

Seeking and Processing Information about Impersonal Risk

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Attempts to model risk response tend to focus on risks that pose a direct personal threat. This study examined the applicability of one risk response model to impersonal risks—risks that threaten something other than the self, in this case, the environment. This study utilized a section of the Griffin et al. risk-information seeking and processing model, which depicts relationships between informational subjective norms and information seeking and processing as being mediated by perceptions of information insufficiency. The results indicate that while those relationships do hold for impersonal risk, informational subjective norms (perceived social pressure to be informed) may play an even more complex role than initially anticipated. These norms may be a powerful predictor of seeking and processing when individuals face impersonal risks.

Keywords: environmental risk; social norms; information sufficiency; risk communication; information seeking; information processing

The seeking and processing strategies that people apply to information encountered in the mass media or elsewhere can influence what they take away from messages (Eagly and Chaiken 1993; McGuire 1974; Petty and Cacioppo 1986). For example, more active seeking, which is goal-directed

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and driven, is more likely than routine and habitual seeking to lead to effortful, systematic processing of the information acquired. People who process information about a given topic more systematically tend to develop attitudes toward that topic that are relatively stable and more resistant to change when compared to more superficial processors (Eagly and Chaiken 1993; Eagly and Kulesa 1997).

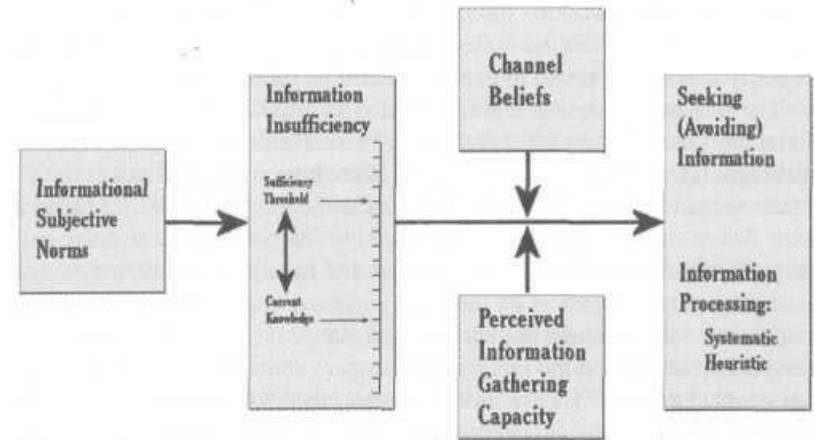
However, scholars who study risk¹ communication often omit information seeking and processing strategies from their research models, instead using exposure to risk information as an independent variable and as a potential predictor of what individuals know or feel about risk or what they will do about a risk. This approach, while informative, cannot take into account variability in information needs and information processing capabilities (Vaughan and Seifert 1992).

A more receiver-oriented approach assumes that individuals will seek and process information only when they perceive that the information will be relevant and useful to them in some way. Studies of everyday reasoning strategies support this representation of how people deal with information (Galotti 1989; Voss, Perkins, and Segal 1991; Wynne 1996). This study, therefore, makes an exploration of predictors of risk information seeking and processing a central goal and draws on a recently developed model that maps these variables (Griffin, Dunwoody, and Neuwirth 1999).

The Griffin, Dunwoody, and Neuwirth model (see Figure 1) pulls together existing theoretical concepts from several research disciplines to try to build a more complex representation of the role of risk communication in potential behavioral change. In constructing their model, the researchers drew most heavily from the model of heuristic-systematic processing developed by psychologist Shelly Chaiken in 1980. The Griffin et al. model integrates Chaiken's concepts of heuristic and systematic processing with concepts from the literature on risk analysis, risk communication, information seeking, and behavioral prediction. In addition to heuristic and systematic processing, two of the more notable concepts in the model are informational subjective norms (perceived social pressure to be informed) and information insufficiency (the perceived gap between knowledge held and knowledge needed).

In some respects, the relationships within the Griffin et al. model are commonsense ones. For example, the model depicts a causal link between information insufficiency and information seeking and processing; this expected relationship, although theoretically well grounded in the psychology literature,² likely comes as no surprise. However, in addition to articulating these relationships, the model offers a framework for (1) testing and assessing the strength of these relationships cross-sectionally; (2) mapping

Figure 1
Relationships of Interest from the Original Griffin et al. (1999)
Model of Risk Information Seeking and Processing



them in a multivariate way that captures the complexity of a risk information processing situation; and (3) explicitly treating seeking and processing strategies as dependent variables.

Although previous research based on the model has been supportive of the relationships depicted (Griffin, Dunwoody, and Neuwirth 1999; Griffin, Neuwirth, et al. 2004; Griffin et al. 2002; Johnson 2005; Kahlor et al. 2003), that body of work has only applied the model to risks that pose a *direct personal threat* to individuals (for example, the consumption of contaminated fish or drinking water). The current study tests the applicability of the model to risks that pose a more *impersonal threat* (in this case, to the general health of the Great Lakes). An impersonal risk is one that is not readily seen as posing a direct personal threat. Many environmental hazards such as global warming, over-fishing, and encroachment of development on wildlife refuges fall into this category of risk.

Impersonal Risk

Although most risk communication research focuses on risks that can afflict the respondent, there is great interest in how to energize individuals

to care about risks that do not affect them directly. Advocacy groups and nongovernmental organizations (NGOs) seek to highlight risks to the environment, for instance, in an effort to convince individuals to adopt more environmentally benign behaviors. Other groups seek to increase our concern about risks posed to other—often distant—populations by war or likely natural disasters to solicit resources. How do we come to feel strongly about risks posed to entities other than ourselves?

The research on health communication has shown that perceived personal relevance is a powerful predictor of individuals' use of health-related messages (cf. Biek, Wood, and Chaiken 1996; Liberman and Chaiken 1992; Markova and Power 1992; Stockdale, Dockrell, and Wells 1989). Markova and Power (1992) reviewed the research on personal relevance and responses to AIDS prevention campaigns and found that unless a message is strategically *targeted* at its intended audience, recipients fail to see the relevance of the message to their own behaviors. If the message is not perceived as relevant and the recipient does not connect the message to his or her own behaviors, Markova and Power and others argue, there can be little hope that the message will help to bring about the intended behavior change (Gollwitzer and Bargh 1996; Maibach, Kreps, and Bonaguro 1993).

The research on cancer information campaigns has reached similar conclusions. Experience with cancer—either through one's direct experiences or indirect experiences via close personal relationships—seems to have an impact on cancer-related information seeking. As personal and familial significance of cancer increases, so does information seeking (Atkin 1973).

Although the research on environmental and risk communication has paid significantly less attention to the role of personal relevance in information seeking and processing, studies that explore these linkages suggest that perceived personal relevance is important here, too. Indeed, in the mid-1980s, Keeney and von Winterfeldt (1986) recommended a paradigm shift in risk communication—with personal relevance as the driving force of that shift. The researchers criticized risk communication professionals for relying too heavily on quantifiable characteristics of risk rather than on the more qualitative characteristics that are more meaningful for laypeople. The researchers suggest, for example, that communication about air quality standards for carbon monoxide focus less on "parts per million of carbon monoxide in the air" and more on "the possible health effects that are significant to individuals" (1986, 420).

However, it is important to note that these scholars are addressing personal relevance only in terms of risks to the self and loved ones. To discuss relevance only in these terms is to ignore a host of risk topics that experts feel are

equally pressing: These are the impersonal risks—the ones that cannot readily be seen as posing a direct personal threat.³ Many environmental hazards such as global warming, forest biodiversity, overfishing, encroachment of development on wildlife refuges, overpopulation, and sustainable development⁴ fall into this category of risk. The primary distinction that differentiates impersonal risks from more personal risks is the focus on something other than personal safety—oftentimes, that focus is on values or distant others. For example, Leiserowitz, Kates, and Parris (2004) argue that when people consider the topic of sustainable development, they focus on "economic development, environmental protection, and social progress/equity" (p. 40). The primary referent is at the societal level rather than the personal level (as it is when a risk poses a direct personal threat). The more immediate perceived impacts are on groups of people or geographic entities rather than the individual.

Risk communication scholars frequently distinguish between individual- and societal-level referents when looking at public perceptions of risk (cf. Coleman 1993; Dunwoody and Neuwirth 1991). For example, recent research on public perceptions of global warming indicates that "Americans perceive climate change as a moderate risk that will predominantly impact geographically and temporally distant people and places" (Leiserowitz 2005, 1433). The Environmental and Societal Impacts Group of the National Center for Atmospheric Research met in Boulder, Colorado, in 2004 to discuss this very dilemma: how to make an impersonal risk such as global warming more salient and urgent to Americans—the majority of whom do not see the risk as personally serious, urgent, or worth worrying about.⁵

There is a body of literature that deals specifically with environmental concern or worry about more impersonal risks such as overpopulation (Van Liere and Dunlap 1983) and forest biodiversity (McFarlane 2005). The resulting research has isolated many relevant predictors of such concern, including self-interest and altruism (human and biospheric; Dietz, Fitzgerald, and Shwom 2005), affiliation with environmental organizations, professional interests (or having a family member with related professional interests; McFarlane 2005), and acceptance of dominant social norms such as support for the status quo and for economic growth (Van Liere and Dunlap 1983).

This current research effort is an attempt to further explore impersonal risk, specifically the factors that motivate risk-related behaviors such as information seeking and processing, when the primary entity threatened is not the individual but is, instead, a larger, complex, typically nonhuman unit. The specific context for this effort is information seeking and processing of information about threats posed to the health of the Great Lakes.

These threats stem from, among other things, (1) the introduction of exotic species of plant, crustacean, fish, and mollusk and (2) the cumulative secondary effects on plants, fish, and humans of dangerous emissions of toxins such as mercury, lead, dioxin, mirex, and toxaphene from industry, power plants, automobile exhaust, and runoff from cities and farms.⁶

Information Seeking

When conceptualizing information seeking, it helps to think in terms of level of intensity. That is, people can seek information by expending very little or quite a lot of effort. According to McGuire (1974), information seeking can be dichotomized into two classifications of intensity: active and passive seeking.⁷

Active seeking describes a more goal-driven behavior, while *passive seeking* describes a more ritual-based behavior. Active seeking is characterized as behavior that goes beyond routine media use and is driven by such motivating factors as the desire for autonomy, tension reduction, or self-expression. It may involve, for example, using Internet search engines or going to the library to search for relevant publications.

Passive seeking, in contrast, is characterized as routine or habitual and is driven by such motivating factors as identity building, identity reinforcement, and modeling. An example of passive seeking would be habitual scanning of the morning paper or tuning in to the evening news.⁸

McGuire (1974) asserts that what distinguishes passive from active seeking are the strength of the motivating factors and the relative or perceived accessibility of the information channels that can assist an individual in meeting his or her information needs. For example, researchers interested in health communication have noted an increase in multichannel information seeking when a topic has personal relevance (such as when one experiences illness), which can drive perceived information need (Gantz, Fitzmaurice, and Fink 1991). Multichannel information seeking may involve accessing not only the major news media and the Internet but also family, friends, and health professionals (Gantz, Fitzmaurice, and Fink 1991). Researchers should therefore consider the goals that drive information seeking as well as the situation in which the seeking takes place.

Just as information seeking can be energized, so can it be inhibited. Thus, another consideration that must be addressed when looking at information seeking is the presence of goals and other factors that inhibit seeking—specifically, the factors that drive information *avoidance*. Information

avoidance has received recent attention in the health communication literature (cf. Brashers, Goldsmith, and Hsieh 2002; Brashers, Neidig, and Goldsmith 2004; Case et al. 2005; Feltwell and Rees 2004).

Indeed, the research indicates, that information avoidance is, in some ways, conceptually distinct from information seeking. As Case et al. (2005) write, "The assumption that individuals actively seek information underlies much of the psychological theory and communication practice, as well as most models of the information-seeking process" (p. 354). However, the research indicates that under certain circumstances, people do *actively* avoid information that they perceive as likely to cause them psychological discomfort. As Case et al. suggest, avoidance is not merely the absence of seeking. That is, screening phone calls to avoid hearing the results of a medical test is a behavior quite apart from choosing not to engage in an online search for additional information about one's disease.⁹ Like information seeking, the level of effort expended to avoid information can vary depending on the motivating factors.

Information avoidance is a relatively understudied phenomenon in the risk communication literature. One risk researcher, Witte (1992, 1994), has looked quite extensively at predictors of message rejection within the context of fear appeals. Her research indicates that individuals are more likely to engage in motivated message rejection and avoidance when they perceive themselves to be in high fear, low self-efficacy situations.¹⁰

Information Processing

Like information seeking, information processing is generally conceptualized as consisting of two styles. The heuristic-systematic model (HSM), one of the more robust of the dual-processing models, labels these processing styles as heuristic and systematic processing (cf. Chaiken 1980, 1987; Eagly and Chaiken 1993).

Systematic processing is "a comprehensive, analytic orientation in which perceivers access and scrutinize all information input for its relevance and importance to their judgment task, and integrate all useful information in forming their judgment" (Chaiken, Liberman, and Eagly 1989, 212). When processing information systematically, individuals are said to "exert considerable cognitive effort. . . . They actively attempt to comprehend and evaluate the message's arguments" (Chaiken 1980, 752). Systematic processing, according to Chaiken, will take place when an individual encounters information of significant personal importance (also see Liberman and Chaiken

1996). In such "high issue involvement" situations, information reliability and accuracy outweigh time or energy constraints (Chaiken 1980, 754). The receiver focuses on message content rather than on peripheral characteristics of the message. Other reasons for engaging in systematic processing include perceived accountability for one's judgments, need for cognition, and need for control (Maheswaran and Chaiken 1991).

Chaiken, Liberman, and Eagly (1989) acknowledge, however, that systematic processing can vary in its extensiveness. Therefore, this definition, with its reference to the scrutiny and integration of all relevant information, more accurately refers to the upper end of a processing continuum. Lower-end systematic processing, on the other hand, simply needs to use "more than marginal levels of effort and cognitive capacity" (Chaiken, Liberman, and Eagly 1989, 212).

In terms of effort, heuristic processing also would, at first glance, appear to belong at this lower end of the processing continuum. However, conceptually speaking, it belongs on a different continuum altogether; heuristic processing, Chaiken and colleagues argue, is qualitatively distinct from systematic processing. It involves a different processing strategy. For example, level of effort is *less relevant* when one is processing heuristically—primarily because the goal of heuristic processing is to bypass in-depth processing in favor of "simple inferential rules, schemata, or cognitive heuristics" (Chaiken, Liberman, and Eagly 1989, 213). In other words, rather than attempting to scrutinize the information wholesale, heuristic processors rely on "more accessible information, such as the source's identity or other non-content cues in deciding to accept a message's conclusion" (Chaiken 1980, 752). Such heuristics are learned and tested; they are based on past experiences and observations (Chaiken, Liberman, and Eagly 1989). Heuristic processing is more likely to occur with low-issue involvement (Chaiken 1980), when time does not permit more extensive processing (Ratneshwar and Chaiken 1991), when an individual does not perceive more in-depth processing to be of much consequence (Chaiken and Maheswaran 1994; Moskowitz and Chaiken 2001), or when an individual wishes to avoid contrary information (Giner-Sorolla and Chaiken 1997).

According to its creators, the HSM applies to general communication contexts in which people "are exposed to information about themselves, other persons and events, and have to make decisions or formulate judgments about these entities" (Chaiken, Liberman, and Eagly 1989, 239). The perceived need to formulate a judgment can result from outside pressures

(e.g., perceptions that an "other" will ask questions about the information) or internal pressures (e.g., need to assess the validity of a given message before committing time and energy to processing the message or accepting its contents; Eagly and Chaiken 1998).

Information Insufficiency: Perceived Information Need

One of the key motivators of more effortful processing is the perceived need for additional information. Chaiken and colleagues assert that this perceived need is driven by an individual's desire to have confidence in his or her subsequent judgments about the information that is before him or her (Chaiken, Liberman, and Eagly 1989; Maheswaran and Chaiken 1991). The researchers maintain that because processors must be selective about how much energy they allocate to each message that comes before them, it is likely that a mechanism exists that allows them to strike a balance between effort allocated and their desired level of judgmental confidence for each message.

Chaiken and colleagues dub this mechanism the sufficiency principle (Chaiken, Liberman, and Eagly 1989). The principle states that an individual will continue to actively engage in processing until he or she has reached some necessary depth or breadth of understanding (Chaiken, Liberman, and Eagly 1989; Eagly and Chaiken 1993; Jain and Maheswaran 2000; Maheswaran and Chaiken 1991). Eagly and Chaiken (1993) explain that according to the principle, "people will exert whatever effort is required to attain a 'sufficient' degree of confidence that they have accomplished their processing goals" (p. 330). The perception of a large gap between one's understanding of a risk and the level of understanding needed to make decisions about the risk is associated with more systematic processing (Chaiken, Liberman, and Eagly 1989; Eagly and Chaiken 1993; Jain and Maheswaran 2000; Maheswaran and Chaiken 1991). Gap size is also associated with actively seeking additional information through the use of multiple information sources, regardless of processing style (Eagly and Chaiken 1993).

In adapting the sufficiency principle to their risk information seeking and processing model, Griffin et al. focus on *information sufficiency* (or more properly, information [^]sufficiency), that is, the gap between what people know about a given risk (*current knowledge*) and what they say they need to know for their own purposes (the *sufficiency threshold*).

Informational Subjective Norms: Perceived Social Pressures to Be Informed

Ajzen's Theory of Planned Behavior (1988, 1991, 2002) provides a conceptual framework for looking at human behaviors and behavioral intentions. According to the theory, a behavior is guided by existing beliefs about such aspects of the behavior as its consequences, the expectations of others, and individual control over performing the behavior. For example, a behavior such as recycling, according to the theory, would be guided by beliefs about whether recycling is an effective means of reducing the burden on landfills, whether you believe that others think you should recycle, and whether recycling is an affordable and otherwise doable behavior for you to perform.

A handful of researchers have attempted to apply this theory specifically to the study of health and/or environmental behaviors. According to Bratt (1999), science frequently provides ambiguous information about desired environmental or health behavior change. It is for this reason that subjective norms concerning environmental and health behaviors are likely to be important determinants of actively engaging in such behaviors. Subjective norms are indeed important predictors of positive health behaviors such as eating more fruits and vegetables (Lytle et al. 2003) and using condoms during risky sexual intercourse (Fishbein, Von Haften, and Appleyard 2001) and of positive environmental behaviors such as recycling (Terry, Hogg, and White 1999).

Little research exists, however, that looks specifically at what Griffin et al. call *informational subjective norms*—perceptions that others believe that we should be or should become informed about a particular topic. It is for this reason that informational subjective norms are one of the more significant contributions offered by the Griffin et al. model of risk information seeking and processing. A 2004 Griffin, Neuwirth, Dunwoody, and Giese study indicated that informational subjective norms were positively related to the perceived gap between current knowledge and knowledge needed (information insufficiency). That is, people who reported that others expect them to be informed about a risk also reported a larger gap between the knowledge they had about that risk and the amount of knowledge that they felt was sufficient.

Channel Beliefs and Perceived Information-Gathering Capacity

In a 1987 discussion of the public's ideation of the media (or schema, as Kosicki and McLeod [1990] later termed it), McQuail suggested that beliefs

about media stem from an accumulation of observations and ideas about each information channel, including "what it is, what it is good for, how it fits into daily life, how it should be 'read'" (p. 5). Credibility is one of the more enduring concepts to have surfaced in the study of these schemas (Becker and Kosicki 1996; Whitney 1985). Another concept that has appeared in the research of Kosicki and McLeod (1990) and Becker and Kosicki (1996) is *patterning*. *Patterning* refers to "whether the news in the media forms—across time—a comprehensive picture of the outside world" (Becker and Kosicki 1996, 3). Beliefs about information channels are likely to impact the information seeking and processing behaviors in which people engage. For example, people who view the media as patterned are more likely to actively process (and learn from) media content (McLeod, Kosicki, and Pan 1991).

One's sense of self-efficacy (Bandura 1982) or perceived behavioral control (Ajzen 1988) is also likely to influence the performance of behaviors. That is, when an individual feels capable of performing a certain behavior, it is more likely that he or she will do it. It follows, then, that information-gathering capacity, which is one aspect of behavioral self-efficacy, is likely to influence information seeking and processing behaviors (Chaiken 1987). Thus, an individual who perceives herself or himself as able to process information—both in terms of cognitive ability and physical ability or accessibility—is more likely to do so actively and systematically.

The Hypotheses

Thus far, the Griffin et al. model has only been tested within the context of risks that pose direct personal threats, such as the consumption of contaminated fish. This current effort attempts to test the applicability of the model to more impersonal risks—the general perceived health of the Great Lakes. To allow for some limited comparisons between these two risk situations (personal and impersonal), the following hypotheses closely parallel those tested in earlier applications of the model:

Hypothesis 1: Informational subjective norms will be positively related to information insufficiency (i.e., the perceived gap between knowledge held and knowledge needed).

Hypothesis 2: Information insufficiency will be positively related to information seeking.

Hypothesis 3: Information insufficiency will be negatively related to information avoidance.

Hypothesis 4: Information insufficiency will be positively related to systematic information processing.

Hypothesis 5: Information insufficiency will be negatively related to heuristic information processing.

Although we do not formulate hypotheses as to their relationships to information seeking and processing, the concepts of channel beliefs and perceived information-gathering capacity are included in the analyses below to allow for some comparisons with earlier applications of the model.

The Sample

Data for this analysis came from a subset (237 people) of a larger data set (1,123 people). The larger study was designed to investigate risk information seeking and processing concerning three risks: risks posed to the self through the consumption of Great Lakes fish, risks posed to the self through the consumption of municipal drinking water, and risks posed to the general health of the Great Lakes ecosystem. The 237-person subsample was asked questions solely related to the third (impersonal) risk—that is, the risk posed to the general health of the Great Lakes ecosystem.

Sampling and Interviewing

Two communities on the Great Lakes—Milwaukee, Wisconsin, on Lake Michigan and Cleveland, Ohio, on Lake Erie—were used as the research sites. These two medium-sized Midwestern cities have experienced increases in concentrations of pollutants in the fish, water, and sediments within their lakes.

From October 1996 to March 1997, the Wisconsin Survey Research Laboratory, a professional research organization formerly associated with the University of Wisconsin-Extension, conducted a sample survey by telephone of 1,123 adult residents of Milwaukee (579 people) and Cleveland (544 people). Residences were contacted using random-digit dialing, and respondents were chosen randomly among adults within households. The response rate was 55 percent, and interviews took approximately 20 minutes.

After answering initial questions regarding their consumption of Great Lakes fish, respondents were assigned to one of three paths of questioning through the questionnaire. The bulk of respondents were queried about the risks of eating contaminated fish. Those whose answers to filter questions made them ineligible for the fish path were randomly assigned to either the

contaminated-drinking-water path or the Great Lakes-ecosystem path. The filter questions were intended to locate individuals who do not eat Great Lakes fish (or do not know if they eat Great Lakes fish) but have not made a conscious decision to avoid eating at least some Great Lakes fish. These individuals were assigned to either the drinking-water path or the ecosystem path. It is the 237 ecosystem/lake path respondents that are the focus of this analysis." This subset of respondents closely mirrors the larger sample in terms of gender (59 percent female for the subset versus 52 percent for the larger sample), age (47 versus 49), minority status (24 percent non-white versus 22 percent), education ("some college"), and income (\$42,000 versus \$45,000).

Aside from the initial two questions asking about fish consumption, which were intended to locate individuals who lack that personal link to the lakes, the questions on the lake path were intended to highlight the more impersonal aspects of risks posed to the Great Lakes ecosystem. Lake path questions focused on the health of the lake, loss of habitat for wildlife, and human impact on the lake—rather than the lake's impact on human health. For example, these respondents were not asked about their personal consumption of water sourced from the lake.

The Variables

The following variables, which are reflected in Figure 1 and in the hypotheses, will be used in this study: informational subjective norms, information insufficiency, information seeking, and information processing. Several additional variables not reflected in the hypotheses will also be used. Those include channel belief factors and perceived information-gathering capacity, which are both represented in Figure 1, as well as several additional demographic variables that are historically used in studies of risk perception and risk judgment.

Informational Subjective Norms

Informational subjective norms, the perceived social pressure to be informed about a given risk, is captured by the item, "People who are important to me would expect me to stay on top of information about threats to the health of Lake [Michigan] [Erie]." Responses also ranged from 1 to 5, with a mean of 3.6 ($SD = .9$).

Information Insufficiency

Information insufficiency was captured using two items positioned in a multiple regression analysis such that the variance accounted for by current knowledge is removed from the equation before the inclusion of knowledge needed. This procedure follows Cohen et al. (2003) and is preferred over subtracting one variable from the other (i.e., creating a difference score), a technique that can compound measurement error. For example, difference scores can suffer from ceiling effects, which can, in turn, amplify unreliability. This is the same variable used in previous applications of the model (cf. Griffin, Neuwirth, et al. 2004; Kahlor et al. 2003).¹²

Current knowledge was captured with the item, "Now we would like you to rate your knowledge about threats to Lake [Michigan] [Erie]. Using this scale, how much do you think you currently know about threats to Lake [Michigan] [Erie]?"

To determine knowledge need, the information sufficiency threshold was captured with the item, "This time we would like you to estimate how much knowledge you would need to achieve an understanding of the threats to the health of Lake [Michigan] [Erie] that is good enough for your purposes."

Responses ranged from 0 to 100 for both questions. The mean was 33.5 ($SD = 23.4$) for current knowledge and 65.7 ($SD = 24.8$) for the information sufficiency threshold.

Information Seeking and Processing

As previously mentioned, this study was intended to allow for some limited comparisons between two risk situations—risks that pose personal threats and risks that pose impersonal threats. The current analyses focus on a risk that poses an impersonal threat. However, to allow comparison to previously published findings regarding the application of the model to risks that pose personal threats, we opted to use in our current analyses factor weights generated from the full ($N = 2,470$) data set, as reported below. These factor weights, which have demonstrated stability across studies,¹³ have been reported in previously published applications of the model (cf. Griffin et al. 2002).

Respondents were asked to indicate whether they *strongly agreed* (5), *agreed* (4), *felt neutral* (3), *disagreed* (2), or *strongly disagreed* (1) with the following items. These items were framed as "statements that some people have made about how they personally deal with information about any threats to the health of Lake [Michigan] [Erie]."

Table 1
Information Seeking Factor Analysis (principal axis factoring,
oblique rotation)

Item	Information-Seeking Factor	
	Avoidance	Active Seeking
When this topic comes up, I am likely to tune it out.	.635	-.400
Whenever this topic comes up, I go out of my way to avoid learning more about it.	.609	-.200
Gathering a lot of information on [this topic] is a waste of time.	.602	-.433
When [this topic] comes up, I try to learn more about it.	-.478	.755
When it comes to [this topic], I am likely to go out of my way to get more information.	-.297	.711
Initial Eigenvalues	2.338	1.01
Rotation sum of squared loadings	1.452	1.463
Reliability (omega)	.64	.85

Note: Factor correlation: $r = -.475$. $N = 2,470$. Scale: 1 = *strongly disagree*, 2 = *disagree*; 3 = *feel neutral/don't know*; 4 = *agree*; 5 = *strongly agree*.

Information Seeking

1. When this topic comes up, I'm likely to tune it out.
2. Whenever this topic comes up, I go out of my way to avoid learning more about it.
3. Gathering a lot of information on threats to Lake [Michigan] [Erie] is a waste of time.
4. When the topic of threats to Lake [Michigan] [Erie] comes up, I try to learn more about it.
5. When it comes to threats to Lake [Michigan] [Erie], I'm likely to go out of my way to get more information.

These items were subjected to principal axis factor analysis (oblique rotation), which produced two distinct factors, shown in Table 1. The first factor, which measures the tendency to avoid information about risks, is labeled *avoidance*. The second factor, seeking, reflects levels of activity in gathering and learning about the topic. Again, to ensure that variables in this analysis are comparable to those of other analyses of the model that use data from the other respondent waves, factor score coefficients from the larger data set ($N = 2,470$)¹⁴ were utilized to construct these indices of avoidance

(Cronbach's alpha = .65; omega = .64) and active seeking (Cronbach's alpha = .69; omega = .85). See Carmines and Zeller (1979) for a discussion of omega as a reliability coefficient.¹⁵

Information Processing

1. After I encounter information about this topic, I am likely to stop and think about it.
 2. If I need to act on this matter, the more viewpoints I get, the better.
 3. When I encounter information about this topic, I read or listen to most of it, even though I may not agree with its perspective.
 4. After thinking about this topic, I have a broader understanding.
 5. When I see or hear information about this topic, I rarely spend much time thinking about it.
- There is far more information on this topic than I personally need.
When I encounter information about this topic, I focus only on a few key points.
If I need to act on this matter, the advice of one expert is enough for me.

These items were subjected to principal axis factor analysis (oblique rotation), which produced two distinct factors, shown in Table 2. The two factors were consistent with the concepts of heuristic and systematic processing. As with seeking, factor score coefficients from the larger data set ($N = 2,470$) were utilized to construct these indices of systematic (Cronbach's alpha = .58; omega = .69) and heuristic (Cronbach's alpha = .57; omega = .68) processing.

Other Model Variables

Channel belief factors. In this current research effort, beliefs about media channels were captured with five items:

1. The media often exaggerate and sensationalize the news.
2. News media often represent their own bias and interests.
When the same information appears in many places, I'm more likely to believe it.
Stories with statistics are more believable than those without.
Individual news items may seem like bits and pieces, but in the long run, they form a meaningful pattern.

Respondents were asked to indicate whether they *strongly agree* (5), *agree* (4), *feel neutral* (3), *disagree* (2), or *strongly disagree* (1) with those statements. These items were subjected to principal axis factor analysis (oblique

Table 2
Information Processing Factor Analysis (principal axis factoring, oblique rotation)

Item	Information Processing	
	Systematic	Heuristic
After I encounter information about this topic, I am likely to stop and think about it.	.636	-.393
If I need to act on this matter, the more viewpoints I get, the better.	.569	-.354
When I encounter information about this topic, I read or listen to most of it, even though I may not agree with its perspective.	.426	-.297
After thinking about this topic, I have a broader understanding.	.425	-.136
When I see or hear information about this topic, I rarely spend much time thinking about it.	-.409	.534
There is far more information on this topic than I personally need.	-.342	.534
When I encounter information about this topic, I focus on only a few key points.	-.165	.509
If I need to act on this matter, the advice of one expert is enough for me.	-.264	.437
Initial Eigenvalues	2.502	1.138
Rotation sum of squared loadings	1.473	1.406
Reliability (omega)	.69	.68

Note: Factor correlation: $r = -.489$. $N = 2,470$. Scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *feel neutral/don't know*; 4 = *agree*; 5 = *strongly agree*.

rotation), which produced two distinct factors, shown in Table 3. These were media distort (Cronbach's alpha = .65; omega = .72) and media provide processing cues (Cronbach's alpha = .40; omega = .60).¹⁶ These two factors were consistent with prior applications of the model (Griffin et al. 2002). To further ensure that this study is comparable to other studies of the model to date, factor score coefficients from the larger data set ($N = 2,470$) were utilized to construct these indices.

Perceived information-gathering capacity. This covariate was captured with the items "If I wanted to, I could easily get all the information I need about this topic" and "It is hard for me to get useful information about this topic" (the latter item reverse scored). Respondents were asked to indicate

Table 3
**Channel Beliefs Factor Analysis (principal axis
 factoring, oblique rotation)**

Item	Channel Beliefs Factor	
	Media Distort	Media Processing Cues
The media often exaggerate and sensationalize the news.	.699	-.084
News media often represent their own bias and interests.	.689	-.048
When the same information appears in many places, I am more likely to believe it.	.001	.517
Stories with statistics are more believable than those without.	.008	.481
Individual news items may seem like bits and pieces, but in the long run, they form a meaningful pattern.	-.121	.302
Initial Eigenvalues	1.516	1.352
Rotation sum of squared loadings	.978	.599
Reliability (omega)	.72	.60

Note: Factor correlation: $r = -.100$. $N = 2,470$. Scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *feel neutral/don't know*; 4 = *agree*; 5 = *strongly agree*.

whether they *strongly agreed* (5), *agreed* (4), *felt neutral* (3), *disagreed* (2), or *strongly disagreed* (1) with those statements. The alpha, which is marginal at best, was .54. However, the index is included in the analysis to remain consistent with other applications of the model.

Control Variables

To control for possible variance produced by location or local culture, respondents' communities were taken into account. Milwaukee was coded as 1 and Cleveland was coded as 2. The sample was nearly evenly split between the two cities (49 percent of the sample was from Milwaukee).

Other controls included gender, age, education, minority status, income, and political conservatism. Sixty percent of the sample was female. Respondents' ages ranged from 22 to 95, with a mean of 48 ($SD = 17$). The modal level of education was "some college," and the mean level of income was \$42,000. Twenty-five percent of the sample was nonwhite (20 percent African-American, 2 percent Hispanic, 1 percent Asian/Pacific Islander, 1 percent American Indian, and 1 percent Other).

Political philosophy was measured with the item, "These days, we hear the words *liberal* and *conservative* talked about a lot. Would you say you are (1) *liberal*, (2) *somewhat liberal*, (3) *middle of the road*, (4) *somewhat conservative*, or (5) *conservative*!" Fifteen percent of the sample responded that they were liberal, 10 percent responded that they were somewhat liberal, 31 percent responded that they were middle of the road, 22 percent responded that they were somewhat conservative, and 22 percent responded that they were conservative.

Again, this demographic snapshot of the lake path respondents closely mirrors the respondents from the larger sample (cf. Griffin et al. 2004).

Analyses

A series of five hierarchical multiple regressions was performed.

As was the case with indices discussed earlier, the control variables political philosophy, gender, ethnicity, age, education, and income, gathered at each of the three waves, demonstrated such stability across waves that a universal set of items was compiled by the original researchers to represent all three waves.

To test the model's ability to accommodate a risk that poses an impersonal threat, the data were regressed as follows:

1. Information sufficiency threshold was regressed on the control variables, current knowledge, and informational subjective norms.
2. Active information seeking was regressed on the control variables, informational subjective norms, perceived information-gathering capacity, channel beliefs, current knowledge, and information sufficiency threshold.
3. Information avoidance was regressed on the same variables as information seeking.
4. Systematic processing was regressed on the same variables as information seeking.
5. Heuristic processing was regressed on the same variables as information seeking.

When regressed on current knowledge, the sufficiency threshold variable represents information insufficiency.

Results

Hypothesis 1 predicted that informational subjective norms would positively relate to information insufficiency (the perceived gap between

knowledge held and knowledge needed). This relationship did emerge (beta = .21, $p < .001$). As Table 4 indicates, the more social pressure one feels to be informed about threats to the lakes, the greater the gap between what one thinks he or she knows and thinks he or she ought to know.

Hypothesis 2, which predicted that information insufficiency would positively relate to more active information seeking, was also supported (beta = .15, $p < .01$). The larger the gap between what one thinks he or she knows and thinks he or she ought to know, the more actively he or she will seek related information. Conversely, Hypothesis 3 predicted that information insufficiency would *negatively* relate to information avoidance. This was also supported (beta = -.19, $p < .01$), meaning that the larger the gap between what one thinks he or she knows and thinks he or she ought to know, the less likely he or she is to engage in active avoidance of information (see Table 4).

Hypothesis 4 predicted that information insufficiency would be positively related to systematic information processing. This hypothesis was supported (beta = .23, $p < .001$), indicating that the larger the gap between what one thinks he or she knows and thinks he or she ought to know, the more likely he or she is to process related information systematically. And, as Hypothesis 5 predicted, the larger the gap between what one thinks he or she knows and thinks he or she ought to know, the less likely he or she is to process related information heuristically (beta = -.21, $p < .001$).

Although all the predicted relationships were supported, indicating that the model holds equally well when applied to impersonal risks versus personal risks, several unexpected relationships also surfaced in the analyses—a few of which are worth noting here (see Table 4).

Perhaps the most notable is the overall strength of informational subjective norms relative to all variants of information seeking and processing. This variable emerged as our strongest predictor. Also serving as a moderately strong predictor of these dependent variables is current knowledge. Finally, level of education remains as a moderately strong predictor of avoidance, systematic processing, and heuristic processing. We will speculate below that the impersonal nature of the risk situation may be playing a role in the emergence of some of these relationships.

Discussion

After an extensive review of the literature on efforts to communicate information about health or environmental risks, Covello, von Winterfeldt, and Slovic (1986) concluded the following:

Table 4
Hierarchical Multiple Regression Analysis

	Information Seeking		Information Processing		
	Information Insufficiency	Active Seeking	Avoidance	Systematic	Heuristic
Controls					
Metropolitan area (Milwaukee = 1, Cleveland = 2)	-.02	.10	-.11	.12*	-.15*
Female gender	-.02	.08	-.13**	.07	-.14*
Age	-.05	.15**	.00	.01	.09
Education	-.07	.04	-.22***	.18**	-.23***
Minority	.17**	.16**	-.10	.08	-.02
Income	.03	.05	-.08	.11	-.10
Political conservatism	-.03	-.15**	.16**	-.10	.09
ΔR^2	.03	.13***	.15***	.12***	.16***
Model Variables					
Informational subjective norms	.21***	.40***	-.24***	.19**	-.15*
ΔR^2	.07***	.22***	.11***	.08***	.05***
Perceived information-gathering capacity	-.04	.03	.07	.03	-.04
ΔR^2	.00	.00	.00	.00	.00
Channel Beliefs					
Media distort validity cues	-.02	-.05	-.03	.04	-.06
ΔR^2	.01	.02	.00	.02*	.00
Information (In)sufficiency					
Current knowledge	.26***	.22***	-.16**	.14**	-.11*
ΔR^2	.06***	.06***	.04***	.04***	.03**
Information sufficiency					
threshold		.15**	-.19**	.23***	-.21***
ΔR^2		.02***	.03**	.05***	.04***
Adjusted R^2	.12***	.45***	.30***	.26***	.24***

Note: $N = 237$. Significant regression coefficients are in bold.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Most federal regulatory agencies view risk problems from a societal or macro-perspective. As a result, most analyses by government agencies provide only aggregate or population statistics for the community or nation as a whole. Aggregate or population statistics are, however, usually of little interest to individual citizens, who are most likely to view risks from a micro-perspective and

to be more concerned about risks to themselves or to their loved ones than about risks to society or the community as a whole, (p. 177)

Clearly, for a message to have its intended impact, it needs to be personally relevant to the audiences that can most benefit from it. However, while the call to action issued by Covello and colleagues is an important one, it fails to address the unique challenge posed for risk communicators working with impersonal risks: how to optimize behavior change when a risk just does not seem all that personal *or* relevant to the general public.

The concept of impersonal risk drove this current research effort, which tested the Griffin et al. risk information seeking and processing model within an impersonal risk context. In a snapshot, the model predicts that informational subjective norms and perceived need for information about a risk (information sufficiency) will both be important precursors to effortful information seeking and processing of information about a risk (see Figure 1). As predicted, a significant positive relationship emerged between informational subjective norms and information insufficiency regarding a risk that poses an impersonal threat. Similarly, positive relationships emerged between information insufficiency and information seeking and processing. These results support this portion of the model and mirror earlier findings (see, for example, Griffin, Neuwirth, et al. 2004; Griffin et al. 2002).

The results suggest that communicators working with impersonal risks such as global warming can turn to the Griffin et al. model as a guide when developing strategic messages but that the relative importance of the variables in the model may vary. To encourage more effortful processing of their messages, environmental risk communicators working with impersonal risks may wish to appeal to audience perceptions about (1) how little they (the audience) currently know, (2) how much they need to know, and (3) how informed others expect them to be. Although conjectural, any or all of these appeals are likely to have some impact on the likelihood that audiences will tend more effortfully to available risk information—even in the absence of a compelling personal threat.

Indeed, based on this current study, which deals with impersonal risk exclusively, how informed others expect us to be is likely to be among the most influential appeals of the three. This implication is suggested by the two unpredicted relationships that emerged within this portion of the model: the relationships between informational subjective norms and information seeking and informational subjective norms and information processing. These were among the strongest relationships within the model—especially when it came to information seeking (beta = .40, $p < .001$) and avoidance (beta = -.24, $p < .001$).

So, while the relationship between informational subjective norms and information insufficiency still appears to be valid, these norms may play a more direct role in information seeking and processing than was initially anticipated, at least with regard to impersonal risks.

One interpretation is that the link between informational subjective norms and information insufficiency represents, at least in part, what some researchers call the transformation of social norms (others' expectations that I be informed) into personal norms (I should be more informed; Ajzen 2002). That is, the information sufficiency principle could represent an internalized informational subjective norm: others' expectations may influence our perceived need to be informed (through this internalization process), but they may also exert some direct influence on our actual efforts, at least when it comes to impersonal risks.

The relative *strength* of the unexpected relationship is more difficult to explain. This could be a function of impersonal risk; in the absence of a direct threat, the expectations of others may be much more powerful—powerful enough to overshadow other variables. The relative strength of these relationships may also be a function of the concept of impression-motivated processing.¹⁷ Chen, Shechter, and Chaiken (1996) explain that the motivation to make a favorable impression can lead to more effortful processing in hopes of gauging the "interpersonal consequences of expressing a particular judgment in a given social context" (p. 263). The direct link found here between informational subjective norms and seeking and processing could be a manifestation of that phenomenon.

Similarly, the strong link between norms and information seeking and processing could be a reflection of what has been identified in the knowledge gap literature as "social interest," a motivating force in knowledge gain (Geneva and Greenberg 1979, 89). Genova and Greenberg explain social interest as "the perceived utility of the information to the individual's social milieu, to the kinds of interpersonal networks important to the individual" (pp. 81-82). It could also be a reflection of societal-level normative referents. Recent work by Neuwirth and Frederick (2004) suggests that under some circumstances, when engaging in communicative behavior, people incorporate perceptions of social norms that extend beyond peers. These referents can include *most people in the community or the majority of people*.

Further research, therefore, is needed to determine (1) the potential role of impression motivation and social interest, as well as societal-level normative influence, in the relationships between informational subjective norms and information seeking and processing and (2) whether these relationships exist for both personal and impersonal risks.

Research is also needed to further extend the concept of impersonal risk. While the vast majority of risk communication research focuses on personal risk, large areas of American policy attend to impersonal risks, among them environmental policy, the health of the commercial sector, and sociopolitical risk—that is, threats posed to the quality of life of people in faraway nations or risks posed to political and economic systems by such forces as radical changes in governmental structures. We consistently measure public opinions about these things but struggle to understand the basis for those opinions. The concept of impersonal risk may offer yet another vehicle for such an understanding.

The findings reported here also suggest that people who perceive that they know more about an issue are more active seekers and processors regarding that issue. An existing knowledge base (or the perception of such a knowledge base) appears to give people the drive or ability to process additional information more actively.

This finding is consistent with the literature on knowledge gaps. The knowledge gap hypothesis, introduced in 1970 by Tichenor, Donohue, and Olien, asserts that "segments of the population with higher socioeconomic status tend to acquire . . . information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tends to increase" (p. 159). The researchers attribute this knowledge differential in part to reading and comprehension skills and existing background knowledge. Since 1970, more than seventy empirical studies, commentaries, and critiques have been published in support of the knowledge gap concept; these studies have located gaps regarding topics ranging from public affairs to science and health information (see Viswanath and Finnegan 1995 for a review of the literature).

Knowledge gap researchers contend that education is among the most powerful mediators of knowledge gaps because when less educated individuals do access text-based media, they may lack the analytical skills needed to tackle more complex topics. Those skills include training in public affairs or civics, the ability to evaluate different types of evidence, and access to additional information (Griffin 1990). Viswanath and Finnegan (1995) explain, "Higher formal education provides a 'trained capacity' to follow certain issues, to relate these to other similar events and causes, and to better comprehend their significance" (p. 200).

This assertion also helps give meaning to the relationships that surfaced between the control variable education and information processing. Again, consistent with the knowledge gap literature, these relationships may represent the influence of formal knowledge on one's ability to process

information actively. Formal knowledge and formal knowledge-building skills also appear to deter information avoidance. This suggests that among the most challenging audiences facing risk communication experts is the less educated, who not only appear to lack processing skills but also are more likely to avoid information that is made available to them.¹⁸ To help communicators better reach this segment of the population, further research needs to focus on the role of knowledge and education in risk information processing and information avoidance.

Finally, it is important to note several shortcomings of this research effort. First, this effort was, for all intents and purposes, a secondary analysis. That is, although the questions that informed this effort were designed with this general project in mind, the instrument was developed with the primary intention of looking at perceptions regarding personal risks. Had the original study been designed to look primarily at impersonal risk—and therefore inquired about a variety of impersonal threats—the study could have avoided the potential confounds of using one case to represent a whole category of risk. An additional shortcoming was the low reliabilities of the indices used in the analyses. Although these indices mirror earlier applications of the model—and therefore allow for some general comparisons to be made—they are, by most standards, below what is generally deemed acceptable. Another shortcoming of this effort was that, although the health of the Great Lakes was our impersonal risk of choice, there is the possibility that some of our respondents did perceive this risk to be personal if they recalled that their tap water came from the Great Lakes. Respondents in the lake path were not queried about their tap water, so the survey did not prime them in that sense. But the data also did not permit us to control for that possible confound.

Notes

1. The conceptual definition of *risk* used in this study is best captured by Stern and Fineberg (1996):

A concept used to give meaning to things, forces, or circumstances that pose danger to people or to what they value. Descriptions of risk are typically stated in terms of the likelihood of harm or loss from a hazard and usually include: an identification of what is "at risk" and may be harmed or lost (e.g. health of human beings or an ecosystem, personal property, quality of life, ability to carry on an economic activity); the hazard that may occasion this loss; and a judgment about likelihood that harm will occur. (pp. 215-16).

2. The concept of information insufficiency is rooted in both the "sufficiency principle" and "judgmental confidence," which are integral concepts in the heuristic-systematic model.

The sufficiency principle "embodies the idea that efficient information processors must strike a balance between minimizing their processing efforts and maximizing their judgmental confidence" (Chaiken, Liberman, and Eagly 1989, 221). Judgmental confidence refers to an individual's level of confidence that he or she has enough information to formulate an opinion or make a decision. According to the sufficiency principle, individuals will process information to the extent that they feel comfortable with their ability to formulate an opinion.

3. For a discussion of societal-level risks, see Tyler and Cook (1984) and Dunwoody and Neuwirth (1991).

4. The goal of sustainable development is to achieve a sustainability transition that will meet human needs and reduce hunger and poverty while maintaining the life support systems of the planet (Leiserowitz, Kates, and Parris 2004).

5. More information about the workshop and the goals of the group can be found at <http://www.esig.ucar.edu/changeworkshop/index.html>.

6. According to an executive summary prepared by the Environmental Protection Agency about the health of the Great Lakes, human impact on the Great Lakes continues to threaten the lakes' biological diversity. Ongoing threats include "toxics, alterations of nutrient inputs, acidification, salinization, alteration of lake levels/natural fluctuations, alteration of stream flow, alteration of water tables, temperature changes, disruption of longshore transport, sedimentation, fire suppression, habitat destruction, changes in forage base, increased competition, disease and increased predation/grazing" (U.S. Environmental Protection Agency 1994). Reports such as these have resulted in a flurry of policy attention and the creation of nonprofit public education organizations including Great Lakes Forever and the Great Lakes Information Network.

7. This active-passive dichotomy is similar to the instrumental-ritualized dichotomy articulated in the uses and gratifications literature (cf. Rubin 1984). According to Rubin, *instrumental media use* refers to "goal-directed use of media content to gratify informational needs or motives," while *ritualized media use* refers to "a more or less habitualized use of a medium to gratify diversionary needs or motives" (p. 69).

8. *Passive seeking* may seem to be a contradiction of terms. However, the phrase is simply meant to capture information seeking that is based on habits that individuals have established in their routine selection of channels—picking up the daily newspaper for a quick scan, for example. For some, it may be just a step away from no seeking at all.

9. For an illustrative discussion of information avoidance among individuals with HIV or AIDS, see Brashers, Neidig, and Goldsmith (2004).

10. Other researchers have looked at message rejection and avoidance outside of a risk context. For example, a meta-analysis recently published in *Psychological Reports* links cognitive dissonance theory to selective exposure of consonant messages and selective avoidance of dissonant messages (D'aleccio and Allen 2002).

11. To aid in the development of this questionnaire, Griffin and colleagues hired the Wisconsin Survey Research Laboratory to conduct four focus groups with a random sample of Milwaukee-area residents in the spring of 1996. The focus groups were designed to gather information about various components of the model that needed some exploratory investigation, including information needs in regard to Lake Michigan and fish contamination, in regard to drinking water supplies, and general orientations toward the lake as an ecosystem. Information from those focus groups was used to help prepare the first drafts of the final questionnaire. These drafts were then distributed in the summer of 1996 to a convenience sample of 301 students at the researchers' three home universities. The questionnaires operationalized all of the model components across a variety of personal risks, including sun exposure and consuming contaminated drinking water or fish, and environmental risks posed to aquatic ecosystems. Item and scale

analyses yielded the measures that were used in the final questionnaire. The survey lab conducted three telephone pretests of the resulting questionnaire with random samples of Milwaukee and Cleveland residents before actual interviews began in late October 1996.

12. The bulk of the research on information sufficiency was experimental and treated sufficiency as an inferred or manipulated variable. This is one of only a handful of studies that attempts to empirically measure this construct (for another example, see Griffin et al. 2004).

13. An in-depth analysis of how these factor weights hold up across risks is discussed in Griffin, Powell, Dunwoody, et al. (2004).

14. Because data were gathered from the same sample in three waves, this *N* includes multiple observations from the same individuals over time.

15. When interitem variances are not equal, alpha is a lower bound, and therefore conservative, estimate of reliability (Lord and Novick 1968). Omega, on the other hand, provides a more accurate estimate of reliability in such situations (Carmines and Zeller 1979). Although the reliability coefficients reported here are not optimal, they do fall under the moderately acceptable range (Robinson, Shaver, and Wrightsman 1991).

16. Although lower than desirable, the reliabilities are similar to figures reported elsewhere (Fredin, Monnett, and Kosicki 1994; Griffin et al. 2002).

17. Impression-relevant involvement is one of three types of motivational involvement discussed in the persuasion literature. The other two types of involvement are outcome relevance and value relevance. For a meta-analysis, see Johnson and Eagly (1989).

18. Brashers et al. (2000) assert that information avoidance can also be motivated by the desire to maintain uncertainty—they characterize this as a need to preserve and/or establish "psychological well-being in some circumstances (e.g., if certainty is likely to produce distress)" (p. 64).

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