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Development and Validity Testing of the Risk Communicator Style Scale

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Abstract

This study developed and validated the Risk Communicator Style Scale (RCSS). The RCSS is based on the technical and democratic models of risk communication described by Fiorino (1989). This study found a problem with Fiorino's original conceptualization of technical risk communication. Fiorino's original conceptualization of technical communication equated the use of scientific and statistical information with low affective instruction, which was not shown to be statistically meaningful. The study proposed that Fiorino's terms (technical and democratic) were not as meaningful for communication scholars, so the terms scientific and affective risk communication were implemented. The study concluded that the revised scientific factor is a reliable and valid scale for measuring the extent a risk communicator uses scientific and statistical information. The study examined the predictive validity of the RCSS using variables common in instructional communication: nonverbal immediacy, communication clarity, receiver apprehension, satisfaction, and perceived credibility. The scientific factor correlated negatively with receiver apprehension, but positively with perceived communicator competence. The affective factor correlated positively with risk communicator nonverbal immediacy, risk communicator clarity, personal satisfaction (cognitive, behavioral, and affective), and perceived risk communicator credibility (competence, caring/goodwill, and trustworthiness), and negatively correlated with receiver apprehension.

For many people, the term "risk communication" conjures a connection with public relations and big corporations. However, the field of risk communication is broader in its scope than public relations. Rowan (1991) defined risk communication as any communication about a physical hazard. In other words, when a teacher explains to her or his students about the negative effects of drugs like MDMA (N-methyl-3, 4-methylenedioxymethampetamine) commonly referred to as "ecstasy" or "E," that teacher is functioning as a risk communicator. Another example of risk communication as a form of education occurred in the wake of the 2001 anthrax scare where letters laced with anthrax had been found in media outlets and in congress. As a result of these highly publicized events, the Center for Disease Control (CDC) released a series of videos educating postal workers and mailroom clerks on properly handling mail. The CDC also released a series of educational videos that explained to health workers the risks involved with anthrax and how to spot and treat anthrax victims. These videos, while clearly instructional, were a form of risk communication (CDC, 2001a, 2001b, 2001c). In fact, there is a strong connection between health education and risk communication (Green, 1999).

Innately, risk communication is a specialized form of instructional communication where a risk communicator educates a group of stakeholders on the possible morbidity and mortality associated with a specific hazard. Whether we are examining risk communication in the corporate world or the classroom, basic instructional communication components (e.g., nonverbal immediacy, clarity, credibility, etc…) are important. Additionally, for the furthering of risk communication research, it is also necessary to start designing research measures specifically targeting risk communication. The goal of this study was to design a new research measure to examine receiver perceptions of risk communicators' communicator style, the Risk Communicator Style Scale. Before examining the process that was taken to create the Risk Communicator Style Scale, a discussion of two trends in defining risk and a discussion of Fiorino's (1989) risk communication model will occur.

What is risk?

The first major area that should be discussed to understand risk communication is a simple definitional issue. What is risk? While this question seems fairly easy, the answer is neither simple nor straightforward. A number of researchers have attempted to define what risks actually are (Groth, 1991; Rowan, 2001; Sandman, 1991a). Generally, definitions of "risk" fall along two different lines of perception: the scientific community's and the general public's perceptions of risk. Scientists generally examine risks in terms of the nature of a harm happening, the probability that the harm will occur, and the number of people who will be affected by the harm if it does occur (Groth, 1991). Comar (1979) believed that people in the general public would generally accept a risk if it resulted in no more than one additional fatality per million citizens unless the risk provided a clear benefit (driving your car) or could be easily reduced (changing implants from silicone to saline). Comar deemed this level of acceptable risk as risk *de minimis*. According to Mumpower (1986), *de minimis* is taken from the legal expression "*de minimis non curat lex*, or the 'law does not concern itself with trifles' (p. 437). This principle seems to work well on paper, but the general public simply does not adhere to this principle.

In 1991, Sandman's definition of the word "risk" was the first definition to include the general public's perception of risk, which states that Risk = Hazard + Outrage. According to Gordon and Rowan (2000), "hazard" refers to the chance of loss of life and limb; where as, "outrage" is the emotional response a person has when presented with a specific risk. Sandman

(1991b) believed that risk is ultimately a combination of the physical hazard itself and the outrage the general public has about this hazard.

Risk Communication Model

The communication of risk-oriented messages can be viewed through the understanding of two basic models of risk communication: technical and democratic (Fiorino, 1989, 1990a, 1990b, 2000; Green, 1999; Rowan, 1991). These two models of risk communication have been seen consistently in the literature even if the names are not always consistent. Each model provides a different approach for defining, assessing, and making decisions about risks. To understand these two different methods of risk communication, the following discussion of each model is presented.

The Democratic Model of Risk Communication. The second model that has been employed by risk communicators is the democratic model of risk communication. Where the emphasis of the first model is generally one-way communication, the democratic model strives to achieve full participation from the people whose lives may be affected by the risks. The democratic model according to Fiorino (1989) is a model for risk communication built on "political oversight of administration, negotiated problem-solving, and 'popular epidemiology'" (p. 293). According to Fiorino (1989), the objective of the communication in the democratic model is to make stakeholders feel that there is legitimacy in lay judgments of risk. Quigley, Handy, Goble, Sanchez, and George (2000) believe that risk communication should encouraged a form of participatory research that includes members from all stakeholders of a risk situation. Or as Williams and Olaniran (1998) stated it, risk communication should be a dialogue, not a monologue. In recent years, this dialogue approach has become very common in both the public relations and health education approaches to risk communication (Fiorino, 1990a; Green, 1999). The democratic approach to risk communication starts with the idea that all people who are directly affected by a specific risk should be allowed to participate in the risk management and assessment process. And as Fiorino (1989) simply put it, "The lay public are not fools" (p. 294).

Fiorino (1990a) believes that there are four criteria that have to be exhibited in the democratic model of risk communication. These four criterion stem out of what Fiorino (1990a) refers to as participation theory. The first criterion is that a mechanism should allow for the direct participation of amateurs in decision making about risks. In other words, if a risk communicator comes out and tells a stakeholder directly about the scope of a risk, the stakeholder is less likely to believe the risk or change their behavior. However, if a stakeholder is involved in the risk decision process, the stakeholder will be more likely to change her or his behavior. While the participation process is obviously more complex, this process of risk assessment has been shown to have longer lasting effects on behavioral change (Green,1999).

The second criterion of the democratic model of risk communication is that there is a mechanism for which an assessment of the extent to which a risk communicator enables citizens to share in the collective decision making process. In other words, risk communicators should have a clear benchmark goal for stakeholder involvement. If that benchmark for stakeholder involvement is not being met, then the risk communicator must decide how he or she should proceed to achieve this goal.

The third criterion in participation theory is the degree to which a mechanism provides a structure for face-to-face discussion over some period of time. Interpersonal contact with someone discussing the realities of a specific risk over a period of time are necessary for people to be completely knowledgeable about a risk. Discussion, debate, disagreement, and the quest for knowledge are all parts of the basic participatory process. In other words, you cannot rush the risk communication process just because it would be more advantageous for the sponsoring organization. People need time to be educated about the reality of a specific risk. One way to accomplish this is through a number of publicly held meetings where people can ask questions and interact directly with the risk communicator.

Lastly, a mechanism would be in place to allow the public to participate on some basis of equality with administrative officials and technical experts. If we truly want people to be actively involved in the participatory process of risk management, people should be able to question technical experts and administrators. In the area of risk communication, the use of community advisory panels is one way to ensure public participation. A generalizable sample of the community population will sit on a panel along with the administrative officials and technical experts when developing risk communicative messages and campaigns.

The democratic model of risk communication also takes into account the problem that many health educators and risk communicators notice, just because someone cognitively knows that something is a harmful risk, does not mean that it affects their behavior. A number of studies have shown that an individual's level of knowledge about a risk does not necessarily influence her or his behavior (Brener & Gowda, 2001; Kilander, 2001; Patty, 2001). For this reason, the affective process of the democratic model of risk communication is important for behavioral change (Boot, McGregor, & Hall, 2000).

This "more interactional" approach to risk communication has been shown to have positive benefits in the risk communication process (De Rodes, 1994; Heath & Gay, 1997; Quigley et al., 2000), but the actual research showing its effectiveness does not currently exist outside a number of highly specialized case studies in both public relations and health education.

Technical Model of Risk Communication. The technical model is the traditional model that was historically used to perform risk assessments, or "the best guesses of the experts in a given field as to the probability of an event, and the consequence should that event occur" (De Rodes, 1994, p. 324). The technical model according to Fiorino (1989) is a model for risk communication built on "science-advisory panels, the search for elite consensuses, and a reliance on formal analytic techniques" (p. 293). According to Fiorino (1989), the objective of the communication in the technical model "is to present these expert formulations clearly, objectively, and persuasively to nonexperts" (p. 294). This "expert-to-the-ignorant" view of risk communication was epitomized during the early years of risk communication, and is the cause of the major apprehension about risk communication with the general public historically (Leiss, 1996). This view of risk communication is based on the notion that if people just knew the scientific basis or lack of a scientific basis for a specific risk, their behavior would change accordingly.

The technical model has also been used by health educators to communicate about risks. Health risk campaigns often focus on the transmission of scientific information hoping for change in behavior (CDC, 2001c; Green, 1999; Witte, Meyer, & Martell, 2001). In fact, many health campaigns have focused on the dissemination of scientific information related to health risks expecting changes to naturally occur (Brown & Simpson, 2000). Unfortunately, risk communication that relies heavily on the use of scientific information can actually cause public anxiety instead of alleviating fear or changing behavior (Glassner, 1999; Lewis, 1990).

One avenue of persuasion literature has examined the use of statistical information versus personal testimony on influencing people's decisions. Some of the research has shown that statistical summaries are more persuasive (Baesler & Burgoon, 1994; Massi, Yun, & Ah, 2003); other studies have shown personal testimony to be more persuasive (Koballa, 1986); and yet other studies have found no difference in persuasiveness between statistical information versus personal testimony (Krupat, Smith, Leach, & Jackson, 1997). One problem with the use of statistics in risk communication relates to the area of statistical reasoning. Statistical reasoning, or the ability to make decisions based on statistical information, is rarely taught in schools (Sedlmeier, 1999). In a study conducted by Yamagishi (1997), the researcher found that adults rated a cancer as riskier when it was described as killing "1,286 out of 10,000 people" than when described as killing "24.14 out of 100 people." In the first case, only about 8% of the people died, but in the second case 24% of the people died. Clearly, the second is more hazardous. Research results such as the Yamaggishi (1997) study have led many researchers to believe that the general public is currently not educated enough to understand the realities of risk (Glassner, 1999; Lewis, 1990; Slovic, Finucane, Peters, & MacGregor, 2004).

A review of literature shows there is a clear distinction between democratic model of risk communication and the technical model of risk communication (DeRodes, 1994; Fiorino, 1989; Green, 1999; Rowan, 1991). This polarization with regard to delivery methodology has influenced the way that risk communicators present risk messages. While the two forms of risk message delivery have been discussed at length in the literature, no tools have been created to measure these models. It has been hypothesized that the democratic model is the best way to present risk messages because it is receiver-focused instead of being message-focused like the technical model (Fiorino, 1989).

Study Purpose

The purpose of this study was to create a measure for examining the communication processes of each of these models was generated. The ***Risk Communicator Style Scale*** (RCSS) was created to measure a risk communicator's tendency to use either the democratic or technological model of risk communication. This instrument is based on Fiorino's (1989) conceptualization of the democratic and technical models of risk communication. While the democratic and technological models have been used conceptually to examine how risk communicators have approached risk communication, measures of these concepts have never been developed. The democratic model of risk communication purports that there are some risk communicators that have a strong tendency to rely on open interaction with the people directly affected by the risks. As McComas and Scherer (1998) explained the democratic model, "most risk managers responsible for communication to non-technical or "lay" audiences recognize that approaches such as "top-down" or persuasive models are inadequate to meet most audiences information needs" (p. 347). On the other hand, The technical model of risk communication purports that there are some risk communicators that have a strong tendency to rely on scientific information when attempting to communicate risks.

Risk Communicator Style Scale Creation

Using the discussion from Fiorino (1989) about the democratic and technical models of risk communication, a scale of 30 items was created[1]. The dimensionality of the 30 items from the Risk Communicator Style Scale was analyzed using a principal component factor analysis. Three criteria were used to determine the number of factors to rotate: sampling adequacy, the scree test, and the interpretability of the factor solution. To examine sampling adequacy, Kaiser's Measure of Sampling Adequacy was used. The Kaiser's Measure of Sampling Adequacy obtained was .91, which is considered "marvelous" for conducting a factor analysis (Kaiser, 1974). The scree plot clearly indicated that there were two primary factors.

To create the final version of the Risk Communicator Style Scale, the top ten Eigenvalue loadings for each factor were used. Since the democratic factor only had ten items with eigenvalues above .5, only the top ten items were used from both factors in the creation of the final instrument in an effort to keep the instrument's factors symmetrical (Table 1). No items had a secondary Eigenvalue loading over .2. To make sure that we truly measured two distinct factors, a Pearson Product Moment correlation was calculated between the two factors, which was not significant, $r\ (415) = .000$, $p = .993$.

TABLE 1 Factor Analysis of the Risk Communicator Style Scale

	Factor 1	Factor 2
1. The risk communicator(s) wanted my full participation in decision-making.	.47	.00
2. The risk communicator(s) used statistics during her or his presentation about the risk.	.00	.72*
3. The risk communicator(s) was concerned with my perception of the risks involved.	.60*	.00
4. The risk communicator(s) discussed the risk using scientific information.	.11	.68
5. The risk communicator(s) tried to understand our concerns about risks.	.58*	.17
6. The risk communicator(s) did not use mathematical information to explain the risk.	.00	-.58
7. The risk communicator(s) did not try to persuade me to a specific point of view.	.12	.13
8. The risk communicator(s) did not use statistical information while discussing the risk.	.00	-.78*
9. The risk communicator(s) wanted me to feel satisfactorily informed about the risks involved.	.55*	.00
10. The risk communicator(s) used statistics to communicate risks.	.00	.83*
11. The risk communicator(s) did not listen to my point of view about the risks involved.	-.68*	.00
12. The risk communicator(s) presented the risks scientifically.	.00	.76*
13. The risk communicator(s) cared about my perceptions of the risks involved.	.78*	-.00
14. The risk communicator(s) did not present a scientific analysis of the risk.	.10	-.64
15. The risks communicator(s) did not care if I was informed or not.	-.60*	.00
16. The risk communicator(s) was very scientific in her or his explanation of the risk.	-.12	.67
17. The risk communicator(s) did not solicit our opinions about the risks involved.	-.15	-.12
18. The risk communicator(s) presented a scientific analysis of the risk.	-.00	.78*
19. The risk communicator(s) avoided one-way "expert-to-the-ignorant"	.44	-.00

communicative messages.		
20. The risk communicator(s) did not present the risks scientifically.	.11	-.73*
21. The risk communicator(s) did not care about my perceptions of the risks involved.	-.71*	.00
22. The risk communicator(s) did not use statistics to communicate risks.	.00	.69
23. The risk communicator(s) did not care about our concerns about the risks involved.	-.74*	.00
24. The risk communicator(s) used statistical information while discussing the risk.	-.00	.81*
25. The risk communicator(s) listened to my point of view about the risks involved.	.76*	.00
26. The risk communicator(s) used mathematical information to explain the risk.	.00	.73*
27. The risk communicator(s) tried to persuade us to her or his point of view about the risks involved.	.00	-.11
28. The risk communicator(s) did not discuss the risk using scientific information.	-.00	-.70*
29. The risk communicator did not want me to participate in the decision-making process.	-.59*	.00
30. The risk communicator(s) did not use statistics during her or his presentation about the risk.	.00	-.74*

Factors 1 & 2 were calculated using a Principal Component Analysis
Items with a "*" next to them were kept in the final scale.
Factor I – Democratic Risk Communication Factor
Factor II – Technical Risk Communication Factor

After the creation of the two factors, Cronbach (1951) alpha reliabilities were conducted on the two ten-item factors. Scores for both factors of the RCSS factor can range from 10-50, which was seen in this study. All alpha reliabilities were computed using Cronbach's (1951) method. The democratic factor had an alpha reliability of .86 (M = 37.71; SD = 7.38). The technical factor had an alpha reliability of .92 (M = 25.20; SD = 9.99).

With the creation of the new Risk Communicator Style Scale, a series of validity tests needed to be conducted to examine the predictive validity of the Risk Communicator Style Scale. For this reason, six previously validated research measures were employed to test the predictive validity of the two measures created in this current study.

Predictive Validity Hypotheses

Consistently, the risk communication literature has discussed the problem the general public has with the technical model of risk communication while demonstrating the benefits of using the democratic model of risk communication (Green, 1999; DeRodes, 1994; Rowan, 1991; Sandman, 1987). If the benefits and downfalls of the democratic and technical models of risk communication exist, then a number of predictions can be made about the Risk Communicator Style Scale.

Nonverbal Immediacy. Immediacy refers to communication behaviors that enhance physical or psychological closeness to another person (Mehrabian, 1967, 1969, 1981). Mehrabian (1969) noted that nonverbal immediacy cues are behaviors like touch, distance, forward lean, eye contact, and body orientation, which are all ultimately associated with positive attitudes from a receiver. Burgoon and Dillman (1995) stated that immediacy is at the core of interpersonal relationships of relationships. Immediacy has been studied in a variety of contexts such as the classroom and interpersonal relationships. Andersen, Andersen, and Jensen (1979) found a relationship between immediacy and relational closeness. McCroskey and Richmond (1992) have illustrated relationships between teacher's nonverbal immediacy and students' positive evaluations for the teacher. Wrench and Richmond (2004) noted that nonverbal immediacy was positively related to a student's degree of both cognitive and affective learning in the classroom.

Ultimately, the research in the area of nonverbal immediacy has consistently shown that audiences who perceive a sender to be more physically and/or psychologically close are seen more positively by those audiences (Andersen, Andersen, & Jensen, 1979; Burgoon & Dillman, 1995, McCroskey & Richmond, 1992). At the same time, DeRodes (1994) noticed that one of the problems with the technical model of risk communication was that people feel detached from the risk communicators because of the "expert-to-the-ignorant" view that is taken. Therefore, a negative relationship between the technical model of risk communication and nonverbal immediacy would exist. The democratic model of risk communication, on the other hand, attempts to draw people together for decision making and education. The democratic model is more people centered, so people who perceive a risk communicator as using the democratic model will probably also perceive that risk communicator as being nonverbally immediate.

H1: There will be a positive relationship between the democratic factor of risk communication and nonverbal immediacy, and a negative relationship between the technical factor of risk communication and nonverbal immediacy.

Communication Clarity. Teacher clarity is the process through a teacher stimulates a specific content message in her or his students' minds using appropriately-structured verbal and nonverbal messages (Chesebro, 1998). Since teaching is fundamentally about having students accurately understand a given message, teaching is fundamentally about clarity (Chesebro, 2002; Eisenberg, 1984). According Chesebro (2002), the components of clarity include verbal fluency; use of explanations and examples; and the use traditional structural devices: previews, organization, transitions, reviews, outlines, and visual aids. All of the factors of teaching clarity are also important factors for any good public speaker (Richmond & Hicks, 2002; Richmond, Wrench, & Gorham, 2001).

Previous research examining the concept of teacher clarity has shown that communicator clarity positively relates to student learning, student affect, and nonverbal immediacy while negatively relating to state receiver apprehension (Chesbro & McCroskey, 2001). Too often, people who communicate risks using the technical model of risk communication are not understood by the general public (DeRodes, 1994; Glassner, 1999; Lewis, 1990; Tappe & Galer-Unti, 2001). One of the primary factors of the democratic model of risk communication, on the other hand, is working with receivers to make sure that they understand a communicated risk message.

H2: There will be a positive relationship between the democratic factor of risk communication and communication clarity, and a negative relationship between the technical factor of risk communication and communication clarity.

Receiver Apprehension. Previous research has shown that receiver apprehension, or "…the fear of misinterpreting, inadequately processing, and/or not being able to adjust psychologically to messages sent by others," (Wheeless, 1975, p. 263) is positively correlated with a number of variables: information processing (Beatty, 1981), cognitive complexity (Beatty & Payne, 1981), processing demand (Ayres, Wilcox, & Ayres, 1995), and communication apprehension (Wheeless, Preiss, & Gayle, 1997). A number of theses issues are similar to the problems with risk communication noted by De Rodes (1994) and Rowan (1991). Examining receiver apprehension in relation to risk communication was expected to help in understanding risk communication.

Beatty (1981) proposed that receiver apprehension was a product of cognitive backlog, or being unable to understand information using one's current schema. If information is very complex and technical, individuals may have greater difficulty understanding the information and become anxious trying to decode the information. At the same time, individuals who become anxious while trying to decode information will probably not be satisfied with their interaction with a risk communicator because the risk communicator is causing the receiver to feel anxious. Since the technical risk communication model examines the use of scientific terminology, and since most people are unable to understand scientific information about risks (DeRodes, 1994; Glassner, 1999; Lewis, 1990), the following research hypothesis can be posed:

H3: There will be a negative relationship between the democratic factor of risk communication and receiver apprehension, and a technical relationship between the scientific factor of risk communication and receiver apprehension.

Interaction Satisfaction. Interaction satisfaction is the degree to which an individual is satisfied with a communicator at the completion of an interaction. Wolf, Putnam, James, and Stiles (1978) devised a three-factor model for interaction satisfaction from a patient's perspective which examines three factors of satisfaction: cognitive, behavioral, and affective. While using a research tool that is primarily used in medical research may seem unusual, the interactions between physicians and patients are similar to the interactions between risk communicators and stakeholders (Green, 1999). For further clarification of these similarities, the three factors involved in Wolf et al.'s (1978) Medical Interview Scale will be explained using examples from risk communication.

Cognitive satisfaction is the degree to which an individual is satisfied with the amount of information he or she has been given. If an individual believes that he or she has been given all the pertinent information about a risk, then he or she will have increased satisfaction levels with the risk communicator. The second factor of Wolf et al.'s (1978) model of satisfaction is affective satisfaction. Affective satisfaction is the degree to which an individual feels that the risk communicator is open to listening to (and understanding) the receiver's thoughts about a hazard. Affective satisfaction resembles the collaborative nature of the democratic model discussed by Rowan (1991). The final factor of Wolf et al.'s (1978) model of satisfaction is behavioral satisfaction. Behavioral satisfaction is the satisfaction related to a receiver's perception of a risk communicator's manner of doing things during an interaction. Receivers who perceive that a risk communicator is cold and calculating in her or his interactions should have lower satisfaction levels than those receivers who have risk communicators who are open to discussion. Once again, this resembles the democratic verses the technical model of risk communication. Since risk communication and satisfaction do appear to be highly related constructs, the Risk Communicator Style Scale should be highly related to the Satisfaction Scale.

H4: There will be a positive relationship between the democratic factor of risk communication and receiver satisfaction, and a negative relationship between the technical factor of risk communication and receiver satisfaction.

Credibility. McCroskey (2001) defined credibility as “the attitude toward a source of communication held at a given time by a receiver” (p. 83). Perloff (2003) refers to credibility as one of the “Big 3” communicator factors along with authority and social attractiveness. Since studying the concept of credibility dates back to Aristotle, a lot of persuasion research has focused on how sources achieve credibility with their audiences (McCroskey, 2001; Perloff, 2003). One major important characteristic that must always be kept in mind with credibility research is that it is a perception of an audience not a concrete factor (Hart, Friedrich, & Brummett, 1983). McCroskey and Teven (1999) proposed that credibility is the combination of three factors: competence, trustworthiness, and goodwill. Competence is the extent that an individual truly knows what he or she is discussing. The second component of credibility is trustworthiness, which is the degree to which one individual perceives another person as being honest. The final component of credibility, goodwill, is the perceived caring that a receiver sees in a source. Out of all of these, goodwill may be the most important aspect of ethos (McCroskey, 1998). Most of the research completed studying credibility outside of traditional persuasion research has been in classroom settings examining teacher credibility (McCroskey & Teven, 1999; Teven & McCroskey, 1997; Toale, 2001; Wrench & Richmond, 2004).

While little specific research has actually focused on risk communicator credibility, Leiss (1996) did note that one of the primary problems with risk assessment was a lack of public trust. What research that has been conducted in the area of credibility has primarily focused on trust (Sjoberg, 2001; Slovic, 1993; Trumbo & McComas, 2003). Since trust is a factor in the credibility construct as seen by McCroskey and Teven (1999), connection between credibility and risk communication can be easily linked. At the same time, Rowan (1991) noted that the technical model of risk communication has been an ineffective way to communicate risks to the general public because they do not feel as though the risk communicator is truly concerned with their opinions. Additionally, both Green (1999) and Rowan (1991) believed that the democratic model of risk communication is more effective because people feel that the risk communicator is encouraging their participation and understanding of the risk. Realistically, Green (1999) and Rowan’s (1991) concerns about the technical and democratic models of risk communication really just examine the public’s perception of caring and good will, which again is a factor of credibility. Additionally, it is likely that the competence factor of credibility will follow the same pattern as the previous two factors of credibility because the three factors of credibility are so highly inter-correlated (McCroskey & Teven, 1999; Teven & McCroskey, 1997). The last factor of credibility, perceived competence or expertise, can be somewhat problematic. If a risk communicator is seen as overly competent, he or she may seem distant and unable to communicate directly to a stakeholder. As Levine and Vale (1975) noted, someone who appears to be on another person’s level is generally perceived as more competent. Again because of the “expert-to-ignorant” view of the technical model of risk communication, it is likely that technical risk communicators may actually be viewed as less competent than a risk communicator using the democratic model of risk communication.

> H5: There will be a positive relationship between the democratic factor of risk communication and a risk communicator’s perceived credibility, and a negative relationship between the technical factor of risk communication and a risk communicator’s perceived credibility.

Method

Participants

Participants in this study were students attending a large mid-Atlantic university. Classes used in this study were both upper and lower level courses that serve as large service classes for the university. The study was conducted during the twelfth week of a fifteen-week fall semester in 2001. All participants received extra credit for their participation.

The participants were asked two demographic questions to give basic understanding about who the participants were in this study. The sample consisted of 215 (51.8 %) males, 199 (48.0 %) females, and 1 (.2%) not responding for a total of 415 participants. The mean age of the sample was 20.45 with a *SD* = 2.16.

Procedure

Two scenarios were generated to introduce participants to the basic terminology of risk communication (risk, risk communicator, hazard, and method of communication). Once the participants had read the two scenarios, they were asked to "think of a time in the past 6 months when an individual or group of individuals has attempted to communicate a risk to you directly. Use this specific instance when a risk was communicated to you to answer the rest of this survey." The participants were then asked to read a list of different categories of risk and select the category that the risk communicated to them most closely resembled (health, medical, environmental, transportation, terrorist, food, human, substance, and other risks). The categories were selected because of their inclusiveness of different types of risks and their distinctness from the other categories (Rowan, 2000). The breakdown of the types of risks related in this study are as follows: 56 (13.5 %) health, 76 (18.3 %) medical, 4 (1.0 %) environmental, 50 (12.0 %) transportation, 3 (0.7 %) technological, 82 (19.8) terrorist, 11 (2.7 %) food, 23 (5.5 %) human, 100 (24.1 %) substance, and 10 (2.4 %) other[1]. Participants were then asked to fill out a series of eight scales. More information will be given about the individual scales in the Instrumentation section below.

Validity Instrumentation

This section discusses the information related to the development, scoring, validity, and reliability of the instruments used in this study to validate the two instruments created in this study related to risk communication.

Nonverbal Immediacy Measure. The version of the Nonverbal Immediacy Measure used in this study was derived from McCroskey, Richmond, Sallinen, Fayer, and Barraclough's (1995) nonverbal immediacy measure tooled for the classroom environment. Since risk communication is about teaching individuals about risks, revising this instrument for the risk context was appropriate. The original scale has ten items that uses a 5-point Likert format ranging from "strongly agree" to "strongly disagree." Higher scores indicated that a communicator was perceived as highly nonverbally immediate by her or his receiver. Cronbach's (1951) method for estimating an alpha reliability was used in this study. The estimate obtained was .74 (*M* = 33.41; *SD* = 5.69).

Communicator Clarity Measure. The Communicator Clarity Measure was based on a teacher clarity measure created by Chesebro and McCroskey (1998). Where the original instrument said "teachers," the revised instrument implanted the phrase "risk communicators." The instrument is a series of ten self-report items that uses a 5-point Likert format ranging from "strongly agree" to "strongly disagree." Higher scores indicated that a communicator was perceived as highly clear in her or his communication by her or his receiver. Cronbach's alpha reliability estimate in this study was .83 (*M* = 39.81; *SD* = 6.19).

Receiver Apprehension Test. The Receiver Apprehension Test (RAT) is a self-report measure that examines an individual's apprehension towards receiving messages developed by Wheeless (1975). This measure was re-written to measure apprehension towards receiving risk-oriented messages. The RAT is a twenty 5-point Likert format ranging from "strongly agree" to "strongly disagree." Higher scores indicated that a receiver perceived her or himself as highly anxious while receiving risk oriented messages. Cronbach's alpha reliability estimate was .89 (*M* = 47.76; *SD* = 10.67).

Interaction Satisfaction Scale. The Interaction Satisfaction Scale is a re-design of a measure originally created to examine patient-physician interactions. The Medical Interview Satisfaction Scale (MISS) was developed as a way to gauge patients' satisfaction with their primary care physician (Wolf, Putnam, James, & Stiles, 1978). The MISS measures three factors of patient satisfaction: cognitive, behavioral, and affective. The Communication Satisfaction Scale is a re-tooling of the MISS to examine risk communication specifically. The MISS instrument is a 26-item, self-report measure that uses a 5-point Likert format ranging from "strongly disagree" to "strongly agree." Higher scores indicated that a receive was highly satisfied during an interaction with a risk communicator. The alpha reliability for the cognitive component in this study was .83 (*M* = 34.29; *SD* = 6.03); affective reliability was .80 (*M* = 32.35; *SD* = 6.45); behavioral reliability was .83 (*M* = 30.36; *SD* = 5.58).

Credibility Measure. The Credibility Measure was designed to test an individual's perception of a communicator's credibility (competence, trustworthiness, and caring/goodwill). Since the original measure was designed to be used in a number of situations to examine a communicator's credibility, the measure used in this study did not have to be re-tooled to examine risk communication. The measure is a series of 18 oppositely worded adjectives with a seven step bi-polar scale created by McCroskey and Teven (1999). Higher scores indicated that a communicator was perceived as highly credible by her or his receiver. The alpha reliability for competence in this study was .83 (*M* = 32.80; *SD* = 7.34); trustworthiness was .91 (*M* = 34.38; *SD* = 7.86); and caring/goodwill was .89 (*M* = 32.78; *SD* = 8.33).

Results

The goal of this study was to test the newly developed Risk Communicator Style Scale's (RCSS) predictive validity. Simple Pearson Product Moment correlations were calculated between the two factors of the RCSS and the previously validated variables (nonverbal immediacy, communicator clarity, receiver apprehension, satisfaction, and credibility). First, the democratic factor of risk communication was correlated with the study variables using an alpha level of .01 to account for possible Type I error: nonverbal immediacy, r (406) = .46 , $p < .0001$; communicator clarity, r (415) = .56 , $p < .0001$; receiver apprehension, r (414) =.10 , $p > .01$; cognitive satisfaction, r (411) = .52 , $p < .0001$; affective satisfaction, r (411) = .65 , $p < .0001$; behavioral satisfaction, r (411) = .59 , $p < .0001$; competence, r (411) = .39 , $p < .0001$; caring/goodwill, r (411) = .57 , $p < .0001$; and trustworthiness, r (411) = .50 , $p < .0001$.

Second the technical factor of risk communication was correlated with the study variables using an alpha level of .01 to account for possible Type I error: nonverbal immediacy, r (406) = .01 , $p > .01$; communicator clarity, r (415) = .03 , $p > .01$; receiver apprehension, r (414) =.12 , $p > .01$; cognitive satisfaction, r (411) = -.01 , $p > .01$; affective satisfaction, r (411) = -.08 , $p > .01$; behavioral satisfaction, r (411) = .-.00 , $p > .01$; competence, r (411) = .17 , $p < .0001$; caring/goodwill, r (411) = -.08 , $p > .01$; and trustworthiness, r (411) = .02 , $p > .01$.

To gain further knowledge of the relationship between the Risk Communicator Style Scale and the previously validated research measures, a multivariate regression was conducted.

Using the two factors of the RCSS (technical and democratic) as independent variables and the previously validated variables (nonverbal immediacy, communicator clarity, receiver apprehension, satisfaction, and credibility) as the dependent variables a multivariate regression was calculated to examine all of the hypotheses. The overall model was significant. Using an exact calculation of Wilks' Lambda, the overall model was significant, F (18, 770) = 26.55 , $p <$ .0001. The results from the individual regressions can be seen in Table 2.

TABLE 2 Multivariate Regression Analysis

Dependent Variable	DF	*F*	*p*	R^2	Democratic Factor		Technical Factor	
					t	*p*	*t*	*p*
Nonverbal Immediacy	(2, 393)	50.52	.0001	.20	10.04	.0001	.04	.69
Communicator Clarity	(2, 393)	100.68	.0001	.34	14.19	.0001	-.16	.87
Receiver Apprehension	(2, 393)	6.20	.002	.03	-2.62	.005	2.36	.01
Cognitive Satisfaction	(2, 393)	75.28	.0001	.28	12.26	.0001	-.53	.59
Affective Satisfaction	(2, 393)	150.38	.0001	.43	17.16	.0001	-2.5	.01
Behavioral Satisfaction	(2, 393)	103.26	.0001	.34	14.37	.0001	-.24	.81
Competence	(2, 393)	49.51	.0001	.20	8.96	.0001	4.30	.0001
Caring/ Goodwill	(2, 393)	92.23	.0001	.32	13.52	.0001	-1.3	.19
Trustworthiness	(2, 393)	68.72	.0001	.26	11.72	.0001	-.01	.99

Discussion

The purpose of this study was to create and validate the Risk Communicator Style Scale. This discussion section will start off with a general discussion of the overall results, followed by an examination of the multivariate regression results, and lastly examine possible applications and implications of the Risk Communicator Style Scale.

General Discussion

The original purpose of this study was to create a research measure based on Fiorino's (1989) two models of risk communication (democrat and technical). When examining the basic results in this study, it is evident that Fiorino's conceptualization of the two models of risk communication is not completely clear. Fiorino's original view of the two models had one model where participation was high (democratic) and the other model where participation was low (technical), which exist theoretically on a continuum. In essence, there would be one model of risk communication with a high and low end for perceived stakeholder participation. If the basic conceptualization of the two models had stopped with the participation component, then the democratic model of the Risk Communicator Style Scale (RCSS) would clearly be all that was necessary to quantitatively analyze a risk communicator's communication style.

However, Fiorino's (1989) conceptualization of the technical model was built on the foundation of using scientific and statistical language while communicating risks. With the addition of the use of scientific and statistical messages, the measurement of the democratic and technical models becomes slightly awkward. The first factor of the RCSS measures the degree to which one feels that he or she is participating in the risk communication process (democratic model), and the second factor of the RCSS measures the use of scientific and statistical messages while communicating risks. The results from this study demonstrate, to a degree, that the use of scientific and statistical messages while communicating risks does not positively or negatively affect a receiver's perception of a risk communicator. However, the degree to which a receiver perceives that he or she is participating in the risk communication process greatly impacts the receiver's perception of a risk communicator.

Ultimately, the two factors of the RCSS innately have nothing to do with each other, which is evident by the lack of a statistical relationship between the two factors. While the democratic model clearly measured participation, the technical model measured both participation and the use of scientific and statistical messages. While describing the technical model as measuring two different variables may be useful for qualitative research, the two concepts in the technical model needed to be distinguishable for research to be conducted quantitatively. In essence, the re-conceptualization of the democratic and technical models as discussed in this article enables a much clearer delineation for future research. Ultimately, this distinction is akin to the distinction between source and message factors generally discussed in persuasion literature (O'Keefe, 2002; Perloff 2003). The democratic model measures participation (a source factor); where as, the technical model measures the use of scientific and statistical messages (a message factor).

With this re-conceptualization made clear, the implications from this study can also be discussed. Overall, this study has found that the democratic factor of the RCSS accounts for some of the variance in a receiver's perception of a risk communicator's nonverbal immediacy, communicator clarity, receiver apprehension, satisfaction (cognitive, affective, and behavioral), and credibility (competence, caring/goodwill, and trustworthiness). On the other hand, this study has found that the technical factor of the RCSS accounts for some of the variance in receiver apprehension, affective satisfaction, and competence. To further analyze these individual results, this discussion will now examine the results from the multivariate regression analyses.

Multivariate Regression Results

The first dependent variable examined by the multivariate regression was nonverbal immediacy. While it was originally predicted that the democratic factor would positively relate to nonverbal immediacy and negatively relate to the technical factor, only the democratic factor accounted for 20% of the variance in nonverbal immediacy in this study. This finding definitely provides a level of predictive validity for the democratic factor of the Risk Communicator Style Scale (RCSS). As DeRodes (1994) noticed, people who receive a risk message from someone using the democratic model tend to view those communicators more favorably. Since nonverbal immediacy has been previously shown to enhance an audience's perception of a communicator (Andersen, Andersen, & Jensen, 1979; Burgoon & Dillman, 1995, McCroskey & Richmond, 1992; Wrench & Richmond, 2004), the relationship between using the democratic model of risk communication and nonverbal immediacy is clear. Additionally, as Williams and Olaniran (1998) noted, risk communication should be about a dialogue not a monologue, which innately would be more interactive and thus more immediate from a receiver perspective.

The lack of a relationship between the technical factor of the RCSS and nonverbal immediacy is not surprising. Since the technical model of risk communication is a message factor and not a source factor, the lack of a relationship is understandable because an individual's perception of nonverbal immediacy behaviors is not affected. In essence, what this finding suggests is that nonverbal immediacy is impacted by a source's behavior not her or his specific message.

The second dependent variable examined by the multivariate regression was communicator clarity. While it was originally predicted that the democratic factor would positively relate to communicator clarity and negatively relate to the technical factor, only the democratic factor accounted for 34% of the variance in communicator clarity in this study. This finding provides further predictive validity for the democratic factor of the RCSS. Since Fiorino's (1989) conceptualization of the democratic model of risk communication is innately participatory, making sure that the nature of a risk is communicated in a clear fashion is important. For people to actively participate in the risk communication process, they must understand the nature of a risk.

The lack of a relationship between the technical factor and communicator clarity of the RCSS is also easily explained. While Fiorino's (1989) technical model of risk communication equated the use of scientific and statistical messages with a lack of participation, the technical factor of the RCSS just measures the use of scientific and statistical messages. Despite what the literature would expect, the results from this study would indicate that it is possible to use scientific and statistical messages and be clear or unclear depending on the risk communicator. In essence, some risk communicators can use scientific and statistical messages in a clear way and others will communicate using scientific and statistical messages in an unclear way.

The third dependent variable examined by the multivariate regression was receiver apprehension. While the correlations were not significantly related to either the democratic or technical factors of risk communication, the multivariate regression indicated that a significant, albeit small (3%), portion of the variance in receiver apprehension could be accounted for by the linear combination of the two independent variables. On the democratic factor front, the small nature of the negative relationship could have to do with the problem that Sandman (1991b) noted when he discussed the problems educating people about risks. Often, people are resistant to risk information, so it would not matter if an individual was trying to be democratic while informing a person about a risk. The receiver may simply not alter her or his beliefs about the risk despite the communication strategy employed.

The positive relationship between receiver apprehension and the technical factor of the RCSS can also be explained based on the literature. Beatty (1981) predicted that people who were exposed to technical or complex information may become more anxious listening to messages because they are unable to process the information in a routine manner. While the finding in this study supports the hypothesis, the diminutive size of the relationship should raise some doubt as to the importance of this finding.

The fourth dependent variable examined by the multivariate regression was cognitive satisfaction. While it was originally predicted that the democratic factor would positively relate to cognitive satisfaction and negatively relate to the technical factor, only the democratic factor accounted for 28% of the variance in cognitive satisfaction in this study. The positive relationship between the democratic factor of the RCSS and the cognitive satisfaction is interesting. In essence, this result says that the degree to which an individual feels like he or she is participating in the risk communication process impacts the degree to which he or she is satisfied with the amount of information given by the risk communicator. In other words, through participation people feel that they gain understanding and are thus more satisfied.

The lack of a relationship between the technical factor of the RCSS and cognitive satisfaction is also interesting. This result would indicate that the use or non-use of scientific and statistical messages during risk communication neither adds to nor detracts from an individual's satisfaction with the amount of information he or she has been given by a risk communicator.

The fifth dependent variable examined by the multivariate regression was affective satisfaction. The original prediction that the democratic factor would positively relate to cognitive satisfaction and negatively relate to the technical factor was supported. The multivariate regression indicated that a significant portion of the variance (43%) in affective satisfaction could be accounted for by the linear combination of the two independent variables. While clearly the democratic factor accounted for most of the variance in affective satisfaction, the technical factor did uniquely contribute as well. In this result, the democratic factor positively and the technical factor negatively related to affective satisfaction. The finding of a positive relationship between the democratic factor of the RCSS and affective satisfaction is not surprising since they are closely related concepts. The democratic model encourages participation and affective satisfaction is the extent to which an individual feels that the risk communicator is open to listening to the receiver's thoughts about a hazard (Wolf et al.'s, 1978). In essence, affective satisfaction is a part of the democratic model.

The negative relationship between the technical factor of the RCSS and affective satisfaction appears to be preference oriented. In the field of risk communication, it is common thought that the general public is not educated enough to adequately understand the true nature of risk (Glassner, 1999; Lewis, 1990; Slovic, Finucane, Peters, & MacGregor, 2004). Conversely, Fiorino (1989) believes that the general public is educated enough to scientific and statistical messages. In reality, the negative reaction that researchers see to scientific and statistical messages may be affective and less cognitive. In other words, it is possible that people simply prefer not to listen to scientific and statistical messages, so when a risk communicator increases her or his use of scientific and statistical messages a receiver's affective satisfaction decreases.

The sixth dependent variable examined by the multivariate regression was behavioral satisfaction. While it was originally predicted that the democratic factor would positively relate to behavioral satisfaction and negatively relate to the technical factor, only the democratic factor accounted for 34% of the variance in behavioral satisfaction in this study Since Fiorino (1989) explained that the democratic model of risk communication was perceived more positively by stakeholders, the positive relationship that has been seen between the democratic factor of the RCSS and behavioral satisfaction is consistent. According to Wolf et al.'s (1978) description of behavioral satisfaction, behavioral satisfaction is related to a receiver's perception of a risk communicator's manner of doing things during an interaction.

The lack of a relationship between the technical factor of the RCSS and behavioral satisfaction is also consistent. As previously discussed, the technical factor of the RCSS is a message factor and not a source factor. As such, the lack of a relationship between behavioral satisfaction and the technical factor of the RCSS further validates the notion previously espoused that message and behavioral perceptions are not related.

The seventh dependent variable examined by the multivariate regression was competence. While it was originally predicted that the democratic factor would positively relate to competence and negatively relate to the technical factor, both factors positively accounted for a portion in the variance of competence. The multivariate regression indicated that a significant portion of the variance (20%) in competence could be accounted for by the linear combination of the two independent variables. The positive relationship between the democratic factor of the RCSS and source competence supports the notion by Levine and Vale (1975) that someone who appears to be on the same level is generally perceived as more competent.

The positive relationship between the technical factor of the RCSS and risk communicator competence negates the original hypothesis in this study; however, upon further clarification of what the democratic and technical factors of the RCSS, the positive relationship does make sense. Since the competence factor of McCroskey and Teven's (1999) three factor structure of credibility deals with the information portion, an individual who demonstrates that they know what they are talking about through the use of scientific and statistical messages would be seen as more competent. At the same time the variance accounted for by the linear combination of both the democratic and technical models is fairly small, so over emphasizing this finding should be avoided.

The eighth dependent variable examined by the multivariate regression was caring/goodwill. While it was originally predicted that the democratic factor would positively relate to caring/goodwill and negatively relate to the technical factor, only the democratic factor accounted for 19% of the variance in caring/goodwill in this study. As Rowan (1991) noted, the democratic factor focuses on making the stakeholders feel apart of the risk communication process. According to McCroskey and Teven (1999) caring/goodwill is the perceived caring that a receiver sees in a source. If a stakeholder feels like he or she is a part of the risk communication process through the stakeholder's interactions with a risk communicator, it is likely that the stakeholder will believe the risk communicator cares about the stakeholder on a personal level.

The lack of a relationship between the technical factor of the RCSS and perceived caring/goodwill is once again a question of message and behavior. Caring/goodwill is innately about observable behaviors that a stakeholder sees in a risk communicator. The use of scientific and statistical messages, on the other hand, has nothing to do with overt source behavior, but rather is a message factor (O'Keefe, 2002; Perloff, 2003).

The last and ninth dependent variable examined by the multivariate regression was trustworthiness. While it was originally predicted that the democratic factor would positively relate to trustworthiness and negatively relate to the technical factor, only the democratic factor accounted for 26% of the variance in trustworthiness in this study. Previous research in risk communication has greatly focused on the nature and implications of trust (Sjoberg, 2001; Slovic, 1993; Trumbo & McComas, 2003). Since the democratic factor of the RCSS measures the degree to which stakeholders feel they are participating in the risk communication process, this finding suggests that stakeholders are more likely to trust risk communicators who they perceive as being open to the stakeholders' ideas and suggestions.

The lack of a relationship between the technical factor of the RCSS and perceived trustworthiness is once again a question of message and behavior. While there could clearly be trust issues related to the use of scientific and statistical messages, the use or non-use of these messages does not indicate a relationship with source trustworthiness. Additionally, as was discussed in the results for caring/good will, trustworthiness is a stakeholder's perception of a risk communicator's behavior. The use of scientific and statistical messages, on the other hand, has nothing to do with overt source behavior, but rather is a message factor (O'Keefe, 2002; Perloff, 2003).

Applications and Implications

The first major application that the Risk Communicator Style Scale can have is in the area of risk communication research. While this study helps in the process of quantifying how risk communicators actually communicate, more research needs to be conducted experimentally to determine the degree to which the technical and democratic models must be employed to achieve the desired effects in a risk communication situation.

A second research application of the Risk Communicator Style Scale could be in the area of crisis communication. Since there is a close link between risk and crisis communication, it would be interesting to see if the two models work similarly under both risk and crisis communication episodes.

A third possible application for the Risk Communicator Style Scale has nothing to do with research, but rather how the RCSS can be used by risk communication practitioners. Risk communication practitioners can use the scale to see if their audiences of stakeholders perceive them as being democratic or technical during an instance of risk communication. Since this research confirms the benefits that being a democratic risk communicator, knowing whether or not your audiences perceive you to be such can be extremely important when engaging in risk campaigns.

In addition to the previously described applications of the Risk Communicator Style Scale, there are two implications for the study of risk communication as well. The first implication for future research is strictly in the conceptualizations of democratic and technical risk communication. Democratic risk communication as discussed above truly examines the extent to which someone feels that he or she is part of the risk communication process. While there is clearly a continuum in democratic risk communication from highly involved to lowly involved, this continuum has nothing to do with a risk communicator's use of science and statistics during risk communication. At the same time, communicating about scientific and statistical evidence is aspect that risk communicators must understand as well. Future research in the area of risk communication should focus on how the democratic and technical models of risk communication work together.

The second implication for the study of risk communication is educating the public about the basic terms used in the study of risk. To accurately discuss risks with the general public, the public must be taught to think and discuss risks in a more meaningful manner. One of the hardest parts of risk communication is clearly taking the science of risk to the general public. Future research needs to examine why the public has a hard time conceptualizing morbidity and mortality and how a risk communicator can more accurately make this information meaningful to her or his receivers.

The third and final implication for the study of risk communication is the idea that risk communication practitioners and researchers need to broaden their scope of research and understanding. As was noted in the method section of this study, the participants reported being a receiver for a variety of risk oriented messages that lay outside the traditional boundaries of risk communication about foodborne illnesses, nuclear energy, and pollution. While these areas need to be studied, studying how high school teachers communicate the risks of dangerous drugs can be useful for the furthering of risk communication theory and practice as well.

Conclusion

Risk communication as an area of interest to communication scholars is new only in term. Since researchers started studying persuasion, we have been studying how to persuade people about certain risks. While persuading people about the realities of risk are not new, the field of risk communication is primarily a non-communication scholar endeavor. Hopefully, this study and similar studies published in communication journals will gain a new following of researchers interested in the study of risk education and risk communication.

More importantly, risk communicators are often charged with the task of communicating to save lives. Why should meat be completely cooked? Why should a teenager not do drugs? Why should someone be worried about the use of pesticides in foods? All of these messages have the ability to decrease the incidence of morbidity and mortality surrounding their specific hazard. Additionally, all of these messages require the risk communicator to instruct her or his audience about the hazard in the most meaningful and persuasive way possible.

Author Notes

1. Scoring of the Risk Communicator Style Scale is completed by examining the two different factors separately. Each factor is scored individually. The participants were asked to respond to a series of Likert-type items from 1 = Strong Disagree to 5 = Strong Agree. The items on the technical factor of risk communication were coded so that the higher scores were given to those risk communicators who used the most scientific and statistical information while communicating risk messages. The items on the democratic factor of risk communication were coded so that the higher scores were given to those risk communicators who were the most concerned with their audience's perceptions, feelings, and involvement.
2. A possible limitation to this study occurred because of the September 11, 2001, national tragedy. The communication of possible terrorist acts after September 11th definitely influenced a good portion of the participants in this study. While the communication about future risks related to terrorist events clearly would fall under the scope of this project, there were probably a few participants who filled out the survey thinking about the crisis communication that occurred instead of the risk messages associated with potential future problems.

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