conference, GFS introduced itself as an organization of concerned citizens, local business owners, and regional environmental groups seeking to protect the lake's landscape and businesses from invasive industrialization and stated that it was applying for full party status to resist threats posed by the project to the community character and integrity of natural environment (Goldberg, Nasmith, & Earthjustice, 2015). Other citizens have organized rallies, which were often held at the US Salt property, blockading the facility's entrance. Arrests with charges of trespassing were

reported since September 2012 (“Sheriff arrests three in Watkins Inergy protest,” 2012). We Are Seneca Lake (WASL), another grassroots opposition group established in 2014, explicitly resorted to civil disobedience approaches in the protests it led, resulting in numerous arrests. According to the group, an accumulated total of 657 arrests of 404 different individuals have been made during protests at the gas storage site as of July, 2016 (We Are Seneca Lake, 2016).

Local communities. Local governmental bodies have been divided in their position over the gas storage. The legislature of Schuyler County, which includes the gas storage site, passed an initial resolution in support of the project in June 2014 (Schuyler County Legislature, 2014). The legislature then passed another resolution in August 2016 renewing its support for the project after Crestwood scaled back the scope of its original proposal (Schuyler County Legislature, 2016). Although the Town of Reading Board did not adopt an official position on this issue, local media have portrayed it as suppressing opponent voices at board meetings (“Reading chief says ‘Enough!’ about Crestwood,” 2015; Wilber, 2015a) and interpreted its lack of official stance as tacit support for the project (Wilber, 2015b). In contrast, other legislatures across the Finger Lakes region and upstate New York have adopted more critical positions against the project. According to information compiled by Gas Free Seneca (2016), local government bodies in upstate New York that adopted an official position against the project include seven counties (Cayuga, Onondaga, Ontario, Seneca, Tompkins, Wayne, Yates), four cities (Geneva, Ithaca, Rochester, Syracuse), two villages (Waterloo, Watkins Glen), and 19 townships (Brighton, Caroline, Fayette, Geneva, Hector, Ithaca, Junius, Lodi, Lyons, Ovid, Romulus, Rush, Seneca Falls, Skaneateles, Starkey, Torrey, Ulysses, Varick, Waterloo). Among these, three counties and 10 municipalities have a shoreline at Seneca Lake.

Table 3.1 Summarized history of Seneca Lake LPG storage application

Date	Event
10/1/2009	Inergy seeks permit to store LPG from DEC and Town of Reading
1/10/2010	Inergy announces plan to acquire Seneca Lake Gas Storage
2/2/2010	DEC designated as lead agency for project
11/17/2010	Positive declaration announced by DEC following SEQR requiring dEIS
4/13/2011	Inergy holds local meeting
4/14/2011	Gas Free Seneca organizes and holds first public event
7/14/2011	Inergy announces completion of cavern acquisition from NYSEG
9/27/2011	First DEC holds public hearing
11/3/2011	Second DEC holds public hearing
9/7/2012	First arrest of protesters reported
6/19/2013	Crestwood acquires Inergy
6/9/2014	Schuyler County legislature passes resolution supporting storage (Resolution #213)
8/6/2014	DEC staff determines to hold adjudicatory hearing
8/11/2014	DEC announces that issues conference will be held to determine issues and parties
9/29/2014	McClymonds designated as administrative law judge for adjudicatory hearing
2/12/2015	Issues Conference takes place in Horseheads, NY
7/18/2016	53 individuals from We Are Seneca Lake arrested during protests
8/8/2016	Crestwood scales back plan dropping plan for butane and truck/truck transport
8/8/2016	Schuyler County legislature passes resolution renewing support (Resolution #251)
9/8/2017	Judge McClymonds rules denying need of adjudication
5/17/2018	Crestwood's attorney sends NYSDEC letter acknowledging cavern leakage
7/9/2018	Schuyler County Legislature rescinds previous resolution supporting project
7/12/2018	NYSDEC commissioner Seggos makes decision denying project permit

The risk manager. In February 2010, Alexander Grannis, then-commissioner of the New York State Department of Environmental Conservation (NYSDEC), designated NYSDEC as the lead agency to conduct the environmental review under the New York State Environmental Quality Review (SEQR) Act, concluding the dispute between the Town of Reading and the NYSDEC regional office to undertake lead agency status (Grannis, 2010). In November, 2010, NYSDEC announced a “Positive Declaration” on the project based on the determination that it had potentially significant adverse environmental impacts (New York State Department of

Environmental Conservation, 2018), requiring the project applicant (i.e., FLLPG) to submit a draft environmental impact statement (dEIS). Since this ruling, which enabled the public to formally comment on the dEIS submitted by the applicant, NYSDEC held two public hearings in 2011, the second of which occurred because the first hearing could not accommodate all requests for comment (Shaw, 2011b). In August, 2014, the NYSDEC staff at the regional office determined that it was necessary to hold an adjudicatory hearing (Harkawik, 2014), a process resembling civil court proceedings in which parties may present evidence and argue about issues under oath before an administrative law judge who will then prepare a report to be submitted to the

NYSDEC commissioner (New York State Department of Environmental Conservation, 2018).

After NYSDEC Chief Administrative Law Judge James McClymonds was assigned to preside over the adjudicatory hearing (McClymonds, 2014), NYSDEC held an issues conference in February 2012 at a hotel in Horseheads to determine the party status for any person who has properly filed a petition and to define the scope of issues, if any, that would require full adjudication. At the issues conference, three petitions were filed applying for full party status; these included one by GFS and another jointly by 12 counties, towns and villages around the Seneca Lake region including Seneca County and Yates County. Among others who applied for amicus (friend of the court) party status, which required less responsibility than a full party, were a coalition of Finger Lakes area winery business owners, two Schuyler County legislators who were against the project, the New York State L.P. Gas Association, and the National Propane Gas Association. While arguing for their party status, opponents of the project raised issues such as threats to the wine and tourism industry, community character, noise and traffic, cavern integrity, and water quality. Following the issues conference, in which those applying for party status presented their case pointing to issues they believed requiring adjudication, the NYSDEC

staff submitted a post-issues conference brief which was largely supportive of the project. It concluded that none of the proposed issues met the threshold level of importance needed to serve as a basis for adjudication and requested the judge to dismiss the issues proposed for adjudication (Maglienti, Schwartz, & Weintraub, 2015). Following a review that took more than two years, Judge McClymonds ruled in September 2017 that the full party petitioners have failed to raise any issues requiring adjudication and accordingly denied their full party status with the caveat that their petitions were accepted as filed and may be considered in NYSDEC's final decision (McClymonds, 2017). At the time, this ruling was widely considered as a major victory for Crestwood in its pursuit for the storage permit (Shaw, 2017). However, in May 2018, a letter from Crestwood's attorney to the NYSDEC Commissioner Basil Seggos acknowledging their discovery of leaks between the cavern wells gave renewed rise to safety concerns (Bernstein, 2018). Consequently, Schuyler County Legislature rescinded its previous resolution supporting the project in July 2018 (Platsky, 2018). Three days later, Commissioner Seggos issued a final decision denying the permit for the gas storage project citing leakage issues and conflict with community character (Seggos, 2018).

Appropriateness of the Study Context

Various aspects of the Seneca Lake LPG storage issue made the context appropriate to conduct a study on the attitude strength attributes of trust. First, the type of events that had unfolded in relation to this issue could serve as sources of ample variance for many variables in the hypothesized model. As for the communication variables, there were multiple opportunities for residents to observe the key actors through both direct interaction and news stories covering them. On the record, there were at least three public hearings hosted by NYSDEC, one meeting organized by the project applicant, legislative meetings at the county level, board meetings at the

municipal level, and numerous protests and rallies against the project. Participants in these events presumably would have been able to observe and interact with representatives from NYSDEC, Crestwood (formerly Inergy), and the protester groups in person, which could lead to increased knowledge of these targets. These public events also would have served as opportunities to take part in focused interpersonal discussion with other community members and stakeholders in the issue. In addition, print and online news media covering local issues in areas around Seneca Lake (e.g., Finger Lakes Times, The Star Gazette, The Observer Review & Express, The Odessa File) have extensively covered this issue throughout the development of the review process. The actions and quotes of key actors reported in these news stories would have allowed many local residents to recognize the issue, form impressions about the agencies and organizations involved in the issue, and think deeply about the potential consequences of the project.

Second, the presence of clearly identifiable judgment targets was also highly desirable for an empirical study. For some issues, risk management responsibilities may be divided across multiple parties, which could confuse members of the public who are asked to report their impressions about authorities handling a risk. For example, following major pollution crises in drinking water systems in the U.S., federal agencies (e.g., the Environmental Protection Agency), state agencies overseeing environment and health, and public or private companies running water treatment plants and supply systems may be simultaneously involved managing contamination and disease risks. From the public's perspective, it may be difficult to discern the jurisdictional boundaries between these agencies, which in turn may lead to confusion as the try to attribute responsibility of new events. In contrast, in the Seneca Lake LPG Storage case, there was a clearly defined lead agency (i.e., NYSDEC) overseeing and making decisions in the

application review. For the same reason, it was also helpful that Crestwood, the parent company of FLLPG, was the sole applicant of the project permit responsible for new development activities. In addition, among the multiple organizations joining the opposition movement (e.g., GFS, WASL, Seneca Lake Pure Waters Association, Finger Lakes Wine Business Coalition, Concerned Reading Citizens, counties and municipalities against the project), GFS, a locally-based opposition group specifically organized to protest the gas storage as early as 2011, appeared to stand out as the most visible and influential in news coverage.

Third, the inconclusive status of NYSDEC's decision on this issue at the time of data collection posed another advantage for the empirical study. Trust in risk managers, perceived risk, and acceptability of the risk are three highly correlated constructs, and it is often difficult to determine the direction of causality among them. For example, whereas Poortinga and Pidgeon (2005) found support for a model in which acceptability of the risk caused both trust and perceived risk, Eiser, Miles, and Frewer (2002) had also found some evidence that the three variables can be explained as a causal chain where trust causes risk perception, which in turn affects acceptability. Using an inconclusive risk management issue as a context for a study can yield superior evidence about the effects of trust because trust in risk managers in these contexts is not predetermined by participants' attitude toward the outcome of the risk managers' decisions. In the case of the current study, I was able to measure participants' intention to accept NYSDEC's decision regardless of its final outcome before that decision was made, which allowed for an opportunity to more validly measure the effects of trust.

Finally, the geographical proximity of the study site to my area of residence was another feature of the context which helped make the study physically and financially feasible. The site of the proposed gas storage was at a highly accessible location, only a 40-minute drive away

from my institution. The proximity of the study site made it possible to conduct multiple interviews with key informants in the local area during the preliminary fieldwork preceding the survey and facilitated data collection via mail surveys.

Thus, after learning about the history of events through local media and online sources, the Seneca Lake LPG storage issue emerged as a highly viable context to study the strength-related attributes of trust. Based on this judgment, I designed preliminary fieldwork involving qualitative interviews to deepen my understanding of this issue and inform the design of the main study.

Preliminary Fieldwork on the Study Context

Goals of the Preliminary Fieldwork

Preliminary fieldwork took place between February and April, 2017 using semi-structured interviews with key informants. The interviews were designed to achieve several objectives. First, the interviews sought to verify the assumption that direct interactions between the public and the judgment targets would afford unique knowledge that could serve as the basis of strong forms of trust. According to the theoretical reasoning detailed in Chapter 2, individuals deeply involved in this issue would be very likely to have direct experience and specific observations about other parties with whom they interact. In the interviews during the preliminary fieldwork phase, I attempted to verify whether informants highly involved in the issue can indeed tap on knowledge running deeper than simple heuristics (e.g., value similarity) when they judge other targets. It was also important to identify the specific contents of those knowledge as they could potentially inform the design of the questions in the quantitative survey.

Second, the interviews sought to identify channels of communication through which potential participants would exchange information about this issue. To effectively operationalize

the three communication variables—direct interaction, news media use, and interpersonal discussion—it was important to consider all important modes of communication used in the context. In addition, the interview questions also explored whether any certain news outlets stood out as particularly more influential than others in the local context.

Third, in addition to informing the survey testing preestablished hypotheses about the strength-related attributes of trust, the interviews sought to identify any themes that would organically emerge from the participants' remarks so that the survey to follow could further investigate them.

Participants and Instruments

To achieve these goals, I conducted semi-structured interviews with nine individuals who had been actively involved in the Seneca Lake Gas Storage issue between February 2017 and April 2017. Nine out of 17 individuals invited completed the interview. The length of interviews ranged from 29 minutes to 84 minutes, with a mean of 54 minutes. The initial group of interviewees was selected based on their comments quoted in publicly available sources and were recruited via publicly available contact information. Upon interviewer's solicitation, some interviewees recommended other individuals who may also be interested in the study after completing their interviews. Interviews took place at interviewees' preferred locations using their preferred mode of communication. Accordingly, interviews were conducted in various settings including interviewees' office, residence, a conference room at the interviewer's department, or over the phone. Interviewees included two local politicians, one supportive of the gas storage project and the other opposing it. The other seven were residents and business owners who had been actively involved in this issue by contributing articles and letters to local media outlets or taking part in protests against the project. Among these, one was supportive of the gas storage

whereas the other six were opposed. All interviews were conducted one-on-one except for one case in which two participants joined the interview together. One participant was interviewed twice after leaving the first interview early before it was concluded. Table 3.2 lists the nine participants with anonymous code identifying each participant used in this dissertation. Interviews were digitally recorded using a voice-recording mobile application with participants' consent. The consent form informed participants that their names will be replaced with pseudonyms to keep their responses confidential and anonymous. The interview protocol was approved by Cornell University's Institutional Review Board for Human Participants.

Table 3.2 List of Interviewees and Interview Mode

Interviewee	Capacity	Interview mode
POL1	Local area politician supporting project	In person
POL2	Local area politician opposing project	In person
BIZ1	Business owner supporting project	Telephone
BIZ2	Business owner opposing project	In person
OPP1	Opposition group organizer	Telephone
OPP2	Opposition group organizer	Telephone
RES1	Resident opposing project	In person
RES2	Resident opposing project	Telephone
RES3	Resident opposing project	Telephone

The interview guides for the semi-structured interviews consisted of main questions designed to pursue the three goals outlined above (See Appendix A for full example of interview guide). The wording of the questions intended to cover all topics of interest while allowing participants to respond freely without feeling demanded to respond in a certain way. Interviews typically began asking the interviewee for an introduction, followed by questions covering the following subjects, among others: 1) Overall position in the issue; 2) Identification of influential

actors in the issue and trust and distrust toward each identified actor; 3) Personal sources of information on this issue; 4) Overall salience of the issue among the local community. Prior to each interview, I modified the guide slightly to accommodate specific questions appropriate for the interviewee. During the interview, probe questions were used to request more details on certain topics.

Interview Findings

1. Trust-related knowledge gained from direct experiences. Confirming the assumptions I held about this context, interviewees, all of whom had been actively engaged in the issue, were able to articulate their judgments of trust toward NYSDEC, Crestwood, and GFS with confidence, grounded in specific examples gleaned from personal experiences, observations, and discussions with others. Their responses also revealed the contents of information about these targets exchanged in the public discourse which may have been shared with other stakeholders in the issue through various communication channels.

Judgments of NYSDEC. When asked and probed about their trust or distrust in NYSDEC, Crestwood, and GFS, most participants were aware of each agency and organization and acknowledged their role as a visible actor in this issue. Moreover, most participants were able to make nuanced judgments about authorities at different ranks within NYSDEC (e.g., staff members, administrative law judge, commissioner) based on rich knowledge gained from deep involvement in the issue.

Expressing high trust in NYSDEC's technical staff, which had explicitly supported the project in its official capacity (Maglienti et al., 2015), POL1 said that the "legislature made the decision early on that we would abide by the wisdom and experience of the DEC staff." The

participant contrasted his experience with NYSDEC staff with his views of NYSDEC leadership by pointing to the staff member's commitment to technical soundness.

Come on, it's management, which is more political, they're political appointees, as opposed to the technical staff which is all technical. I had worked here for 30 years and had numerous projects with the DEC. [...] I know a lot of the characters over the years, and I've come to appreciate their technical abilities. So, I have no problem with admitting to the legislature's initial reaction that we would abide by whatever determination the DEC technical staff made in regard to the project. [POL1]

On the other hand, three interviewees expressed skepticism about NYSDEC staff members' trustworthiness based on observations made during the Issues Conference in February 2015. They noticed a pattern of close communication between Crestwood representatives and the DEC staff members and considered it as a signal casting doubt on the impartiality of the agency employees.

But, they were passing notes back and forth with the Crestwood attorneys, they were conferring with them during the proceeding, [...] it was very obvious that they were conversing in a way that none of the other parties were conversing. And, to some degree, being apologists for them. [POL2]

I'll tell you this observation after having sat in the hearing [...] The relationship between Crestwood and the DEC was very cozy, which was ... It belied objectivity because of this very, very cozy relationship between them. [BIZ2]

[...] (M)y friends who did attend the issues conference say that you could not tell the difference between the state lawyers and the Crestwood lawyers. I mean, they were saying the same things and taking the same positions. [RES2]

In other instances, participants opposing the project also explained their distrust in the NYSDEC staff by referring to their history of making decisions in favor of development or their lack of credentials to assess the concerns raised by opponents.

And you have to understand that the Division of Mineral Resources is not charged with denying permits for projects like this. [...] The mandate is to develop New York State's

mineral resources. [...] (T)hey were colluding with the gas industry on writing regulations governing the process of hydrofracking. [OPP2]

Another participant recalled that NYSDEC had expedited the environmental impact review process for a power company that had acquired a power plant shut down for three years without going through a full investigation process that he deemed was due.

The DEC approved them to go through a shorted, very quick SEQR, and the DEC does not think to be concerned about the citizens in the area or the law as much as they're concerned about the development in the area. I'm not sure what's behind it. Maybe they just don't have a lot of people, maybe they don't have a lot of money at the DEC. [RES3]

Another participant argued that NYSDEC lacked required credentials to issue geological decisions because the staff members in the agency were not licensed geologists. This participant pointed out that geologists became a licensed profession in New York State since 2016.

So whoever is looking at this may or may not have the same credentials as another geologist who does not work for the state DEC. One of the most interesting things I find with this whole project is that there is a requirement in the law that says that no permit shall be issued unless the project has been approved by the state geologist. [RES2]

However, interviewees on both sides of the issue distinguished their judgments toward the staff members from those toward the decision-making authorities while displaying awareness that the rulings by the latter are not necessarily bound by the opinions submitted by the former. For example, POL2 expressed deep trust in the administrative law judge presiding over the issues conference based on the judge's thorough command of the issue during the hearing. This participant explained that after Crestwood had dropped its plans to transport gas by truck, the project plan still included the truck loading facility. He was impressed when the judge pointed this out and demanded evidence about truck transport.

So, I'll have to say that the judge in this proceeding, James McClymonds, I feel, is very thorough, very careful, and actually very fair that he asked everyone questions that were, that required a good answer. [...] I mean, I felt like he always knew exactly where he was, what was going on, I was quite impressed by the judge. [POL2]

Others opposing the issue also anticipated that the NYSDEC leadership may not necessarily follow the recommendations submitted by the staff, citing political motivations driving the NYSDEC leadership.

Well, I think the state, I think the Cuomo administration, I mean he's obviously a political animal, and he's a sharp, shrewd guy. But I think ultimately he wants to do the right thing for the state and the people, and yet survive politically. So he would like to, I believe in his heart of hearts, deny this without losing red upstate New York. [BIZ2]

I actually think that the decision will be made politically. [...] So I think if the DEC mineral resources bureau has its way that fracking would be allowed in New York State, but the opposition was so strong that the governor decided that he would [...] do an assessment of the health impacts of fracking. [RES2]

In contrast, interviewees supporting the gas storage expressed frustration over what they saw as an unwarranted delay in the decision caused by NYSDEC and the New York State government leadership due to political reasons. POL1 explained that he had become aware from discussions with the NYSDEC staff members that they were ready to approve the project but they were frustrated by the lack of approval from the commissioner's office. BIZ1 similarly suggested that this was ultimately a decision for the governor who was deliberately delaying it.

And this lack of approval had been going on for some months and it became apparent to us that the evaluation of the project and the approval of the project wasn't being made based on the technical merits or concerns regarding the project but based on political considerations. [POL1]

The governor, as we understand it, it's a 100% up to him right now. The decision, as to whether to do it or not, [inaudible] it never has been, and he will make a decision. And

he's been, you know, who else can he ask? [...] And he's been quiet for six months almost. And I think people are sick of it. [BIZ1]

Judgments of Crestwood. Both supporters and opponents of the project agreed that the project applicant did a poor job establishing a positive first impression. Supporters of the issue, in particular, referred to the firm's failure to properly address community concerns early in the project.

I feel very strongly and they admit now that they handled the public relations terribly in the beginning. They came in as big corporations tend to do, and they're gonna do this, and we don't have to cater to the community, and do anything—this is what we're gonna do. They sent in a bunch of out of town people who'd talk to us and it was insulting. [BIZ1]

Asked to further elaborate on this impression, BIZ1 explained that his wife once returned from one of the firm's early public meetings feeling "absolutely furious."

They did not really answer questions. They said we'll let you know or they just did not give real answers when you ask them individual questions. And they burned the local bridges so badly that night, that they hardly ever recovered. [BIZ1]

They didn't respond to the critics in a timely manner. They left things fester way too long. And that lack of response, when people hear the same concerns over and over, and they read it in the papers and on the news, and the advertisements and so forth, that's when they begin to believe that's the fact. [POL1]

These supporters of the project, however, appreciated Crestwood's later efforts to improve its relationship with the public with refined public relations and making voluntary revisions to its project plan to address safety concerns raised by the opponents.

They have new people in there now, in the first place. They have a person who has worked very diligently with community leaders who talk to us and find out our opinions, [...]. And they have worked, as carefully as they can, to address the issues to make up for their ignorance, which went on for quite a few years. [BIZ1]

I was very pleasantly surprised when the applicant decided to propose a mitigation measure. [...] With those types of mitigation measures, [...] it pretty well eliminated the public safety concerns that [...] had a lot of residents from the village of Watkins Glen concerned. [POL1]

In contrast, in recalling their communication experiences with Crestwood's representatives, opponents of the project cited instances where they felt the company was deliberately denying its awareness of unfavorable evidence or was delivering empty threats to shut down the salt plant if it could not obtain the gas storage approval. POL2 recalled his interaction with a Crestwood employee during which he brought up a 2007 accident that occurred in Oneida, New York involving a derailed train with tank cars being ruptured and burnt. According to POL2, although the county's Emergency Management Office personnel who were at the same meeting were able to explain the event in great detail, Crestwood's employee at the meeting seemed to pretend that he had never heard about such an event.

Well listen, I said, what about the incident in Oneida New York where on flat ground a train derailed [...] and he said he didn't know very much about it. [...] So it became very clear that they were not somebody that I could trust that they were going to be frank with me about talking about the dangers so. [POL2]

POL2 also condemned how a Crestwood manager he met threatened that the company would close its currently operating salt plant if it cannot obtain the gas storage permit. At one point, he said, the manager argued that another salt company would purchase the plant simply to keep it shut and reduce competition. Similarly, RES2 perceived Crestwood's allegation as an empty threat.

And sometimes it's amazing how people can believe that other people are like really stupid. [...] How stupid do they think we are that we would believe that our company would buy a salt mine that's lake front property in upstate New York in the middle of this tourism area to just keep it shut, I mean. [POL2]

But what they were saying is, “If Crestwood doesn’t go ahead with this project, which is now going to create all of three jobs,” that they would close US Salt, which actually employs about 150 people. Well, that doesn’t make any sense at all. Why would you close a business that’s making money? [RES2]

In contrast to the supporters who viewed Crestwood’s recent efforts as a sincere gesture to engage community members, opponents appeared to use their distrust to interpret these actions as disingenuous attempts to obtain the permission.

“(T)hey’re trying, [...] they have hired an excellent PR firm, and they are trying to tweak the public image with advertising, with news stories, etc. They are trying to win on the public debate about this. [BIZ2]

Although recognizing that Crestwood’s decision to scale back the scope of the project was a positive move that “takes a big problem off the table,” POL2 said that petitions submitted to the administrative law judge against the project should not be withdrawn because he was concerned that Crestwood may reverse its decision to scale back the project.

(W)e have no understanding that that it’s a permanent change. [...] (I)f we withdrew the petition, they can turn around and change it, and we have no way to come back again, because at that point, it’s like, no, you withdrew the petition, you’re out of here. [POL2]

Judgments of GFS. As expected, opponents of the project expressed high trust in GFS. While some opponents of the project appreciated GFS’s approach in voicing its opposition with scientific analyses rather than protests, others mentioned the positive impression they had while observing the organization’s leaders in person.

I have tremendous respect for Gas Free Seneca. [...] (T)hey were focused not only on the science, but on the economy and jobs, and quality of life issues. They were never involved in the protests, although there may be people who have contributed to Gas Free Seneca that got arrested. [RES2]

RES1 described her experiencing GFS' leader at one of the early public meetings, watching her stand up and speak, RES1 said she thought, "This is the person who really has the energy and the understanding to do something, and I want to be part of that." This positive impression led her to support and join the organization.

As soon as Gas Free Seneca started its active protest and its very, I thought, very well organized outreach to wineries and communities around the lake, I felt confident that there was more that could be done, so I became a member of Gas Free Seneca, and a financial supporter of it as well. [RES1]

In contrast, BIZ1 opposing the issue expressed distrust in the organization by arguing against GFS's position that it was not involved in the civil disobedience protests. BIZ1 said he was involved in GFS, sincerely believing in the organization's honesty and intentions to work with the community. However, he said he was disheartened by what he described as "Gestapo-style tactics" used to overload local law enforcement resources through extensive protests, which he believed had damaging effects on the community and GFS' reputation. Regarding GFS' claim assertion of not being involved in these protests, BIZ1 said:

I personally think that's a blatant lie. I think they have a lot to do with it. And I know that they had members of the Gas Free board who were involved in the forming of Save Seneca Lake [sic]. [...] If you are on the board of directors of an organization, then, how can you do something that is opposed to the organization. [BIZ1]

Similarly, POL1 discredited GFS's movement as relying on unscientific fear-mongering and unfair personal attacks.

When the Crestwood opposition began, I was immediately turned off by the claims and the concerns voiced by the opposition. As having no, what I consider technical basis, it was fear-mongering. And they quickly, viewed me as an opponent, if you will. And there has some... there has been an effort to intimidate me. [...] Bullying tactics. [POL1]

Overall, these quotes vividly portray the type of specific experiences and knowledge people draw on to assess the trustworthiness of risk managers, developers, and opposition groups. The substance of these experiences and knowledge seemed to provide participants with sufficient ground to predict the targets' behavior in the future and to assess targets' motivations and interests underlying such behaviors. Participants' accounts also offered a glimpse of the effects of strong forms of trust, which led to positive interpretation of target's behavior (in the case of trust) or skepticism even in the face of apparently positive gestures from the target (in the case of distrust). For the quantitative phase of the study which followed later, these interviews were regarded as a snapshot of what trust or distrust may look like in its strongest form. I anticipated that in surveys with a more general population of local residents, strength of trust judgments would vary ranging from complete ignorance of these targets to awareness at the level displayed in these interviews.

2. Channels of communication. In addition to experiences of direct communication captured in quotations above, the interviewees also shared their experiences and insights about exchanging issue-related information through local media and discussion with other community members. When asked about prominent local media sources covering local affairs in the area, BIZ1 strongly lamented the decline of available news sources.

The TV station, the newspaper doesn't cover, meaning the Elmira and Ithaca papers, they don't cover this area anymore. [...] There is the, uh, Odessa File, which has a forum page and people occasionally by the letters, too. [...] News is restricted nowadays to word of mouth, Internet, tweets, so no, there's nothing I rely on. [BIZ1]

Instead, BIZ1 identified interpersonal discussion with other individuals in various local organizations as his primary mode of communication related to this issue.

I know people. I'm very involved in the economic development of the community. I'm onboard [inaudible] I'm in [redacted for anonymity], you know, I just know people. And I see them all the time. And I will admit that I certainly see [...] people who are not against the project. It's a totally different crowd of people who are protesting against it. [BIZ1]

In comparison, POL2 and BIZ2 appeared to acknowledge a larger role played by the local media. Similar to BIZ1, POL2 and BIZ2 also mentioned the role of The Odessa File, an online news website covering local Schuyler Count affairs, as a significant source of information.

But there have been some very thorough articles in the Star-Gazette down at Elmira. Then there's the local Review and Express. [...], I sent letters in and they'll publish them. Then locally in Watkins Glen, there's the Review and Express, and they covered the issue. [...] (T)here's the Internet news source, the Odessa File, you should write that down. [POL2]

No, I stay up on the Odessa Files, I read the Star-Gazette, local paper. I talk to people pro and con in the Watkins Glen area, which is kind of that area. [BIZ2]

As individuals actively involved in the issue, OPP1 and BIZ2 described how they had been personally involved in informing and persuading others on this issue through both media advocacy and interpersonal discussion.

I do believe that most of the people who have been paying attention to this issue at all, or have been reading the newspaper, or watching television, or listening to the radio, know that there's a distinction. That's been our sole mission is informing the public, and educating them about this. [OPP1]

But early on, I was in a lot of discussions with people, neighbors, friends. And I found most of the time when you use the reason-based approach that I like to think that I use, people could be swayed to realize this wasn't some great benefit for the area. [...] And the risk of a catastrophe happening is relatively high, so it's high-risk, low-benefit. [BIZ2]

On the other hand, RES3 expressed concern about the overall lack of interest in this issue in the local area and discussed communication on this issue through the media and interpersonal discussion as a phenomenon isolated among the minority who are actively involved. He observed that although a part of the public is very adamantly opposed to the project after thorough discussions and reading about the issue, the rest might be simply not interested in the issue.

Maybe 1 or 2% support it, but I think most people just read about it and are not that concerned, don't think it's a big deal, and maybe don't even read about it. They're more concerned in everyday things. [...] I think the majority of people don't see that as a major issue, or don't understand it, or don't even know about it. [RES3]

In sum, these accounts recognize a declining yet active role of traditional local media (e.g., newspaper, television) in circulating information about the Seneca Lake LPG storage. In addition, they acknowledge that online news sources may be playing an increasing role filling up some of the void in local news reporting despite the ruralness of the area. They also show how interpersonal discussions about the gas storage may take place among people, although this phenomenon might be more isolated to those who are already actively engaged in the issue.

3. Emergent theme: The “outsiders.” One salient theme that emerged early in the series of interviews, especially from participants who supported the project, was their expression of hostile attitudes toward protesters and opponents that came from farther away than the immediate vicinity of the project site. For example, the interviewees had pointed out the influence of people from Ithaca, a city with three college campuses located at the southern end of Cayuga Lake known for its politically liberal and environmentalist attitudes standing out in the region. Residents who were not from one of the counties surrounding Seneca Lake, including those from Ithaca, had actively took part in civil disobedience protests, which often led to large number of arrests (Wilson, 2016). In these accounts, interviewees used descriptors such as “tree-

huggers,” “outsiders,” and “bullies” to depict what they saw as an undue and disproportionately large influence on the issue disrupting their own area.

It’s a totally different crowd of people who are protesting against it. We tend to call them tree-huggers, things like that. You know, the Ithaca mentality. So they don’t hang around with me and I don’t hang around with them. [...] (T)he people who are doing the protest, physical protest [inaudible], do not have that ability to communicate. [BIZ1]

POL1 observed that Schuyler County’s public opinion was divided between the eastern and western part of the county such that the eastern part, overall opposing the project, was receiving influence from the liberal Ithaca area in the adjacent Tompkins County.

Tale of two cities. You’ve got the eastern part of the county, influenced somewhat by Ithaca. [...] I think a part of the population is suspect of outsiders, the influence of outsiders, and that perception is more prevalent further away you get from Ithaca or Hector. [POL1]

POL1 also suggested that this opposition movement influence by outsiders was “very well coordinated, well funded” and “well organized.” He suggested that when he asked business owners who were inclined to support the project to publicly voice their support, they refused out of fear of intimidation. POL1 further argued that counties and municipalities further away from the project site which adopted resolutions against the project made their decision not based on sound knowledge or reasoning but under heavy influence of the allegedly fear-inducing tactics employed by outside opposition groups.

(We) have a legislator on the board who has made it his primary objective to evaluate how they have their own decision-making done, and what do they do to educate themselves in regards to these issues. And virtually in all the cases, they did nothing. They were reacting strictly to the fears of the opposition. [POL1]

Underlying the remarks of both BIZ1 and POL1 was the assumption that the residents of administrative units which included the project site (e.g., Schuyler County, Town of Reading)

held exclusive legitimacy in voicing their opinions to influence this issue. Interested by this emergent theme, I decided to further explore this notion during interviews with opponents of the project by bringing up how supporters of the issue characterize some protesters as outsiders and what they thought about it. Surprisingly, the responses were far more colorful than a monotonous rejection of the outsider/insider distinction. While none of the opponents explicitly endorsed the distinction, some acknowledged that it was a frame resonating with the local residents closer to the storage site (e.g., Schuyler County), negatively affecting the credibility of the larger opposition movement.

(I)n the local community, you know, Ithaca has a very liberal reputation, so you know when groups over there, do you need people to come, it's like, no don't bother because, they don't want to hear from anyone that's not a resident of our county. [POL2]

Unfortunately, this ongoing civil disobedience campaign has, let's just say some of the locals who were concerned about the project, got angry with the people that were getting arrested. Because it was costing them money, the taxpayers money and using up sheriff's resources. And it turned a lot of people locally off. [OPP1]

RES2, while not explicitly contesting the insider/outsider distinction, instead argued that the boundary between inside and outside should be expanded to include all communities directly dependent on the lake.

Well, my feeling is that anybody who drinks, recreates, or makes their living from, or lives on Seneca Lake should have a say on this issue, that it's not strictly a Schuyler County or Town of Reading issue [...] (I)t's not just a drinking water source for Schuyler County. Seneca Lake is a drinking water source for the entire region. [RES2]

On the other hand, RES1 and RES3 explicitly rejected the distinction between insiders and outsiders, pointing out to the connectedness across people and people's right to voice their opinions on social issues.

I don't think there are insiders or outsiders on this. As far as environmental issues are concerned, if you don't recognize that everything connects, then you're not a real environmentalist. [...] The people who are in the legislature and the people in the Town of Reading do not consider tourists outsiders, because they're spending money there, and as long as they're well behaved tourists, they love them. [RES1]

RES1 further pointed out that people often engage in protests to promote larger social justice, even without holding immediate stake in the issue.

I mean, there were people protesting the war in Iraq who had no, in quotes, "stake" in it, and yet to believe for one minute that you're not connected with people all over the world, or other mothers and fathers with children going to war, that's crazy. So yeah, protest, and the idea of in and out is wrong. [RES1]

RES3 acknowledged that the legal system requires that one essentially needs to have something to lose to have standing in an issue. However, similar to RES1, he suggested that people can seek voice and influence in broader social issues such as when many from around the nation joined to protest the Dakota Access pipeline in solidarity with Native American tribes.

I think maybe the people with standing have more of a say, but I think everybody should have some say on this because it's a president setting putting fuel over the safety and environment of the people that live there. [...] You don't have to be from the area to see this as a major concern. [RES3]

The most intense challenge against the supporters' insider/outsider taxonomy was raised by BIZ2 who not only shared beliefs about the connectedness of the region and its people with RES1 and RES3, but also went further to argue that Crestwood, the project applicant from Texas, was in fact the "outsider."

They're the ones that are from outside the region, they're from Texas. The people there might not all be on Seneca Lake, but all the communities on Seneca Lake except Reading Center and Watkins voted against this. [...] Crestwood cares nothing about the Finger Lakes [...]. They care about the cheapest way to store gas. [BIZ2]

Overall, findings from the interviews reveal diverse perspectives based on different assumptions disputing who should and who shouldn't have voice to influence the siting decision. On one extreme, among the supporters of the LPG storage project, there seems to be a clear rejection of voices from other counties which views the influence of "outsiders" as unwarranted. On the opposite extreme, Crestwood, the project applicant, was characterized as the "outsider" disrupting the community character. However, between these two extremes, the interviews found a variety of more moderate viewpoints, including some calling for the adjustment of the inside/outside boundary to include a larger geographical scope and others rejecting the dichotomous distinction, assuming that people from farther regions had legitimate reasons to be concerned about the project.

Fascinated by this diversity in social judgments directed toward others seeking to have voice in this issue, I decided to include preliminary measures to assess these perceptions in the quantitative survey under preparation. To design an exploratory study identifying the conceptual role of these perceptions in theory, I also decided to include possible correlates of these perceptions. On the one hand, it could be that these judgments were politically motivated based on whether stakeholders in the issue see the "outsiders" as potential allies or foes in the dispute. On the other hand, it might also be possible that these judgments were driven by stakeholders' beliefs about and identities within the region (e.g., their relative attachment to Schuyler County, Seneca Lake, or Finger Lakes region). I also sought to explore the relationships between "outsider" perceptions and these potential correlates and accordingly included relevant variables in the survey. These variables are further discussed in Chapter 5.

Conclusion

A review of previous research suggested that risk management issues at the local environment can provide promising opportunities to test the causes and effects of strength-related attributes of trust. This is because local contexts bring together parties of interest into physical co-presence raising the possibility of direct interaction, enhancing the sense of personal relevance of the issue, increasing exposure to information about the focal issue through local media, and facilitating interpersonal discussion about the issue.

Accordingly, I selected an environmental dispute over the siting of an LPG storage using salt caverns under a scenic lake in upstate New York as a viable context to test the role of strength-related attributes of trust. Confirming expectations derived from previous research, interviews from the preliminary fieldwork in the context revealed that individuals highly involved in the issue used rich and pertinent knowledge to form judgments of trust on key actors in the issue. In addition, they relied on various communication channels to acquire their information which included direct communication with and observation of the judgment targets, following the news from local media, and interpersonal discussion with other community members. In accordance with these findings, I designed a quantitative survey to test the antecedents and consequences of strength-related attributes of trust. Chapter 4 describes the method and results of this study in detail.

In addition, during the interviews, it was found that participants not only judge risk managers, but also spontaneously make judgments about groups and people from other areas seeking to influence the issue, an emergent pattern that was not a preplanned focus of this study. In designing the quantitative survey, I also added questions to explore the conceptual role of these judgments and present findings related to this line of inquiry in Chapter 5.

The findings in this chapter are not generalizable to a larger population. In addition to the small number of participants, they were all very actively involved in the issue, often with more capacity to influence the decision makers relative to ordinary members of the public. Nevertheless, because of their active involvement, the participants were able to offer insightful perspectives for a study seeking to understand the role of rich knowledge, thinking, and conviction in risk communication. The participants also provided me with rich information that bolstered my understanding of the context. Drawing on these findings, the next chapter presents an empirical study showing a new approach to study trust in risk management using the concept of attitude strength.

CHAPTER 4

WHEN TRUST IS DURABLE AND IMPACTFUL: REVEALING THE STRENGTH-RELATED ATTRIBUTES OF TRUST

In most risk communication literature, researchers have treated trust as a type of an attitude. One of the earliest theorizations of trust in the field by Renn and Levine (1991) posited that trust comprises five components: perceived competence, objectivity, fairness, consistency, and faith. Numerous subsequent studies in the field have invested considerable effort in revealing the underlying dimensions of trust (Allum, 2007; Earle et al., 2007; Frewer et al., 1996; Hunt, Frewer, & Shepherd, 1999; Johnson, 1999; Peters et al., 1997; Poortinga & Pidgeon, 2003; Siegrist et al., 2012; Slovic, 1993; White & Eiser, 2006). A common feature binding these studies is that their operationalizations of trust ask participants to make a series of evaluative judgments on a risk-managing target using multiple items. Indeed, a comprehensive review of trust research in the field by Earle (2010) suggests that soliciting evaluations of a risk manager on a set of qualities is the most prevalent mode of measuring trust in risk managers. These types of evaluative judgments exemplify typical definitions of attitudes including the broadly cited one by Eagly and Chaiken (1993) who posited that an attitude is a “psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor” (p. 1).

Despite this tendency to treat trust as an attitude, as this chapter will argue, research of trust in risk communication has been lagging in theory development because it has neglected important advances made in research on attitudes. This neglect has resulted in a detrimental dearth of theoretical guidance as researchers seek to identify the conditions under which trust will deliver on its promises for better cooperation with risk managers. In other words, although previous studies tell us a great deal about the possible antecedents, consequences, and underlying

dimensions of trust, we know far less about when trust matters or not. Instead of treating the variance in the effects of trust as an empirical question, studies have often simply assumed that such variances originate from some unexplained differences in the technologies or type of risk managers studied across different contexts.

The current chapter builds on previous research on attitude strength to improve theorization of trust in risk communication research. Specifically, the current study shows how research can better predict when trust becomes durable and impactful by measuring and modeling attributes of attitude strength related to trust. Furthermore, it seeks to reveal the communication processes that contribute to the strength in trust judgments drawing on findings from previous communication research. To this end, I test hypotheses derived from attitude strength and communication research using a survey conducted in the context of a local environmental dispute.

Literature Review

Attitudes as Constructions versus Retrievals from Memory

One of the most central and perennial debates going on in research about attitudes concerns the ontological status of the concept. That is, there is a continued disagreement on whether people merely *construct* an evaluative judgment on the spot whenever they need to make one or *retrieve* attitudes stored in memory upon encountering an attitude object. Part of this disagreement stems from competing evidence suggesting that whereas attitudes often tend to be vulnerable to apparently trivial contextual influence, they can also be very stable (Bohner & Dickel, 2010).

Researchers who view attitudes as constructions (e.g., Conrey & Smith, 2007; Gawronski & Bodenhausen, 2007; Schwarz, 2007) hold that attitudes are evaluative judgments formed using

feelings or thoughts most salient and accessible at the time when such judgments are needed. Thus, they effectively reject the proposition that people store evaluative information about possible attitude objects in their memory and refer to them to make judgments. According to this perspective, our evaluative judgments are the result of affective responses depending on the mental associations activated when we encounter an attitude object (Gawronski & Bodenhausen, 2007). This perspective parsimoniously explains why attitudes are dependent on context. Subtle changes in context such as question wordings (Schuldt, Konrath, & Schwarz, 2011; Schuman, Presser, & Ludwig, 1981; Schwarz, 1999) or different states of mood across time (Isen, Shalker, Clark, & Karp, 1978; Schwarz, Strack, Kommer, & Wagner, 1987) can sway our evaluative judgments because different inputs render different information more accessible in the judgment (Schwarz, 2007). On the other hand, according to this perspective, stable attitudes may be observed because inputs across judgments may have similar evaluative implications or because repeated judgments of the same object render certain information chronically more accessible than others (Schwarz, 2007).

On the other hand, other researchers argue that evaluative judgments occur because people retrieve stored attitudes from memory (Fazio, 2007; Petty, Briñol, & Tormala, 2007). According to Fazio (2007), attitudes are associations between attitude objects and attached evaluations represented in memory varying in strength and activated upon encounter of the object. This view posits that attitudes are simply another type of knowledge holding evaluative information summarizing past experiences with an object. Thus, attitudes can serve as an adaptive mental system containing summary evaluations of an object, enabling people to learn from past experience, and react quickly and efficiently in future encounters with the object. In their Meta-Cognitive Model of attitudes, Petty et al. (2007) go one step further to argue that

alongside evaluative associations, people can also attach meta-cognitive judgments about the validity of such object-evaluation associations. The value of these ‘validity tags’ result in varying degrees of confidence by which attitudes are held. The perspective seeing attitudes as retrievals from memory, however, is open to the possibility that *some* attitudes can be constructed—for novel entities that one has never evaluated before, one will have to establish new judgments from scratch (Fazio, 2007). Such construction may vary in cognitive effort depending on the perceiver’s motivation to reach an accurate judgment (Fazio, 1990).

Inconsistent Assumptions of Trust in Risk Research

These competing perspectives toward attitudes invite risk communication researchers to reflect on their assumptions about attitudes when they study trust. To my knowledge, no articulated theory of trust in risk research has explicitly aligned itself with either of these perspectives. However, one may still infer the assumptions these studies make from their theoretical propositions or measurement approaches.

On the one hand, they seem to assume that participants hold specific evaluative judgments based on some information stored in their memories, such as when a given study asks specific questions directly relevant to judgments of trust (e.g., honesty, responsibility, care, expertise, competence) about a certain target. Many studies exploring the dimensionality of trust have taken this approach. Studies adopting these types of measurements assume that evaluative judgments of various dimensions are like file drawers that participants can refer to when they are asked to rate the trust of risk managers. Accordingly, trust becomes a stable disposition of an individual which has an enduring influence on risk management consequences such as risk perception and acceptance of technology.

On the other hand, some theoretical perspectives contend that people cannot form and hold such knowledge in memory due to its large cognitive demand and instead resort to heuristics that are not immediately diagnostic of trust (Earle, 2010). Heuristics determining trust in risk managers may include perceived similarity to the risk manager in identity or values (Earle et al., 2007; Siegrist et al., 2000), affect at the time of judgment which may be unrelated to the risk (Dunn & Schweitzer, 2005), and even global judgments about the risk issue (e.g., risk perception, acceptability of technology), which are often considered as the consequence of trust in other theories (Poortinga & Pidgeon, 2005). In a similar vein, risk communication studies drawing on Hovland et al.'s (1953) seminal work on source credibility have also operationalized the construct as a heuristic (McComas & Trumbo, 2001; Trumbo, 1999). The trust, confidence, and cooperation model of trust (Earle et al., 2007) and its precedent theory, the salient value similarity theory of social trust (Cvetkovich, Siegrist, Murray, & Tragesser, 2002; Siegrist et al., 2000) explicitly articulate their assumptions about trust formation arguing that any values "currently active for the observer" (Earle et al., 2007, p. 9) comprise the criteria by which a risk manager will be judged on its moral and relational aspects. Assumptions underlying these theoretical approaches are highly consistent with the view that attitudes are constructions established on the spot as needed.

Overall, whereas individual studies have often operationalized trust as if evaluative judgments of risk managers can be retrieved from memory, influential theoretical perspectives in the field tend to assume that people construct their trust judgments using salient information available at the time of judgment. Scant, if any, visible effort in risk communication research has sought to explicitly acknowledge and reconcile these inconsistent assumptions. Actively addressing this inconsistency can help advance theory on trust in a similar way the debate on the

ontological status of attitudes has induced researchers to explicate when attitudes are stable versus context-sensitive.

When does Trust become Durable and Impactful? An Attitude Strength Perspective

The view that trust judgments are primarily constructed using heuristics such as similarity, affect, or acceptance of technological risks can well explain how people can make judgments about risk managers they barely know. Although people may hold very little information about a particular risk manager (Hunt et al., 1999; Walls, Pidgeon, Weyman, & Horlick-Jones, 2004), people requested to evaluate it in a survey are still likely to provide some kind of response. Even when people hold no information about a risk-managing agency in memory, the name of the agency alone may suffice to invoke mental associations that allow respondents to construct a judgment of trust (Walls et al., 2004). Nevertheless, few research efforts in the field have sought to explain how the effects of trust constructed on the spot using heuristics differ from trust retrieved from evaluative judgments stored in memory.

Research has pointed the concept of attitude strength as a key moderator which can help explain when attitudes are constructed versus retrieved from memory (Bohner & Dickel, 2010; Fazio, 2007; Nayakankuppam, Priester, Kwon, Donovan, & Petty, 2018; Petty et al., 2007). According to the definition by Krosnick and Petty (1995), an attitude is strong to the extent that it possesses four defining features: 1) it remains unchanged over extended period of time (persistence); 2) it withstands counter-attitudinal attacks (resistance); 3) it influences information processing and judgments by making it easier for certain information to come to mind or some decisions to be made, often leading to bias (impact on information processing); and 4) it guides attitude-consistent behavior (impact on behavior). In this study, I refer to these outcomes as *strength-defining consequences*. Whereas the first two of these features can be categorized as

indicators of an attitude's durability, the latter two can be considered as indicators of an attitude's impactfulness.

Petty and Krosnick's (1995) edited volume identified and reviewed evidence for several determinants of attitude strength, which I refer to as strength-related attributes of attitudes. These include *knowledge*, which is defined as the amount of information stored in memory related to an attitude object (Wood et al., 1995); *elaboration*, which is the amount of relevant thinking one has done about an attitude object (Petty et al., 1995; Wegener et al., 1995); and *certainty*, which is the subjective sense of conviction about one's attitude (Gross et al., 1995) or the extent to which one is confident or sure of one's attitude (Tormala & Rucker, 2007). Thus, an attitude strength approach would predict that attitudes based on more knowledge, formed through more elaboration, and held with higher certainty will be more durable and impactful.

Early empirical evidence has shown that attitudes high in strength in terms of certainty or accessibility (i.e., the ease with which an attitude comes to mind) tend to be more resilient against manipulations inducing bias (Chaiken & Baldwin, 1981; Hodges & Wilson, 1993). Furthermore, in a recent article, Nayakankuppam et al. (2018) conducted three studies directly testing the hypothesis that attitude strength determines when attitudes are constructed or retrieved. Their findings reveal that when participants spend little cognitive effort on an attitude object (i.e., weak attitudes), their evaluations of the object seemed to be the product of construction. In contrast, when the same object was processed with high elaboration (i.e., strong attitudes), evaluations seemed to be retrieved from memory.

These findings bear significant implications for risk research because, as reviewed above, most of the current theories consider trust as a construction based on heuristics. According to the attitude strength perspective, such theories may only account for the effects of weak trust

judgments, which are less likely to be durable or impactful. This is a problem because for risk managers, investing resources to build trust is a long-term effort with uncertain outcomes. Trust is not very useful if it collapses easily in crisis situations or exerts minimal influence on the perceiver's behavior no matter how positive its valence. To be informative, a comprehensive theory of trust needs to explicate when trust will become strong—persistent, resistant, and influential on subsequent information processing and behavioral states.

Strength-Related Attributes of Trust: Antecedents and Consequences

(Objective/Perceived) Knowledge, Elaboration, and Certainty. In the current study, I focus on four strength-related attributes of attitudes—objective knowledge, perceived knowledge elaboration, and certainty—that were judged to be highly relevant to and potentially useful for risk communication research. Knowledge about the judgment target has been studied as a key component of trust in theories of interpersonal trust development. In particular, Lewicki and Bunker (1995) argue that whereas trust at the beginning of relationships is rooted in the calculus of the partner's motivation to continue (vs. defect from) the relationship, trust in more mature relationships takes root in the knowledge about the partner (e.g., preferences, intentions, problem-solving approaches). Interestingly, consistent with the attitude strength perspective, these authors predict that the latter form of trust based on knowledge is also more resilient against trust-violating events. In this study, I refer to the amount of actual knowledge relevant to the judgment target as objective knowledge.

However, it may be useful to separately consider the role of one's perceived knowledge, which is one's subjective sense of the amount of knowledge stored in memory about the target (Visser & Holbrook, 2012). Previous research suggests that although obtaining new information about an object can increase the sense of perceived knowledge (S. M. Smith et al., 2008), in

some cases, it may also lead to less perceived knowledge (Kruger & Dunning, 1999). Similarly, previous research has found that the correlation between objective and perceived knowledge is only weak (Radecki & Jaccard, 1995).

In addition, elaboration plays a significant role in the development of trust in relationships. When trust-building is in progress, information obtained from direct interaction or observation needs to be further processed to make interpretations about their meaning and inferences about trustworthiness. Likewise, effortful cognitive activities figure prominently in the decline of trust when one attempts to make sense of the partner's action violating trust. While emotional responses also influence the decline of trust, the individual also needs to determine cognitively how important the violation is and how to attribute responsibility (Lewicki & Bunker, 1996).

Finally, certainty can facilitate the development of trust when it is bolstered through direct and repeated interactions (Tormala & Rucker, 2007). Previous research has found that people with direct experience with the attitude object become more confident in their attitudes than those with only indirect experience. This confidence, in turn, predicted strength-defining consequences such as attitude-expressive behavior (Fazio & Zanna, 1978). In addition, repeated encounters with the target in an ongoing relationship can also increase certainty because repeated expression of attitudes increases confidence in attitudes (Holland et al., 2003; Petrocelli et al., 2007).

Antecedents of strength-related attributes. In light of previous research on knowledge, elaboration, and certainty, understanding the sources of these strength-related attributes of trust needs to consider how people gain information about risk managers, when people are prompted to form judgments about them, and when they become motivated to think deeply about them.

Accordingly, using variables that capture interpersonal and mediated communication experiences in which people talk with, observe, or discuss risk managers appears to be a promising approach to predict these strength attributes. Using types of communication observed during the preliminary fieldwork phase (Chapter 3), this study considers three primary modes of communication experiences as antecedents of knowledge, elaboration, and certainty.

First, direct interactions with risk managers afford opportunities to learn and think deeply about risk managers. In interviews conducted during the preliminary fieldwork, participants referred to instances in which they saw representatives of NYSDEC, Crestwood, or GFS in person. For example, interviews with participants opposed the project who had attended the issues conference reveal how merely observing NYSDEC staff members exchanging notes or talking privately with Crestwood lawyers led them to suspect NYSDEC's impartiality as a risk manager. Communication studies have regarded direct, face-to-face interactions with a special status in that they enable exchange of rich information between involved parties. Compared to conversation mediated through telecommunication technologies or written text, face-to-face interaction affords immediate feedback and multiple nonverbal cues such as body language and tone of voice (Daft & Lengel, 1986; Lengel & Daft, 1984). This richness of information reduces ambiguities and uncertainty in communication by adding contextual information. Face-to-face interaction also entails focused attention between the two parties, which makes them sensitive to various cognitive and emotional cues informing judgments about each other (Boden & Molotch, 1994). For these reasons, individuals may detect subtle cues signaling unarticulated intentions such as condescending smirks or displays of reluctance to disclose information to form rich judgments about risk managers. In addition to making available rich information about the target,

direct interactions will also afford opportunities and motivation to reflect meta-cognitively on the validity of judgments made about the target (Tormala & Rucker, 2007). Thus, I hypothesize:

H1: *Direct interaction with judgment targets will be positively related to objective knowledge about the targets.*

H2: *Direct interaction with judgment targets will be positively related to perceived knowledge about the targets.*

H3: *Direct interaction with judgment targets will be positively related to elaboration about the targets.*

H4: *Direct interaction with judgment targets will be positively related to the certainty with which trust judgments about the targets are held.*

Second, use of community-focused media such as local news can predict the strength in judgments about risk managers. Participants in the preliminary fieldwork interviews identified local newspapers and online news channels as possible sources of information about the gas storage project. Although mediated experience may not be as impactful as direct interactions with risk managers, local residents may still intake considerable information about risk managers by attending to news about the issue. Such information may include quotations from and observations of authorities and experts involved in the risk management process. Such experiences of learning about the issue can also present opportunities to think about the risk managers featured in the news. Studies of mass communication have consistently found that use of news media, especially printed media such as newspapers or magazines, is a strong predictor of knowledge in public affairs (Jennings, 1996; Robinson & Levy, 1996; H. H. Smith, 1986; Tichenor et al., 1970). In addition, community members paying more attention to local media have also been found to have more extreme attitudes toward local issues (Scheufele et al., 2002),

higher interest, knowledge, and participation in local politics (McLeod et al., 1996) and deeper knowledge structures in politics (Curnalia, 2010). Research has also found that media use facilitates elaboration about political figures (Birch & Allen, 2015). Accordingly, I hypothesize positive relationships between local news media use and strength-related attributes of trust.

H5: Use of local news media will be positively related to objective knowledge about the judgment targets.

H6: Use of local news media will be positively related to perceived knowledge about the judgment targets.

H7: Use of local news media will be positively related to elaboration about the judgment targets.

H8: Use of local news media will be positively related to the certainty with which trust judgments about the targets are held.

Third, members of a community and other stakeholders may discuss with each other the conduct and intentions of their risk managers. Interview participants have mentioned occasions in which they tried to persuade others about the issue and what they heard from close others who had direct experiences observing or interacting with the risk managers. In addition to spreading information about the judgment targets to a larger number of people, interpersonal discussions can also facilitate thinking about such information. Researchers have argued that interpersonal communication and subsequent elaboration on issues can stimulate the formation of strong attitudes. Valentino and Sears (1998) found that interpersonal communication about political events plays a pivotal role in political socialization processes in which political attitudes acquired during adolescence from close others such as family carry over into adulthood. Zaller and Feldman (1992) suggested that increased thinking induced by discussions can help strengthen

attitudes by sensitizing individuals to conflicting and ambivalent considerations underlying an attitude and motivating them to establish consistency across those cognitions. McLeod et al. (1999) found that interpersonal discussion increased elaboration about political information, which in turn positively affected participatory behaviors in politics. Eveland (2004) found that discussion increases knowledge and elaboration because individuals mentally rehearse in anticipation of interpersonal discussions and also because the discussion itself stimulates deep thinking. Thus, interpersonal discussion is hypothesized to positively affect strength-related attributes of trust:

H9: Interpersonal discussion will be positively related to objective knowledge about the judgment targets.

H10: Interpersonal discussion will be positively related to perceived knowledge about the judgment targets.

H11: Interpersonal discussion will be positively related to elaboration about the judgment targets.

H12: Interpersonal discussion will be positively related to the certainty with which trust judgments about the targets are held.

Finally, it seems reasonable to test the extent to which these three communication antecedents explain unique or overlapping variance in the four strength-related attributes. This may be achieved by simultaneously entering these variables into multiple regression models predicting each strength-related attribute. Considering the lack of theoretical guidance to formulate a hypothesis, I proffer the following research question:

RQ1: Do the three communication antecedents explain unique or overlapping variance in strength-related attributes of trust?

Consequences of strength-related attributes. Based on general predictions derived from attitude strength research (Petty & Krosnick, 1995; Visser et al., 2006; Visser & Holbrook, 2012), the four strength-related attributes in the current study can be expected to overall positively predict the four strength-defining consequences: 1) persistence over time, 2) resistance to counter-persuasive appeals; 3) impact on information processing; and 4) impact on attitude-expressive behavior.

First, as for the persistence of trust, which is operationalized as a binary variable indicating whether the valence of trust regarding the same target had changed between the two waves of the survey, I hypothesize only the main effects of strength-related attributes of trust. In other words, I predict that the greater one's trust judgment is in strength-related attributes, the less likely it is that the valence of trust will change between Wave 1 and Wave 2. It should be noted here that for persistence, trust or the interaction between trust and strength-related attributes are excluded from models predicting persistence because this would result in a regression equation where the judgment of trust at Wave 1 is included in both sides of the equation. This approach testing only the main effects of strength-related attributes on persistence is consistent with past research (Bassili, 1996). In addition to individual tests of the effect of each strength-related attribute, I also examine whether they account for unique or overlapping variance by entering them simultaneously into a single model predicting persistence.

H13: *Objective knowledge will be positively related to the persistence of trust judgments.*

H14: *Perceived knowledge will be positively related to the persistence of trust judgments.*

H15: *Elaboration will be positively related to the persistence of trust judgments.*

H16: *Certainty will be positively related to the persistence of trust judgments.*

RQ2: Do the four strength-related attributes explain unique or overlapping variance in persistence?

Next, the strength-related attributes will positively affect resistance. Because resistance in this study was operationalized using two different approaches, some explanation of these outcome variables is necessary. Both measures of resistance were participants' response to a mock news article challenging their judgment of trust toward the target at Wave 1. The first resistance outcome, which I call *post-persuasion judgment*, was a single-item summary judgment of trust. The second resistance outcome, counterarguing, was participants' self-reported degree of reactance against the article. Because participants who expressed positive trust judgments (trusters) in Wave 1 received and responded to a differently valenced article than those who expressed negative judgments (distrusters), the two groups are analyzed separately. In these separate analyses grouping participants by trust valence, each strength-related attribute will intensify the group's general tendency to react to the reactance outcome task, which will manifest as each attribute's main effect. In addition, the strength-related attribute will enhance the main effect of trust on the resistance outcome (Fazio & Zanna, 1978; Rucker & Petty, 2004; Sawicki et al., 2011), which will manifest as a trust \times strength-related attribute interaction.

The expected direction of the hypotheses will differ between the two resistance outcomes because trust at Wave 1 will always have a positive main effect on post-persuasion judgments in both trusters and distrusters, but not for counterarguing. For the post-persuasion judgment task, the main effect of strength-related attributes will be positive for trusters but negative for distrusters (e.g., among distrusters, those more certain of their trust judgments are more likely to express negative judgments after reading a positive article). However, the main effect of the strength-related attributes on counterarguing will be positive for both trusters and distrusters who

are both exposed to counter-attitudinal material customized to challenge their position. In addition, because the interaction effect (strength-related attribute \times trust) is expected to enhance the main effect of trust, its valence should be consistent with the expected main effect of trust in each analysis. Thus, it is hypothesized that the interaction effect will be positive in both tasks for trusters, but positive in the post-persuasion judgment task and negative in the counterarguing task for distrusters. The valence of the hypotheses in each analysis is summarized in Table 4.1.

Table 4.1 Predicted valence of hypothesized effects on resistance outcomes

	Post-persuasion judgment		Counterarguing	
	Truster	Distruster	Truster	Distruster
Strength attribute (H17a-H20a)	+	-	+	+
Trust	+	+	+	-
Interaction (H17b-H20b)	+	+	+	-

H17a: *Objective knowledge will have a main effect on resistance outcomes consistent with predictions in Table 4.1.*

H17b: *Objective knowledge will have an interaction effect with trust on resistance outcomes consistent with predictions in Table 4.1.*

H18a: *Perceived knowledge will have a main effect on resistance outcomes consistent with predictions in Table 4.1.*

H18b: *Perceived knowledge will have an interaction effect with trust on resistance outcomes consistent with predictions in Table 4.1.*

H19a: *Elaboration will have a main effect on resistance outcomes consistent with predictions in Table 4.1.*

H19b: *Elaboration will have an interaction effect with trust on resistance outcomes consistent with predictions in Table 4.1.*

H20a: *Certainty will have a main effect on resistance outcomes consistent with predictions in Table 4.1.*

H20b: *Certainty will have an interaction effect with trust on resistance outcomes consistent with predictions in Table 4.1.*

RQ3: *Do the four strength-related attributes explain unique or overlapping variance in resistance outcomes (post-persuasion judgment / counterarguing)?*

In addition, strength-related attributes were hypothesized to enhance the positive effect of trust on information processing favorable toward the target. Specifically, participants were asked to attribute the cause of a hypothetical mishap on part of the judgment target without learning the full details about the event. One of the available attributions (i.e., external attributions) were more favorable to the target, whereas the other two were less favorable (i.e., internal attributions) (Heider, 1958). I assumed that the more one trusts the judgment target, the more likely he or she will use the favorable attribution upon learning about a negative event related to the target. This effect of trust will be augmented as the strength-related attribute increases which should manifest as an interaction effect between trust and the attitude strength attribute. I predict no main effect of the strength-related attributes because these effects will differ in valence between trusters and distrusters. Additionally, I examine whether each strength-related attribute accounts for unique variance.

H21: *As objective knowledge increases, the effect of trust on favorable attribution of mishap information will increase.*

H22: *As perceived knowledge increases, the effect of trust on favorable attribution of mishap information will increase.*

H23: *As elaboration increases, the effect of trust on favorable attribution of mishap information will increase.*

H24: *As certainty increases, the effect of trust on favorable attribution of mishap information will increase.*

RQ4: *Do the four strength-related attributes explain unique or overlapping variance in favorable attribution of mishap information?*

Finally, the strength-related attributes of trust will enhance the effect of trust on trust-expressive behaviors. Because behaviors indicative of future trust-related outcomes (e.g., acceptance of unfavorable risk management decision) could not be measured with a survey, I used behavioral intentions, which is often considered as the closest predictor of trust (Ajzen, 1991) as a proxy variable to assess the impact on trust-expressive behavior. Behavioral intention items related to cooperation with each of the three judgment targets were measured in both waves of the survey. Because trust will be positively associated with cooperative behavioral intentions, the interaction effect which indicates the enhancement of trust's effect will also be positive. In addition, I examine whether each strength-related attribute accounts for unique variance.

H25: *As objective knowledge increases, the effect of trust on trust-expressive behavioral intentions will increase.*

H26: *As perceived knowledge increases, the effect of trust on trust-expressive behavioral intentions will increase.*

H27: *As elaboration increases, the effect of trust on trust-expressive behavioral intentions will increase.*

H28: *As certainty increases, the effect of trust on trust-expressive behavioral intentions will increase.*

RQ5: *Do the four strength-related attributes explain unique or overlapping variance in behavioral intentions?*

Value of separately measuring strength-related attributes of trust in surveys.

Because the strength-related attributes in the current study are theoretically independent from trust itself (Petty & Krosnick, 1995), they should be able to account for additional variance in the strength-defining consequences of trust. Thus, I predict that the strength-related attributes of trust will account for unique variance in the strength-defining consequences beyond what is already accounted for by trust. This test was not run for persistence because, as described above, predicting persistence with trust could be problematic.

H29: *The strength-related attributes of trust will account for unique variance of resistance outcomes (post-persuasion judgment / counterarguing) in addition to what is accounted for by trust.*

H30: *The strength-related attributes of trust will account for unique variance of information processing (i.e., favorable attribution of mishap information) in addition to what is accounted for by trust.*

H31: *The strength-related attributes of trust will account for unique variance of trust-expressive behavioral intentions in addition to what is accounted for by trust.*

Method

I tested these hypotheses using data collected from a two-wave survey in a local environmental dispute setting. As discussed in detail in Chapter 3, local-level issues can be fertile ground to observe different communication processes lending variance to strength-related

attributes of trust. The specific context used in the survey was the dispute over the siting of an LPG storage using salt caverns under the scenic Seneca Lake in upstate New York. At the time of data collection, NYSDEC was reviewing the draft environmental impact statement submitted by a Texas-based energy company named Crestwood as part of the permit application while various civic groups including GFS were leading opposition movements. The NYSDEC commissioner's final decision on the project's permit remained inconclusive throughout the entire period of data collection. However, the NYSDEC administrative law judge made a ruling in September 2017 denying the presence of adjudicable issues while data collection for Wave 2 was still in progress; this ruling was widely reported as a major victory for Crestwood. Chapter 3 further describes the details about the context's history. The survey comprised two waves designed to enable measurement of strength-related outcomes of trust. Participants completed the survey either by taking the survey online or by requesting a paper copy of the survey which was delivered and collected back via post mail. Data collection for the survey took place from August to October 2017.

Participants

Participants were residents of four counties (Schuyler, Yates, Ontario, Seneca) surrounding Seneca Lake in upstate New York. To enable contrasts between the county holding direct jurisdiction of the LPG storage site and those that do not, I employed a stratified random sampling procedure to sample half of the participants from Schuyler County and the other half evenly from the three other counties (i.e., 16.7% each). Using tax parcel data for the 2016 fiscal year made publicly available by the New York State government (2017), 6,000 residential addresses were randomly selected (Schuyler: 3,000; other counties 1,000 each). Letters inviting

participants to the survey were sent to the selected tax parcel addresses, explaining the purpose of the survey and offering participants two potential options to participate: online or mail.

Out of 6,000 invitation mails sent, 1,215 were returned after failed delivery for various reasons including vacancy of the property, absence of mail receptacles, failure to forward, or invalid addresses. Of the 4,785 invitations that were not returned, 460 participants completed the first wave of the survey (381 online, 79 by mail) and 253 followed through to complete the second wave of the survey (195 online, 58 by mail). Thus, the response rate was 10% for the first wave, with a wave-to-wave retention rate of 55%. The distribution of responses by county are displayed in Table 4.2.

Table 4.2 Mail Delivery and Completed Responses by County and Response Method

	Schuyler	Yates	Ontario	Seneca	Total
Invitation mails sent	3,000	1,000	1,000	1,000	6,000
Delivered (not returned)	2,315	773	864	833	4,785
Wave 1 completed (online)	215	56	57	53	381
Wave 1 completed (mail)	50	14	5	10	79
Wave 2 completed (online)	110	29	24	32	195
Wave 2 completed (mail)	33	13	5	7	58
Wave 1 participant total	265	70	62	63	460
Wave 2 participant total	143	42	29	39	253

Demographically, 61% of the participants in Wave 1 were male. Participants' age ranged from 19 to 94, with a median age of 63. In terms of education, 12% reported that they had received a high school diploma or less; 56% had some college education, an associate degree, or a bachelors' degree; and 32% had a post-graduate degree. A vast majority (96%) identified themselves as white or Caucasian. Participants were very evenly distributed in terms of political party affiliation with 31% identifying as a Democrat, 29% as Republican, and 30% as

independent. As for political ideology, 46% identified themselves as leaning liberal, 38% as leaning conservative, and 15% as independent.

Procedure

Participants who chose the online option were instructed to access the URL included in the letter to find the online survey and use their unique six-digit identification code to enter and complete it. Those who chose the mail option were instructed to either call or text the author with their identification code to request a printed copy of the survey, which was delivered to them with a return envelope. The mail option was considered necessary because the study area was fairly rural with an expectedly considerable proportion of seniors in the population. Mailed letters invited participants to take part in the survey for a chance to enter a raffle for a \$100 gift card, available for redemption at Amazon.com or Walmart, with 10 winners. For participants who did not respond to the survey and whose initial invitation mails were not returned in two weeks, a reminder postcard with participation instructions was delivered.

Wave 1. To complete the study online, participants had to access the URL and enter their six-digit survey identification number. Following the consent form, participants read a brief instruction passage explaining the LPG storage issue, the three main judgment targets (NYSDEC, Crestwood, GFS), and the purpose of the survey. For online participants in Wave 1, the median duration to complete the survey was 21 minutes and 33 seconds. At the end of the survey, participants were asked to provide their email addresses which were used to contact them for invitations to Wave 2 and run the raffle for gift cards.

Mail participants notified the author their survey identification number when making the request for a printed survey copy. An envelope including the Wave 1 survey booklet, a stamped return envelope, and a note of instructions was mailed to them typically on the same or next day.

(See Appendix B for a full example of the survey booklet for Wave 1) The content and question order of the survey questionnaire was identical to the online version.

Wave 2. Three weeks after each participant completed the response in the online survey, an automated email was sent to their email addresses asking them to take part in the second wave of the survey. The opening passage of the second wave of the survey reminded participants of the issue and judgment targets. The median duration to complete the online survey was 12 minutes and 8 seconds. Because Wave 2 of the survey involved mock articles designed to invoke resistance, participants were thoroughly debriefed about the fictitious nature of these articles at the end of the survey.

A mail package for Wave 2 was sent to all participants who took part in Wave 1 via mail approximately 17 days from the date on which the response to Wave 1 was received. The package consisted of a booklet for the Wave 2 questionnaire, a booklet of mock articles used as instruments to test resistance, a stamped return envelope, and a note with instructions. Within the questionnaire where resistance was measured, participants were asked to read the corresponding article in their “Article Booklet.” (See Appendix C for an example of the survey booklet for Wave 2 and Appendix D for articles featured in the Article Booklet.) All responses returned via mail were entered into a spreadsheet which was later merged with data collected online.

Measurement and Instruments

Trust in NYSDEC, Crestwood, and GFS. Participants rated their trust in the three targets in both Wave 1 and Wave 2 using the same semantic differential scale. The scale consisted of five items adopted from McComas and Trumbo (2001) (Can be trusted/Can't be trusted, Inaccurate/Accurate, Unfair/Fair, Tells the whole story/Doesn't tell the whole story, Unbiased/Biased) and two additional word pairs that were deemed relevant to risk management

and applicable to all three judgment targets (Not concerned about the public's interest/Concerned about the public's interest, Incompetent/Competent). Three of the seven items were reverse-coded. Participants first rated their trust in NYSDEC using this scale, followed by assessments of Crestwood and GFS using the same scale. Because the scale was reliable for all three targets, (Wave 1: $\alpha_{NYSDEC} = .94$, $\alpha_{Crestwood} = .93$, $\alpha_{GFS} = .93$; Wave 2: $\alpha_{NYSDEC} = .94$, $\alpha_{Crestwood} = .92$, $\alpha_{GFS} = .93$), all items were averaged for analysis. Full wording of all survey items is available in Appendices B and C.

Antecedents of Strength-Related Attributes. The three communication processes predicting the strength-related attributes of trust were measured in Wave 1. To measure direct interaction, the questionnaire asked three different questions for three types of judgment targets: a NYSDEC employee, a GFS member, and a Crestwood employee. The three questions were how many times one has 1) spoken; 2) seen, and 3) received a personalized email or letter from or had a telephone call in person with any of the three targets in person over the last five years (*1 = Not at all; 5 = A great deal*). The scale was reliable for each target $\alpha_{NYSDEC} = .84$, $\alpha_{Crestwood} = .89$, $\alpha_{GFS} = .84$ and the mean of the three items was used for analysis.

To measure news media use, the survey employed two questions to ask the number of days in the previous week on which one watched or read any news covering local affairs (*None to 7 days*) and the level of attention paid to news covering local affairs (*1 = None at all; 5 = A great deal*) for three different types of news sources: television, print newspaper, and online news. The two-items made up a reliable scale for all three types of media (Spearman-Brown coefficient for television: .80, newspaper: .81, online news: .79). After a mean index was calculated for each media type, the three values were summed into a single scale of news media use.

To measure interpersonal discussion, four items were used asking how often respondents engaged in the following activities: 1) discuss local politics with others (e.g., family friends, neighbors...), 2) discuss environmental issues in the local area with others, 3) discuss new development projects in the local area with others, and 4) attend public hearings or meetings in your community to discuss local affairs. All responses were recorded on a five-point scale ($I = \text{Never}$; $5 = \text{Always}$). Because the four items were reliable $\alpha = .85$, they were averaged into a composite scale of interpersonal discussion.

Strength-Related Attributes of Trust. Four types of strength-related attributes of trust—objective knowledge, perceived knowledge, elaboration, certainty—were assessed in Wave 1. Objective knowledge was measured by asking participants to indicate the validity of nine statements, three pertaining to each of the three judgment targets (e.g., *NYSDEC held an issues conference on this LPG storage project in 2015 [true]; Crestwood has claimed that the gas storage facility will create at least 80 new permanent jobs [false]*). For each judgment target, one statement was true whereas the other two were false. To discourage guessing, participants were specifically instructed that it was “okay to respond incorrectly or say you don’t know” and were offered “don’t know” choice option to answer these questions. The proportion of correct responses ranged from 13% to 73% across the nine items. Participants received a score of 1 for correctly responding to an item, thus receiving a score with a possible range of 0 to 3 for each judgment target.

To measure perceived knowledge, the survey used an item adapted from previous research on risk information seeking and processing (Griffin et al., 2002). Participants were asked to estimate their knowledge of the three judgment targets on a 0 to 100 scale, where 0 meant knowing nothing and 100 meant knowing everything the participant could possibly know

about each target as it related to the gas storage issue. In the online survey, the question was presented as a slider in which one could drag a bar along the scale to choose the desired response. Scale points were labeled in increments of 10. In the printed survey, participants were presented with a scale that resembled the slider question in the online version but were instructed to place a check mark (✓) on the scale to respond. Mailed responses to this scale were coded in increments of five. For example, if the check mark was placed approximately around the midpoint between scale points labeled 20 and 30, it was coded as 25.

Unlike other strength-related attributes of trust, elaboration was only measured for NYSDEC due to space constraints and an intent to minimize response fatigue. Five items measuring systematic processing of information (Eagly & Chaiken, 1993) in a risk communication context (Trumbo & McComas, 2003) were adapted to measure elaboration about NYSDEC. For example, one item read “I have made a strong effort to carefully examine how trustworthy and competent NYSDEC is as a lead agency overseeing important environmental decisions” (*1 = Not true of me at all; 5 = Extremely true of me*). The scale was reliable, $\alpha = .83$, and the items were averaged for analysis.

Finally, certainty of trust was measured with a single-item question following the semantic-differential scale measuring trust for each target using language adapted from standard attitude strength research (Wegener et al., 1995). For example, the item measuring the certainty of trust in NYSDEC read, “How certain do you feel about your ratings of NYSDEC you just provided?” (*1 = Not at all certain; 5 = Extremely certain*).

Consequences of Strength-Related Attributes. Consequences of the strength-related attributes were persistence, resistance, impact on information processing, and impact on attitude-expressive behavior. To measure persistence, the same measure of trust for the three judgment

targets used in Wave 1 was repeated in Wave 2. If the mean of the seven items remained unchanged in valence (positive, neutral, negative) between Wave 1 and Wave 2, the attitude was coded as ‘persistent’ (1). If it changed, it was considered ‘not persistent’ (0). This measurement procedure was adopted from previous research on attitude strength (Bassili, 1996).

Resistance was operationalized with two outcomes, both of which were used in parallel to examine effects on resistance. First, post-persuasion judgment was measured by presenting participants with a counter-attitudinal article and asking participants to rate their trust in the agency after reading. Participants received three mock news articles, one for each target, that represented a position opposite to the valence of trust they expressed in Wave 1. For example, a participant who indicated distrust toward NYSDEC in Wave 1 would receive a positive article about NYSDEC in Wave 2. To create these articles, opinion pieces and letters to the editor published in local newspapers (e.g., Finger Lake Times, the Observer-Review Express) were selected and modified to fit the purpose of the current study and become similar in length. All six articles were presented in a single page and ranged from 244 to 248 words. Full text of the resistance articles is available in Appendix E. After reading the article, a single-item measure of *resistance judgment* asked, “Taking this information as well as what you already know about the [judgment target], overall, would you say you trust or distrust [judgment target]?” (1 = *Strongly distrust*; 7 = *Strongly distrust*). Immediately following this question for each target, three items measured self-reported *counterarguing* with items such as “Were you criticizing the article when you were reading it,” “Were you feeling skeptical of the author’s arguments?” (1 = *Not at all*; 7 = *Very much*). These items were adapted from previous research on reactance (Silvia, 2006). Participants who expressed a neutral judgment of the target in Wave 1 were excluded from the analysis of resistance outcomes.

To measure trust's impact on information processing, participants were asked in Wave 2 to determine the cause of a mishap on part of the judgment target without being told the full details of the event. Three types of mishap statements were randomly associated with judgment targets for counterbalancing. The three statements were “A press release issued by [judgment target] was found to include inaccurate information,” “A contractor conducting a risk assessment on behalf of [judgment target] was found to have a conflict of interest,” and “An argument [judgment target] made about the salinity of Seneca Lake was found to be completely ungrounded.” In a procedure inspired by Heider’s (1958) attribution theory, participants were asked to imagine that this event occurred and answer questions to indicate how they would guess the cause of the event initially before learning about the full details of what had happened. The three types of attributions were “This most likely happened due to an accident beyond [judgment target]’s expected control” (external attribution) “This most likely happened due to [judgment target]’s lack of competence” (internal competence attribution) and “This most likely happened due to [judgment target]’s deliberate attempt to mislead the public” (internal morality attribution; *I = Strongly disagree; 7 = Strongly agree*). After the external attribution score was reverse-coded, scales of favorable attribution consisting of the three items showed acceptable reliability for each judgment target, $\alpha_{NYSDEC} = .74$, $\alpha_{Crestwood} = .73$, $\alpha_{GFS} = .72$. Thus, they were averaged into a single scale of favorable attribution.

Finally, to measure trust's impact on trust-expressive behavioral intentions, two items per judgment target were used. Trust-expressive behavioral intention toward NYSDEC was measured with agreement with the statements “I will accept NYSDEC’s decision on this issue even if it is against my opinion,” and “I will support NYSDEC’s leadership in future environmental disputes regardless of their decision on the LPG storage case” (*I = Strongly*

disagree; 7 = Strongly agree). For Crestwood, the two statements were “I will write letters or emails to politicians in support of Crestwood’s gas storage project” and “I will sign petitions drafted by Crestwood supporting the project if they ask.” For GFS, the items read “I will join protests organized by Gas Free Seneca” and “I will sign petitions drafted by Gas Free Seneca opposing the project if they ask.” Trust-expressive behavioral intentions were measured in both Wave 1 and Wave 2. The two items for each judgment target were reliable (Spearman Brown Coefficients in Wave 1: NYSDEC = .89, Crestwood = .76, GFS = .89; Wave 2: NYSDEC = .90, Crestwood = .85, GFS = .87), and averaged into composite indices of behavioral intention.

Data Analysis

Data were analyzed using SPSS Statistics Version 25. Prior to all analyses, continuous independent variables were centered to the mean. The effects of antecedents of strength-related attributes on the four strength attributes were first tested individually using simple linear regression to test each hypothesis and then jointly with multiple regressions to determine if the variance explained by the antecedents overlap.

Because persistence was a binary variable, it was tested with a logistic regression. As explained above, only the main effect of each strength-related attribute is tested for persistence. To test the effects of strength attributes on resistance, impact on information processing, and impact on behavioral intentions, multiple regression was used with trust, the strength-related attribute, and the interaction term (trust \times the strength-related attribute) as predictors.

To test H29 through H31 which concerned whether the strength-related attributes account for unique variance in addition to trust, hierarchical regression models were used to determine whether the R^2 value of the model significantly changed as variables involving the strength-related attributes were added to the initial models in which trust was the sole predictor.

Results

On average, participants tended to oppose the LPG storage project. Responding to a question asking whether they supported or opposed the proposed project (1 = Strongly oppose; 7 = Strongly support), the participants' median response was 2 with a mean of 2.83 ($SD = 2.27$). Approximately 65% indicated a position opposing the project whereas 27% expressed support for the project. Schuyler County ($M = 3.20$, $SD = 2.44$) showed greater support for the project than Yates ($M = 2.01$, $SD = 1.76$), Ontario ($M = 2.43$, $SD = 1.83$), and Seneca ($M = 2.52$, $SD = 2.08$), $F(3, 454) = 6.63$, $p < .001$, $\eta^2 = .042$. The difference in project support among the latter three counties was not statistically significant.

Overall, the valence of trust (Wave 1) was slightly positive for NYSDEC ($M = 4.42$, $SD = 1.44$) and GFS ($M = 4.32$, $SD = 1.61$) but slightly negative for Crestwood ($M = 3.22$, $SD = 1.52$). Trust in Crestwood was significantly lower than that of NYSDEC, $F(1, 450) = 265.76$, $p < .001$, and GFS, $F(1, 450) = 62.26$, $p < .001$. Trust in NYSDEC and GFS was not significantly different, $F(1, 450) = 1.18$, $p = .279$.

On average, participants had 2.42 ($SD = 2.09$) of the nine objective knowledge items correct. For all three targets, the mean number of correct items was lower than 1 (NYSDEC: $M = 0.70$, $SD = 0.92$; Crestwood: $M = 0.78$, $SD = 0.88$; GFS: $M = 0.95$, $SD = 0.81$). The mean perceived knowledge was highest for GFS, $M = 45.34$, $SD = 30.63$, followed by NYSDEC, $M = 44.56$, $SD = 25.38$, and Crestwood, $M = 32.35$, $SD = 26.83$. Perceived knowledge of Crestwood was significantly lower than that of NYSDEC, $F(1, 447) = 96.38$, $p < .001$, and GFS, $F(1, 447) = 129.37$, $p < .001$. The mean of elaboration, which was measured only for NYSDEC, was very close to the scale midpoint, $M = 2.99$, $SD = 0.87$. Finally, the certainty in trust judgments for each target was highest for GFS, $M = 3.75$, $SD = 1.02$, followed by NYSDEC, $M = 3.59$, $SD =$

0.91, and Crestwood, $M = 3.57$, $SD = 1.04$. Certainty in GFS trust judgments was significantly higher than NYSDEC, $F(1, 449) = 14.10$, $p < .001$, and Crestwood, $F(1, 449) = 15.68$, $p < .001$, but was not significantly different between NYSDEC and Crestwood.

Effects of Communication Antecedents on Strength-Related Attributes

Direct communication occurred most often with GFS, $M = 1.98$, $SD = 1.13$, followed by NYSDEC, $M = 1.56$, $SD = 0.78$, and Crestwood, $M = 1.37$, $SD = 0.74$. Direct communication with NYSDEC was significantly lower than GFS, $F(1, 457) = 57.79$, $p < .001$, and significantly higher than Crestwood, $F(1, 457) = 19.15$, $p < .001$. The composite scale of news media use had a mean of 9.91 and a standard deviation of 4.34. The most popular mode of news media use was online news, $M = 3.61$, $SD = 2.01$, followed by television, $M = 3.41$, $SD = 2.03$, and newspaper, $M = 2.93$, $SD = 1.86$. The composite scale of interpersonal discussion had a mean value slightly lower than the midpoint ($3 = \text{About half the time}$), $M = 2.54$, $SD = 0.83$.

H1 – H4: Effects of direct interaction. Hypotheses 1 through 4 predicted that direct interaction with targets will be positively related to objective knowledge (H1), perceived knowledge (H2), elaboration (H3), and trust certainty (H4). Regression results displayed in Table 4.2 show that all four hypotheses were supported across all three targets. As direct communication increased, objective knowledge, perceived knowledge, elaboration, and trust certainty increased, supporting the positive relationships hypothesized in H1 to H4.

Table 4.3 Simple regression results of direct communication predicting strength-related attributes of trust

Dependent variable	NYSDEC			Crestwood			GFS		
	b	SE	b *	b	SE	b *	b	SE	b *
H1: Objective knowledge	.46 ***	.05	.39	.38 ***	.05	.33	.24 ***	.03	.34
H2: Perceived knowledge	12.31 ***	1.42	.38	17.46 ***	1.49	.49	16.47 ***	1.03	.60
H3: Elaboration	.31 ***	.05	.28	-			-		
H4: Certainty	.34 ***	.05	.29	.24 ***	.06	.18	.28 ***	.04	.31

Note. Each row represents a separate simple regression analysis. Intercepts are omitted from presentation.

*** $p < .001$.

H5 – H8: Effects of news media use. Hypotheses 5 through 8 predicted that local news media use will be positively related to the four strength-related attributes. Test results of these hypotheses are displayed in Table 4.3. Again, all four hypotheses were supported across three judgment targets. As predicted, as news media use increased, objective knowledge (H5), perceived knowledge (H6), elaboration (H7), and certainty in trust judgment (H8) increased.

Table 4.4 Simple regression results of news media use predicting strength-related attributes of trust

Dependent variable	NYSDEC			Crestwood			GFS		
	b	SE	b *	b	SE	b *	b	SE	b *
H5: Objective knowledge	.03 **	.01	.15	.03 **	.01	.14	.03 **	.01	.16
H6: Perceived knowledge	1.52 ***	.27	.26	1.60 ***	.28	.26	2.05 ***	.32	.29
H7: Elaboration	.06 ***	.01	.28	-			-		
H8: Certainty	.04 ***	.01	.17	.05 ***	.01	.19	.05 ***	.01	.21

Note. Each row represents a separate simple regression analysis. Intercepts are omitted from presentation.

** $p < .01$, *** $p < .001$.

H9 – H12: Effects of interpersonal discussion. Hypotheses 9 through 12 predicted that interpersonal discussion with others will be positively related to the four strength-related

attributes. Test results of these hypotheses are displayed in Table 4.4. Again, all hypotheses were supported across the three judgment targets. As interpersonal discussion increased, objective knowledge (H9), perceived knowledge (H10), elaboration (H11), and certainty (H12) increased.

Table 4.5 Simple regression results of interpersonal discussion predicting strength-related attributes of trust

Dependent variable	NYSDEC			Crestwood			GFS		
	b	SE	b *	b	SE	b *	b	SE	b *
H9: Objective knowledge	.24 ***	.05	.21	.20 ***	.05	.19	.14 **	.05	.14
H10: Perceived knowledge	9.33 ***	1.38	.30	10.17 ***	1.46	.31	14.07 ***	1.62	.38
H11: Elaboration	.42 ***	.05	.40	-	-	-	-	-	-
H12: Certainty	.22 ***	.05	.20	.31 ***	.06	.25	.37 ***	.06	.30

Note . Each row represents a separate simple regression analysis. Intercepts are omitted from presentation.

** $p < .01$, *** $p < .001$.

RQ1: Uniqueness of explained variance. Finally, RQ1 asked whether the three communication antecedents each explained unique variance in the strength-related attribute outcomes. To test this, the three variables were simultaneously entered into multiple regression models predicting strength-related attributes. The results of these multiple regression models across all three judgment targets are displayed in Table 4.5. Noticeably, direct interaction with the judgment targets and news media use seem to account for unique variance for all four strength-related attributes of trust, across all judgment targets. However, controlling for these two variables, interpersonal discussion with others was no longer a significant predictor of objective knowledge in NYSDEC and GFS. Overall, except for these two cases, each of the three communication variables accounted for unique variance in all models predicting the strength-related attributes of trust across the three judgment targets.

Table 4.6 Multiple regression of the three communication antecedents predicting strength-related attributes of trust

	NYSDEC			Crestwood			GFS		
	b	SE	b *	b	SE	b *	b	SE	b *
Objective knowledge									
(Intercept)	.03	.04		.04	.04		.05	.04	
Direct int.	.42 ***	.05	.35	.36 ***	.05	.31	.23 ***	.03	.32
Media usage	.02 *	.01	.11	.02 *	.01	.11	.02 *	.01	.11
Discussion	.10	.06	.09	.11 *	.05	.10	-.01	.05	-.01
R ²	.17			.13			.13		
Perceived knowledge									
(Intercept)	.03	1.06		-.03	1.05		-.04	1.11	
Direct int.	10.74 ***	1.40	.33	16.20 ***	1.43	.45	14.44 ***	1.06	.53
Media usage	1.14 ***	.26	.19	1.21 ***	.25	.20	1.17 ***	.27	.17
Discussion	4.95 ***	1.39	.16	5.53 ***	1.35	.17	4.84 **	1.50	.13
R ²	.22			.32			.42		
Elaboration									
(Intercept)	.00	.04							
Direct int.	.21 ***	.05	.19						
Media usage	.03 ***	.01	.17						
Discussion	.32 ***	.05	.30						
R ²	.22								
Certainty									
(Intercept)	.01	.04		.00	.05		.00	.04	
Direct int.	.30 ***	.05	.26	.19 **	.06	.13	.20 ***	.04	.22
Media usage	.03 **	.01	.13	.03 **	.01	.13	.03 *	.01	.12
Discussion	.11 *	.05	.10	.23 ***	.06	.18	.23 ***	.06	.18
R ²	.12			.09			.15		

Note . * p < .05, ** p < .01, *** p < .001.

Effects of Strength-Related Attributes on Strength-Defining Consequences

Six dependent variables were used to operationalize the four strength-defining consequences. Persistence was operationalized as whether the valence (i.e., positive, neutral, negative) of the trust judgment had changed between the two waves of the study. Accordingly, the proportion of persistent trust judgments for NYSDEC, Crestwood, and GFS was 69.7%, 84.3%, and 81.4%, respectively. The first operationalization of resistance, post-persuasion judgment, was a single-item measure of trust following exposure to a counter-persuasive message. For those who expressed a positive judgment toward the target in Wave 1 (trusters), the post-persuasion judgment remained above the scale midpoint (NYSDEC: $M = 4.15$, $SD = 1.61$, Crestwood: $M = 4.31$, $SD = 1.61$, GFS: $M = 4.73$, $SD = 1.27$). For those who expressed a negative judgment toward the target in Wave 1 (distrusters), the post-persuasion judgment remained below the scale midpoint (NYSDEC: $M = 3.65$, $SD = 1.43$, Crestwood: $M = 2.65$, $SD = 1.23$, GFS: $M = 3.01$, $SD = 2.55$). The second operationalization of resistance, counterarguing, was the level of self-reported reactance against the counter-persuasive message. For trusters, counterarguing was more pronounced for Crestwood, $M = 4.67$, $SD = 1.57$, and GFS, $M = 4.38$, $SD = 1.41$, than NYSDEC, $M = 3.69$, $SD = 1.52$. Similarly, for distrusters, counterarguing was stronger for Crestwood, $M = 4.70$, $SD = 1.57$, and GFS, $M = 4.66$, $SD = 1.82$, than NYSDEC, $M = 4.06$, $SD = 1.62$, revealing the polarizing nature of the topic. Impact on information processing was operationalized as the extent to which one attributed a mishap involving the target to an external rather than an internal cause. Favorable attribution of mishap was highest for NYSDEC, $M = 4.09$, $SD = 1.28$, followed by GFS, $M = 3.92$, $SD = 1.35$, and Crestwood, $M = 3.50$, $SD = 1.30$. Finally, impact on behavior was operationalized as two measurements of behavioral intentions repeated during the two waves of the survey. In Wave 1, cooperative behavioral

intentions were highest for NYSDEC, $M = 3.97$, $SD = 1.69$, followed by GFS, $M = 3.88$, $SD = 2.14$, and Crestwood, $M = 2.59$, $SD = 1.79$. In Wave 2, a similar pattern was observed with behavioral intentions highest for NYSDEC, $M = 4.16$, $SD = 1.66$, followed by GFS, $M = 3.26$, $SD = 1.96$, and Crestwood, $M = 2.83$, $SD = 1.90$.

H13 – H16, RQ2: Effects on persistence. H13 through H16 predicted that the four strength-related attributes will have a positive main effect on persistence. The top part of Table 4.7 displays results of separate logistic regression analyses where each strength-related attribute was entered as the sole predictor of persistence. These analyses revealed broad overall support for the hypothesized effects of objective knowledge (H13), perceived knowledge (H14), and certainty (H16), except for the lack of support for H13 when Crestwood was the target. H15 testing the effect of elaboration was not supported. To further examine whether these strength-related attributes explain unique variance (RQ2), these variables were simultaneously entered into a logistic regression model predicting persistence. Results show that when NYSDEC and Crestwood was the judgment target, only certainty remained significant when the effects of other strength-related attributes were controlled for. However, when GFS was the target, only perceived knowledge remained significant.

Table 4.7 Logistic regression of strength-related attributes predicting persistence

Independent variables	NYSDEC			Crestwood			GFS		
	b	SE	OR	b	SE	OR	b	SE	OR
Individual models									
H13: Objective knowledge	.40 *	.16	1.49	.24	.21	1.28	.82 **	.25	2.26
H14: Perceived knowledge	.01 *	.01	1.01	.02 *	.01	1.02	.03 ***	.01	1.03
H15: Elaboration	.27	.17	1.31	-			-		
H16: Certainty	.75 ***	.17	2.12	.52 **	.17	1.68	.52 **	.16	1.68
Simultaneous entry (RQ2)									
Objective knowledge	.23	.18	1.26	.05	.22	1.05	.52	.27	1.69
Perceived knowledge	.00	.01	1.00	.01	.01	1.01	.02 **	.01	1.02
Elaboration	.04	.20	1.04	-			-		
Certainty	.66 ***	.18	1.94	.46 *	.19	1.58	.22	.18	1.25
Constant	.91 ***	.15	2.47	1.73 ***	.19	5.66	1.67 ***	.19	5.29
Nagelkerke R^2	.12			.07			.15		

H17 – H20, RQ3: Effects on resistance. H17 through H20 predicted that the four strength-related attributes and their interaction with trust will be related to the two resistance outcomes, post-persuasion judgment and counterarguing. Regression models testing these hypotheses are presented in Tables 4.8 through 4.11. Separate analyses were conducted for trusters and distrusters of each target, each on the two resistance outcomes. Within each table, Model 1 tests the main effect of the strength-related attribute (hypotheses with suffix a), whereas Model 2 tests the strength-related attribute \times trust interaction effect (hypotheses with suffix b).

Effects of objective knowledge. H17a predicted the effect of objective knowledge on resistance outcomes. Out of 12 tests of this hypothesis (2 judgment outcomes \times 2 valences \times 3 judgment targets), the effect of objective knowledge was significant in eight cases and marginally significant in one (Table 4.8). H17b predicted a positive interaction effect between

objective knowledge and trust. This hypothesized interaction effect was not supported in any of its 12 tests.

Effects of perceived knowledge. Out of 12 tests of H18a, seven supported the hypothesis and an additional four were marginally significant (Table 4.9). Out of the 12 tests of H18b, the hypothesized interaction effect was observed in three.

Effects of elaboration. Because the survey measured elaboration only about NYSDEC, four tests (2 judgment outcomes \times 2 valences) of H19 were conducted. As displayed in Table 4.10, the hypothesized main effect of elaboration (H19a) was observed in two of the four tests, while the effect was marginally significant in the other two tests. The interaction effect (H19b) was not observed in any of the four tests.

Effects of certainty. Of the 12 tests of H20a, the hypothesized main effect of certainty was observed in 11 cases and marginally significant in the one other case. The interaction effect with trust hypothesized in H20b was not observed in any of the 12 tests.

Considering these overall results, the main effects of the strength-related attributes on resistance seem to be robust, lending support for H17a through H20a. In contrast, less support was found for H17b through H20b which hypothesized the strength-related attribute \times trust interaction effect.

Table 4.8 Main and interaction effects of objective knowledge on resistance outcomes

2

Judgment target	Post-persuasion judgment				Counterarguing			
	Trusters		Distrusters		Trusters		Distrusters	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
NYSDEC								
Objective knowledge (H17a)	.35 ***	.22 †	-.05	.16	.20 *	.14	.04	-.08
Trust	-	.49 ***	-	.46 ***	-	.29 **	-	-.32 **
Obj. know. × Trust (H17b)	-	.03	-	.23	-	-.01	-	-.13
R ²	.12	.35	.19	.20	.04	.12	.00	.10
Crestwood								
Objective knowledge (H17a)	.23 †	.09	-.24 **	-.08	.19	-.14	.22 **	.01
Trust	-	.65 ***	-	.57 ***	-	.34 *	-	-.31 ***
Obj. know. × Trust (H17b)	-	.02	-	.04	-	.29	-	-.18
R ²	.05	.43	.06	.36	.04	.16	.05	.15
GFS								
Objective knowledge (H17a)	.22 *	.01	-.24 *	-.35	.20 *	-.03	.30 **	.66 *
Trust	-	.45 ***	-	.61 ***	-	.27 **	-	-.40 ***
Obj. know. × Trust (H17b)	-	.19	-	-.16	-	.24	-	.41
R ²	.05	.26	.06	.44	.04	.13	.09	.29

Note. All coefficients are standardized coefficients.

† p < .10, * p < .05, ** p < .01, *** p < .001.

Table 4.9 Main and interaction effects of perceived knowledge on resistance outcomes

Judgment target	Post-persuasion judgment				Counterarguing			
	Trusters		Distrusters		Trusters		Distrusters	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
NYSDEC								
Perceived knowledge (H18a)	.37 ***	.10	-.13	-.34	.20 *	-.07	.19 †	.11
Trust	-	.48 ***	-	.44 ***	-	.25 **	-	-.31 **
Perc. know. × Trust (H18b)	-	.18 †	-	-.25	-	.27 *	-	-.08
R ²	.14	.38	.02	.21	.04	.16	.04	.13
Crestwood								
Perceived knowledge (H18a)	.35 **	.22	-.22 **	-.09	.39 **	.49	.15 †	-.05
Trust	-	.63 ***	-	.56 ***	-	.29 *	-	-.33 ***
Perc. know. × Trust (H18b)	-	-.14	-	.09	-	-.23	-	-.23 *
R ²	.12	.44	.05	.37	.16	.22	.02	.17
GFS								
Perceived knowledge (H18a)	.37 ***	-.03	-.21 †	.08	.33 ***	.15	.21 †	.00
Trust	-	.38 ***	-	.63 ***	-	.22 *	-	-.81 ***
Perc. know. × Trust (H18b)	-	.33 **	-	.15	-	.11	-	.00
R ²	.14	.30	.04	.42	.11	.15	.05	.22

Note. All coefficients are standardized coefficients.

† p < .10, * p < .05, ** p < .01, *** p < .001.

Table 4.10 Main and interaction effects of elaboration on resistance outcomes

Judgment target	Post-persuasion judgment				Counterarguing			
	Trusters		Distrusters		Trusters		Distrusters	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
NYSDEC								
Elaboration (H19a)	.16 †	-.07	-.24 *	-.39 †	.19 *	.06	.20 †	-.13
Trust	-	.56 ***	-	.46 ***	-	.29 **	-	-.31 **
Elaboration × Trust (H19b)	-	.09	-	-.14	-	.07	-	-.39
R ²	.03	.33	.06	.26	.04	.12	.04	.18

Note. All coefficients are standardized coefficients.

† p < .10, * p < .05, ** p < .01, *** p < .001.

Table 4.11 Main and interaction effects of trust judgment certainty on resistance outcomes

Judgment target	Post-persuasion judgment				Counterarguing			
	Trusters		Distrusters		Trusters		Distrusters	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
NYSDEC								
Certainty (H20a)	.48 ***	.22 *	-.39 ***	-.60 *	.37 ***	.23 †	.19 †	.31
Trust	.38 ***	-	.43 ***	-	.15	-	-.34 **	
Certainty × Trust (H20b)	.06	-	-.42	-	.08	-	.30	
R ²	.22	.34	.15	.27	.14	.16	.04	.11
Crestwood								
Certainty (H20a)	.36 **	-.15	-.42 ***	-.32 **	.52 ***	.15	.28 ***	.24 *
Trust	.60 ***	-	.53 ***	-	-.02	-	-.28 **	
Certainty × Trust (H20b)	.21	-	-.16	-	.43	-	.11	
R ²	.13	.45	.18	.39	.27	.30	.08	.14
GFS								
Certainty (H20a)	.33 ***	.12	-.56 ***	-.42 *	.26 **	.26 *	.41 ***	.36
Trust	-	.41 ***	-	.51 ***	-	.24 *	-	-.34 **
Certainty × Trust (H20b)	-	.01	-	-.19	-	-.15	-	.16
R ²	.11	.24	.30	.45	.07	.11	.17	.24

Note. All coefficients are standardized coefficients.

† p < .10, * p < .05, ** p < .01, *** p < .001.

Unique variance accounted for by strength-related attributes. To answer RQ3 which asked whether the four strength-related attributes account for unique variance, the attributes were simultaneously entered into the regression models predicting post-persuasion judgment and counterarguing. Interaction effects were excluded due to their lack of effect as demonstrated in tests of H17b - H20b. Results are displayed in Table 4.12. For each test, a model that did not control for the effects of trust (Model 1), and another that controlled for the effect of trust (Model

2) are reported. In 12 of tests that did not control for trust, certainty accounted for unique variance in the resistance outcome in 10 cases. Perceived knowledge accounted for unique variance in four cases. Certainty, objective knowledge, and perceived knowledge accounted for unique variance in four, two, and two out of the 12 analyses, respectively, after controlling for the effects of trust. In sum, it appears that the certainty of trust judgments appears to account for most of the unique variance in resistance outcomes. Furthermore, the explanatory power of certainty persisted in multiple cases even after controlling for the effect of trust.

Table 4.12 Main effects of strength-related attributes and trust predicting resistance outcomes

Judgment target	Post-persuasion judgment				Counterarguing			
	Trusters		Distrusters		Trusters		Distrusters	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
NYSDEC								
Objective knowledge	.15 †	.15 †	.02	-.01	.06	.05	.00	.02
Perceived knowledge	.20 *	.17 *	.08	.07	.06	.05	.08	.09
Elaboration	-.07	-.12	-.19	-.25 *	.05	.04	.13	.18
Certainty	.39 ***	.16 †	-.36 **	-.19	.31 **	.23 *	.13	-.02
Trust	-	.43 ***	-	.38 **	-	.16	-	-.33 **
R ²	.30	.42	.17	.28	.15	.17	.07	.16
Crestwood								
Objective knowledge	.14	.08	-.13	-.06	.10	.10	.15 †	.12
Perceived knowledge	.25 †	.09	-.06	-.08	.25 *	.25 †	.03	.04
Certainty	.27 *	-.01	-.37 ***	-.17 *	.45 ***	.44 **	.24 **	.11
Trust	-	.61 ***	-	.49 ***	-	.02	-	-.28 **
R ²	.21	.45	.20	.40	.36	.36	.10	.17
GFS								
Objective knowledge	.08	.07	-.17 †	-.21 *	.06	.06	.25 *	.27 **
Perceived knowledge	.25 *	.19 *	.06	.08	.23 *	.19 †	.00	.00
Certainty	.19 *	.03	-.56 ***	-.26 *	.15	.07	.38 **	.19
Trust	-	.37 ***	-	.51 ***	-	.20 *	-	-.33 **
R ²	.17	.27	.34	.51	.13	.15	.24	.31

Note. All coefficients are standardized coefficients.

† p < .10, * p < .05, ** p < .01, *** p < .001.

H21 – H24, RQ4: Effects on information processing. H21 through H24 predicted a positive interaction effect between trust and each of its strength-related attributes on favorable attribution. Table 4.13 displays test results for these hypotheses. H21 predicting a positive interaction effect between objective knowledge and trust was supported when Crestwood and GFS were the judgment targets. When NYSDEC was the judgment target, the effect was marginally significant. H22, predicting a positive interaction effect between perceived knowledge and trust, was supported when Crestwood was the target but not in the other cases. H23, predicting a positive interaction effect between elaboration and trust, was not supported. The positive interaction effect between certainty and trust predicted by H24 was not observed except for a marginally significant effect when NYSDEC was the target. Overall, among hypotheses predicting the effect of strength-related attributes on favorable information processing, the effects of objective knowledge received strongest support. There was little evidence in support of the effects of perceived knowledge, elaboration, and certainty.

Table 4.13 Regression of strength-related attributes predicting favorable attribution

	NYSDEC			Crestwood			GFS		
	b	SE	b *	b	SE	b *	b	SE	b *
(Intercept)	4.12 ***	.06		3.52 ***	.06		3.95 ***	.06	
Trust	.54 ***	.05	.60	.58 ***	.04	.69	.56 ***	.04	.67
Obj. Know.	.08	.07	.06	.02	.07	.02	.04	.08	.02
Interaction (H21)	.08 †	.04	.10	.09 *	.04	.11	.16 **	.05	.15
R ²	.40			.52			.50		
(Intercept)	4.11 ***	.06		3.50 ***	.06		3.95 ***	.06	
Trust	.53 ***	.05	.59	.55 ***	.04	.66	.57 ***	.04	.67
Perc. Know.	.01 **	.00	.17	.00	.00	-.03	.00	.00	.04
Interaction (H22)	.00	.00	.06	.00 *	.00	.12	.00	.00	.05
R ²	.42			.51			.48		
(Intercept)	4.14 ***	.06							
Trust	.56 ***	.05	.62						
Elaboration	.00	.08	.00						
Interaction (H23)	.03	.06	.02						
R ²	.39								
(Intercept)	4.11 ***	.06		3.52 ***	.06		3.97 ***	.06	
Trust	.49 ***	.05	.55	.56 ***	.05	.67	.54 ***	.05	.65
Certainty	.18 *	.07	.13	.03	.06	.02	.07	.07	.05
Interaction (H24)	.10 †	.06	.11	.07	.05	.09	.07	.05	.08
R ²	.41			.51			.48		

Note. † p < .10, * p < .05, ** p < .01, *** p < .001.

H25 – H28, RQ5: Effects on behavioral intentions. H25 through H28 predicted a positive interaction effect between trust and each strength-related attribute. As displayed in Table 4.14, out of 10 tests of this hypothesis on the three judgment targets in Wave 1, this interaction effect was significant in six cases and marginally significant in two additional cases. The stronger the trust judgments were, the higher the expressed intentions to engage in trust-expressive behavior were. Interaction effects involving all four strength-related attributes received some support depending on the judgment target.

Table 4.14 Multiple regression of the strength-related attributes predicting behavioral intentions at Wave 1

	NYSDEC			Crestwood			GFS		
	b	SE	b *	b	SE	b *	b	SE	b *
(Intercept)	3.96 ***	.07		2.61 ***	.07		3.87 ***	.06	
Trust	.67 ***	.05	.57	.60 ***	.05	.51	1.02 ***	.04	.77
Obj. Know.	.04	.07	.02	-.05	.08	-.02	-.02	.08	-.01
Interaction (H25)	.10 *	.04	.09	.10 †	.05	.08	.10 *	.05	.07
R ²	.36			.28			.61		
(Intercept)	3.96 ***	.07		2.59 ***	.07		3.88 ***	.06	
Trust	.69 ***	.05	.58	.55 ***	.05	.47	1.01 ***	.04	.76
Perc. Know.	.00	.00	-.02	.01 *	.00	.10	.01 ***	.00	.11
Interaction (H26)	.00 *	.00	.08	.01 **	.00	.15	.00	.00	.02
R ²	.37			.31			.62		
(Intercept)	3.99 ***	.06							
Trust	.68 ***	.05	.58						
Elaboration	-.24 **	.07	-.13						
Interaction (H27)	.11 *	.05	.09						
R ²	.39								
(Intercept)	3.96 ***	.06		2.62 ***	.07		3.88 ***	.06	
Trust	.61 ***	.06	.52	.58 ***	.06	.49	1.05 ***	.05	.79
Certainty	.12 †	.07	.07	.21 **	.07	.12	.14 *	.06	.07
Interaction (H28)	.16 **	.06	.13	.11 †	.06	.10	-.04	.05	-.03
R ²	.37			.30			.61		

Note. † p < .10, * p < .05, ** p < .01, *** p < .001.

This pattern supporting the hypothesized effect of strength-related attributes was further replicated when trust-expressive behavioral intentions at Wave 2 were regressed on trust judgments from Wave 1 (Table 4.15). Out of 10 tests of the interaction effect on the three judgment targets, the effect was statistically significant in five cases and marginally significant in two. However, the interaction effects between certainty and trust were no longer significant in Wave 2.

Table 4.15 Multiple regression of the strength-related attributes predicting behavioral intentions at Wave 2

	NYSDEC			Crestwood			GFS		
	b	SE	b *	b	SE	b *	b	SE	b *
(Intercept)	4.21 ***	.08		2.86 ***	.11		3.30 ***	.10	
Trust	.66 ***	.06	.58	.31 ***	.07	.26	.65 ***	.07	.53
Obj. Know.	-.01	.09	-.01	-.04	.13	-.02	.15	.13	.06
Interaction (H25)	.14 *	.06	.13	.12	.08	.10	.14 †	.08	.09
<i>R</i> ²	.37			.09			.30		
(Intercept)	.08 ***	.08		2.79 ***	.11		3.30 ***	.10	
Trust	.06 ***	.06	.59	.25 **	.08	.21	.59 ***	.07	.48
Perc. Know.	.00	.00	-.06	.00	.00	-.02	.01 **	.00	.15
Interaction (H26)	.00 *	.00	.12	.01 **	.00	.23	.01 **	.00	.18
<i>R</i> ²	.39			.13			.35		
(Intercept)	4.27 ***	.08							
Trust	.66 ***	.06	.58						
Elaboration	-.30 **	.10	-.15						
Interaction (H27)	.16 *	.07	.12						
<i>R</i> ²	.42								
(Intercept)	4.22 ***	.09		2.85 ***	.11		2.00 ***	.38	
Trust	.62 ***	.07	.54	.27 **	.09	.22	-.05	.22	-.04
Certainty	.09	.09	.05	.21 †	.12	.11	.34	.34	.24
Interaction (H28)	.10	.08	.09	.14	.09	.12	.33 †	.19	.48
<i>R</i> ²	.36			.10			.30		

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Finally, to answer RQ5 which asked whether the strength-related attributes accounted for overlapping or unique variance, the interaction effects between trust and the four strength-related attributes were entered simultaneously in a regression model alongside their respective lower-order main effects (Table 4.16). The significance tests on the four interaction effects was significant in three out of six cases for perceived knowledge \times trust, and one out of six for objective knowledge \times trust. The interaction effects were not significant in all other cases. These

results indicate that each of the four strength-related attributes' effect on trust-expressive behavioral intentions mostly overlap with each other except for perceived knowledge which showed some evidence of unique effects.

Table 4.16 Multiple regression of the strength-related attributes simultaneously predicting behavioral intentions

	NYSDEC		Crestwood		GFS	
	Wave 1	Wave 2	Wave 1	Wave 2	Wave 1	Wave 2
Trust	.52 ***	.55 ***	.46 ***	.20 *	.79 ***	.47 ***
Obj. Know.	.02	.00	-.10 *	-.04	-.06 †	-.02
Perc. Know.	.00	-.01	.10 *	-.04	.11 **	.16 *
Elaboration	-.15 ***	-.17 **	-	-	-	-
Certainty	.09 *	.06	.10 *	.11	.02	.00
Obj. Know. × Trust	.05	.09	.03	.02	.07 *	.02
Perc. Know × Trust	.03	.05	.12 *	.20 **	.02	.17 **
Elaboration × Trust	.05	.07	-	-	-	-
Certainty × Trust	.07	.02	.04	.04	-.06	.03
<i>R</i> ²	.40	.43	.33	.14	.62	.35

Note . All coefficients are standardized. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

H29 – H31: Effects independent from trust effects. Finally, H29-H31 hypothesized that the effects of the strength-related attributes on resistance (H29), information processing (i.e., favorable attribution; H30), and behavior (i.e., trust-expressive behavioral intentions; H31) will account for variance in addition to what is accounted for by trust. To test these hypotheses, hierarchical regressions were conducted (Table 4.17) to track the *F*-change across models that predict strength-defining outcomes with trust in the respective target only (Model 1), trust and main effects of strength-related attributes (Model 2), and trust, main effects, and interaction effects between trust and the strength-related attributes.

Supporting H29, adding variables involving the strength-related attributes of trust significantly increased the R^2 in eight of the 12 tests of resistance. On average, the strength-related attributes increased the amount of explained variance in resistance outcomes by 8% points, or 50% of what was already accounted for by trust. Supporting H30, the strength related attributes of trust significantly increased the R^2 in all three tests of impact on information processing. Across tests on the three judgment targets, the strength-related attributes of trust increased the amount of explained variance by 5 percentage points, or 11% of what was already accounted for by trust. Finally, supporting H31, the strength-related attributes significantly increased the R^2 in models predicting behavioral intentions for all three judgment targets in both Wave 1 and Wave 2 of the survey. On average, strength-related attribute variables increased the amount of explained variance by 4 percentage points or 13% of what was already accounted for by trust. Overall, on average, the strength-related attributes of trust increased the amount of explained variance of strength-defining consequences by 8 percentage points, improving the predictive power of trust by 29%.

Discussion

Conventional approaches to measuring trust in risk managing authorities have rarely considered how the effect of trust may differ across subpopulations or individuals. In so doing, research may have given rise to the unrealistic assumption that trust as a psychological construct has some uniform effect across different contexts and societal groups. Rather than seeking ways to actively model this variance, most research has satisfied with testing the average causes and effects of trust. The assumption that trust has a uniform effect in risk management also seems to relate to perspectives that view trust as an attitude constructed on the spot without a stable

representation in memory and used as a heuristic to reach cognitively effortless judgments about risk.

Table 4.17 Changes in explained variance in strength-defining outcomes as variables of strength-related attributes are introduced in predictive models

	Model 1			Model 2			Model 3			ΔR^2 (M3-M1)	ratio		
	R^2	Adj. R^2	F	R^2	ΔR^2	Adj. R^2	ΔF	R^2	ΔR^2	Adj. R^2	ΔF		
Resistance													
<i>Post-persuasion judg.</i>													
NYSDEC (trusters)	.33	.32	62.75 ***	.42	.09	.39	4.85 **	.44	.02	.40	1.21	.11	34%
NYSDEC (distrusters)	.19	.18	19.71 ***	.28	.09	.24	2.62 *	.31	.03	.23	0.76	.12	64%
Crestwood (trusters)	.43	.42	40.77 ***	.45	.02	.40	0.44	.46	.02	.38	0.53	.03	7%
Crestwood (distrusters)	.35	.34	80.38 ***	.40	.05	.38	3.85 *	.41	.02	.38	1.49	.07	19%
GFS (trusters)	.22	.21	36.50 ***	.27	.05	.25	3.10 *	.31	.05	.28	2.73 *	.10	45%
GFS (distrusters)	.42	.41	57.21 ***	.51	.09	.49	4.93 **	.55	.04	.51	2.21 †	.13	32%
<i>Counterarguing</i>													
NYSDEC (trusters)	.11	.11	16.78 ***	.17	.05	.13	2.09 †	.22	.06	.16	2.18 †	.11	97%
NYSDEC (distrusters)	.10	.09	9.40 **	.16	.06	.10	1.33	.21	.05	.11	1.26	.11	107%
Crestwood (trusters)	.14	.13	8.93 **	.36	.22	.31	5.74 **	.40	.04	.31	0.99	.25	179%
Crestwood (distrusters)	.13	.13	23.57 ***	.17	.03	.14	2.06	.21	.04	.17	2.44 †	.07	55%
GFS (trusters)	.10	.09	15.23 ***	.15	.06	.13	2.93 *	.18	.02	.13	1.24	.08	80%
GFS (distrusters)	.20	.19	20.91 ***	.31	.11	.28	4.21 **	.37	.05	.31	2.15	.16	81%
Resistance Mean ΔR^2	.23			.08				.04				.11	50%
Favorable attribution													
NYSDEC	.39	.39	159.35 ***	.43	.04	.42	3.93 **	.44	.01	.42	1.19	.05	12%
Crestwood	.55	.55	106.51 ***	.61	.06	.59	2.92 *	.63	.02	.59	1.26	.08	14%
GFS	.48	.48	224.29 ***	.48	.00	.48	0.38	.51	.02	.49	3.81 *	.03	5%
Fav. Attribution Mean ΔR^2	.48			.03				.02				.05	11%
Behavioral intention													
NYSDEC (Wave 1)	.36	.36	250.20 ***	.39	.02	.38	4.28 **	.40	.02	.39	2.66 *	.04	11%
NYSDEC (Wave 2)	.38	.37	149.48 ***	.41	.03	.40	3.28 *	.43	.02	.41	2.42 *	.06	15%
Crestwood (Wave 1)	.28	.28	169.22 ***	.31	.03	.31	6.85 ***	.33	.02	.32	3.62 *	.05	18%
Crestwood (Wave 2)	.09	.08	23.61 ***	.10	.01	.09	1.12	.14	.04	.12	3.94 **	.05	61%
GFS (Wave 1)	.60	.60	666.20 ***	.62	.02	.61	5.49 **	.62	.01	.62	2.09	.02	3%
GFS (Wave 2)	.31	.31	110.59 ***	.33	.02	.32	1.88	.35	.03	.34	3.55 *	.04	14%
BI Mean ΔR^2	.34			.02				.02				.04	13%
Overall Mean ΔR^2	.29			.05				.03				.08	29%

Note. Model 1 includes only trust of the respective target as independent variable (IV). Model 2 includes trust and the main effects of strength-related attributes (objective knowledge, perceived knowledge, certainty, and also elaboration when target is NYSDEC). Model 3 adds to Model 2 the interaction effects between trust and the strength-related attributes. ΔR^2 (M3-M1) is the R^2 difference between Model 3 and Model 1. ΔR^2 (M3-M1) ratio is the ratio of additional variance explained by strength-related attributes to those explained initially by trust only.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

The current study has revealed a promising method to better predict positive risk management outcomes related to trust drawing on the concept of attitude strength. Even when participants indicate the same level of trust toward an authority, the strength of that trust may vary in various attributes such as objective knowledge, perceived knowledge, elaboration, and certainty. Different levels of strength in trust may result from various communication experiences such as direct communication with the risk-managing authority, news media use, and interpersonal discussion with others. In essence, these results suggest that those who have more communicative experience related to the risk management issue will have stronger forms of trust, perhaps as a more stable mental representation in memory compared to those less involved in the issue.

In turn, these strength-related attributes reliably amplify the predictive value of trust on strength-defining outcomes which are important to risk management. Overall, objective knowledge, subjective knowledge, and certainty performed well as predictors of persistence. All four strength-related attributes significantly enhanced the predictive value of trust for judgments and counterarguing following exposure to a counter-persuasive material. Objective knowledge well increased the predictive value of trust on favorable processing of negative information. Finally, all four attributes enhanced the predictive value of trust for behavioral intentions, even when behavioral intentions were measured three weeks later. Across these relationships, adding variables of strength-related attributes to models where trust is predicting the four strength-defining consequences significantly improved the amount of explained variance in the model across the most occasions.

To put it more boldly, these findings show that the strength-related attributes of trust can help better understand when trust is *real*. Weak forms of trust may be nothing more than

constructed responses to a survey question. On the other hand, strong forms of trust should be able to protect risk managers from bad news cycles, crisis situations, and attack from opponents. The strength-related attributes of trust can provide a simple yet promising avenue to quantify and predict the variance in strength of trust, which may help predict and explain when trust is valuable and when it is not.

The current chapter sought to deepen the understanding of social judgments in risk communication using an alternative approach to reconsider one of the most frequently studied types of social judgments in the field—the public’s trust toward risk-managing authorities. The next chapter seeks to broaden the scope of social judgments in the field by exploring a social judgment that has been rarely studied empirically—judgments of standing between participants in public participation procedures.

CHAPTER 5

PERCEIVED STANDING: EXPLORING WHY PEOPLE ACCEPT OR REJECT OTHERS' ACCESS TO PUBLIC PARTICIPATION

Public participation is essential to decision making in risk management and environmental conservation in democratic societies. Although early technocratic approaches viewed risk communication merely as a tool to convey expert decisions to laypersons, recent paradigms of risk communication broadly acknowledge the significance of involving the public throughout the assessment, characterization, and management of risk (Fischhoff, 1995; Lynn, 1990; McComas, Arvai, & Besley, 2009). Support for public participation in these contexts go beyond normative arguments that it is the right thing to do in a democratic society and also involves instrumental (i.e., public participation leads to greater legitimacy and acceptance of decision outcomes) and substantive (i.e., decisions made with public participation are superior in quality) arguments (Fiorino, 1990).

However, in specific contexts, disagreements may abound over what exactly public participation entails. Fung (2006) identified three dimensions along which mechanisms of public participation may vary. First, participation mechanisms vary in the selection of participants. For example, participant selection may be based on self-selection, selective recruitment, or random selection, depending on the public participation mechanism. Second, participation processes vary in how participants communicate with each other to reach decisions together. Whereas participants' role may be restricted to merely attending as a spectator, in other settings, participants may be expected to gain high expertise and use it for technical discussions. Third, participation processes may vary in how the discussion outcomes translate into policy or public action. Whereas many participatory processes may use public input simply to inform experts

who retain control over the final decision, others may give more power to participants such as veto rights over the final outcome.

The subject of this chapter relates to the first of these three dimensions, namely, the question of who should be eligible to participate. Many authors in the field have advanced normative and substantive arguments defining the scope of “public” in public participation processes (McComas et al., 2009; National Research Council, 2008; Renn & Walker, 2008). In addition, risk research on procedural fairness has illuminated how the subjective sense of having a voice influences people’s experiences in risk communication (e.g., Besley, 2010; Besley & McComas, 2014; Webler, 2013). Whereas the former approach focuses on who should have voice in participatory processes, the latter empirically examines the extent to which people experience having voice and its subsequent effects.

The inquiry in this chapter combines these two approaches in that it focuses on subjective judgments members of the public make, but the topic of the judgment concerns the normative question of who should be eligible to have voice. As the ample body of research on trust demonstrates, people make judgments about the trustworthiness and competence of authorities and experts in social contexts. Similarly, they may also make judgments about other groups or individuals seeking to influence the risk issue they share interest in. In this chapter, I present an exploratory study of the judgments people make about other members of the public regarding their legitimacy or right to have representation in and influence on controversial issues of environmental risk. In this study, I refer to these judgments as *perceived standing*. The term ‘standing’ here is not used in its strict legal sense but rather as an indication of civic legitimacy, which encompasses the respect, esteem, and consideration one receives while seeking participation as a member of the public (Senecah, 2004). While people may vary in how much

representation and influence their own selves deserve to have in an issue, they may also make these judgments about others. In this chapter, I focus primarily on the potential antecedents of perceived standing. Although the strategic motivation to identify allies and foes in the contested issue may drive these perceptions, variables such as perceived similarity with the target, place attachment, and feelings of one's own standing may also influence them.

Literature Review

Inclusion in Public Participation

A fundamental belief upholding public participation is that “those who are affected by a decision have a right to be involved in the decision-making process” (International Association for Public Participation, 2008). However, implementing this principle in practice requires careful balancing between competing demands and consideration of resources that enable meaningful participation. Research on public participation has thus actively engaged with the questions of who should be included and with what extent of influence.

Some of the most stringent and minimal views of public participation may be those adopted in legal proceedings defining the right of standing. In the U.S., as a concept derived from common law, the right of standing in court requires that those seeking redress in court demonstrate an injury in fact which is a concrete, particular injury suffered due to the actions of another party (Cox & Pezzullo, 2016). The plaintiff's failure to establish standing according to this criterion has often been cited as a reason for dismissing lawsuits over environmental issues (Van Tuyn, 2000).

However, in other public participation processes, broader segments of the public have been included as targets of engagement. A report by the National Research Council (2008) Panel on Public Participation in Environmental Assessment and Decision Making distinguished four

different types of publics that may be involved in participatory processes: 1) the stakeholders, which are organized groups that are or will be directly affected by the decision, 2) the directly affected public, which are individuals and non-organized groups that will experience the effects of the decision, 3) the observing public, which includes those who may comment on and influence the issue such as the media or opinion leaders, and 4) the general public, which includes all individuals who are not directly affected but may provide public opinions on the issue. Similarly, Gastil (2008) makes a distinction between *stakeholders* who represent organizations and communities that have a particular stake in the decision and *the public*, which refers to unorganized individuals who may be indirectly affected or hold some interest in the decision.

Fung (2006) uses a typology of participant inclusion based on the method of selection. On a continuum varying in levels of inclusiveness, one of the most inclusive and least restrictive methods is *self-selection* with the decision-making process open to all who wish to attend. Participants may also be *selectively recruited*, often in an effort to engage subgroups that are less likely to engage or *randomly selected* to achieve descriptive representativeness among the target population. On the more restrictive side of the continuum, public participation processes may exclusively involve *lay stakeholders* consisting of unpaid citizens who have a deep interest in the decision or *professional stakeholders* who are paid representatives of organized interests and public officials. Whereas more inclusive methods with lower thresholds can be more inclusive, they are also vulnerable to exploitation by special interests with disproportionately abundant resources relative to more disadvantaged groups. Overall, these perspectives on representation highlight the tension between broad inclusiveness and giving more weight to the voices of those directly affected.

Experiencing Voice in Public Participation

Research on public participation in environmental risk communication has paid much attention to the experience of members of the public who are either included in or excluded from participatory processes and their elements. The theory of trinity of voice (Seneca, 2004) identifies three elements that are essential to build and maintain trust for effective public participation. The first element, *access*, refers to opportunities to express opinions as well as education and information necessary to stay informed in deliberative processes. *Standing*, the second element, denotes the legitimacy given to participants' perspectives which manifests as the respect and esteem expressed toward participants. Finally, *influence* is the sense that participants' contribution in the process received sufficient consideration and had a meaningful effect in the decision-making process, although this does not necessarily mean dictating the decision outcome. The theory predicts that absent any of these three elements, participants will lose trust and seek means to restore it, which may result in disruptive or destructive interventions.

Risk communication research has empirically studied the effects of the subjective sense of voice in public participation processes drawing on theory and findings from the social psychological literature. In social psychology, fairness has been studied as an idea existing in a perceiver's mind, subjective judgments of what is fair or unfair (van den Bos & Lind, 2002). To further specify the dimensions of content underlying these fairness judgments, risk communication studies have drawn on a conceptual framework from organizational research (e.g., Colquitt, Greenberg, & Zapata-Phelan, 2005) to distinguish fairness related to the just allocation of benefits and risk (i.e., distributive fairness) from forms of fairness conceptually independent from the distribution of outcomes (Besley & McComas, 2014). Dimensions of fairness pertaining to the latter are further categorized into the perception that the decision-

making procedure is fair (i.e., procedural fairness), the perception that treatment from decision-makers in interpersonal interactions is respectful (i.e., interpersonal fairness), and the perception that information relevant to the decision was provided adequately (i.e., informational fairness).

While the notion of access in the trinity of voice theory is closely related to informational fairness, standing and influence can be construed as connected to procedural and interpersonal fairness.

Empirical research in the field has revealed ample evidence showing how the subjective sense of fairness is related to positive risk communication outcomes. In a survey of public meeting participants in communities with suspected cancer clusters, McComas, Trumbo and Besley (2007) found that citizens who felt they had a voice at the public meeting were more likely to be satisfied with the meeting, felt greater connection to the community after attending the meeting, and expressed greater willingness to accept the decision and attend future meetings. McComas, Tuite, Waks and Sherman (2007) also found that, among participants who took part in the U.S. Food and Drug Administration's advisory committee meetings, belief about the committee members' fairness was positively related to satisfaction with the meeting and acceptance of recommendations from FDA committees. In a survey asking state residents' opinions about expanding a nuclear power plant site in South Carolina, Besley (2010) found that perceptions of procedural fairness predicted acceptance of the decision-making process, even when controlling for variables such as distributive fairness, competence of nuclear decision makers, or perceived risk of nuclear power. In another survey involving Swiss respondents asking their opinions about the conduct of field experiments on genetically modified (GM) organisms, Siegrist et al. (2012) found that procedural fairness strongly predicted acceptance of GM field experiments. This effect was observed even after controlling for possible confounds

such as perceived honesty of the scientists, perceived lack of concern for health and environment on part of the agriculture and food industry, confidence in the risk managers, and outcome fairness.

Perceived Standing as a Social Perception of Voice

However, these approaches typically consider voice as an individual-level experience. Common operationalizations of procedural fairness or interactional fairness tend to assume that people attend public participation events as individuals whose fairness perceptions are primarily shaped in response to impersonal features of the participation process or the conduct of risk managers. In so doing, it has left the social nature of risk management settings and its influences on participants underexplored. As Renn's (1993) metaphor of the social arena discussed in Chapter 1 illustrates, people are rarely atomized individuals in participatory decision-making—they are often organized in and represented by groups and coalitions. In addition, they actively seek to exercise influence on other parties present in the discussion including the risk managers presiding over the issue, other stakeholders who may have either compatible or adversary interests, observers such as the media, and the general public.

To further illuminate the role of voice in its social context, one promising approach is to consider people's perceptions about the standing others have in the same issue. As described in Chapter 3, research participants who were deeply involved in the LPG storage issue often claimed that protesters and the project applicant were "outsiders," implying that these entities do not have legitimate access to voice in the issue. Opotow and Weiss (2002) argue that such rhetoric is a symptom of a moral orientation which views the target as undeserving of fairness, which in turn rationalizes and justifies harm inflicted on them. Such denial of legitimacy and subsequent exclusion may lead "outsiders" or "extremists" to seek aggressive tactics to achieve

their goals. On the other hand, other participants expressed more acceptance of protesters from farther areas arguing that “everything is connected.” These latter positions reflect an environmentalist point of view that considers not only immediate stakeholders but also the well-being of humans in general and the natural world within the scope of justice. The environmentalist perspective also implies the willingness to assume the cost of environmental protection both at individual and collective levels (Opotow & Weiss, 2002).

Investigating the role of perceived standing may afford new insights to understand social interactions related to risk management and environmental conflicts. First, perceived standing can inform those designing public participation processes to better determine the desirable scope of inclusion. By combining this information with those measuring subjective procedural fairness (or the need thereof), public participation organizers can better understand who seeks voice in the issue and what the consequences will be for other participants when the voice is granted to or deprived from certain parties. This understanding can also be used to design a level playing field that participants will perceive as fair. Second, perceived standing may help predict potential coalitions and adversaries within the public participation setting. Although some issues strictly divide the discussion between supporters and opponents, in other cases, there may be multiple variations of positions which opens room for persuasion and mediation. Understanding how different stakeholders see the standing of each other can help organizers understand these potential intergroup relationships. Third, perceived standing can be an indicator of community cohesion in ongoing environmental conflicts. Development projects often divide otherwise strong communities as conflicts intensify. Whether a segment of the public continues to recognize its opponents as a legitimate partner despite disagreements in the issue can be a

measure of community cohesion that can be tracked throughout the development of an environmental conflict.

Antecedents of Perceived Standing

The current study explores the sources of perceived standing by testing the antecedents of these judgments when residents from other areas seek voice in the same environmental issue.

Various indicators of attitudes, beliefs, and perceptions, which may reflect several different types of underlying motivations, were considered as plausible predictors of perceived standing.

Strategic Motivation. One basic motive to either uphold or reject other community members as legitimate stakeholders could be to influence the discussion in one's favored direction. Immediate stakeholders may see the influence from other community members as an opportunity or a threat depending on their expected position in the issue. In the Seneca Lake LPG storage issue, all local legislatures that had adopted a formal position on this issue except for Schuyler County expressed opposition to this project, including communities that do not have a shoreline at Seneca Lake.

H32. Perceived standing of residents from relatively distant communities will be lower among Schuyler County residents than non-Schuyler County residents.

In addition to county affiliation, one's attitude toward the gas storage project could be a more direct indicator of one's strategic interest in the issue. Those who support the project are likely to see other community members as potential foes whose voices should be denied whereas the opposite will be true for those who tend to oppose the project. Similarly, those who expect more benefits from the project will be more likely to oppose the standing of other community members against the project whereas those who perceive more risk will be more welcoming of their influence.

H33. *Support for the project will be negatively related to perceived standing of residents from relatively distant communities.*

H34. *Perceived benefit of the project will be negatively related to perceived standing of residents from relatively distant communities.*

H35. *Perceived risk of the project will be positively related to perceived standing of residents from relatively distant communities.*

Similarity. Homophily, the notion that people tend to interact with others who are similar to themselves more frequently than with those who are dissimilar, is a powerful principle explaining how humans organize across many domains of social life. (McPherson, Smith-Lovin, & Cook, 2001). In the literatures of risk communication and environmental management, similarity has been studied as a powerful predictor of trust in authorities (Meijnders et al., 2009; Perry, Needham, & Cramer, 2017; Siegrist et al., 2000). Similar processes are likely to take place when individuals judge others seeking standing in the issue such that individuals who perceive others as similar are more likely to accept their participation.

H36. *Perceived similarity to residents from relatively distant communities will be positively related to their perceived standing.*

Sense of place. The literature on sense of place has focused on the social-psychological relationship people have with their spatial settings. In particular, research on place attachment has investigated the role of emotions and feelings associated with places (Low & Altman, 1992). Jorgensen and Stedman (2001) argued that place attachment as affective feelings can be considered as a parallel concept alongside cognitive beliefs (place identity) and perceived advantage (place dependence) about the place, each of which are components of the higher-order construct referred to as sense of place. Alternatively, Kyle, Graefe, and Manning (2005) posited

that place attachment should be conceptualized as the higher-order construct subsuming place identity, place dependence, and social bonding. Among these three constructs, place identity refers to the internal dimensions that define one's identity in relation to the physical environment such as feelings, values, and preferences (Proshansky, 1978). In comparison, place dependence captures the perceived functionality of place in goal achievement while social bonding encompasses social relationships that infuse meaning to the place (Kyle et al., 2005). Despite these distinct conceptualizations, both approaches ascribe an important role to people's affective responses to a place which can be measured and treated as an attitude and used for empirical hypothesis testing. For example, Stedman (2002) found that attachment to a lake was positively related to behavioral intentions to protect the lake. For the purpose of this study, I consider place attachment primarily as one's affective bonding to the environmental settings (Low & Altman, 1992) that can be measured as a valenced attitude.

However, the effects of place attachment may depend on the unit of place one is asked about, especially when place units overlap in a nested structure. For example, Wenzel (2000) tested how self-categorization as an "East German" alongside self-categorization with the superordinate category of "German" predicted perceptions of economic entitlement among a sample of residents in the former East Germany region. He found that the inclusive self-categorization of "German," but not that of "East German," was positively related to the feeling that they were entitled to economic prosperity enjoyed by West Germans. Furthermore, self-categorization as German moderated the effects of perceived distributive injustice, the gap between perceived entitlement and actual economic situation, such that for those with a stronger German self-categorization, perceived distributive injustice was more positively associated with positions endorsing social protesting against the economic situation. Identification to different

groups in a nested structure also has implications for how people treat outgroup members. Stone and Crisp (2007) found that among British undergraduate participants, identification with the subgroup (i.e., British) was positively related to intergroup bias whereas identification with the superordinate group (i.e., European) was negatively associated with intergroup bias.

In the Seneca Lake gas storage issue, it was expected that participants would express strong attachment to Seneca Lake because all were residents in a county with a shoreline at the lake. However, their identification with the larger Finger Lakes region, which includes Seneca Lake could be expected to have more variance. Based on the literature of social identity regarding nested groups, it seems reasonable to investigate the effects of place attachment and identity on perceived standing with both Seneca Lake and the larger Finger Lakes region as the target. Given the studies reviewed above, attachment to the superordinate Finger Lakes region is likely to have a positive effect on the perceived standing of others who are part of that region but outside the scope of Seneca Lake communities. Directional prediction regarding the effect of identification with the subordinate Seneca Lake is more tenuous.

H37. Place attachment to the Finger Lakes region will be positively related to perceived standing of residents from relatively distant communities.

RQ6. Is place attachment to the Seneca Lake related to perceived standing of residents from relatively distant communities?

Perceived Underrepresentation. Finally, one's perception about their own voice can influence perceived standing. Participants who strongly feel that they deserve a voice may more easily empathize with farther communities, perceiving them as sharing a similar problem. Such empathy may be further enhanced if members from these communities are perceived as part of an ingroup, leading to favorable attitudes toward them (Tarrant, Dazeley, & Cottom, 2009).

However, social psychological research also suggests that people make sense of their own status by constantly comparing it with others' in the social environment, which consequently influences affective and behavioral responses (Corcoran, Crusius, & Mussweiler, 2011; Crosby, 1976; Festinger, 1954; H. J. Smith, Pettigrew, Pippin, & Bialosiewicz, 2012). In defining the concept of psychological entitlement, Campbell et al. (2004, p. 31) argued that entitlement is a sense that "one deserves more and is entitled to more than others," suggesting how deservingness stems from social comparisons. They found that their psychological entitlement scale, a personality scale measuring entitlement as a trait, was positively associated with a variety of selfish and aggressive attitudes and behaviors. Accordingly, it may be the case that those who feel underrepresented in the issue may express more exclusive attitudes toward other community members seeking voice in the same issue.

RQ7. Is the perception that one is underrepresented in the issue related to perceived standing of residents from relatively distant communities?

Method

Participants and the data collection procedure with the survey were described in detail in Chapter 4. All data used for the analyses in the current chapter were collected during the first wave of the survey. Thus, the sample size for the current study was 460, with 381 participants who completed the study online and 71 by mail. Among these participants, 58% were residents of Schuyler County, and 42% resided in one of the other three counties.

Measurement

Independent variables. Before describing the measurements for each variable, an explanation of an experimental manipulation used for this study is in order. Participants were randomly assigned to conditions to judge the standing of communities from either Cayuga

County or Tompkins County. The two counties were comparable in that both are communities within the Finger lakes region without a shoreline at Seneca Lake. The two counties also similarly share borders with some of the counties surrounding Seneca Lake. However, Tompkins County in upstate New York stands out among its neighboring counties for its distinctively liberal political leaning as evidenced by its voting record (New York State Board of Elections, 2018). If any effect of this manipulation on perceived standing had been observed, mediation analyses using the variables below as mediators (e.g., similarity, underrepresentation, political orientation) could have explored and revealed its underlying psychological mechanisms. Nevertheless, because no significant effect on perceived standing was observed, $t(448) = .30$, $p = .767$, this experimental manipulation was dropped from subsequent analyses.

Residency in Schuyler County was coded into a dummy variable based on the county participants were sampled from. Participants recruited from Schuyler County were coded as 1 whereas those from the counties of Yates, Ontario, and Seneca were coded as 0. Support for the project was measured with a single-item scale, “Do you personally support or oppose the currently proposed project to store liquefied petroleum gas (LPG) in the salt caverns located at Seneca Lake?” (1 = *Strongly oppose* to 7 = *Strongly support*). Perceived benefit was assessed using five items following a prompt asking how beneficial for the local community one considered each of the listed aspects related to the project. The five items here were higher tax revenue, addition of new jobs, lower LPG prices, independence from foreign-sourced energy, and improved air quality resulting from cleaner emissions relative to oil and coal (1 = *Not beneficial at all* to 5 = *Extremely beneficial*). These items were derived from Crestwood’s public relations materials (Crestwood, 2017). The five items were reliable ($\alpha = .95$) and averaged into a composite scale. Similarly, perceived risk was measured using five items following a prompt

asking how risky one considered each of the listed aspects. The five items were explosion of gas during storage, leak or spillage of gas during storage or transportation, increase of salinity in the lake, loss of scenic value of landscape, and threat to local tourism industry. Development of these items was guided by arguments featured in participant interviews during the exploratory phase of the study (see Chapter 3). The five items were reliable ($\alpha = .96$) and averaged into a composite scale.

To measure perceived similarity, three items from Stone and Crisp (2007, Study 4) were adapted to fit the study context and each participant's experimental condition. These items were: "I feel similar to people in (Cayuga/Tompkins) County in general," "I feel that I have a lot in common with people in (Cayuga/Tompkins) County," and "I feel that I possess attributes that are associated with people in (Cayuga/Tompkins) County" ($1 = \text{Strongly disagree}$ to $7 = \text{Strongly agree}$). The three items were reliable ($\alpha = .95$) and averaged into a composite scale.

Given the alternative conceptualizations of place attachment, I adopted place attachment items from both Jorgensen and Stedman (2001) and Kyle et al. (2005). In accordance with Low and Altman's (1992) emphasis on the affective nature of place attachment, I extracted the place attachment subscale from Jorgensen and Stedman (2001) and the place identity subscale from Kyle et al. (2005). For example, the four items from Jorgensen and Stedman's (2001) scale included "I feel relaxed when I'm at Seneca Lake" and "I feel happiest when I'm at Seneca Lake" ($1 = \text{Strongly disagree}$ to $5 = \text{Strongly agree}$). The four items from Kyle et al. (2005) included "The Seneca Lake region means a lot to me" and "I am very attached to the Seneca Lake region" ($1 = \text{Strongly disagree}$ to $5 = \text{Strongly agree}$). These scales were repeated with the target of attachment replaced with "Finger Lakes." A negatively coded item from the place identity subscale by Kyle et al. (2005) ("I feel no commitment to the (Seneca Lake/Finger Lakes)

region") was removed because of its deleterious effects on scale reliability. The remaining seven items were found to be reliable, $\alpha_{\text{Seneca Lake}} = .93$, $\alpha_{\text{Finger Lakes}} = .94$, and averaged into scales of place attachment for each target.

Finally, underrepresentation was measured by calculating the difference between perceptions of one's actual voice and deserved level of voice in the issue. To measure actual voice, the survey asked participants to "rate how well you feel interests of residents in your county are **currently** being represented to influence this issue" on a slider bar scale ($0 = \text{Interests are not represented at all}$ to $100 = \text{Interests are well represented as those of any other group}$). Emphases were added to highlight differences across apparently similar questions. Deserved level of voice was measured using a question asking participants to "rate how well you feel interests of residents in your county **should** be represented to influence the issue" ($0 = \text{Interests should not be represented at all}$ to $100 = \text{Interests should be well represented as those of any other group}$). The former was subtracted from the latter, resulting in the scale of underrepresentation.

Dependent variable. To measure perceived standing, participants were first presented with a map of the Finger Lakes region, with instructions asking them to locate Cayuga or Tompkins County (depending on their experimental condition) and the LPG storage site which were depicted on the map. Then, they were told that "recently, several municipalities in (Cayuga/Tompkins) County have drafted resolutions on the Seneca Lake gas storage issue, arguing that the project would affect the Finger Lakes region as a whole." Following this prompt, the question measuring perceived standing asked, "please rate how well you feel interests of (Cayuga/Tompkins) County residents **should** be represented to influence this issue ($0 = \text{Interests}$

should not be represented at all to 100 = Interests should be well represented as those of any other group).

Control variables. In models predicting perceived standing, demographic variables were included to control for their effects. These variables included gender, age, educational attainment, race, political ideology, and environmental concern. Considering the predominantly large proportion of white residents in the sample (see Chapter 4), race was dummy-coded into a binary variable (i.e., white vs not white). In addition, educational attainment was transformed into a dummy variable based on whether one had attained a bachelor's degree or not. Environmental concern was measured using a single-item scale, "Generally speaking, how concerned are you about the state of the natural environment?" (*1 = Not at all concerned* to *7 = Extremely concerned*).

Data Analysis

Data were analyzed using IBM SPSS Statistics Version 25. After generating descriptive statistics, the hypotheses were analyzed using a hierarchical regression procedure. In the first step of the regression, all demographic variables were added to control for their effects before independent variables were subsequently introduced. In the second step, participants' residency in Schuyler County was entered. The third step of the regression introduced other independent variables more directly suggestive of strategic motivation. The fourth step added perceived similarity and the fifth step added place attachment variables to the model. Finally, the effect of perceived underrepresentation is examined. The change in the amount of explained variance was assessed between each model.

Results

Table 5.1 displays the descriptive statistics for each variable included in the current analysis alongside zero-order correlations. On average, participants saw themselves as Seneca Lake residents and living closely to the lake. They also strongly self-identified as year-round and long-time residents. When they were asked if they live close to any other lake, the average response was slightly negative. Participants were 39% female, 62 years old on average, and predominantly white. About 58% had a bachelor's degree or higher. Although participants' political ideology was close to the scale midpoint, overall, environmental concern was very high.

Overall, participants rated the perceived standing of more distant community residents as higher than the scale midpoint. Support for the project and perceived benefit was below the scale midpoint whereas perceived risk was above the midpoint. Participants' perceived level of similarity to the target community members was higher than the scale midpoint. Participants also indicated a strong attachment to both Seneca Lake and the larger Finger Lakes region.

Results of the hierarchical regression are displayed in Table 5.2. When demographic variables were introduced in Model 1, female gender, liberal political ideology, and environmental concern positively predicted perceived standing. Model 2 investigated the effects of residency in Schuyler County, which was the only county that adopted a resolution supporting the project through its legislature. This variable was assumed to be linked to a strategic motivation to reject the voice of Cayuga or Tompkins County residents. Specifically, H32 predicted that Schuyler County residents would be less supportive of the standing of distant community members than non-Schuyler County residents. Confirming this hypothesis, residency in Schuyler County was negatively related to perceived standing.

Table 5.1 Means, standard deviations, and zero-order correlations of variables

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Dependent Variables			61.09	35.13	-											
Independent Variables																
2. Schuyler County	0.58	0.49	-.26 ***	-												
3. Project support	2.83	2.27	-.70 ***	.19 ***	-											
4. Perceived benefit	2.49	1.16	-.52 ***	.09 *	.76 ***	-										
5. Perceived risk	3.29	1.39	.71 ***	-.19 ***	-.86 ***	-.70 ***	-									
6. Similarity	4.48	1.80	.69 ***	-.31 ***	-.69 ***	-.59 ***	.70 ***	-								
7. FL place attachment	4.24	0.77	.43 ***	-.15 **	-.46 ***	-.35 ***	.48 ***	.43 ***	-							
8. SL place attachment	4.01	0.82	.27 ***	.09 †	-.36 ***	-.34 ***	.37 ***	.33 ***	.74 ***	-						
9. Underrepresentation	39.56	28.37	.30 ***	-.06	-.31 ***	-.26 ***	.32 ***	.25 ***	.17 ***	.13 **	-					
Control Variables																
10. Female	0.39	0.49	.19 ***	-.01	-.23 ***	-.18 ***	.28 ***	.19 ***	.11 *	.08	-.01	-				
11. Age	61.49	12.68	.09 †	.01	-.09 †	-.13 **	.05	.07	.07	.11 *	.02	-.10 *	-			
12. BA degree or higher	0.58	0.49	.12 *	-.11 *	-.17 ***	-.10 *	.12 *	.15 **	.07	.03	.09 †	.06	-.01	-		
13. White	0.96	0.19	.00	.00	.08 †	.05	-.06	.00	-.04	-.05	-.06	.08 †	.03	.03	-	
14. Conservative ideology	3.86	1.66	-.41 ***	.05	.53 ***	.45 ***	-.49 ***	-.44 ***	-.18 ***	-.14 **	-.20 ***	-.24 ***	-.07	-.21 ***	.03	-
15. Environmental concern	6.11	1.05	.30 ***	-.03	-.40 ***	-.38 ***	.41 ***	.40 ***	.35 ***	.16 **	.05	.15 **	.05	-.06	-.33 ***	

Note. SL = Seneca Lake, FL = Finger Lakes region, BA = Bachelor's

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Model 3 tested more direct indicators of strategic motivation. H33 through H35 predicted that those who oppose the project, perceive fewer benefits, and perceive more risk will be more likely to recognize the standing of farther community members, respectively. Whereas H33 and H35 were supported, H34 was not. Controlling for the effects of demographics, county residency, project support, and perceived risk, perceived benefits had no significant effect on perceived standing.

Model 4 tested H36 which predicted that perceived similarity to the target community members will be positively associated with their perceived standing. Controlling for the effects of variables included in Model 3, similarity positively predicted perceived standing, lending support to H36.

Model 5 introduced variables of place attachment, testing H37, which predicted a positive effect of attachment to the Finger Lakes region, and RQ6 which concerned the relationship between attachment to Seneca Lake and perceived standing. Controlling for the effects of variables entered up to Model 4 and attachment to Seneca Lake, attachment to the superordinate Finger Lakes region was positively associated with the perceived standing of residents from farther counties, supporting H37. With regards to RQ6, attachment to Seneca Lake was negatively associated with perceived standing, controlling for the effects of Model 4 variables and Finger Lakes place attachment. Interestingly, this relationship controlling for third variable effects was in the opposite direction of the positive zero-order correlation between Seneca Lake attachment and perceived standing (Table 5.1).

Table 5.2 Hierarchical regression of perceived standing

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	b	SE	b	SE	b	SE	b	SE	b	SE	b	SE
Constant	32.84 *	16.06	42.57 **	15.66	24.14	15.12	3.60	14.68	.45	15.13	-2.93	15.16
Female	7.11 *	3.29	7.37 *	3.19	-.14	2.55	-.21	2.42	-.32	2.41	.06	2.41
Age	.16	.13	.16	.12	.11	.10	.11	.09	.12	.09	.12	.09
BA degree or higher	2.87	3.20	1.44	3.11	-.56	2.45	-.64	2.33	-.77	2.32	-.88	2.31
White	2.16	8.64	3.05	8.37	9.62	6.58	8.17	6.25	7.79	6.22	8.19	6.20
Conservative ideology	-6.58 ***	1.03	-6.46 ***	1.00	-.90	.86	-.66	.82	-.74	.83	-.70	.82
Environmental concern	6.10 ***	1.57	5.89 ***	1.52	-.09	1.26	-1.53	1.21	-1.84	1.25	-1.83	1.25
Schuyler County	-	-	-16.09 ***	3.03	-7.66 **	2.44	-3.74	2.39	-2.07	2.49	-2.25	2.48
Project support	-	-	-	-	-4.82 ***	1.16	-3.54 **	1.12	-3.51 **	1.12	-3.38 **	1.12
Perceived benefit	-	-	-	-	2.24	1.58	3.35 *	1.51	2.90 †	1.52	3.00 *	1.51
Perceived risk	-	-	-	-	11.46 ***	1.77	8.99 ***	1.73	8.39 ***	1.74	8.08 ***	1.74
Similarity	-	-	-	-	-	-	6.41 ***	.96	6.34 ***	.95	6.31 ***	.95
FL place attachment	-	-	-	-	-	-	-	-	6.01 *	2.39	5.96 *	2.38
SL place attachment	-	-	-	-	-	-	-	-	-4.41 *	2.14	-4.37 *	2.13
Underrepresentation	-	-	-	-	-	-	-	-	-	-	.08 *	.04
R ²	.21	.26	.55	.60	.60	.60	.60	.60	.60	.61	.61	.61
Adjusted R ²	.20	.25	.54	.59	.59	.59	.59	.59	.59	.59	.59	.59
F Change	18.32 ***	28.19 ***	87.13 ***	44.97 ***	44.97 ***	3.27 *	3.27 *	3.27 *	3.27 *	4.12 *	4.12 *	4.12 *
(df1, df2)	(6, 410)	(1, 409)	(3, 406)	(1, 405)	(1, 405)	(2, 403)	(2, 403)	(2, 403)	(2, 403)	(1, 402)	(1, 402)	(1, 402)

Note. SL = Seneca Lake, FL = Finger Lakes region, BA = Bachelor's

† p < .10, * p < .05, ** p < .01, *** p < .001.

Finally, RQ7 sought to examine the relationship between one's feeling of being underrepresented in the issue and the perceived standing of others. In Model 6, controlling for the effects of variables included in Model 5, the more one felt underrepresented, the more likely they were to recognize the standing of residents from communities relatively more distant to Seneca Lake.

In the final Model 6, which included all variables, the significant effects of demographic variables and Schuyler County residency observed in previous models were no longer significant. In addition, the effect of perceived benefit on perceived standing, which failed to reach levels of statistical significance in Model 3, was significant with an unexpected positive relationship. This effect was in the opposite direction of the negative zero-order correlation reported in Table 5.1.

Standardized coefficients in the final Model 6 indicate that similarity and perceived risk had the largest effect on perceived standing, .322 and .321, respectively. This was followed by support for the project, -.220, attachment to the Finger Lakes region, .129, attachment to Seneca Lake, -.101, and perceived underrepresentation, .068.

Throughout each step in the hierarchical regression, there was a significant increase in the amount of explained variance, suggesting that newly introduced variables contributed to improved predictions of perceived standing. The largest increase in R^2 occurred between Model 2 and Model 3 when the three variables indicative of strategic motivation to favorably influence the issue were introduced. After project support, perceived benefit, and perceived risk were entered into the model, the additional variance explained by similarity (Model 4), place attachment (Model 5), and underrepresentation (Model 6) was relatively modest in size but statistically significant.

Discussion

Public participation is upheld as a normatively valuable principle that improves the quality of public decision-making in democratic societies, especially for management of risk and environmental issues. Nevertheless, in practice, the exact scope of participation is often intensely contested over issues such as who should be allowed to participate, in what capacity, and with what level of control over the decision. Independent from normative perspectives on the scope of inclusion for public participation processes, members of the public often make lay judgments about who should and who should not be included to have a voice in risk management issues.

The current study sought to measure these perceptions about the standing of other stakeholders and test potential antecedents which may reflect alternative motives to support or reject others' standing. As anticipated, in the context of the current study in which Finger Lakes communities outside the Seneca Lake region were mostly opposing the project, participants' attitudes toward the issue and perceptions of the project's risks and benefits strongly predicted perceived standing of those other communities. However, predictors of perceived standing were not limited to strategic concerns. Perceived similarity with other communities, place attachment, and perceived underrepresentation all had unique and positive effects on perceived standing.

Drawing on findings from the hierarchical regression, a post-hoc analysis was conducted to further illuminate the relationship between independent variables. Because the effect of Schuyler County residency was initially significant in Model 2 but not so from Model 4 on, it seemed plausible that its effects were fully mediated by variables introduced in latter models. A mediation analysis using Hayes' Process Macro for SPSS (Version 3.0) was conducted to analyze indirect effects mediating the relationship between Schuyler County residency and perceived standing. When the seven variables featured in H33 through RQ7 were tested as

parallel mediators, four mediators with significant indirect effects emerged: project support, bootstrapped 95% CI: [-6.76, -1.20], perceived risk, bootstrapped 95% CI: [-7.10, -1.76], similarity, bootstrapped 95% CI: [-10.07, -4.26], and attachment to the Finger Lakes region, bootstrapped 95% CI: [-3.28, -.18]. The full results of the mediation analyses are presented in Figure 5.1. These results suggest that identity and place attachment processes as well as strategic concerns may have prompted non-Schuyler County participants to be more accepting of the standing of Tompkins and Cayuga residents.

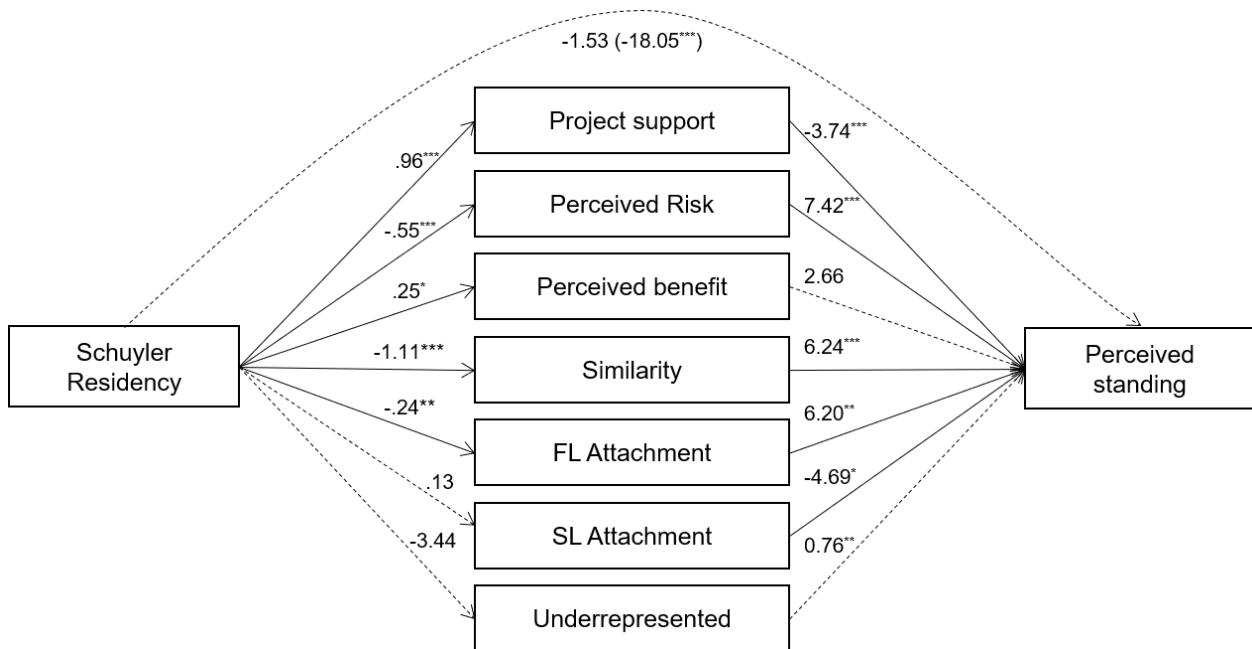


Figure 5.1 Mediation analysis of the effect of Schuyler County residency on perceived standing. All coefficients are unstandardized coefficients. Coefficient in parentheses is the effect of Schuyler County residency not controlling for the mediators. * $p < .05$, ** $p < .01$, *** $p < .001$.

Nevertheless, one should use caution in interpreting the findings of this study. Because data used for the current study was correlational, it is difficult to justify claims regarding the

presence or direction of causality in relationships. In addition, it is likely that the effects observed in the current study are highly context-dependent. In the Seneca Lake LPG storage issue, it was quite commonly known that communities outside the Seneca Lake watershed area mostly opposed the siting of the storage. The valence of the observed effects may change if participants perceive that the party seeking standing is likely to support the focal development project.

A more fundamental skepticism toward these findings may concern whether stakeholders' perception toward other community members' standing matter at all in the first place. One may argue that standing should be determined by some demonstration of injury as in legal proceedings rather than individual perceptions. Nevertheless, issues such as standing or injury can be subject to debate just as the environmental issue itself, and making a ruling on these issues in democratic decision-making should be informed by the basic understanding of how potential parties in the public participation process view each other. By understanding perceived standing, risk managers can better design public participation processes that can be perceived fair by predicting how a decision to include or exclude a certain party will be accepted by others. Tying standing to the perception of other stakeholders may also incentivize those seeking standing to engage in civil and productive discourse that can contribute to the quality of the deliberation. Future empirical research can test the effects of perceived standing by examining how these perceptions affect the attitudes and behavior of those making the judgment in public participation processes, how risk managers respond to information about standing judgments made across stakeholder groups, and how groups and individuals seeking for standing react to information about how others perceive their standing.

To understand the dynamics of public participation processes, research should be able to capture the social nature of experiences shared by those taking part in the social arena (Renn, 1993). Just as stakeholders make judgments about risk managers who may be at the center of the arena, they may also hold perceptions about other stakeholders with whom they may compete or cooperate to influence the decision outcome. Whereas the former has been extensively studied through the rich literature on trust in risk communication, the latter type of social judgment has been left mostly underexplored. The current study represents one of the most initial quantitative empirical studies exploring inter-stakeholder perceptions in environmental conflicts. As expected, the current study has found that people are more likely to acknowledge the perceived standing of others if they see that the judgment target shares similar attitudes toward the development project under dispute. However, the findings suggest that inclusive positions to others' standing can also be driven by perceived similarity with those targets, attachment to the superordinate regional unit shared with those targets, and the feeling of the self being underrepresented in the public participation process, which may be shared with those targets. Further research is necessary for a more detailed understanding of the process of how people make these judgments of standing and what implications these judgments might have for risk management and environmental conflict resolution.

CHAPTER 6

CONCLUSION

Early research in risk communication aptly demonstrated that people's responses to risk are not merely the product of weighted expectations of costs and benefits but rather constructions contingent on social and cultural processes. In a world with innumerable types of risks, social institutions rooted in moral values filter the type of risks we focus on as a society and influence how we think about those risks (Douglas & Wildavsky, 1982). Similarly, risks that are often determined trivial by experts can be socially amplified as news media, cultural groups, and interpersonal networks interpret and respond to certain types of risks (Kasperson et al., 1988). In addition, members of society perceive whether institutions tasked with managing technological risks on behalf of society are meeting their fiduciary responsibilities and use this perception to respond to the risk (Freudenburg, 1993).

Social judgments that individuals make about others in society are fundamental to these social processes. Risk events concerning the conduct of social agents are amplified through society with high signal value (Kasperson et al., 1988). In turn, the awareness of being judged by constituencies to whom one feels accountable motivates people to adjust their behaviors to maintain a positive impression (Tetlock, 1992). In the social arena of risk communication (Renn, 1993), this motivation to receive and maintain positive social judgments can explain the behaviors of risk managers, stakeholders, observing media, and opinion leaders because they all seek to maximize their influence among their respective audiences. Thus, understanding how these agents exchange social judgments is indispensable for social science research seeking to unravel the nature of social dynamics in risk communication.

Drawing on reviews of previous literature and new empirical findings, the five previous chapters sought to both deepen and broaden risk communication research on social judgments. Chapter 1 explicated the scope and goals of this dissertation by highlighting the diversity of social relationships in risk management using the Renn's (1993) metaphor of the social arena. The chapter specified two strands of inquiry related to social judgments as topics of this dissertation. Research has paid ample attention to how members of the public judge key actors in risk communication (e.g., risk managers) by focusing on the role of trust. The first goal of this dissertation was to deepen this line of research by investigating the attributes related to the strength of trust such as knowledge, elaboration, and certainty. In addition to judgments on authorities, however, the social arena metaphor suggests that there is a wider array of social relationships, which will necessarily accompany a wider set of social judgments. Specifically, I decided to focus on the judgments various stakeholders in an issue make about the standing of each other. Accordingly, the second goal of this dissertation was to broaden the scope of social judgments research in risk communication by exploring the role of perceived standing.

Chapters 2 through 4 proceeded to achieve the first goal of the dissertation by revealing the strength-related attributes of trust. Chapter 2 explicated the theoretical reasoning showing why strength is an important and relevant aspect of trust that requires empirical investigation. Reviewing some of the most influential theories of trust in risk communication, the chapter pointed out how they assume that trust stems from categorically simple heuristics-based judgments. I argued that this assumption fails to explain empirical findings often showing how members of the public thoughtfully interpret the meaning of their risk managers' conduct. This assumption also precludes trust from exhibiting meaningful consequences such as durability and impactfulness. Instead, theories of impression formation (Brewer, 1988; Fiske & Neuberg, 1990)

and development of trust (Lewicki & Bunker, 1995) suggest that trust can vary in the level of cognitive effort and the amount of supporting knowledge. In addition, reviewing previous communication literature, the chapter argued that direct and indirect communication practices between risk managers and constituents, as well as interpersonal discussion among constituents, could serve as processes that bolster the strength-related attributes of trust.

Chapter 3 highlighted local-level environmental issues as a prominent venue to observe strong forms of trust and described the local context selected for the study. Local-level contexts afford multiple conditions that can foster strength in risk managers' trust. Due to the physical copresence, residents are more likely to directly interact with their local risk managers. The high relevance of local environmental issues increases people's motivation to reach an accurate judgment of risk-managing agencies. Local media and interpersonal discussions focusing on local topics are likely to generate knowledge and stimulate elaboration. The Seneca Lake LPG storage issue, which was selected as the context for the empirical study, well featured these expected characteristics with clearly identifiable judgment targets whose trust could be measured and studied. Preliminary fieldwork with interviewees deeply involved in the gas storage issue confirmed the presence of strong forms of trust afforded by these characteristics of the local level. While explaining reasons for their trust or distrust, participants drew on direct experiences in which they communicated with or observed the judgment targets. In addition, they identified local news media and interpersonal discussions as sources of information about the issue.

Chapter 4 presented the empirical study revealing the strength-related attributes of trust using a survey on the Seneca Lake LPG storage issue. The survey measured variables focusing on the strength-related attributes of trust (i.e., objective knowledge, perceived knowledge, elaboration, certainty) and enabled hypothesis tests for both the antecedents and consequences of

these variables. Overall, these tests yielded strong evidence showing that, as predicted, engagement in communication processes relevant to the issue (i.e., direct communication with risk managers, use of local news media, interpersonal discussion about the issue) helped build knowledge, elaboration, and certainty in trust toward the judgment targets. In addition, these strength-related attributes significantly predicted the strength-defining consequences of trust (i.e., persistence, resistance, impact on information processing and behavioral intentions), accounting for unique variance beyond what was explained by trust alone. Redundant hypothesis tests on the three judgment targets—the NYSDEC, Crestwood, and Gas Free Seneca—further bolstered the evidentiary value of these hypothesis tests, reducing the possibility that these statistical relationships were observed by chance.

Chapter 5 presented empirical evidence answering the second line of inquiry of this dissertation related to perceived standing. Interviews with opinion leaders in the Seneca Lake LPG storage issue from Chapter 3 illustrated how stakeholders in the issue resort to rhetoric defining their opponents as “outsiders.” Because such rhetoric was an apparent attempt to deny the target’s access to representation in and influence on the issue, I referred to these judgments directed to other ordinary stakeholders in the issue as the perceived standing of others. Pursuing this emergent theme, the empirical study in Chapter 5 explored the motivational and attitudinal sources driving these perceptions. Participants expressed their perceived standing of members from other communities located farther from the project site than themselves. Because of the common knowledge that these farther communities are likely to oppose the gas storage project, I expected that participants’ strategic concern to have more allies and fewer opponents in the issue would be related to judgments of perceived standing. Consistent with this expectation, attitudes toward the project as well as beliefs about the project’s risks and benefits predicted perceived

standing. However, influences on perceived standing were not limited to strategic concerns. Perceived similarity with the target community residents, attachment to Seneca Lake, attachment to the larger Finger Lakes region, and perceptions of oneself being underrepresented in the issue all exhibited unique effects on perceived standing even after controlling for variables of demographics and strategic concerns.

Implications

These findings on the strength-related attributes of trust and perceived standing provide researchers and practitioners with alternative ways to approach risk communication. In this section, I discuss the theoretical and practical implications of the findings from this dissertation related to each line of inquiry.

Implications of Strength-Related Attributes

Most importantly, findings on the strength-related attributes of trust show that the cognitive process by which trust is shaped is variable and measurable. As reviewed in Chapter 2 and 4, conventional risk communication theories of trust tend to assume categorically that cognitively effortless processes relying on heuristics dominate when people make judgments about their risk managers' trustworthiness. However, Chapters 2 through 4 suggest that people who are deeply involved or interested in an issue draw on substantially richer knowledge, deeper thinking, and greater confidence when they report their judgments about trust in risk-managing agents. Moreover, results in Chapter 4 show that a small number of simple questions can effectively measure these attributes of strength.

This alternative view of trust first suggests that researchers should also pay attention to the process by which trust is shaped in addition to the resulting level of trust. Conventional measures of trust in Likert-type or semantic differential scales only capture the final judgment of

trust, which is merely the surface-level manifestation of the construct. Although trust reported in such ways can be strong (i.e., durable and impactful) if it is a stable attitude represented in memory, it can also be weak if it was temporarily improvised (i.e., constructed) upon the survey's request. For a more multidimensional understanding of trust reflecting the depth of the relationship between the risk manager and the audience, researchers can directly measure trust's strength-related attributes such as knowledge, elaboration, and certainty.

By considering and measuring the strength-related attributes of trust, researchers can better understand when trust works or not. Risk communication studies have occasionally found that trust is of limited importance (Sjöberg, 2000, 2001). Instead of attributing the varying effectiveness of trust to contextual differences (Bronfman, Vázquez, Gutiérrez, & Cifuentes, 2008; Earle, 2010; Siegrist & Cvetkovich, 2000), the strength-related attributes perspective provides a concrete method to examine and predict *when* trust will become consequential or not. For example, if trust for a governmental agency is positive but the strength of this trust is low, it will be less likely that such trust will withstand negative news cycles or translate into cooperative behaviors from the public.

In addition, the strength-related attributes perspective also encourages researchers to consider a more diverse range of measures to gauge the success of trust-building efforts. Whereas the majority of risk communication research has focused on constructs such as risk perceptions, benefit perceptions, technology acceptance, and policy support as the outcomes of trust, little risk communication research has paid attention to outcomes indicative of the durability of trust or the impact of trust on information processing. Efforts to build trust can often be costly in the short term while its returns are uncertain. Some of these benefits may only manifest under crisis situations or when unpopular decisions are made. Measuring consequences

such as persistence, resistance, or impact on information processing can help researchers better predict what will happen to the risk managers' trust and its effects under 'moments of truth' before they actually undergo such moments.

Finally, the strength-related attributes perspective leads researchers and practitioners to reconsider solutions for building trust. If heuristics such as value similarity or affect are primary determinants of trust as some risk communication research suggests, it follows that a risk manager may build trust by signaling commitment to a certain value or inducing some positive affect regardless of how superficial or irrelevant to trust these heuristics may be. By considering the strength-related attributes of trust, agencies can more accurately measure the signal value of their various actions and words and empirically test how consequential they are. Importantly, this emphasis on the strength of trust can move the focus of risk communication away from managing audience perceptions through public relations toward a expressing a genuine commitment to engage the public with deep and extensive communication.

Implications of the Perceived Standing

Although access to and voice in public participation processes of risk management can be politically contested and negotiated in practice, scant amount of research has investigated how stakeholders and members of the public perceive the legitimacy of different agents seeking representation in an issue. As other political topics of discussion in democratic societies, the decision of who should have standing in an issue, and to what extent, should at least consider public opinion on this topic. The findings presented in Chapter 5 suggest that researchers can effectively measure and study how members of local communities perceive the standing of others in environmental conflicts.

The diversity of antecedents predicting these perceptions of standing suggests that people consider a wider set of criteria than what determines standing in formal legal proceedings (e.g., concrete injury in fact). Rather than simply dismissing other residents' standing based on their distant location from the source of risk, participants in the current study also considered a host of other criteria reflecting their own relationship with those target residents and the larger community. The effects of attitude toward the issue and perceived risks and benefits suggest that people can effectively estimate the goals of others seeking standing in an issue and will accept or reject their standing based on their own strategic needs. However, the significant effect of similarity further suggests that other characteristics shared with the targets such as identity and values can also be grounds to support their standing.

In addition, the effects of place attachment on perceived standing provide several interesting insights related to the social dynamics involving place, identity, and social judgments. Consistent with previous literature showing that place attachment motivates people to engage in place-protective behaviors (Stedman, 2002), both attachment with Seneca Lake and the larger Finger Lakes region had a positive zero-order correlation with the perceived standing of targets who could be reasonably expected to oppose the gas storage project. However, after controlling for the effects of other variables (i.e., demographics, strategic concerns, similarity, attachment to Finger Lakes region, and perceptions of self's underrepresentation), the valence of the effect of attachment to Seneca Lake switched to negative. This suggests that while place attachment may predict place-protective motivations, it may also relate to the desire to exercise exclusive control over the place. In contrast, attachment to the larger place unit in a nested structure of places may be indicative of an ecological perspective that recognizes the connectedness among environmental elements and the people residing across distances. If this is the case, the variance

representing place-protective motivations may be part of attachment to both place units but existing in a more refined form in attachment to the larger Finger Lakes region. Accordingly, when attachment to the larger place unit is controlled for, attachment to the smaller place unit will be more indicative of the alternative motivation to exclusively control the place.

To confirm this conjecture, I conducted a post hoc hierarchical regression in which I introduced Seneca Lake attachment first and Finger Lakes attachment later separately in the Model 5 step of the hierarchical regression analysis reported in Table 5.2. In the original analysis reported in Chapter 5, I had entered these variables simultaneously. When attachment to Seneca Lake was added to the variables present up to Model 4, its effect was not significant. However, confirming the post hoc reasoning stated above, when attachment to the Finger Lakes region additionally entered the model, the effect of Seneca Lake attachment turned negative. This additional finding suggests that place attachment may reflect multiple motivations for stakeholders in place management decisions, which may be teased apart by separately measuring attachment to different place units in a nested structure.

Finally, the study found that one's own feeling of underrepresentation was positively correlated with perceived standing of others. I had made no a priori directional hypothesis about the valence of the relationship between these two constructs because it was unclear which would prevail between two opposite forces: the empathy towards others similarly lacking standing and the sense of exclusive entitlement derived from social comparison. The positive effect of underrepresentation on perceived standing suggests that people who feel that they deserve to have more voice and control are also more likely to support similar rights for others, even if the target communities are not as geographically proximate as their own to the source of risk.

Risk managers designing public participation processes often need to decide whom to include in or exclude from the decision-making. The findings from this study suggest that citizens may use a broader set of criteria than ‘injury in fact’ to determine the appropriate scope of participation. Risk managers who are committed to design inclusive decision-making processes should take into account the social relationship between communities or stakeholder groups to enhance perceptions of fairness among its constituencies. In addition, for scenic places or famous landmarks, people beyond the legally-defined local jurisdiction may often possess deep attachments and place-based identities which require risk managers’ consideration.

Future Research

Future Research on the Strength-Related Attributes of Trust

One limitation of the study related to the strength-related attributes of trust was that the hypothesized relationships were observed in an issue at the local level in which strong forms of trust may be easier to observe. It may be that in risk management issues at a larger scale (e.g., national or international level), information about the authorities’ trustworthiness would be more abstract and diffuse. If this is true, the variance in the strength-related attributes of trust among the relevant public may be smaller and the effects of these strength-related attributes may not be as consequential as they were in this study. Thus, future research first needs to replicate the findings concerning the strength-related attributes of trust in broader contexts to demonstrate the constructs’ utility for general risk communication research.

Building on findings from this study showing how different communication processes influence the strength-related attributes of trust, risk communication research can further examine the effect of various communication elements on trust and its strength. These communication elements may include the effects of messages, channels, and contexts, among

others. Most importantly, risk managers may test how different types of evidence used to demonstrate their trustworthiness contribute to strong forms of trust. For example, risk managers may compare how messages signaling value similarity differ from messages revealing substantive and sincere motivations to engage the public in their effect on the strength-related attributes of trust. Given that trusting is broadly considered as the willingness to make oneself vulnerable to the exchange partner (Luhmann, 1979), messages that make risk managers mutually vulnerable to their audience (e.g., conferring veto rights to community members, committing to take an unlimited amount of questions) may have a particularly high value in bolstering the strength of trust. The current study also found that direct channels of communication with the risk manager have a particularly large impact on the strength of trust. Future studies, for example, may investigate whether personalized communication mediated via email, post mails, or webinars may have comparable effects on building strong forms of trust for those who cannot take part in deliberative processes in person. Risk managers may also need more information on the contextual effects of communication processes to determine when or under what setting it is best to deliver their core messages to maximize the impact on the strength of trust.

Future research should also consider the role of other strength-related attributes that were not examined in this study. These may include, for example, the importance, accessibility, and ambivalence of trust. In particular, as discussed in Chapter 2, research on attitude ambivalence can provide a more systematic framework to study the concept of critical trust, which some researchers have posited as the healthier form of trust relative to ‘blind trust’ (Pidgeon et al., 2007; Poortinga & Pidgeon, 2003). Another area of potentially fruitful research opportunities concerns the internal structure of the various strength-related attributes of trust. Although attitude

strength research has strived to determine the causal relationship between the strength-related attributes of attitudes, research on this topic is yet inconclusive (Visser & Holbrook, 2012).

Research on trust can contribute to this discussion with its findings rooted in attitudes observed from real-world contexts.

Future Research on Perceived Standing

As for research on perceived standing, a natural course for future studies will be to explore the effects of these judgments. For example, does awareness of standing judgments from other stakeholders empower or discourage those who are interested in joining participatory processes? If so, do the effects differ when these judgments come from more or less direct stakeholders than oneself in the issue? In addition, how does awareness of these judgments influence risk managers designing public participatory processes? Will risk managers positively consider inviting new stakeholder groups to the table if they find broad support for their standing from others already involved?

If perceived standing is consequential, groups or individuals seeking standing in environmental issues may wish to consider approaches that will increase support for their standing among others. For example, research can examine whether the use of violent or unlawful tactics to protest a project will undermine or increase one's standing in an issue among project opponents. Stakeholders whose standing is contested may also consider communication approaches that can help frame themselves as legitimate stakeholders rather than "outsiders." It may also be interesting to investigate how the geographical dispersion of support or opposition affects perceptions about standing.

Concluding Remarks

Within social arenas of risk management and environmental conflicts, the types of social judgments across different agents are inevitably diverse and complex. The current dissertation advanced the understanding of these social judgments with theoretical discussion and empirical evidence in two different ways. First, it deepened the risk communication field's understanding of trust in risk managers by revealing the strength-related attributes of trust. In addition, it broadened the scope of social judgments under the field's empirical attention by establishing the concept of perceived standing and exploring its sources. Although incremental on their own, these advancements open doors to unique research opportunities by demonstrating new ways to think about how people, as social agents, exchange judgments about each other as they communicate about shared risks and environmental hazards in our society.

APPENDIX A

Full Example of Interview Guide

In this study, we are interested in how people involved in environmental issues interact with authorities and make sense of those experiences. Specifically, I'm interested in the details of your experience you might have had with authorities such as NYSDEC or Crestwood in this gas storage issue. There are no right or wrong answers to these questions, so please feel free to express your honest thoughts and feelings.

1. First tell me a little about yourself, such as: for example, in which county your business and residence are, how long you have been living in this area, what you do for living?
 - Age
 - Residential history
 - Meaning of Seneca Lake
2. Would you share your overall position on this gas storage projects?
3. As you may know, there are local and federal governmental agencies, as well as private companies, and groups of organized citizens involved in this issue. In your opinion, which currently have the largest influence, or control, on this issue, when it comes to the determining whether this plant should be sited in the area? (Assuming it has been sited, then?)
4. Would you say you trust or distrust that organization?
 - a. (Probe interviewee's certainty in (dis)trust as appropriate.)
 - b. (Probe further about personal episodes or events as appropriate.)
 - I googled a bit about you. I read your letter to the editor about Gas Free Seneca; and also read their response and an email from you they posted on the website where you seemed to be persuading GFS to distance themselves from WASL.

(See if respondent's individuating or categorizing DEC.)

5. When you learn new things about that organization, how does it usually happen? Do you observe them in person? Talk with others? Hear about them in the news?
 - a. (Probe further about unique experiences as appropriate.)
6. In your observation, would you say the overall community in your county area are much interested in this issue?
7. You said _____ is the most important agency in this issue and you trust/distrust that agency. Do you think overall, the rest of the local community also feels about the same?
8. Generally speaking, besides this issue, how would you describe your values when it comes to environmental issues?
9. (Collect missing information as necessary.)

APPENDIX B
Survey Wave 1 Booklet Example



SENECA LAKE LPG STORAGE SURVEY

**Cornell University
Department of Communication**

<https://blogs.cornell.edu/senecalakesurvey/>

Please do not take this printed survey if you have already completed the survey online.

SURVEY ID*: _____

*Your survey ID can be found in your invitation letter or the address label of the mail/postcard.

CONSENT FORM

Please consider this information carefully before deciding whether to participate in this research study. You must be at least 18 years old to participate.

Purpose of this survey: This research seeks to understand how people make judgments about agencies and organizations involved in the Seneca Lake LPG storage issue.

What you will do: We will ask you to fill out a survey.

Time required: The study will take approximately **15-20** minutes to complete.

Risks: There is no more risk than would be expected from typical everyday experiences.

Benefits: No tangible benefits are associated with participating, but you are helping to contribute to social science research.

Compensation: There is no fixed compensation, but you will be able to enter a raffle for a chance to win a \$100 gift card (Amazon.com or Walmart; winner's choice. 10 winners will be randomly selected). You will enter the raffle by simply completing this survey and returning it to us.

Your answers will be confidential: The records of this study will be kept private. In any sort of report we make public, we will not include any information that will make it possible to identify you. Research records will be kept in a locked file; only the researchers will have access to the records.

Taking part is voluntary: Taking part in this study is completely voluntary. You may skip any questions that you do not want to answer. If you decide not to take part or to skip some of the questions, it will not affect your current or future relationship with Cornell University. If you decide to take part, you are free to withdraw at any time.

Contact: If you have questions about this study, please contact Hwanseok Song at hs672@cornell.edu, or the faculty advisor, Professor Katherine McComas (kam19@cornell.edu). If you have any questions or concerns regarding your rights as a participant in this study, you may contact the Cornell Institutional Review Board (IRB) at 607-255-5138 or access their website at <http://www.irb.cornell.edu>. You may also report your concerns or complaints anonymously through Ethicspoint (www.hotline.cornell.edu) or by calling toll free at 1-866-293-3077. Ethicspoint is an independent organization that serves as a liaison between the University and the person bringing the complaint ensuring anonymity.

Please check (✓) this box to acknowledge that you read and understand the above and are 18 or above in age.

You may have heard about the proposed plan to use empty salt caverns near the southern end of Seneca Lake as a storage facility for liquefied petroleum gas (LPG).

Crestwood, an energy company that stores, transports, and supplies LPG, filed the application for this project via its subsidiary Finger Lakes LPG Storage LLC. **Gas Free Seneca** (GFS) is one of the main groups of citizens opposing this project. The **New York State Department of Environmental Conservation** (NYSDEC) is the state agency currently reviewing this project proposal and will make a decision on whether this proposal should be approved.

Although recently in May 2017, Crestwood dropped its plan to establish a liquefied natural gas (LNG) storage at the same site, the application for the LPG storage is still under NYSDEC's review.

In this survey, we will ask you questions about this project, the Seneca Lake region, and its key groups and agencies such as Crestwood, Gas Free Seneca, and the NYSDEC. Having little knowledge about this issue is fine. Please do not refer to external sources while you are taking the survey. Simply use the best of your thoughts and feelings when you respond.

1. Do you personally support or oppose the currently proposed project to store liquefied petroleum gas (LPG) in the salt caverns located at Seneca Lake? Mark **one** response with a check mark (✓).

Strongly oppose	Moderately oppose	Slightly oppose	Neither oppose nor support	Slightly support	Moderately support	Strongly support
_____	_____	_____	_____	_____	_____	_____

2. How certain do you feel about the opposition or support you just indicated?

Not at all certain	Slightly certain	Moderately certain	Very certain	Extremely certain
_____	_____	_____	_____	_____

3. How important to you is this issue?

Not at all important	Slightly important	Moderately important	Very important	Extremely important
_____	_____	_____	_____	_____

4. How much do you personally care about this issue?

Not at all	Little	Somewhat	Much	A great deal
_____	_____	_____	_____	_____

5. One possible source of information about the proposed LPG storage is the New York State Department of Environmental Conservation, the state agency reviewing the LPG storage project. Please select a point between each pair of words or phrases to describe your feelings about NYSDEC. Mark one response with a check mark for each row (✓).

Can be trusted	_____	_____	_____	_____	_____	_____	Can't be trusted
Inaccurate	_____	_____	_____	_____	_____	_____	Accurate
Unfair	_____	_____	_____	_____	_____	_____	Fair
Tells the whole story	_____	_____	_____	_____	_____	_____	Doesn't tell the whole story
Unbiased	_____	_____	_____	_____	_____	_____	Biased
Not concerned about the public's interest	_____	_____	_____	_____	_____	_____	Concerned about the public's interest
Incompetent	_____	_____	_____	_____	_____	_____	Competent

6. How certain do you feel about your ratings of NYSDEC you just provided?

Not at all certain	Slightly certain	Moderately certain	Very certain	Extremely certain
_____	_____	_____	_____	_____

7. Crestwood, the company applying for the LPG storage project, is another possible source of information. Please select a point between each pair of words or phrases to describe your feelings about Crestwood.

Can be trusted	_____	_____	_____	_____	_____	_____	Can't be trusted
Inaccurate	_____	_____	_____	_____	_____	_____	Accurate
Unfair	_____	_____	_____	_____	_____	_____	Fair
Tells the whole story	_____	_____	_____	_____	_____	_____	Doesn't tell the whole story
Unbiased	_____	_____	_____	_____	_____	_____	Biased
Not concerned about the public's interest	_____	_____	_____	_____	_____	_____	Concerned about the public's interest
Incompetent	_____	_____	_____	_____	_____	_____	Competent

8. How certain do you feel about your ratings of Crestwood you just provided?

Not at all certain	Slightly certain	Moderately certain	Very certain	Extremely certain
_____	_____	_____	_____	_____

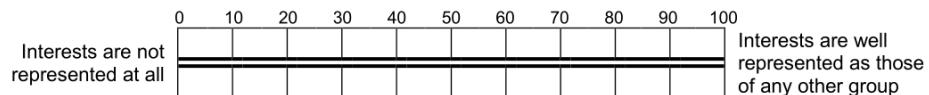
9. Gas Free Seneca (GFS), a group opposing the LPG storage project, is another possible source of information. Please select the point between each pair of words or phrases to describe your feelings about GFS.

Can be trusted	_____	_____	_____	_____	_____	_____	_____	Can't be trusted
Inaccurate	_____	_____	_____	_____	_____	_____	_____	Accurate
Unfair	_____	_____	_____	_____	_____	_____	_____	Fair
Tells the whole story	_____	_____	_____	_____	_____	_____	_____	Doesn't tell the whole story
Unbiased	_____	_____	_____	_____	_____	_____	_____	Biased
Not concerned about the public's interest	_____	_____	_____	_____	_____	_____	_____	Concerned about the public's interest
Incompetent	_____	_____	_____	_____	_____	_____	_____	Competent

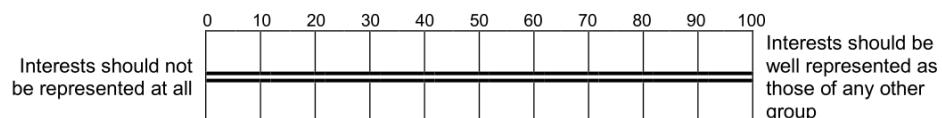
10. How certain do you feel about your ratings of Gas Free Seneca you just provided?

Not at all certain	Slightly certain	Moderately certain	Very certain	Extremely certain
_____	_____	_____	_____	_____

11. Please rate how well you feel interests of residents in your county are ***currently*** being represented to influence this issue by placing a check mark (✓) on the scale below.



12. This time, on the same scale, please rate how well you feel interests of residents in your county ***should*** be represented to influence this issue.

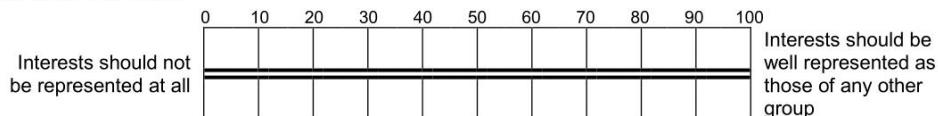


Please view this map and locate where Cayuga County is. Also, locate the proposed LPG storage site.



13. Recently, several municipalities in Cayuga County have drafted resolutions on the Seneca Lake gas storage issue, arguing that the project would affect the Finger Lakes region as a whole.

Please rate how well you feel interests of Cayuga County residents *should* be represented to influence this issue.



14. In a few words, please briefly explain why you think so.

15. Do you agree or disagree with the following statements?

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I feel similar to people in Cayuga County in general.	—	—	—	—	—	—	—
I feel that I have a lot in common with people in Cayuga County.	—	—	—	—	—	—	—
I feel that I possess attributes that are associated with people in Cayuga County.	—	—	—	—	—	—	—

16. Do you agree or disagree with the following statements?

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I will accept NYSDEC's decision on this issue even if it is against my opinion.	—	—	—	—	—	—	—
I will support NYSDEC's leadership in future environmental disputes regardless of their decision on the LPG storage case.	—	—	—	—	—	—	—
I will join protests organized by Gas Free Seneca.	—	—	—	—	—	—	—
I will sign petitions drafted by Gas Free Seneca opposing the project if they ask.	—	—	—	—	—	—	—
I will write letters or emails to politicians in support of Crestwood's gas storage project.	—	—	—	—	—	—	—
I will sign petitions drafted by Crestwood supporting the project if they ask.	—	—	—	—	—	—	—

17. What kind of place is Seneca Lake?

Seneca Lake is...

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
A place to escape from civilization	_____	_____	_____	_____	_____
A place of high environmental quality	_____	_____	_____	_____	_____
A place mostly for vacationers	_____	_____	_____	_____	_____
A place for vineyards and wineries	_____	_____	_____	_____	_____
A place for industrial activities	_____	_____	_____	_____	_____
A place for recreational activities	_____	_____	_____	_____	_____
A community of neighbors	_____	_____	_____	_____	_____
A source of water for residents	_____	_____	_____	_____	_____

18. How important is Seneca Lake to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I feel relaxed when I'm at Seneca Lake.	_____	_____	_____	_____	_____
I feel happiest when I'm at Seneca Lake.	_____	_____	_____	_____	_____
Seneca Lake is my favorite place to be.	_____	_____	_____	_____	_____
I really miss Seneca Lake when I'm away from the lake for too long.	_____	_____	_____	_____	_____

19. How strongly do you identify with the Seneca Lake region?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
The Seneca Lake region means a lot to me.	_____	_____	_____	_____	_____
I am very attached to the Seneca Lake region.	_____	_____	_____	_____	_____
I identify strongly with the Seneca Lake region.	_____	_____	_____	_____	_____
I feel no commitment to the Seneca Lake region.	_____	_____	_____	_____	_____

20. How important are the Finger Lakes to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I feel relaxed when I'm at the lakes.	_____	_____	_____	_____	_____
I feel happiest when I'm at the lakes.	_____	_____	_____	_____	_____
The lakes are my favorite place to be.	_____	_____	_____	_____	_____
I really miss the lakes when I'm away from the lakes for too long.	_____	_____	_____	_____	_____

21. How strongly do you identify with the Finger Lakes region?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
The Finger Lakes region means a lot to me.	_____	_____	_____	_____	_____
I am very attached to the Finger Lakes region.	_____	_____	_____	_____	_____
I identify strongly with the Finger Lakes region.	_____	_____	_____	_____	_____
I feel no commitment to the Finger Lakes region.	_____	_____	_____	_____	_____

22. In general, how risky do you consider each of the following aspects related to the LPG storage project to be for the local community?

	Not risky at all	A little risky	Moderately risky	Very risky	Extremely risky
Explosion of gas during storage	_____	_____	_____	_____	_____
Leak or spillage of gas during storage or transportation	_____	_____	_____	_____	_____
Increase of salinity in the lake	_____	_____	_____	_____	_____
Loss of scenic value of landscape	_____	_____	_____	_____	_____
Threat to local tourism industry	_____	_____	_____	_____	_____

23. In general, how beneficial do you consider each of the following aspects related to the LPG storage project to be for the local community?

	Not beneficial at all	A little beneficial	Moderately beneficial	Very beneficial	Extremely beneficial
Higher tax revenue	_____	_____	_____	_____	_____
Addition of new jobs	_____	_____	_____	_____	_____
Lower LPG prices	_____	_____	_____	_____	_____
Independence from foreign-sourced energy	_____	_____	_____	_____	_____
Improved air quality resulting from cleaner emissions relative to oil or coal	_____	_____	_____	_____	_____

24. How many times have you spoken with any of the following in person over the last five years?

	Not at all	Little	Somewhat	Much	A great deal
A NYSDEC employee	_____	_____	_____	_____	_____
A Gas Free Seneca member	_____	_____	_____	_____	_____
A Crestwood employee	_____	_____	_____	_____	_____

25. How many times have you seen any of the following in person over the last five years?

	Not at all	Little	Somewhat	Much	A great deal
A NYSDEC employee	_____	_____	_____	_____	_____
A Gas Free Seneca member	_____	_____	_____	_____	_____
A Crestwood employee	_____	_____	_____	_____	_____

26. How many times have you received a personalized email or letter from, or had a telephone call in person with any of the following over the last five years?

	Not at all	Little	Somewhat	Much	A great deal
A NYSDEC employee	_____	_____	_____	_____	_____
A Gas Free Seneca member	_____	_____	_____	_____	_____
A Crestwood employee	_____	_____	_____	_____	_____

27. For how many days in the last week did you watch or read any news covering local affairs from the following sources?

	None	1 day	2 days	3 days	4 days	5 days	6 days	7 days
Television	—	—	—	—	—	—	—	—
Print newspaper	—	—	—	—	—	—	—	—
Online news	—	—	—	—	—	—	—	—

28. How much attention do you usually pay to news covering local affairs from the following sources?

	None at all	A little	A moderate amount	A lot	A great deal
Television	—	—	—	—	—
Print newspaper	—	—	—	—	—
Online news	—	—	—	—	—

29. How often do you discuss local politics with others (e.g., family, friends, neighbors...)?

Never	Sometimes	About half the time	Most of the time	Always
—	—	—	—	—

30. How often do you discuss environmental issues in the local area with others (e.g., family, friends, neighbors...)?

Never	Sometimes	About half the time	Most of the time	Always
—	—	—	—	—

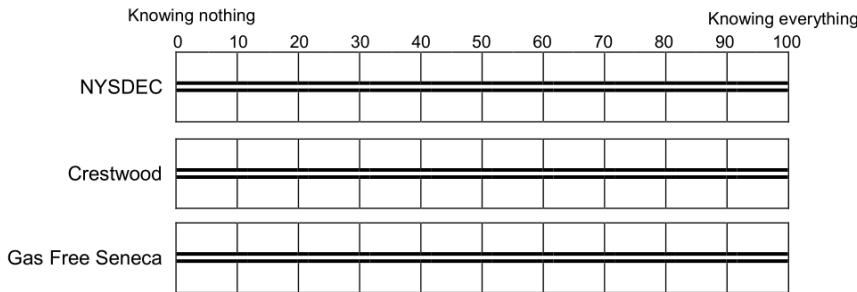
31. How often do you discuss new development projects in the local area with others (e.g., family, friends, neighbors...)?

Never	Sometimes	About half the time	Most of the time	Always
—	—	—	—	—

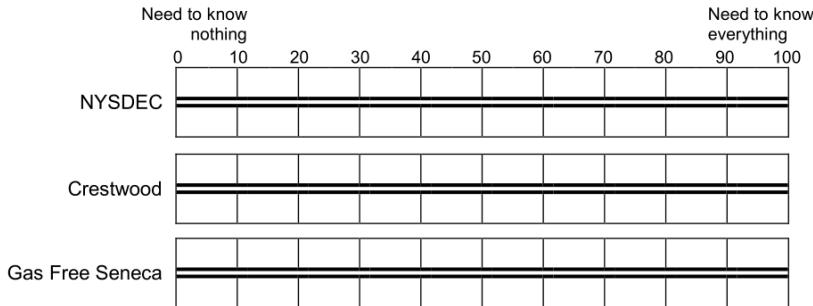
32. How often do you attend public hearings or meetings in your community to discuss local affairs?

Never	Sometimes	About half the time	Most of the time	Always
—	—	—	—	—

33. Please estimate your knowledge of the following organizations on a 0-100 scale, where 0 means knowing nothing and 100 means knowing everything you could possibly know about this organization as it relates to the gas storage issue. How much do you think you currently know?



34. This time, using the same scale as above, please estimate how much you think you need to know about the following organizations.



35. Are the following statements true or false?

(It is okay to respond incorrectly or say you don't know. Please use the best of your current knowledge and do not refer to external resources to answer these items.)

	True	False	Don't know
NYSDEC held an issues conference on this LPG storage project in 2015.			
While NYSDEC may announce its decision on this project, this decision will require ratification from the Schuyler County Legislature to have binding legal effect.			
NYSDEC's technical staff representing the Schuyler County region has openly opposed this project, although this does not necessarily reflect the view of NYSDEC's leadership.			
Crestwood is based in the State of Texas.			

	True	False	Don't know
In 2016, Crestwood announced that it would increase the size of the LPG storage capacity by 30% from its originally proposed plan.			
Crestwood has claimed that the gas storage facility will create at least 80 new permanent jobs.			
Gas Free Seneca has formed a coalition with local businesses around the Seneca Lake to protest this issue.			
GFS was formed in 2002 as a local movement protesting hydraulic fracturing (i.e., fracking).			
GFS leadership has encouraged its members to risk getting arrested during protests at the gas storage site.			

36. How true of you are the following statements?

	Not true of me at all	Slightly true of me	Moderately true of me	Very true of me	Extremely true of me
In order to be better informed about how NYSDEC's decisions will affect this area, I feel that the more viewpoints I can get, the better off I will be.	—	—	—	—	—
I have made a strong effort to carefully examine how trustworthy and competent NYSDEC is as a lead agency overseeing important environmental decisions.	—	—	—	—	—
When news related to NYSDEC's operations comes up, I always try to learn more about it.	—	—	—	—	—
Whether an agency like NYSDEC can be trusted is an important issue, and it has been very important to me to decide how I feel about these agencies.	—	—	—	—	—
When I encounter information praising or criticizing NYSDEC or its employees in this area, I am likely to stop and carefully think about it.	—	—	—	—	—

37. How do you identify yourself as a resident?

Seneca Lake area resident	_____	_____	_____	_____	_____	_____	_____	Not a Seneca Lake area resident
Seasonal resident	_____	_____	_____	_____	_____	_____	_____	Year-round resident
Long-time resident	_____	_____	_____	_____	_____	_____	_____	Recent resident
Residence is close to Seneca Lake	_____	_____	_____	_____	_____	_____	_____	Residence is not close to Seneca Lake
Residence is close to another lake	_____	_____	_____	_____	_____	_____	_____	Residence is not close to any other lake

38. Which one of the following lakes is the closest to your residence?

- Seneca Lake Cayuga Lake Keuka Lake Waneta Lake
 Lamoka Lake Canandaigua Lake Honeoye Lake Candice Lake
 Hemlock Lake Lake Ontario

39. Are you male or female?

- Male Female

40. In what year were you born? (write number)

41. Generally speaking, how concerned are you about the state of the natural environment?



42. What is the highest level of school you have completed?

- Grade 8 or lower
 Some high school, no diploma
 High school diploma or equivalent
 Some college, no degree
 Associate degree
 Bachelor's degree
 Master's degree
 Professional degree (MD, JD)
 Doctorate degree

43. What race or ethnicity do you most identify yourself with?

- White or Caucasian
- Black or African-American
- Asian
- American Indian or Alaska Native
- Native Hawaiian or other Pacific Islander
- Hispanic or Latino
- Other, including multi-ethnic and/or multi-racial

44. When it comes to politics, which of the following do you usually consider yourself to be?

- A Democrat
- A Republican
- An Independent
- Other / None of the above

45. When it comes to politics, which of the following best represents your viewpoint on most issues?

- Very liberal
- Liberal
- Basically independent, but leaning towards liberal
- Independent
- Basically independent, but leaning towards conservative
- Conservative
- Very conservative

46. (Optional) If you have anything else to tell us about this issue or this survey, please let us know.



Thank you so much for your time and effort! It really means a lot to us!

In case you win the raffle for the gift cards, what is the best phone number to contact you?

(Your phone number will not be used for any other purpose. Leave this empty if you prefer to be contacted by mail.)

() - _____

PLEASE READ THIS PAGE ONLY AFTER YOU COMPLETED THE SURVEY

We deeply appreciate your time and effort participating in this study!

Now that the survey is over, we would like to share a few more details about this study. One of the things we were interested in this study was how residents make judgments about people from other areas who claim to have a voice in local issues. To measure this, we presented you with a hypothetical case where residents from Cayuga County would be interested in issuing a resolution related to this issue.

Returning the survey

Please use the enclosed stamped envelope and drop it in a mailbox.

About the raffle

You will automatically enter the raffle by sending us back your completed survey using the return envelope. Please check that the Survey ID at the front cover of this booklet is correct. We will run the raffle in a few days after we complete collection of responses and will reach out to you via phone or mail if we find you won.

Please take part in the follow-up study

We will send you a follow-up survey in about three weeks. This follow-up survey is to track any changes in your thoughts or opinions.

This survey will be much shorter than the current one. In addition, you will have one more chance to enter a separate raffle with the same prize (\$100 gift cards, 10 available). You will have a greater chance to win than the current one because only those participants who completed this first study will receive invitations.

For further requests or questions

If you wish to withdraw your responses, or have any other requests or questions related to this study, please contact Hwanseok Song (hs672@cornell.edu).

Again, we deeply appreciate your participation

We cannot do our research without generous participation like yours and would like to thank you one more time for it! We hope to have your help again when we invite you to the follow-up study. Thank you!

APPENDIX C
Survey Wave 2 Booklet Example



SENECA LAKE LPG STORAGE SURVEY
- Follow-up Survey -

Cornell University
Department of Communication

<https://blogs.cornell.edu/senecalakesurvey/>

Please do not take this printed survey if you have already completed the survey online.

SURVEY ID*: _____

*Your survey ID can be found in your invitation letter or the address label of the mail/postcard.

CONSENT FORM

Please consider this information carefully before deciding whether to participate in this research study. You must be at least 18 years old to participate.

Purpose of this survey: This research seeks to understand how people make judgments about agencies and organizations involved in the Seneca Lake LPG storage issue.

What you will do: We will ask you to fill out a survey.

Time required: The study will take approximately **15** minutes to complete.

Risks: There is no more risk than would be expected from typical everyday experiences.

Benefits: No tangible benefits are associated with participating, but you are helping to contribute to social science research.

Compensation: There is no fixed compensation, but you will be able to enter a raffle for a chance to win a \$100 gift cards (20 winners will be randomly selected). You will automatically enter the raffle by completing this survey using the customized link we provided you via email.

Your answers will be confidential: The records of this study will be kept private. In any sort of report we make public, we will not include any information that will make it possible to identify you. Research records will be kept in a locked file; only the researchers will have access to the records.

Taking part is voluntary: Taking part in this study is completely voluntary. You may skip any questions that you do not want to answer. If you decide not to take part or to skip some of the questions, it will not affect your current or future relationship with Cornell University. If you decide to take part, you are free to withdraw at any time.

Contact: If you have questions about this study, please contact Hwanseok Song at hs672@cornell.edu, or the faculty advisor, Professor Katherine McComas (kam19@cornell.edu). If you have any questions or concerns regarding your rights as a participant in this study, you may contact the Cornell Institutional Review Board (IRB) at 607-255-5138 or access their website at <http://www.irb.cornell.edu>. You may also report your concerns or complaints anonymously through Ethicspoint (www.hotline.cornell.edu) or by calling toll free at 1-866-293-3077. Ethicspoint is an independent organization that serves as a liaison between the University and the person bringing the complaint so that anonymity can be ensured.

Please check (✓) this box to acknowledge that you read and understand the above and are 18 or above in age.

To remind you, this survey is about the proposed plan to use empty salt caverns near the southern end of Seneca Lake as a storage facility for liquefied petroleum gas (LPG).

Crestwood, an energy company that stores, transports, and supplies LPG, filed the application for this project via its subsidiary Finger Lakes LPG Storage LLC. **Gas Free Seneca** (GFS) is one of the main groups of citizens opposing this project. The **New York State Department of Environmental Conservation** (NYSDEC) is the state agency currently reviewing this project proposal and will make a decision on whether this proposal should be approved.

Although recently in May 2017, Crestwood dropped its plan to establish a liquefied natural gas (LNG) storage at the same site, the application for the LPG storage is still under NYSDEC's review.

In this survey, we will ask you questions about this project, the Seneca Lake region, and its key groups and agencies such as Crestwood, Gas Free Seneca, and the NYSDEC. Having little knowledge about this issue is fine. Please do not refer to external sources while you are taking the survey. Simply use the best of your thoughts and feelings when you respond.

- One possible source of information about the proposed LPG storage is the New York State Department of Environmental Conservation, the state agency reviewing the LPG storage project. Please select a point between each pair of words or phrases to describe your current feelings about NYSDEC. Mark one response with a check mark for each row (✓).

Can be trusted	_____	_____	_____	_____	_____	_____	Can't be trusted
Inaccurate	_____	_____	_____	_____	_____	_____	Accurate
Unfair	_____	_____	_____	_____	_____	_____	Fair
Tells the whole story	_____	_____	_____	_____	_____	_____	Doesn't tell the whole story
Unbiased	_____	_____	_____	_____	_____	_____	Biased
Not concerned about the public's interest	_____	_____	_____	_____	_____	_____	Concerned about the public's interest
Incompetent	_____	_____	_____	_____	_____	_____	Competent

- How certain do you feel about your ratings of NYSDEC you just provided?

Not at all certain	_____	Slightly certain	_____	Moderately certain	_____	Very certain	_____	Extremely certain	_____
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3. Crestwood, the company applying for the LPG storage project, is another possible source of information. Please select a point between each pair of words or phrases to describe your *current* feelings about Crestwood.

Can be trusted	_____	_____	_____	_____	_____	_____	_____	Can't be trusted
Inaccurate	_____	_____	_____	_____	_____	_____	_____	Accurate
Unfair	_____	_____	_____	_____	_____	_____	_____	Fair
Tells the whole story	_____	_____	_____	_____	_____	_____	_____	Doesn't tell the whole story
Unbiased	_____	_____	_____	_____	_____	_____	_____	Biased
Not concerned about the public's interest	_____	_____	_____	_____	_____	_____	_____	Concerned about the public's interest
Incompetent	_____	_____	_____	_____	_____	_____	_____	Competent

4. How certain do you feel about your ratings of Crestwood you just provided?

Not at all certain	Slightly certain	Moderately certain	Very certain	Extremely certain
_____	_____	_____	_____	_____

5. Gas Free Seneca (GFS), a group opposing the LPG storage project, is another possible source of information. Please select the point between each pair of words or phrases to describe your *current* feelings about GFS.

Can be trusted	_____	_____	_____	_____	_____	_____	_____	Can't be trusted
Inaccurate	_____	_____	_____	_____	_____	_____	_____	Accurate
Unfair	_____	_____	_____	_____	_____	_____	_____	Fair
Tells the whole story	_____	_____	_____	_____	_____	_____	_____	Doesn't tell the whole story
Unbiased	_____	_____	_____	_____	_____	_____	_____	Biased
Not concerned about the public's interest	_____	_____	_____	_____	_____	_____	_____	Concerned about the public's interest
Incompetent	_____	_____	_____	_____	_____	_____	_____	Competent

6. How certain do you feel about your ratings of Gas Free Seneca you just provided?

Not at all certain	Slightly certain	Moderately certain	Very certain	Extremely certain
_____	_____	_____	_____	_____

7. Do you agree or disagree with the following statements?

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I will accept NYSDEC's decision on this issue even if it is against my opinion.	_____	_____	_____	_____	_____	_____	_____
I will support NYSDEC's leadership in future environmental disputes regardless of their decision on the LPG storage case.	_____	_____	_____	_____	_____	_____	_____
I will join protests organized by Gas Free Seneca.	_____	_____	_____	_____	_____	_____	_____
I will sign petitions drafted by Gas Free Seneca opposing the project if they ask.	_____	_____	_____	_____	_____	_____	_____
I will write letters or emails to politicians in support of Crestwood's gas storage project.	_____	_____	_____	_____	_____	_____	_____
I will sign petitions drafted by Crestwood supporting the project if they ask.	_____	_____	_____	_____	_____	_____	_____

8. Imagine that the following event occurred. How would you guess its cause initially before learning about the full details of what happened?

A press release issued by NYSDEC was found to include inaccurate information.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
This happened due to an accident beyond NYSDEC's expected control.	_____	_____	_____	_____	_____	_____	_____
This happened due to NYSDEC's lack of competence.	_____	_____	_____	_____	_____	_____	_____
This happened due to NYSDEC's deliberate attempt to mislead the public.	_____	_____	_____	_____	_____	_____	_____

9. Imagine that the following event occurred. How would you guess its cause initially before learning about the full details of what happened?

A contractor conducting a risk assessment on behalf of Crestwood was found to have a conflict of interest.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
This happened due to an accident beyond Crestwood's expected control.	—	—	—	—	—	—	—
This happened due to Crestwood's lack of competence.	—	—	—	—	—	—	—
This happened due to Crestwood's deliberate attempt to mislead the public.	—	—	—	—	—	—	—

10. Imagine that the following event occurred. How would you guess its cause initially before learning about the full details of what happened?

An argument Gas Free Seneca made about the salinity of Seneca Lake was found to be completely ungrounded.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
This happened due to an accident beyond Gas Free Seneca's expected control.	—	—	—	—	—	—	—
This happened due to Gas Free Seneca's lack of competence.	—	—	—	—	—	—	—
This happened due to Gas Free Seneca's deliberate attempt to mislead the public.	—	—	—	—	—	—	—

11. For each organization or agency, do you agree or disagree with the following statements?

I feel that the New York State Department of Environmental Conservation:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
... shares similar values as me.	—	—	—	—	—	—	—
... shares similar opinions as me.	—	—	—	—	—	—	—
... takes similar actions as I would.	—	—	—	—	—	—	—

I feel that Crestwood:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
... shares similar values as me.	—	—	—	—	—	—	—
... shares similar opinions as me.	—	—	—	—	—	—	—
... takes similar actions as I would.	—	—	—	—	—	—	—

I feel that Gas Free Seneca:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
... shares similar values as me.	—	—	—	—	—	—	—
... shares similar opinions as me.	—	—	—	—	—	—	—
... takes similar actions as I would.	—	—	—	—	—	—	—

Please read **Article A** in the Article Booklet and respond to the questions below.

12. Taking this information as well as what you already know about the NYS Department of Environmental Conservation, overall, would you say you trust or distrust NYSDEC?

Strongly distrust	Distrust	Slightly distrust	Neither trust nor distrust	Slightly trust	Trust	Strongly trust
_____	_____	_____	_____	_____	_____	_____

13. To what extent did you engage in the following while reading this article?

Not at all 1	2	3	4	5	6	Very much 7
_____	_____	_____	_____	_____	_____	_____

Were you criticizing the article
when you were reading it?

Were you thinking of points that
went against the author's
arguments?

Were you feeling skeptical of the
author's arguments?

Please read **Article B** in the Article Booklet and respond to the questions below.

14. Taking this information as well as what you already know about Crestwood, overall, would you say you trust or distrust Crestwood?

Strongly distrust	Distrust	Slightly distrust	Neither trust nor distrust	Slightly trust	Trust	Strongly trust
_____	_____	_____	_____	_____	_____	_____

15. To what extent did you engage in the following while reading this article?

Not at all 1	2	3	4	5	6	Very much 7
_____	_____	_____	_____	_____	_____	_____

Were you criticizing the article
when you were reading it?

Were you thinking of points that
went against the author's
arguments?

Were you feeling skeptical of the
author's arguments?

Please read **Article C** in the Article Booklet and respond to the questions below.

16. Taking this information as well as what you already know about Gas Free Seneca, overall, would you say you trust or distrust Gas Free Seneca?

Strongly distrust	Distrust	Slightly distrust	Neither trust nor distrust	Slightly trust	Trust	Strongly trust
_____	_____	_____	_____	_____	_____	_____

17. To what extent did you engage in the following while reading this article?

Not at all 1	2	3	4	5	6	Very much 7
_____	_____	_____	_____	_____	_____	_____

Were you criticizing the article
when you were reading it?

_____	_____	_____	_____	_____	_____	_____
-------	-------	-------	-------	-------	-------	-------

Were you thinking of points that
went against the author's
arguments?

_____	_____	_____	_____	_____	_____	_____
-------	-------	-------	-------	-------	-------	-------

Were you feeling skeptical of the
author's arguments?

_____	_____	_____	_____	_____	_____	_____
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Thank you so much! This is the end of the survey!

Please use the enclosed envelope to return this survey booklet. You don't need to return the article booklet.

There is some more information about this survey on the next page.

Thank you so much for taking part in our research!

We deeply appreciate your time and effort participating in this study!

Now that the survey is over, we would like to share a few more details about this study.

About the articles you read

The articles you read are not real newspaper articles. To create the news articles, we took a number of opinion pieces from the local news, and heavily modified them to make them appropriate for the purpose of this study. Thus, while arguments presented in these articles may bear some similarities to those that have been published in newspapers, the articles you read are fictitious in nature.

Also, we took your responses from the previous survey and deliberately presented you with articles that might challenge your previous and/or current views about each organization. For example, if you expressed more disapproval of one organization, you must have read an article approving of that organization this time. We were interested in this because resisting a persuasive attempt is an important feature of strong opinions.

For further requests or questions

If you wish to withdraw your responses, or have any other requests or questions related to this study, please contact Hwanseok Song (hs672@cornell.edu).

About the raffle

You have automatically entered the raffle by completing this study using the link we provided you with. We will run the raffle in a few days after we complete collection of responses and will reach out to you via email if we find you won.

Again, we deeply appreciate your participation

We cannot do our research without generous participation like yours and would like to thank you one more time for it! We hope to have your help again when we invite you to the follow-up study. Thank you!



APPENDIX D

Counterpersuasive Articles of Trust Used to Measure Resistance

Local

At the DEC, Politics Override Science



New York Governor Andrew Cuomo has said repeatedly that, in making the decision on whether to allow horizontal hydrofracking in New York State, he wants to rely on “science, and not emotion.” He is relying on the NYS Department of Environmental Conservation (DEC) to give him that science — but an array of documents suggest the Governor is being badly served.

Documents recently uncovered by Environmental Working Group shine a unique spotlight on privileged access granted to gas industry lobbyists by DEC officials with regards to fracking.

“We have a process. Let’s get the facts,” Governor Cuomo said last year, with regards to ending the state’s temporary moratorium on fracking. “Let the science and the facts make the determination, not emotion and not politics.”

But it’s increasingly clear that the process has actually been based on anything but science. Politics, legal considerations and economic concerns have instead predominated. Most tellingly, documents recently uncovered by Environmental Working Group show that industry representatives were allowed access to drafts of the state’s permit plans, and used that information to lobby hard against testing for radioactivity in wastewater, for example.

But the documents also show a regular pattern of behind-the-scenes communication between the industry and regulators, at the same time as environmental advocates and others were struggling to be heard through public comments and similar official channels. In those emails, extensive lobbying takes place, and industry is provided an early look at the plans the DEC is developing weeks before the public comment period.



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DEC's Reliable Track Record Deserves Credit



Recently, both supporters and protesters of the Seneca Lake LPG storage have been criticizing the Department of Environmental Conservation because that helps their cause. Sadly, they want you to think that the DEC has questionable judgment so you'll ignore the agency's opinions. Had the DEC taken a position that explicitly favored theirs, the agency would have undoubtedly been praised as the utmost authority on the environment (which it is).

Anyone with any experience with the DEC knows that overall, it is a collection of qualified, trustworthy, and experienced people. Calling the DEC out for a few incidents over 50 years doesn't mean the DEC was asleep at the wheel. Dragging the DEC through the mud and trying to make residents feel nervous does not help fix our real problems.

Over the processes of major decisions DEC has made recently, from fracking to the current gas storage issue, the agency has relentlessly collected input from the public, followed due procedure, and pursued analysis with sound scientific research. It should be acknowledged that reconciling conflicting interests with scientific decision-making is not a simple feat and the DEC deserves some respect for that.

I realize that a lot of passionate people are working hard to help the lake and the local economy, but change should be embraced if it is based on scientific evidence. That's true for salt and gas industries and the agriculture industry alike. We should harness this passion and energy into solving the very real problems together before us.



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Crestwood Places Community at Risk



A recent article about support for Crestwood Midstream, the out-of-state gas storage company, caught my attention. It seems rather weak that finding 1,000 supporters for the questionable gas storage facility is newsworthy. Crestwood has hired two PR firms, and this is its attempt to improve its image and create a message that people support having a gas storage.

The real news is that 18 municipalities around Seneca Lake, which represent 604,000 people, have signed resolutions in opposition to Crestwood's plan to turn Seneca Lake into the "gas storage hub of the Northeast."

What Crestwood's release doesn't tell you is how they robo-called and mass-mailed individuals and businesses spreading misinformation about the project. Some employees at US Salt said they were pressured into getting petition signatures. Crestwood alarmed the county legislature by threatening to close the salt plant if their project wasn't supported.

Crestwood quotes a New York resident who implies that having more local storage will bring the cost of propane down. Even if it were intended for local use, propane is a market commodity, and the price is fixed at the hub in Mt. Belvieu, Texas where the firm's profits will end up. Moreover, most of the gas is not intended for local use.

There are many people committed to protecting our lake and land, and to keep Crestwood from reaching its goal of turning us into an industry-led community. We must protect our community from the likes of Crestwood which has proven to be untrustworthy.



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Crestwood has been Good to Employees



Recently, more false statements have surfaced from the protesters of Crestwood's proposed LPG storage facility to help paint their picture of scandal and corruption.

Several local candidates in the recent election made false arguments that Crestwood was threatening to close the US Salt plant if they didn't get the approval for the LPG storage. Each of them were solidly defeated because the public was smart enough to see through their misleading propaganda.

Crestwood never threatened the jobs of their US salt employees and that is a clear fact. I have worked for US Salt for 14 years, and have been a member of the United Steelworkers for as many years. As the former president of USW Local 12460, I can assure you that not one member has been told they would be fired if they didn't support it. There is no way USW would allow a company to bully their members.

The truth is that Crestwood has invested significantly to upgrade our plant's facility. A large part of this upgrade was not merely to increase profit, but to enhance the safety and working conditions for its employees. Such investment reflects genuine care for its workers. It also shows the firm's commitment to keep the plant sustainable for long-term operation.

Considering what Crestwood has done, I believe approval of the LPG storage facility will bring great benefits to the community—more jobs, more resources to put into classrooms, and most importantly, more evidence that upstate New York welcomes businesses.



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GFS Dishonest with Risk Assessments



Gas Free Seneca wanted a quantitative risk assessment (QRA) prepared for the LPG storage project. Crestwood had not one but two QRAs prepared by the experts at Quest Consultants, a firm suggested by Gas Free Seneca. As a former public official, I've reviewed these documents to learn about the real risks and benefits of this project.

Ultimately, these QRAs found the project's risk to the public to be within acceptable ranges, by comparison to published international risk acceptance criteria. Now, that isn't what GFS wanted to hear, which is why the group would rather you believe its lies rather than the honest truth.

There is no better spectacle of this than GFS's most notorious claim based on their own internal analysis: the likelihood of a serious or extremely serious event on Seneca Lake from the LPG storage project over 25 years is more than 40 percent. The problem here is that GFS wants you to accept their opinion as the independent findings of a credible expert. That's plain wrong.

Quest is a nationally recognized expert in quantifying the risks of energy projects like Crestwood's. In the QRA it prepared, Quest concludes that "due to methodological shortcomings, the analysis has little to no value in determining the acceptability of the Finger Lakes LPG facility."

The evidence against GFS is damning, but that hasn't stopped GFS from spreading his false statements as fact. It is incumbent on those of us who aren't experts to do our homework on the project.



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Gas Free Seneca has been True to its Word



In a recent letter, one of the supporters of the gas storage project criticized the leaders of Gas Free Seneca for organizing illegal protests. The author of this article knows perfectly well that GFS has never orchestrated arrests and has opposed illegal activity from the start. This author is deliberately lumping GFS together with other opposition groups because he cannot argue with the constructive and scientific work GFS has done.

Instead of leading protests, GFS has sponsored renewable energy forums and inspired many wineries, businesses and residents throughout the region to go solar. As a result, GFS has helped to reduce fossil fuel consumption and create jobs in the renewable energy industry. In fact, Finger Lakes Wine Country was awarded the 2015 Solar Energy Champion Award from the Solar Energy Industries Association for transforming 21 wineries to renewable energy.

Unlike dishonest critics, Gas Free Seneca is true to its word, and its actions prove it.

Not only are the critics purposefully and maliciously attempting to discredit the lawful and scientific work of GFS by conflating it with other protester groups and slandering the principals of this organization, but they are also attempting to distract the public from the real issue—the serious unaddressed risks of Crestwood's proposed LPG storage—with name-calling and misinformation that border on slander.

These critics owe an apology to Gas Free Seneca and the millions of Finger Lakes residents who have used only lawful means to oppose the misguided project.



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