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Another Part of the Risk Communication Model: Analysis of Communication Processes and Message Content

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The authors undertook a study to define the messages that exist in 2 communities of risk (e.g., high concentration of chemical facilities) using the principles of fantasy theme analysis and symbolic convergence theory. Through several methodological steps including a document review, interviews, focus groups, and a telephone survey ($N = 450$), the researchers determined the messages that dominate in the community, and were able to segment them into rhetorical visions based on master analogues. Analysis indicated that persons who adhere to different perspectives or opinions (measured as rhetorical visions) experience different amounts of uncertainty, control, and support or opposition for the industries that create the risks. This analysis adds depth to the risk communication literature and suggests that public relations practitioners can and should attempt to understand risk discourse content as well as the communication processes and risk perceptions held by key publics.

Risk communication addresses scientific evaluations of risks, the perceptions lay people have of them, and actions that are warranted in light of the degree of risk and people's tolerance of them. Researchers have discussed these topics as well as the processes that affect how government officials, scientists, and ordinary citizens communicate about risks. A growing body of research has examined the risk as-

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sessment and risk management process, but further research is needed to better understand the message content that lay people and experts use to frame and discuss risks. This exploration has substantial implications for public relations practitioners who may be called upon to design messages about risk and to communicate on behalf of companies, activist groups, ordinary citizens, and governmental agencies.

Risk communication, at first glance, appears straightforward. The elementary question seems to be this: How best can spokespersons develop and deliver targeted, data-driven risk messages as well as engage in symmetrical dialogues to reduce or increase key publics' awareness of, understanding of, and tolerance for risks?

The answer to that question is multifaceted because numerous variables have been found to affect risk communication processes, including (a) cognitive involvement (Chaffee & Roser, 1986; Heath & Abel, 1996; Heath & Nathan, 1991; Petty & Cacioppo, 1979; Rimal, Fogg, & Flora, 1995; Syme & Eaton, 1989); (b) first-hand experience (Baird, 1986; Heath & Abel, 1996; Heath & Palenchar, 2000); (c) knowledge (Baird, 1986; Covello, 1992; Covello, von Winterfeldt, & Slovic, 1987; Heath, 1995; Heath & Abel, 1996; Heath & Palenchar, 2000; Juanillo & Scherer, 1995; Nathan, Heath, & Douglas, 1992; National Research Council, 1989; Otway, 1992); (d) perceived economic benefit (Baird, 1986; Heath & Abel, 1996; Heath, Liao, & Douglas, 1995; Kunreuther, Easterling, Desvousges, & Slovic, 1990; Nathan et al., 1992); and (e) trust and credibility (Covello, 1992; Heath & Abel, 1996; National Research Council, 1989; Renn & Levine, 1991; Slovic, 1992).

Some risk communication studies and prescriptions take an atheoretical approach that features an all-knowing source, with scientific or managerial credentials, who offers advice on risks to lay audiences. Covello, Sandman, and Slovic (1988) designed one such treatise to assist the communication efforts of chemical plant managers. The manual advised risk communicators to relate to their audiences in dress and demeanor, feature understandable risk comparisons, and be attentive and personable. Such prescriptions do not discuss issues of conflict and negotiation, or see the risks from the perspective of concerned members of the community who often believe they have reason not to trust any statement regarding risks. Thus, to help risk communicators better understand the lay community, we need to look at risks more from citizens' perspective and less from that of scientists and manufacturing plant managers. To understand the process of risk perception, management, and communication, we should gain additional insights into the content of such discussions.

To that end, the purpose of this study was to examine how lay members of high risk communities express their views on the risks created by the manufacturing facilities that operate near their communities. The goal was to understand the message content of the discussions of these lay members, and to determine whether those messages can be categorized heuristically and discovered to relate to well established risk communication process variables such as uncertainty, control, and company support.

RISK COMMUNICATION

The concept of risk—the fact that people face an enormous variety of risks on a daily, even hourly, basis—is not new. Life hazards are a part of everyday existence in a modern, industrialized society. Media reports concerning hazardous materials, air and water pollutants, pesticide residues in food, carcinogenic elements in our food supply, and a host of other daily risks bombard our attention. Iconic incidents such as Bhopal and Mayak internationally, and Three Mile Island and Hanford nationally, will always remind people of the dangers involved with the production, use, and transportation of hazardous materials.

Out of this complex of risks arose a public relations subdiscipline (risk communication) intended to increase the quality of risk decisions through better communication. As Covello and Johnson (1987) noted,

> Risks to health, safety, and the environment abound in the world and people cope as best as they can. But before action can be taken to control, reduce, or eliminate these risks, decisions must be made about which risks are important and which risks can safely be ignored. (p. vii)

Risk communication deals with actual risks, the perception people have of them, and the content of their thoughts and comments. Public relations practitioners, including risk communicators, have to understand the actual risk involved, but more importantly people's perceptions of the risks, variables that affect those perceptions, and the communication that results from and subsequently influences those perceptions. "We do not perceive risks, we perceive various features of decision problems and this, in turn, leads to feelings of risk" (Brehmer, 1987, p. 26).

What is often not considered, and which warrants additional analysis, is that people often decide what levels of risk are acceptable not based on technical data analysis, but rather on a question of value, such as fairness (Hale, 1987; Krimsky & Plough, 1988). Covello (1992) supported the role value judgments play in evaluating risk. "Because acceptability is a matter of values and opinions, and because values and opinions differ, debates about risk are often debates about values, accountability, and control" (p. 362). Although people in general may debate the perception of risk in value terms, experts remain examiners of the actual risk, though not entirely removed from value judgments. "It is clear, however, that perceived risk has a structure that differs from the structure of expert judgments about risk" (Brehmer, 1987, p. 36). For these reasons at least, understanding the dynamics of the risk communication process is a challenging but vital part of the responsibility of organizational management, professional communicators, and academics who want to assist the risk communication process to be increasingly effective and satisfying to the lay public who typically bear the risks.

Risk communication, according to Fischhoff (1985), is an important research and best practiced topic because key stakeholders, such as activists, and the general public insist "on having a role in deciding how those risks will be managed" (p. 84). People want to be part of the communication and decision process, whether it concerns the transportation of hazardous materials, the licensing of new production facilities, or the approval of new pharmaceuticals.

> A revolution in environmentalism and personal health is requiring that reasonable and responsible communication be employed to change personal and collective behaviors. In this effort, public relations practitioners are asked to employ risk communication to serve many public and private interests. (Heath & Nathan, 1991, p. 15)

Another reason for the expansion of risk communication research is people's feeling of entitlement; key publics hold government and business officials accountable for their policy decisions and actions (Fischhoff, 1985). Public distrust of government officials is readily apparent. Officials often operate on the assumption that they and their audiences share a common framework for evaluating and interpreting risk information (Covello, 1992; Krimsky & Plough, 1988). This distrust also stems from the fact that prominent government officials take opposing viewpoints about environmental risk matters and participate in highly public debates about risk estimations (Krimsky & Plough; National Research Council, 1989).

To lay audiences, risk messages can be confusing because they come from a variety of media sources (can labels, public meetings, newsletters, media, activist documents) that involve a multitude of parties and often reflect competing scientific conclusions (Covello, 1992; Covello & Johnson, 1987; Krimsky & Plough, 1988; National Research Council, 1989). Juanillo and Scherer (1995) noted the decline of the public's confidence in the ability of government and industry to act responsibly in risk assessment and risk management: "Large segments of the public now demand more involvement in debates over risk issues and challenge conclusions and recommendations from scientists and experts" (p. 292). Americans have moved beyond distrust to disdain for politics, government, and business. This disdain challenges risk communicators to ensure the infusion of personal and social issues into political discourse (Slovic, 1992).

Otway (1992) featured the complexity of risk communication:

> Risk communication requirements are a political response to popular demands. The main product of risk communication is not information, but the quality of the social relationship it supports. Risk communication is not an end in itself; it is an enabling agent to facilitate the continual evolution of relationships. (p. 227)

Public relations is a practitioner and scholarly discipline increasingly devoted to understanding the quality of relationship construction, maintenance, and repair. For

this reason, practitioners and scholars have reason to understand variables that affect the risk communication process.

RISK COMMUNICATION PROCESS VARIABLES

Uncertainty is a central variable in the risk perception and communication process. Risks by definition are matters of uncertainty. A trip to the casino or a reaction to a reckless driver quickly proves that point. Weterings and Eijndhoven (1989) stated that risk has two uncertainty dimensions: (a) the probability an event will occur, and (b) the probability its consequence will be good or bad—rewarding or harmful. In this vein, Albrecht (1988) defined uncertainty as "the lack of attributional confidence about cause–effect patterns" (p. 387).

Within risk perception and communication discussions, uncertainty has been related to estimating risk information about technical risks (Covello, 1992; Fischhoff, 1985; Kasperson, 1986; National Research Council, 1989; Wilson & Crouch, 1987), assessing the impact of a new or unfamiliar technology (Bord & O'Connor, 1990; Lindell & Earle, 1983), and calculating the degree of confidence to communicate knowledgeably about risk issues (Heath & Abel, 1996; Nathan et al., 1992).

Uncertainty motivates information seeking because it is uncomfortable. Using that principle, uncertainty reduction theory explains the human incentive to seek information (Berger & Calabrase, 1975). Driskill and Goldstein (1986) defined uncertainty "as the perceived lack of information, knowledge, beliefs and feeling necessary for accomplishing organizational tasks" (p. 41).

Audiences want information to reduce their uncertainties about the subjects under consideration and about the people who are creating those uncertainties. "Risk communicators must recognize how uncertain key audiences are on risk matters" (Heath & Nathan, 1991, p. 19). Most individuals have difficulty judging probabilities, making predictions, or attempting to cope with uncertainty. People deal with uncertainty by a variety of inconsistent and often illogical means. Unknown and unfamiliar risks are seen as more risky (Covello, 1989; Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978). Thus, uncertainty is a measure of confidence regarding (a) the ability to estimate a risk and its consequences, and (b) the ability to communicate knowledgeably on the facts and issues surrounding any specific risk.

Control is a natural response to the uncertainty that characterizes risks. At cards, for instance, children—and even adults—may attempt to cheat to increase their control over the outcome of the risks of chance at play in any specific game. They might strategically mark the corners of key cards to increase their control over risk outcomes. They may expect others, even trust them, to exert control over risks they create. For this reason, members of the public may seek the support of government and activists if they believe that a technological change (such as ge-

netic engineering) or a process (such as transportation of chemicals) is unsafe. To some degree, feelings of personal control—ability to exert control over a risk or its consequences—is an individual expression. Some people are likely to feel a greater sense of self-efficacy than are others.

Thompson (1981) defined control, or the perception of control, as the belief that an individual or organization can influence an event, or at least has the ability to choose to influence the aversive situation. Like uncertainty, control is multifaceted. Lindell and Earle (1983) determined that residents' lack of control created public opposition to hazardous facilities. Covello and Johnson (1987) and Hance, Chess, and Sandman (1989) found that a lack of residents' control over participation in the decision-making process created a less successful risk communication campaign. Covello (1992) argued that an individual's control was a key determinant of people accepting risk, and Bord and O'Connor (1990) found that people's perceptions of industry control affected their risk estimates related to chemical cleanups. Weterings and Van Eijndhoven (1989) and Sharlin (1986) found that economic controls affected risk tolerance levels.

At-risk groups are more willing to accept risks if they have some control over these risks (Covello et al., 1988; Lindell & Earle, 1983). Comparing control and risk situations, Covello (1983), Heath and Gay (1997), and Nathan et al. (1992) determined that a risk would be more acceptable to a person if they have some degree of control over the situation. Sims and Baumann (1983) found that the more a person feels in control (internally or externally) the less he or she should feel that local chemical plant activities will harm his or her health or safety.

As such, control can be divided into two distinct types. *Internal control* may be defined as a person feeling control over his or her own destiny, and *external control* may be defined as outside forces having control over a risk source. Based on these findings, it is reasonable to assume that people respond to the uncertainties of risk occurrence and outcome by attempting to increase personal or community control over the source of the risk. Risk communication processes and statements are more likely to be effective to the extent that they empower citizens of a community of risk. That observation is relevant to the ways that public relations is practiced in risk and crisis situations.

Risk communication research regarding uncertainty and control evolved from a perspective based primarily on the cognitive nature of risk assessment to a process perspective that features interaction between risk assessments, communication infrastructure processes, and efforts to control risks as a community effort. Uncertainty motivates communication—among residents and consumers—which can have implications for what companies, activists, and governmental agencies do and say in their efforts to control risks in the public interest. How this process works can lead citizens to support or oppose organizations that create risks.

In the context of typical organizational risk situations, *support–opposition* has been the primary dependent variable to assess individual or group perceptions of their

government, an organization, or an industry. Because the chemical industry deals with hazardous or "risk" materials on a daily basis, understanding people's support of the industry, and thus their perception of those risks related to the industry, is crucial for improving risk communication with the ultimate aim of having a safer and more satisfied public. To this end, organizations may build relationships based on co-created risk estimates that are achieved through symmetrical communication.

Two key factors seem to predict support for industries that create risks. One factor is economic benefit. Hazards are more acceptable when they produce benefits (Baird, 1986), whether they are objective (economics) or subjective (feeling safe). Supporting this analysis, Heath and Palenchar (2000) found an increase in support related to perceived health and safety benefits. Fischhoff et al. (1978) found a weak but consistent relationship between perceived benefit and risk tolerance. The second factor that predicts support is the perception of the likelihood of adverse events as a result of the risk. According to Kunreuther et al. (1990), support is sensitive to the perceived likelihood of adverse events such as accidents or catastrophes. When risks seem more likely and are expected to have adverse effects, they are less likely to be tolerated and more likely to be opposed.

RISK CONTENT

Public relations practitioners and scholars need to consider the importance of both the risk communication processes and its communication content—concepts related to a public's perception of control to reduce uncertainty. In this balance between risk communication processes and content, much more is known about risk perception and communication processes than about the content of the communication. For this study and practice of public relations, the way messages are framed and supported count. Thus, we need to shoulder the responsibility to better understand the content of risk communication. To that end, this study uses a rhetorical perspective to explore the connection between risk process variables and the content of community messages about risk.

A rhetorical perspective for this study and practice of public relations entails the analysis of words and other symbols. "Meaning defines the identities and prerogatives of organizations, people associated with them, and their relationships" (Heath, 1993, p. 142). Heath derived that perspective from an examination of Burke's (1966) proposition that meaning is created and expressed through *terministic screens*, with which people filter and form interpretations of reality and prescribe corresponding behaviors. Once these terministic screens, or interpretive patterns of perceiving and talking about reality, become observable through actions and discussions, Heath (1993) reasoned, they have become zones of meaning:

> Meaning defines the identities and prerogatives of organizations, people associated with them, and their relationships. Changes that affect businesses and non-profits re-

> sult from calls, voiced in interpretive vocabularies, to constrain their prerogatives by displacing old meanings with new ones. (p. 142)

Within risk communication, discourse that creates and reflects relevant zones of meaning needs to be examined to understand how groups perceive and communicate about their risk perceptions. Heath (1993) postulated that a dynamic relationship exists between the risk communication process and the formation of zones of meaning:

> Each group in the risk communication infrastructure is likely to be part of a different zone of meaning, reflecting different standards of what constitute risk, the appropriate level of apprehension regarding risk, and appropriate plans to avert and respond to risks. (p. 148)

For example, environmental activists share a different, and perhaps competing, zone than the ones held by members of the chemical manufacturing industry, community, or government.

Zones of meaning affect how groups interact with each other, such as activist groups' relationships with chemical companies, neighborhood groups with government agencies, and government agencies with chemical companies. For example, a central theme in such dialogues is the definition and implementation of environmentalism. "Each 'ism' contains evaluative assumptions that challenge organizations to operate in specific ways, provide services and products of a certain quality, relate to customers and employees in a preferred manner, and not harm the environment" (Heath, 1993, p. 142).

Zones of meaning is a multilevel concept. Individuals, small or large groups, and communities, even global ones, can share zones of meaning, that are constantly changing. This is one reason why an examination of risk discourse from both a process and content level is critical. If groups have such zones of meaning, then it should be imperative for risk communicators to understand each stakeholder's zone of meaning. Heath and associates (Heath & Abel, 1996; Heath & Palenchar, 2000) have identified various zones of meaning that can be used to segment a community based on demographics, awareness, risk perception, and knowledge of risk-emergency response measures.

SYMBOLIC CONVERGENCE THEORY

One approach to the empirical analysis of meaning is based on symbolic convergence theory (SCT). SCT postulates that through their conversations and by attending to messages they encounter, people build a symbolic reality that furnishes meaning, emotion, and motive for action (Bormann, 1985). Through their interac-

tion, members of various groups (publics) create shared social realities (intersubjectivity) that serve as fantasy themes and rhetorical visions.

> In group interaction, symbols (words, metaphors, images), that have the power to stimulate fantasies, are presented by persons to each other in their communication and action. Each or most of the persons communicating harbors individual fantasies that contain many similar or related elements. (Bales, 1970, p. 138)

Fantasy theme analysis assumes that humans discuss events and issues in stories, narrative content, and form. *Fantasy* is the technical term used to describe the shared interpretative events (zones of meaning) that a group of people develop to describe their collective experiences (Bales, 1970; Bormann, 1985; Cragan & Shields, 1992).

These visions contain units of analysis such as scenes, heroes, villains, plotlines, a sanctioning agent, and key here-and-now phenomena (instances or examples) that attach the drama to reality. Social dramas result when narrative elements are chained into group fantasy themes to create fantasy types by people who share a rhetorical vision (Cragan & Shields, 1990).

Through shared narratives, people create group consciousness. "The culture of the interacting groups stimulates in each of its members a feeling that he (or she) has entered a new realm of reality—a world of heroes, villains, saints, and enemies—a drama, a work of art" (Bales, 1970, p. 152). Group consciousness results when people's perspectives converge or overlap. This group consciousness and shared meaning give people the power to behave in coordinated and meaningful ways. It explains how they become emotionally attached to the symbols that affect their behavior.

The fantasy theme is the initial and basic unit of quantitative and qualitative analysis. Units within fantasy themes are symbolic cues (shorthand notations of each fantasy theme), fantasy types (repeated fantasy themes across diverse rhetorical visions), and sagas (repeated telling of specific narratives).

Five structural terms make up a rhetorical vision: (a) *Dramatis personae* are characters within the message that provide the human element, containing either positive (hero) or negative (villain) elements; (b) *plot lines* are actions within the context; (c) *scenes* are contexts, where the characters enact the plots; (d) *sanctioning agents* are justifications for a group's existence and their belief in a rhetorical vision; and (e) *master analogues* are value orientations that support competing rhetorical visions.

Cragan and Shields (1995) developed the term master analogue to describe a categorical label for the competing explanations of symbolic reality that correspond to a group's shared perception of reality. Master analogues are three competing rhetorical visions: social, righteous, and pragmatic. The social master analogue views human connections as the basis for rhetorical vision. The righteous master analogue

features beliefs about the right way of acting regardless of economic or social benefits. The pragmatic master analogue stresses efficiency, practicality, and utility. These master analogues demonstrate how different people as well as groups—publics—can view the same situation from different symbolic realities—zones of meaning (Bales, 1970; Bormann, 1985; Cragan & Shields, 1995).

Three evaluative terms, as described by Cragan and Shields (1995), include shared group consciousness that describes the chaining out of initial fantasy themes. Shared group consciousness conveys a rhetorical vision. The second evaluative term is reality links that provide a connection between the rhetorical visions and demographic, sociographic, and psychographic information. Last, fantasy theme artistry is a method by which shared messages lead to shared symbolic realities.

This section has reviewed the current risk communication literature to develop a rationale for using control, uncertainty, and support–opposition as key infrastructural variables to explain the decision making and risk communication processes that are likely to occur in communities at risk. In addition to these concepts, SCT has been explicated to offer a rationale and means for capturing the content of the dialogue that exists on the part of people within the communities at risk. If the logic of this analysis obtains, we now have the rationale for exploring the link between the processes and the content of the dialogue in the community. Thus, this study can be focused into two research questions.

RESEARCH QUESTIONS

RQ1: Do residents in a community with a high concentration of chemical facilities chain fantasies regarding health and safety that reveal rhetorical visions? This question is founded on the logic that people who hold different views of risk will ascribe to different fantasy themes (as zones of meaning, Heath & Abel, 1996; Palmlund, 1992). Such fantasies are developed and used to form opinions, make decisions, and motivate coordinated actions within a community.

RQ2: In a community with a high concentration of chemical facilities that pose health and safety risks, do the master analogues (social, righteous, pragmatic) residents use to discuss those risks correlate with uncertainty, internal control, external control, and company support—key variables in the risk communication process? The question is predicated on the intuition that if people interpret risks with different meaning—fantasies—they may vary in their interpretations of the degree to which they experience uncertainty, perceive control to exist in the community, and decide to oppose or support the sources of risk.

METHOD

One key to unlocking risk discourse, especially so that it can be examined empirically, is the methodology developed by Cragan and Shields (1990) to analyze

SCT-based fantasy themes. Based on their work, four steps are utilized in this study: (a) Conduct a literature review to determine if and to document that fantasies in a community are expressed in written messages, (b) use interviews and focus groups to document oral messages that express fantasies, (c) develop a quantitative research instrument from steps one and two that can measure the competing fantasy theme, and (d) collect and analyze survey data to empirically examine the chained symbolic reality.

Content analysis, interviews, and focus groups are the three primary research means proposed for gathering data, prior to the development of a survey, that coincide with Cragan and Shield's (1990) developed SCT methodology. Morgan (1997) and others have emphasized the value of cross-validation of qualitative research tools as a means to address validity and reliability of data collection. Overall, the benefit of triangulation is that it increases the value of the data collected—"the goal of triangulation is to strengthen the total research project, regardless of which method is the primary means of data collection" (Morgan, 1997, p. 31).

Step One: Literature Review

A content analysis of key stakeholders' internal and external written communication materials (local newspapers, local government documents, activist documents, industry documents, brochures, newsletters, annual reports, environmental reports, industry research, fact sheets) was conducted over a 3-month period to identify issues related to the community and the chemical industry regarding the health and safety of citizens. No attempt was made to randomly select these documents; they were used because they were widely and routinely circulated in the communities. The authors reviewed these documents independent of each other and identified what they believed to be fantasy themes, symbolic cues and sagas, and then discussed and agreed upon key symbolic cues, sagas, and fantasy themes to capture in the personal interviews and focus groups.

The content analysis yielded a variety of symbolic cues (code, word, phrase, slogan, or nonverbal sign/gesture) that suggested community residents shared fantasy themes; such themes utilize symbolic cues as an abbreviated way to discuss a shared experience or concern. For example, the term *Texas City* referred to an iconic explosion in Texas City, Texas, more than 50 years ago, a shared reality related to chemical manufacturing safety issues. Another example is the "roar of the flames," which reflected residents' concern for their proximity to the manufacturing facilities and possible dishonesty on the part of spokespersons for those facilities regarding the health impact of the emissions from the flares.

Sagas are the repeated telling of achievements or events in a group or organization, or, in this instance, a community's life. Examples of sagas related to employees and residents surviving facility incidents, the daily morning cleaning of their

car and porch, workers dying shortly after retirement, and generations of families (especially children) playing in hazardous areas.

The general fantasy themes, such as "this is a great small community" or "the industry doesn't care," are reported in Table 1.

Analysis of fantasy themes, symbolic cues, and sagas helped to analyze the following SCT structural terms: characters (hero/villain), plot line (action), scene (details location of the action), and sanctioning agent (legitimizes the situation). These SCT structural terms, which are crucial to defining the specific fantasy themes that were tested in personal interviews and focus groups, are reported in Table 2.

From the literature review–content analysis of structural terms, six dominant fantasy themes were independently identified and then jointly verified, including (a) "the bottom line," (b) "I can and do make a difference," (c) "they're out to get us," (d) "pull yourself up by the bootstraps," (e) "friends and family are the most important things in life," and (f) "don't rock the boat."

Step Two: Interviews and Focus Groups

Purposeful sampling was used to select the interview and focus group participants based on the researchers' conceptual focus of residents' activities within the communities, taking into consideration key interests such as setting, persons, activities, events, and time. "Qualitative sampling is purposeful because its practitioners strive

TABLE 1
Fantasy Themes Revealed in the Literature Review Concerning Health and Safety Issues Related to Living in a Community With a High Concentration of Chemical Facilities

- Activist groups make a difference
- Cheap town to live in
- Dirty town
- Family lives here (quantity and duration)
- Great small community
- Health problems—asthma, cancer, workers
- Hear the flames
- Industry and government are working together in conspiracy
- Industry does only what is required
- Industry does the best that it can
- Industry doesn't care
- Industry only cares about the bottom line
- Industry provides economic support: jobs, taxes, baseball, school projects
- Personal control to leave if things get bad enough
- Safe community safety concerns—previous incidents
- Self-efficacy (with government)
- Smell the odor of the industry
- Status quo OK
- Without the industry this town would fall apart

to locate themselves at the sites of specific communicative performances and practices" (Lindlof, 1995, p. 126). Specifically, snowball sampling techniques were utilized, developed from sources within the community whom the authors knew after more than 15 years combined of working in the community. More important, however, is the fact that snowball sampling enables researchers to develop samples that represent social networks in the community (Lindlof), the community infrastructural component of the risk communications process.

Participants for both the interviews and focus groups were systematically gathered from the relationships, networks, contacts, and general community

TABLE 2
Symbolic Convergence Theory Structural Elements Revealed in the Literature Review Concerning Health and Safety Issues Related to Living in a Community With a High Concentration of Chemical Facilities

Hero characters
Activist groups
Federal government
Industry
Local government
Residents
State government
Villain
Industry
Federal government
Local government
State government
Plot lines
Residents were able to protect their own health, safety, and economics either by themselves or through risk advocates.
Residents were unable to protect their own health and safety and should avoid harm as much as possible to improve future generations' lot.
Residents were neutral towards protection of their own health and safety and should tolerate to improve future generations' lot (accommodate or flee).
Scenes
Industry and government are either in conspiracy or don't care, and cannot be counted on to protect the health and safety of the community—it is better to accommodate or avoid for economic reasons.
Industry and government do only what is necessary concerning health and safety and at the same time provide positive economic benefits.
Industry and government do the best they can concerning health and safety and at the same time provide positive economic benefits.
Sanctioning agents
Hardworking middle class striving to improve future generations' lot, but they still reserve personal power to flee if the situation gets too bad.
Previous living conditions suggest avoidance–accommodation as the preferred course of action.
Present living conditions provide a sense of personal rights and freedoms.

knowledge gathered that would develop during the participant-as-observer research phase. Interviews were conducted separately at participants' homes, unless a neutral site was preferred. Interviews were recorded on audiotape, and lasted between 45 and 60 min. Interviews began with broad, grand tour questions followed by more specific questions inviting the participants to describe their own perceptions in their own words. Field notes were recorded after each interview to provide the most accurate collection of data and observations. Written memos were used as a device for ongoing evaluation of data, questions, and the decision to end data accrual. Overall, five personal interviews were conducted. Interviewees included two males and three females, all more than 18 years of age. Each interviewee had been a member of the community for at least 10 years and therefore could be expected to be familiar with the operating fantasies, if they indeed existed in the community. One researcher conducted the personal interviews, and both researchers independently reviewed the transcripts and agreed that the six fantasy themes were reinforced with no additional fantasy themes identified.

Next, focus groups were conducted to determine if fantasy themes that were identified in the literature review and partially verified in the interviews, chained out. The level of moderator connection was a combination of low and high moderator involvement called the "funnel" approach. This approach begins with low moderator involvement, which provides time for discussion, but then poses more specific questions on the research topic. Four focus groups were conducted at a community center, with both researchers present. Each was audiotaped and lasted between 45 and 60 min. Focus groups are a vital part of this research protocol. The assumption is that comments by group members promote one another to chain out fantasies. Overall, focus groups are a means of the constant comparative method itself, a fundamental methodological approach and an appropriate means to test the researchers' understanding of the phenomena studied (Morgan, 1997).

The focus groups contained seven or eight residents and were used to refine risk communication process variables, to determine fantasy theme chaining, and to develop SCT master analogue questions for the survey instrument. Each author reviewed the tapes and transcripts independently and determined fantasies. These results were jointly assessed and the researchers discussed their findings until they reached consensus. The following dialogues demonstrate typical fantasy theme chaining:

Resident 1: "Sometimes at night you can hear the torches going."
Resident 2: "Sounds like thunder."*various people nodding heads in agreement, some laughter*
Resident 3: "I wake up at night and sometimes it's so loud it scares me."
voice gets louder throughout comment
"uh-huh" background agreement from other residents

Resident 4: "When it's pretty quiet you can hear it."
Resident 2: "Yah."
Resident 1: "I know they're dumping stuff at night, I know."
Resident 2: "Yah, you can hear them going stronger at night, they don't want us to know what's up, or at least not that stuff."

Resident 1: "See these chemical plants cover things up. They keep things in. That's why you don't see no city fire fighters go in there. They take care of it and they can't go in until they get the green light to go in."
Resident 2: "Yes."
Resident 1: "They got their own paramedics. They got their own fire department. They take care of themselves."
Resident 3: "They keep everything so secretive."
Resident 4: "All they're trying to do is cover themselves. They're trying to keep it before it gets out." *several residents nod in agreement–as noted by researchers*
Resident 5: "They're not concerned."

Using these fantasy themes, the authors looked for master analogues. Once these had been identified individually, the researchers discussed the analogues until consensus was reached. Statements were ascertained to be typical of each type of analogue. These statements were formed into response item measures that could be answered by survey respondents with choices ranging from *strongly disagree* to *strongly agree*.

Step Three: Develop Questionnaire

The survey instrument (32 close–ended questions) used a 9-point Likert scale ranging from 1 (*strongly disagree*) to 9 (*strongly agree*), except for one question that measured support for the company with a 9-point scale ranging from 1 (*strongly do not support*) to 9 (*strongly support*) and another question that used a yes–no format (Do you consider yourself to be a community activist?). The questions were designed to measure uncertainty, control, support–opposition, and master analogues (pragmatic, social, and righteous).

The response "undecided" was coded as five, and missing values were assigned the number zero. The "undecided" responses are included in statistical tests. To address internal validity regarding fantasy types, this study used tested adaptations of Q-sort methodology (Cragan & Shields, 1992; Vasquez, 1994).

Questionnaire items and reliability analyses for all of the variables can be found in the Appendix. *Company support* is defined as the extent to which an individual

has positive feelings toward the chemical industry and its presence in the community. *Uncertainty* is defined as the degree to which subjects doubt their ability to foretell the likelihood of health or safety consequences. *External control* is defined as the degree to which subjects perceive that another individual, group, or entity will exert the desired level of control over the source of risk. *Internal control* is defined as the degree to which a subject perceives personal feelings of power over some entity or outcome. *Social master analogue* is defined as the degree to which the fantasy themes features social relationships—human connections—as the basis for rhetorical vision, such as the presence and importance of friends and family in decision making. *Pragmatic master analogue* is defined as the degree to which the fantasy themes feature efficiency, practicality, and utility as rhetorical visions, such as living somewhere because it is practical and not necessarily a trendy neighborhood. The reliability coefficient α was .42 for this master analogue, which was below the desired level of .70. Nevertheless, this measure was used so that all three of the master analogues could be used in this exploratory study. *Righteous master analogue* is defined as the degree to which the fantasy themes features the right (correct, proper, moral) thing to do, regardless of pragmatic or social benefits.

Step Four: Conduct Survey

Participants were randomly selected from two communities where large concentrations of chemical manufacturing activities occur. Using a professional telesurvey company, 225 telephone interviews were conducted in each city from a random sample ($N = 450$). Residents were qualified so that males and females were evenly represented and all respondents were at least 18 years old. The survey was conducted over a period of 27 days during which no major industry incident occurred locally or nationally. A total of 5,334 calls were placed. Individuals fitting the screen criteria for initiation of the survey answered 32% of the calls. Out of those 1,707 calls, the survey completion rate was 28%. Refusal rate was 35%, and termination rate was 30%. Seven percent were eliminated to ensure equal gender distribution.

RESULTS

Of the 450 people surveyed, 50% were female and 50% were male. Twelve percent of respondents categorized themselves as activists. In terms of support of the chemical industry, 33.8% were pleased to have the chemical industry in their community while 48.4% were displeased (17.8% were undecided). Almost 51% (50.9) said that the chemical industry deserved residents' support, while 31.6% disagreed (17.3% were undecided; 0.2% did not answer).

Close to half (42.3%) of the residents perceived that activists helped to reduce the community's exposure to hazardous chemicals, while 32.6% disagreed (24.9% were undecided; 0.2% did not answer). More than 45% (45.2) observed that local community organizations helped to reduce the community's likelihood to exposure of hazardous chemicals, while 29.2% disagreed (25.4% were undecided; 0.2% did not answer). Government was seen as exerting control; 48.4% stated that government regulation reduced the likelihood of exposure to hazardous chemicals, while 30.7% disagreed (20.7% were undecided; 0.2% did not answer).

RQ1 asked, "Do residents in a community with a high concentration of chemical facilities chain fantasies regarding health and safety that reveal competing rhetorical visions?" The qualitative data generated in this study warrant a positive answer to this question. Table 3 presents SCT's structural elements that comprise the three rhetorical visions.

The "we can do things" vision views the industry as a positive part of the community because of economic support, with a negative side composed of health and safety problems. These residents feel some personal control through individual decisions and action, through risk advocates with whom they can work to effect change, or by risk arbiters who will intervene in the community if risks were to get out of control (by either the industry, government, or residents). Residents who adhere to this vision are neither afraid nor ignorant about how to go about advocating change. They are, however, not proactive. These residents are in a nondramatic, prebreach stage of crisis (Palmlund, 1992). They seek no change in the social order; however, one major catastrophe or health ailment could motivate them to become active.

The "accept and move on" vision incorporates a sense of neutrality toward risk advocates, risk arbiters, or themselves as effective agents of change. These residents are not as aware of—nor concerned about—the dangers of the chemical industry. They do not think about these dangers often. They believe the industry and government do the best they can do under the circumstances. This group has a unique combination of self-efficacy concerns. They do not have knowledge of how to effect change, nor do they necessarily want to upset the community. They are concerned for their children's safety and health, however. Residents maintain a positive outcome attitude that relates to their emphasis on family, friends, and community. "As long as everyone is all right, the kids and mom and everybody, then I like living here. But as soon as something's really wrong, then I'm out of here." They perceive a sense of internal control if the situation would absolutely require it. Their control, however, involves fleeing with their families, not effecting change in the community. Residents who ascribe to this vision remain neutral, even suffer quietly if they have to, to maintain a sense of order and community, family, and friendships. This lends credence to the idea that the "accept and move on" vision is also in a nondramatic, prebreach stage of crisis. The community is not providing leverage to change the chemical industry's practice regarding health and

TABLE 3
Identified Risk Communication Rhetorical Visions

Structural Terms	*"We Can Do Things" Vision*	*"Accept and Move On" Vision*	*"Don't Want to Know" Vision*
Hero	Residents, activist groups, and government	Friends and family	Future generations
Villain	Industry	Industry	Industry and government
Plot lines	Able to protect their own health, safety, and economics; by themselves alone, or through risk advocates or by risk arbiters.	Neutral towards protection of their own health and safety; tolerate to improve future generations' lot; accommodate or flee.	Unable to protect their own health and safety; avoid or tolerate harm as much as possible to improve future generations' lot.
Scene	Industry and government do only what is necessary concerning health and safety, and at the same time provide positive economic benefits.	Industry and government do the best they can concerning health and safety, and at the same time provide positive economic benefits.	Industry and government are either in conspiracy or don't care, and cannot be counted on to protect their health and safety; and it is better to accommodate or avoid fear of possible repercussions.
Sanctioning agent	U.S. Constitution's Bill of Rights and other self-described personal freedoms.	Hardworking middle class (who suffer quietly if need be); goal is to improve future generations' lot; but still reserve personal power to flee if the situation gets too bad.	Previous living conditions, economic or governmental, suggest avoidance as the preferred course of action.

safety concerns. "Conflicts over risk are processes played out over time, where anxiety is contrasted with security, and where perceptions of chaos and risk are intermingled with perceptions of order and certainty" (Palmlund, 1992, p. 206). For these residents, order (sense of community) and certainties (family and friends) are equal when contrasted to risks of living in a community with a high concentration of chemical facilities.

The "don't want to know" vision is dissimilar from the other two fantasy types. Adherents to this vision have no belief in a present day hero, though they hope that their future generations will do better than they did. The most distinguishing characteristic is their complete lack of control, or self-efficacy. They have neither the knowledge nor desire to effect change in their community. They fear participation out of threat of possible economic, social, or political repercussions to themselves and their friends and family. As such, they try to be uninvolved, as well as avoid possible health or safety risks. It is quite possible that prior living conditions, political systems, or similar situations with large industries created such an importance placed on avoidance rather than involvement or action.

A detailed explanation of the three competing analogues developed from fantasy themes is important to determine whether the respondents place the fantasy themes in the appropriate master analogue classifications. Table 4 provides this comparison, showing the 11 fantasy themes utilized (four social, four righteous, three pragmatic) with their corresponding mean scores by master analogue classifications. Cragan and Shields (1995) determined that reliability and validity of analogue classification could be achieved by Q-methodology. A difference of .50 or more mean score suggests significant differences between classifications.

Mean scores of the 11 dominant fantasy themes demonstrate that the master analogue fantasy theme classifications compete as the primary vision in the mind of different people in the community. If all people held the same visions and ascribed to the same analogues, the community would evidence an atypical amount of consensus. For example, the social fantasy theme "I am willing to accept the health risks associated with living in a community with chemical plants because my friends and family live here" has a population mean score of 5.22 and a social, righteous, and pragmatic score of 7.03, 3.92, and 3.93, respectively. Competition between these classifications is captured by a means difference of .50 between social and either righteous or pragmatic. The social fantasy theme about accepting health and safety risks associated with living in a community with chemical facilities is best explained by a social classification theme of human relations importance, rather than a righteous classification concern (doing the right thing) or pragmatic classification concern (practicality). For this fantasy theme, residents participate in the social symbolic reality and are linked to the chemical industry through participating in the symbolic creating of the fantasy theme chaining. Similar explanations can be drawn for each of the fantasy themes presented in Table 4. This analysis supports an affirmative answer to RQ1. Residents in a community

TABLE 4
Revealed Dominant Fantasy Themes by Social, Pragmatic, and Righteous Classifications

Fantasy Themes	*Population Mean (n = 450)*	*Social Class (n = 162)*	*Righteous Class (n = 150)*	*Pragmatic Class (n = 101)*
I am willing to accept the health risks associated with living in a community with chemical plants because here, neighbors look out for one another. (S)	5.33	**7.83**	4.77	2.71
I am willing to accept the safety risks associated with living in a community with chemical plants because the community has a small-town feeling. (S)	5.26	**7.11**	4.60	2.99
I am willing to accept the health risks associated with living in a community with chemical plants because my friends and family live here. (S)	5.22	**7.03**	3.92	3.93
I am willing to accept the safety risks associated with living in a community with chemical plants because I enjoy living here. (S)	5.44	**7.05**	5.40	2.70
I am willing to have the chemical industry operate in this community because its taxes provide needed services. (R)	5.62	5.57	**7.09**	3.26
I am willing to have the chemical industry operate in this community because it provides support for school activities. (R)	5.70	5.74	**7.09**	3.37

I am not willing to have the chemical industry operate in this community because its pollutants affect residents' health (recoded). (R)	4.41	3.46	**6.79**	1.94
I am not willing to have the chemical industry operate in this community because of the lack of communication regarding hazards and pollutants (recoded). (R)	4.49	3.44	**7.03**	2.04
I am willing to accept the health risks associated with living in a community with chemical plants because I cannot afford to live elsewhere. (P)	5.44	5.67	4.51	**6.45**
The chemical industry does only what it is required to do concerning the safety of residents in the community. (P)	5.84	6.11	4.47	**7.51**
When I smell the odor of chemicals in my community, I worry about my health but do not take any actions. (P)	5.95	6.39	4.38	**7.67**

Note. Numbers in bold indicate the highest mean score for a dominant fantasy theme. S = social master analogue fantasy theme; R = righteous master analogue fantasy theme; P = pragmatic master analogue fantasy theme. A means-centered approach determines significance and interprets mean scores. A difference of .50 mean score is used to determine the chance subjects have in sorting statements in similar ways. Mean score differences of .50 or greater demonstrate significant differences.

with a high concentration of chemical facilities chain fantasies regarding health and safety that reveal competing rhetorical visions.

Research question two asked whether the master analogues (social, righteous, pragmatic) held by residents in a community with a high concentration of chemical facilities that pose health and safety risks correlate in important ways with uncertainty, internal control, external control, and company support. Evidence generated in this research project suggests that people who hold different analogues to be more important are also likely to experience more or less uncertainty, control, and support. Thus, the content of the messages (the zone of meaning) believed by residents reflects the sense of concern and the likelihood of support or opposition as a consequence. Table 5 presents the means of persons who prefer each of the analogues for support, uncertainty, external control, and personal control.

Mean scores of the four risk communication process variables demonstrate the competing nature of master analogues. For example, uncertainty has a population mean score of 4.83 and a social, righteous, and pragmatic score of 3.80, 4.05, and 5.03, respectively. The competing nature of the three classifications is captured by a means difference of .50 between righteous and either the social or pragmatic. The uncertainty about accepting health and safety risks associated with living in a community with chemical facilities is best explained by a righteous classification theme, rather than a social classification concern or pragmatic classification concern. Similar explanations can be drawn for each risk communication process variable in Table 5. Overall, company support, uncertainty, and internal control are best explained by the righteous analogue that expresses concern for doing the right thing rather than a social classification concern for human relationships or a pragmatic classification concern for practicality.

In addition to comparing the means scores for persons who hold each of the three analogues, the relationship between the analogues and the four key variables was examined using Pearson product moment correlation. Table 6 presents the results of this analysis.

These findings demonstrate that as people hold a more social view of the industry, they are more likely to support it, are likely to sense their own control over the risks it creates, are more likely to perceive that external control is exerted to minimize its risks, and are likely to feel less uncertainty about risks it creates.

People with a pragmatic view of the industry are less likely to support industry, are less likely to sense their own control over the risks it creates, and are more likely to feel more uncertainty about risks it creates.

People who have a righteous view of industry are more likely to (a) support it, (b) sense their own control over the risks it creates, (c) perceive external control over its risks, and (d) feel less uncertainty about the risks it creates.

TABLE 5
Risk Communication Process Variables by Social, Pragmatic, and Righteous Classifications

Risk Communication Process Variables	*Population Mean (n = 450)*	*Social Class (n = 162)*	*Pragmatic Class (n = 101)*	*Righteous Class (n = 150)*
Support	5.12	4.85	3.32	**6.39**
Uncertainty	4.83	3.80	4.05	**5.03**
External control	3.73	5.29*	5.03*	5.61*
Internal control	5.36	3.59	3.04	**4.61**

Note. Numbers in bold indicate the highest mean score for a risk communication variable. A means-centered approach determines significance and interprets mean scores. A difference of .50 mean score is used to determine the chance subjects have in sorting statements in similar ways. Mean score differences of .50 or greater demonstrate significant differences.

*Indicates shared risk communication variable theme.

TABLE 6
Correlation Coefficients for Symbolic Convergence Theory Master Analogues and Risk Communication Process Variables

	Social (r)	*Pragmatic (r)*	*Righteous (r)*
Company support	.27*	–.29*	.60*
Uncertainty	–.20*	.35*	–.54*
External control	.17*	–.05	.23*
Internal control	.26*	–.34*	.54*

$p < .01$.

These results justify an affirmative answer to research question two. People who use different analogues to view the health and safety risks in their community are likely to respond differently to (i.e., hold different perceptions and opinions of) levels of control, uncertainty, and support.

Overall, we should keep in mind the effects of the community, sex, and activist status in regard to risk communication. Publics may define themselves by shared and cognitively involved recognition of problems that motivate them to seek information and voice concern. Previous studies (e.g., Heath & Abel, 1996; Heath & Palenchar, 2000; Slovic, 1992) have reported risk demographic differences by gender and activism. While not hypothesized, this study found similar patterns. Especially relevant are the differences between genders and activists/nonactivists. *T* tests revealed that men were more supportive of the chemical industry, $t(447) = 4.18$, $p < .01$, males $M = 5.55$, females $M = 4.59$. Men felt more internal control, $t(447) = 4.30$, $p < .01$, males $M = 4.12$, females $M = 3.34$. Men were also more righ-

teous, $t(447) = 3.06$, $p < .01$, males $M = 5.38$, females $M = 4.73$. Thus, sex differences exist for risk variables and message content.

T tests revealed that activists were more supportive of the chemical industry, $t(105) = 4.26$, $p < .05$, activist $M = 5.37$, nonactivist $M = 4.32$. Activists felt less uncertainty, $t(105) = 4.70$, $p < .05$, activist $M = 4.72$, nonactivist $M = 5.33$. Activists felt more internal control, $t(105) = 4.70$, $p < .01$, activist $M = 4.33$, nonactivist $M = 3.18$. Activists felt more external control, $t(105) = 4.57$, $p < .05$, activist $M = 5.52$, nonactivist $M = 4.61$. Activists were more social, $t(105) = 2.84$, $p < .01$, activist $M = 5.95$, nonactivist $M = 4.15$. (Note: With only 12% of the 450 respondents declaring themselves activists, a random sample of the nonactivists, equal to the number of activists, was selected for the *t* test.)

DISCUSSION

The findings reported in this study give depth to our understanding of the risk communication process and offer an empirical foundation for understanding risk communication message content. As anticipated, residents living in a community with a high concentration of chemical facilities chain fantasies regarding health and safety risks that reveal repeating rhetorical visions. Of more importance, research reveals that people who hold different analogues to be important (and chain fantasies and rhetorical visions based on those analogues) will respond differently to the levels of control, uncertainty, and support. It is likely that they will not only experience different levels of support, control, and uncertainty, but will identify with persons who hold the analogues they do and differ from people with competing analogues. Thus, the research conducted here suggests that not only must researchers understand the prevailing risk communication variables, but that they also need to understand and respond proactively to the different zones of meaning that exist in these communities.

The dialogue that transpires among citizens and between them and company spokespersons, representatives of governmental agencies, and activists will express different message content and will reflect different perceptions of the degree of risk, its control, the locus of its control, and uncertainty. The unique combinations of control, uncertainty, support–opposition, and meaning indicate the differentiated nature of the dialogue in the community. Professional communicators are wise to understand and respond to the opinions and message needs of their stakeholding public. This conclusion suggests support for two-way symmetrical communication as a preferred communication approach in communities at risk.

The findings also report that residents use different master analogues in their discussion of risks, and that company support, and internal and external control are best explained by the righteous classification concern for doing the right thing rather than the social or pragmatic classification concern. For the risk communica-

tion variables company support, internal and external control, and uncertainty, residents participate in the righteous symbolic reality and are linked to the chemical industry through participating in the symbolic creating of risk communication process variables.

A positive correlation was detected between the social master analogue and risk communication process variables internal control, external control, and company support. The social master analogue had a negative correlation with uncertainty. Intuitively, this makes sense. For these residents, messages based on social themes should increase residents' sense of control and reduce their uncertainties related to health and safety risks.

A significant positive correlation was detected between the righteous master analogue and risk communication process variables internal control, external control, and company support. Righteousness had a significant negative correlation with uncertainty. Intuitively, this makes sense as well. Messages based on a righteous theme of doing things correctly should increase residents' sense of control and reduce their uncertainties.

The third master analogue, pragmatic, demonstrated a negative correlation with internal control and company support, a positive correlation with uncertainty, and did not demonstrate a significant correlation with external control. These results were not anticipated. Prior risk communication research suggested that pragmatic issues should relate positively with company support. Baird (1986) detected a significant correlation between perceived economic benefits and company support. However, his definition of economic benefits focused generally on benefits to the community as a whole. Residents' pragmatic views of issues, which in this study were determined through focus groups, dealt primarily with personal benefits to the family. As such, more research is required to analyze righteous and social process variables.

A negative correlation between pragmatic and company support, and a positive correlation between pragmatic and uncertainty, poses an interesting scenario. Intuitively, one would reason that messages of a pragmatic nature should increase residents' support of the industry and reduce their sense of uncertainty; similar to the social and righteous master analogues. However, if a lack of pragmatic benefits was central to residents' opposition of the chemical industry and to the creation of health and safety uncertainties, then messages based on pragmatic issues could backfire. The results suggest that further research into the pragmatic context of risk communication is needed. Although not anticipated, the negative correlation of pragmatic to company support and its positive correlation with uncertainty, is a new issue that can be analyzed by the combination of content and process research approaches.

Overall, the righteous analogue established the strongest correlations with the risk communication process variables. These results suggest that messages dealing with residents' uncertainty, company support, internal control, and external control should focus on message characteristics of a righteous nature.

In these ways, this study offers insights into the relationships between risk communication process variables and meaning, which deserve further analysis. This commitment is vital because public relations practice and scholarship should be interested in the processes of the practice and the ability of practitioners to listen, respond, takes stands, and seek collaborative decisions in light of the perspectives expressed by their publics. One can easily imagine that a public can be characterized by its sense of the process variables and by its unique perspective expressed in message content.

As a methodological challenge, the combination of SCT, fantasy theme analysis, and risk communication process variables analysis demonstrated that an approach focusing on both message content and process is an important new direction for risk communication research—one that should lend to a more comprehensive understanding of the rhetorical nature of risk discourse. Overall, this article strengthens the confidence of the rhetorical view of risk communication.

Definitions of risk, knowledge, and responses to information and uncertainty are based ultimately on the attempted maintenance of familiar social identities. This is more complex and comprehensive than the dominant idea that (objectively existent) risks are perceived and valued according to a person's pre-existent and discrete "values" or "interests." Physical risks thus have to be embedded within and shaped by social relations and the continual tacit negotiation of our social identities (Wynne, 1992, p. 293).

A majority of the risk communication research has focused on a finite set of variables within linear relationships, and has not expanded the scientific discovery to the area of both content and process. This study sought to expand risk communication research in this direction. It is dangerous, however, to overly focus on the limits of risk communication before a more thorough and systematic research approach can be conducted. These research efforts will need to focus not only on risk communication process variables, which have been well established, but also on the dynamics of both the process and content of risk communication.

CONCLUSION

A rhetorical perspective is very important in risk communication where so many meanings, symbols, behaviors, and attitudes affect the communication process, as well as shape public policy. "This rhetorical paradigm adds value to organizations by increasing their sensitivity to how stakeholders create interpretative frames to impose limits on their business and non-profit activities" (Heath, 1993, p. 142).

Research into different risk communication process variables and the specific discourse content is critical to further enhancing practitioners' and academics' understanding of an organizations' publics, developing effective and targeted messages, affecting policy, and ultimately improving an organization's strategic plans and objectives. This approach should help public relations practitioners develop

models and strategies to create open and effective two-way communication strategies that will benefit stakeholders, the corporations, and the general community in the long run regarding risk events.

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APPENDIX
Reliability Analysis for Risk Process Variables and Master Analogues

Company Support

Variable	*Item–Total Correlation*	α *if Item Deleted*
Like	.64	.77
Support	.69	.71
Support level	.66	.75
Reliability of coefficients (N = 450)	n of items = 3	α = .81

Questions: (1) I am pleased to have the chemical industry located in my community, (2) the chemical industry deserves the support of residents in my community, and (3) indicate your level of support for the chemical industry in your community.

Uncertainty

Variable	*Item–Total Correlation*	α *if Item Deleted*
Pipeline rupture	.55	.76
Tanker truck	.47	.77
Chemical plant	.49	.77
Pipeline release	.63	.75
Operations	.52	.76
Predictions health	.63	.75
Predictions safety	.63	.75
Reliability of coefficients (N = 450)	n of items = 7	α = .82

Questions: (a) A pipeline is likely to rupture and leak chemicals in my community, (b) a tanker is likely to overturn and leak chemicals in my community, (c) a chemical plant is likely to release chemicals in my community, (d) a chemical pipeline is likely to release chemicals in my community, (e) I am confident I can predict fairly accurately how likely chemical plant operations will affect the safety of residents in my community, (f) I am certain that the operation of the chemical industry does not significantly affect my health, and (g) I am confident I can predict that the operations of the local chemical industry will not significantly harm the safety of citizens in my community over the next 10 years.

External Control

Variable	*Item–Total Correlation*	α *if Item Deleted*
Activists	.41	.46
Community organizations	.54	.35
Government	.42	.45
Reliability of coefficients (N = 450)	n of items = 3	α = .69

Questions: (a) activist organizations help to reduce the community's likelihood of being exposed to hazardous chemicals, (b) local community organizations help to reduce the community's likelihood of being exposed to hazardous chemicals, and (c) government regulation of the chemical industry reduces the likelihood of the community's exposure to hazardous chemicals.

Internal Control

Variable	*Item–Total Correlation*	α *if Item Deleted*
Exposure	.29	.71
Personal safety	.50	.58
Influence	.55	.55
Opportunities	.52	.58
Reliability of coefficients ($N = 450$)	n of items = 4	α = .69

Questions: (a) operations of chemical plants expose me to risks beyond my control, (b) I have control over my personal safety as it relates to the operations of chemical plants in my community, (c) I have an influence on the operations of chemical plants in my community as it relates to my health, and (d) chemical plants provide me with opportunities to help reduce the community's exposure to hazardous chemicals.

Social Master Analogue

Variable	*Item–Total Correlation*	α *if Item Deleted*
Neighbors	.62	.65
Small-town	.65	.63
Friends and family	.40	.77
Enjoyment	.52	.70
Reliability of coefficients ($N = 450$)	n of items = 4	α = .75

Questions: (a) I am willing to accept the health risks associated with living in a community with chemical plants because, here, neighbors look out for one another, (b) I am willing to accept the safety risks associated with living in a community with chemical plants because the community has a small-town feeling, (c) I am willing to accept the health risks associated with living in a community with chemical plants because my friends and family life here, and (d) I am willing to accept the safety risks associated with living in a community with chemical plants because I enjoy living here.

Pragmatic Master Analogue

Variable	*Item–Total Correlation*	α *if Item Deleted*
Affordability	.21	.29
Requirements	.17	.33
Odor	.33	.14
Reliability of coefficients ($N = 450$)	n of items = 3	α = .42

Questions: (a) I am willing to accept the health risks associated with living in a community with chemical plants because I cannot afford to live elsewhere, (b) The chemical industry does only what it is required to do concerning the safety of residents in the community, and (c) When I smell the odor of chemicals in my community, I worry about my health but do not take any actions.

Righteous Master Analogue

Variable	*Item–Total Correlation*	α *if Item Deleted*
Taxes	.59	.73
School activities	.55	.75
Health	.62	.71
Communication	.59	.73
Reliability of coefficients (N = 450)	n of items = 4	α = .78

Questions: (a) I am willing to have the chemical industry operate in this community because its taxes provide needed services, (b) I am willing to have the chemical industry operate in this community because it provides support for school activities, (c) I am not willing to have the chemical industry operate in this community because its pollutants affect residents' health, and (d) I am not willing to have the chemical industry operate in this community because of the lack of communication regarding hazards and pollutants.

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