Y2K and the Construction of Risk Perception in Newspapers in Japan and the United States

by Akiko FUKUMOTO
Mary M. MEARES*

Abstract

This study explored cultural construction of risk perception of the Year 2000 problem using content analysis of Japanese and U.S. American newspapers. This study examines national cultural influences on Y2K risk perception, as well as the applicability of risk perception literature to the Y2K problem. Using four risk perception dimensions, responsibility, blame, control, and anticipated impact, 50 articles from a Japanese newspaper and 52 articles from a U.S. American newspaper were coded. Significant differences were found in coverage between the two newspapers. The Japanese newspaper attributed more responsibility for dealing with Y2K problems to its own government than the American newspaper. The Japanese had a greater proportion of coverage portraying Y2K problems as under control or controllable than the U.S. American newspaper, whereas the American newspaper had more background material not specifying control, impact or responsibility.

Introduction

Welcoming the year 2000 was a breathtaking moment for two reasons. For one reason, it was a beginning of a new millennium. Where to go and how to spend the night of December 31, 1999 was a topic of conversation among people worldwide. Major cities around the world held millennium events attracting participants estimated at approximately two million along the Thames River in London and over a million in Madison Square Garden in New York (*Yomiuri Shimbun*, 2000). Welcoming the first moment of the new millennium was an enjoyable, once-in-a-lifetime event. On the other hand, welcoming the year 2000 was like a judgment day; everyone was wondering whether the Year 2000 problem, or Y2K, would significantly influence our lives as anticipated.

* Akiko FUKUMOTO (Ph.D., University of New Mexico) is an assistant professor at Aichishukutoku University.

Mary M. MEARES (Ph.D., University of New Mexico) is an assistant professor at the Edward R. Murrow School of Communication at Washington State University, U.S. The authors would like to thank John G. Oetzel, Associate Professor, University of New Mexico, for his contributions to this paper. An earlier version of paper was originally presented at the Global Fusion conference in St. Louis, MO, US.

The Year 2000 problem, or Y2K, was a computer-related problem with the potential to have significant impact on our daily life. Engineers used to design computers to process the year with the last two digits only, omitting the first "19" so that extra space in computer memory could be utilized for other purposes. The year 2000 altered this data processing procedure into a new problem. A computer that processes data with only the last two digits is unable to recognize differences between the year 2000 and the year 1900. Nowadays, even an ordinary couple who does not own a computer relies on 72 computers on the average each day to lead their life normally (*MCMXCIX Lifestyle Video*, 1998).

The potential anticipated impact of Y2K varied in its significance. It could have been a mere inconvenience like a failure to record a TV program by VCR or a failure to project a map on a navigation system. It could also have been the disruption of lifeline forcing people to live without food, water, and electricity in the winter for days and weeks. Food manufacturers and distributors control their inventory with computers and utility companies manage supplies of water, gas, and electricity with computers. In the worst case scenario, the malfunction of military systems might have launched missiles accidentally as computers are used to plan missions for fighters and to manage the warning system of the U.S. Forces (Pear, 1999).

Fortunately, the global society averted the worst-case scenario. Even though several minor problems were reported in each country and the hot water supply stopped for 900 households in South Korea for a day, lifelines including gas, electricity, and water supplies remained normal overall ("No chaos," 2000). The Gardner Group, a computer research organization, predicted success in dealing with the Year 2000 problem on December 27, 1999 due to preparedness based on estimated spending of 300 to 600 billion dollars (U.S.) worldwide (Shimada, 2000). Although some experts still warned of possible bugs in computers and related problems toward the end of February 2000 or the 2000 fiscal year, risk management and prevention preparations conquered the Year 2000 problem (Shimada, 2000).

An important question remains. Did each country perceive and tackle the Y2K problem in the same way? Culture influences perception of risk and induces selective attention on certain aspects of reality. Douglas (1992) argues that risk is a cultural construction of reality. Accordingly, our major purpose in this study is to explore cultural influences of risk perception of Y2K. We decided to explore Y2K through newspapers across countries, because media influences individuals in their risk perception (Renn, Burns, Kasperson, Kasperson, & Slovic, 1992) and the rhetoric of risk defends a particular worldview (Dake, 1992). Accordingly, we will explore cultural construction of risk perception by media using content analysis.

Literature Review

This section reviews risk and risk perception, including the cultural influences on risk and level of agency for risk analysis, dimensions of risk perception, and uniqueness of Y2K.

Risk and Risk Perception

Risk involves two aspects: probability and impact. Dake defines risk as "the probability of an event occurring, combined with an accounting for the losses and gains that the event would represent if it came to pass" (1992: 22). Accordingly, risk involves assessment of those two aspects as to whether the probability of occurrence is significant and what levels of countermeasures are necessary considering cost and losses/gains.

Assessment of risk is not based on objective physical existence or risk or evidence present all the time. Rather, risk involves intersubjectivity. Risk perception is a cultural construction of reality (Dake, 1992; Douglas, 1992; Douglas & Wildavsky, 1982). It is filtered through "cultural lenses" that help people decide "what to select and magnify as a risk" (Dake, 1992: 33). An individual or a group of people selects what to attend to and constructs risk based on their perceptions. Culture influences those selective perceptions, and rhetoric in media and society reinforces them.

In the literature, there are different types of culture that influence risk perception, such as national culture (Kelinhesseling & Rosa, 1991; McDaniels & Gregory, 1991), gender (Fothergill, 1996), and occupation (Cvetkovich & Earle, 1992; Renn, Burns, Kasperson, Kasperson, & Slovic, 1992). Kelinhesseling and Rossa found that national culture, including sense of control, history, and attention on an issue in society, differentiated risk perceptions between U.S. American and Japanese students (1991). U.S. American students perceived drinking and smoking as more risky than Japanese students due to a high level of societal attention to those issues in the U.S. Japanese students perceived nuclear technology as more dreaded than American students due to their country's history during World War Ⅱ.

Gender is another cultural aspect that has been found to influence risk perception. Females tend to perceive risk more than males. Fothergill (1996) reviewed literature on risk perception, preparedness, and disaster. She found out that females tend to perceive risk more than males due to lack of control in society and that females tend to prepare more for possible disasters than males due to heightened risk perception.

Occupation is the other cultural aspect that differentiates risk perception. Authorities such as governments and experts tend to assess risk objectively based on physical and scientific data, such as impact and probability of an incident; whereas

members of the public assesses risk subjectively based on scale of exposure to themselves (Renn et al., 1992). Accordingly, Cvetkovich and Earle (1992) suggest that authorities need to address both objectivity as well as subjectivity for effective risk communication to the general public.

Reviewing research on risk perception research helps organize types of culture as well as factors that need to be considered for this research. Cvetkovich and Earle (1992) consider risk as a social issue involving influences of power resulting from structure of an organization and human perceptions. Accordingly, research needs to identify the level or structure of agent involved in a particular risk perception as well as dimensions of perception.

Considering the level of the agent is significant in risk perception research. Agents are the actors in decision-making based on perceptions of risk. McDaniels and Gregory (1991) propose a framework for cross-cultural research in risk and decision-making including the levels of agents involved and the research topics. The three levels of agents they identified are government, organization, and individual. The three major research topics for each level of agents include decision-making practices, financial risk behaviors, and physical risk behaviors including risk perception. In order to compare research in risk across cultures, the level of agents and topics of research need to be comparable. McDaniels and Gregory (1991) consider the level of agents as a significant issue since different organizations have different interests in dealing with risk and power in the enforcement of their decisions.

Dimensions of Risk Perception

Reviewing studies on risk and technological disaster illustrates several dimensions of risk. All of them overlap each other and yet are different somehow. Yamagishi et al. (1999) identify nine dimensions of risk including level of catastrophe, degree of emotional (calm or dread) in expression, severity of consequences, sense of control over the risk, voluntary nature of exposure, newness of the risk, scientific knowledge of the risk, immediacy, and level of publicity in society. William and Wong Wee Voon (1999) identify six dimensions of risk including outcome uncertainty, potential gains and losses, framing of risk and situation, personal involvement, perceived safety, and perceived control. Gill and Picou (1998) identify five unique features of technological disaster compared with natural disaster; blame and responsibility due to lost control, long term threat of exposure to health, contested degree of threat between plaintiff and defendant in a lawsuit, deterioration of social relationships due to lawsuits, and prolonged stress. These three studies identify several dimensions for analyzing or measuring risk or technological disaster based on the literature and some of them overlap. In order to identify appropriate dimensions for this study, the uniqueness of Y2K needs to be examined.

The Uniqueness of Y2K

The Year 2000 problem was different from previous crises, disasters, and environmental pollution problems in three ways. First, the range of impact could have been extremely broad, influencing all countries in the world. Due to the reliance on computers, most countries and organizations needed to take countermeasures to fix year data processing in computers. Otherwise, their nations and members could have suffered in a variety of ways. Unlike a natural disaster, which might have affected several countries simultaneously but not every continent, the broad impact of this disaster allows for comparison as to how different countries handled the same problem.

Second, the probability of the problem was 100 percent guaranteed. Unless countermeasures were taken, occurrences of corruption of data and chaos in public life would have been inescapable. Even before the year 2000, some minor problems occurred in the world. On July 11, 1997, a supermarket chain whose headquarters is located in Michigan filed the first Y2K related lawsuit against an office automation manufacturer (*The Sankei Shimbun*, 1997). Registers supplied by the manufacturer could not properly process credit card with expiration dates in 2000 and countermeasures taken by the manufacturer were slow. Without appropriate preparation, disruption of our lives was anticipated as definite.

Third, the deadline for a crisis was clear for the Year 2000 problem. Unlike other disasters or crises, people knew when Y2K was going to be a problem. It was like a time bomb. On a specific day, systems would start to dysfunction. Y2K was unique for its impact, probability, and deadline. Considering those three unique features of Y2K, the following four dimensions are relevant and significant to examine in this study.

Dimensions 1&2: Responsibility and Blame. Due to close relationship between these two dimensions, this section includes both responsibility and blame. Y2K is a human-made technological disaster. As Gill and Picou (1998) point out, a technological disaster involves identification of responsibility and blame for litigation against those who caused the disaster. Sue and Sue (1992) point out that worldviews have two dimensions: locus of responsibility and locus of control. Due to close relationship between rhetoric of risk and worldview as pointed out by Duke (1992), considering responsibility in this research is also reasonable.

According to Sue and Sue (1992), locus of responsibility (internal or external) and locus of control (internal or external) create four potential combinations (a 2x2 diagram). They categorize North Americans and Europeans as holding internal locus of control and internal locus of responsibility; whereas Asian-Americans are described as generally holding external locus of control and external locus of responsibility. In a culture (like the U.S.) where locus of responsibility is internal and division of labor is clear, boundaries of responsibility are also clear (Sakurai, 1998).

Sakurai contrasts the boundaries of responsibility between Americans and Japanese. The collectivistic decision-making style that is predominant in Japan blurs boundaries and locus of responsibility, whereas the individualistic culture in the U.S. maintains clear boundaries of responsibility. Such clear boundaries of responsibility can result in blaming when responsibility is not carried out. Accordingly, this study examines the following research questions:

RQ1: Did U.S. newspaper coverage of Y2K attribute responsibility for solving Y2K problems differently than Japanese coverage?

RQ2: Did U.S. newspaper coverage of Y2K attribute blame for the problem differently than Japanese coverage?

Dimension 3: Control. The third dimension is perceived control over situation or risk. Both Yamagishi et al. (1999) and William and Wong Wee Voon (1999) identify control as a dimension of risk perception. Yamagishi et al. (1999) define "control over risk" as the degree of avoidableness; William and Wong Wee Voon (1999) define perceived control as degree of controllableness over risk. Both of them commonly share sense of control over risk although their definitions are slightly different. Other studies illustrate the significance of controllability as a risk dimension. Fukumoto (1998) tested a scale of disaster beliefs and found that factors loaded by controllability over situation rather than agency or religious views such as fatalism. As previously described, Forthergill (1996) reviewed literature on gender, risk, and disaster and found that perceived control over situation and life differentiated risk perception across genders. Nishikawa, Balz, and Ferrari (1999) found that culture influence locus of control and that U.S. Americans scored significantly higher in internal locus of control than Japanese. Kelinhesseling and Rosa (1991) compared Japanese and North American university students and found that American students perceived less dread of contaminated food than Japanese students due to stronger sense of control over situation and choices of food. Accordingly, control influences risk perception and Americans hold a stronger sense of internal control than Japanese. Therefore, this third research question in this study is:

RQ3: Did U.S. newspaper coverage of Y2K express control over the year 2000 problem differently than that of Japanese newspaper coverage?

Dimension 4: Anticipated impact. The fourth and last dimension of risk perception is anticipated impact. Both Yamagishi et al. (1999) and William and Wong Wee Voon (1999) identify impact as a dimension of risk perception. Yamagishi et al.(1999) include three issues related to impact such as level of catastrophe, emotional tone in expression, severity of consequences. William and Wong Wee Voon (1999) include four issues related to perceived impact such as outcome uncertainty, potential gains and losses, perceived safety, and situational framing. Both of the studies include several dimensions related to impact anticipated.

In the literature, the perceived impact of technological risk differs between U.S. Americans and Japanese. Kelinhesseling and Rosa (1991) found that a

Japanese sample perceived technological risks of food contamination and nuclear weapons as more dreaded than a U.S. American sample. In contrast, McDaniels and Gregory (1991) predict from the literature that Japanese decision-making style based on consensus leads to lower perceptions of technological risk and that Japanese tend to place trust in the ability of industry and government to manage technological risk. Since Y2K is known for its risk and requires governmental as well as industrial actions to fix the wide array of problems, this study tested McDaniels and Gregory's view of perceived impacts. Accordingly, the fourth and last research question in this study is:

RQ4: Did Japanese newspaper coverage of Y2K express the anticipated impact of Y2K differently than American coverage?

Based on the literature review, the major purpose of this study is to examine the research questions on Y2K risk perception. The dimensions we will examine are responsibility, blame, control, and perceived impact.

Methods

To answer our research questions a content analysis was conducted using one newspaper from the United States, the *New York Times*, and one from Japan, the *Yomiuri Shimbun*. The units of analysis were the two newspapers and the units of observation were the articles in the newspapers.

The New York Times was founded in 1851 and is acknowledged as one of the media agenda setters in the United States and other parts of the world (Dearing and Rogers, 1986). It has the fourth largest circulation of any newspaper in the United States with an estimated daily circulation of 1,066,658 (Newspaper Association of America, 1999). Although there are newspapers with larger circulation (the *Wall Street Journal, USA Today*, and the *Los Angeles Times*), the *New York Times* is an elite newspaper, sold nationally and recognized for its leadership role. The search for *New York Times* articles was conducted using the Lexus-Nexus database, using the keywords "Y2K" and "Year 2000 Problem." A total of 706 articles between January 1997 (the earliest article that appeared in this newspaper) and December 31, 1999 included one of these terms. After December 31, the extent of the Y2K problem and its impact was known, and, therefore, no longer a matter of anticipation. Although there were additional articles that appeared in January 2000 and after, the focus of this study was risk perception so these articles were not included.

Yomiuri Newspaper Corporation was established in 1874. Its newspaper circulation is 10.2 million. It is the most widely circulated newspaper in the world. According to the Japan Audit Bureau of Circulation (the *Yomiuri Shimbun*, 2000), 22 percent of households in Japan subscribe to the *Yomiuri Shimbun*. The G-search Database Service, the self-claimed largest database site for business information

in the Japanese language, was used to locate and retrieve the articles. Although the *Yomiuri Shimbun* Company publishes an English version of their newspaper (the *Daily Yomiuri*) that is accessible through Lexus-Nexus, the researchers decided to analyze the Japanese version. The English version, although similar to the Japanese, included many fewer articles about Y2K. In addition, it is reasonable to believe that the audience may be one factor influencing editorial choices about what to include in each version. The audience for the English version includes expatriate English-speakers and tourists, as well as English-speaking Japanese, and therefore may be different from the Japanese edition.

The search for *Yomiuri Shimbun* articles on Y2K or the year 2000 problem resulted in a list of 1359 articles including four different local morning editions (Tokyo edition, Osaka edition, Chubu edition, Seibu edition) and the Tokyo evening edition. To be comparable to the *New York Times*, only the Tokyo morning edition was used. The total number of articles in the Tokyo morning edition between July 1, 1997 (the earliest available in the database) and December 31, 1999 was 616.

Because of the number of articles about Y2K in the two newspapers, every 10th article was sampled randomly for this study. However, some articles mentioned Y2K only in passing, so the designated articles were examined to determine their relevance. If the article was about another subject and only mentioned the Y2K problem in passing (for example, in reference to New Year's Eve plans or company stock prices), the next relevant article was chosen. A total of 50 *Yomiuri Shimbun* articles and 52 *New York Times* articles were analyzed.

The coding unit for this analysis was the sentence. An earlier pilot study revealed the complexity of coding larger units. Paragraphs often had sentences with contrasting categorizations. For this reason, Weber (1990) advocates using small units because of the difficulty in achieving high reliability with larger units. The sentence level, while still allowing for coding of the risk perception ideas presented, was a small enough unit that there was usually not conflict between the coding categories. Conversely, choice of a smaller unit would have given less insight into the risk perception themes that are the purpose of this study. Although useful, a word-by-word analysis would be an oversimplification in this case.

Coding

First, a coding scheme was developed based on the theoretical categories in the literature related to disaster and hazards. Each sentence was classified four times, based on four different dimensions of risk perception: responsibility for the Y2K problem, blame for the problem, control over the problem, and anticipated impact. The coding options and examples were compiled into a list for coder training and reference. In addition, a coding record sheet was developed to record coding decisions for each sentence and to summarize the articles.

The first dimension was responsibility, either directly or indirectly related to Y2K. Often responsibility was described in terms of who was taking action to solve the problems (or anticipated problems) or who *should be* taking those actions. The possible categories for this dimension included (1) "Own Government," (2) "Other Government," (3) "Corporate or Business," (4) "Individuals," or (5) "Not Applicable." "Own Government" included action taken by government officials in their government role (i.e. "aviation safety officials will fly on New Year's Eve"), government assessment of the Y2K situation, and implied action by the government. This includes government action at the federal, state, and local level, but is limited to government entities in the country where the newspaper is published. "Other Government" was similar in scope, but only used for actions taken by governments outside the country of the newspaper. The "corporation/business" option was used for actions recommended to businesses by governments and actions taken by businesses including those implied (even refusal to give details about actions taken). "Individual Actions," those actions taken by individuals and reflecting their responsibility for solving the problem, were a separate category. This included actions recommended to individuals by government or businesses (direct or implied), including statements like "Most computer problems can be fixed" (i.e. you should/ can fix it), "patches can be downloaded," "you can buy a repair program," and "if you have not yet checked your computer for potential problems, you should." The last category, "not applicable," was used when no action was needed or taken. Most often this applied to background information or the reasons for taking actions. It included statements of fact or past non-Y2K actions including statements like "about 1000 officers and supervisors make up the team," "officials have come up with a list of possible terrorist targets," and background like "Apple has a Y2K information web page (www.applecomputer.com)." This category would also include statements like "there are glitches" if stated without any indication if anyone should/can do anything about the problem.

The second dimension was blame for the Y2K problem. There were four potential blame categories: (1) "companies and manufacturers" of computer software and hardware, as well as their employees including programmers, (2) corporate "purchasers" of computer software, (3) "individual consumers," or (4) "no one." These categories were used for both direct and implied blame. The last category included any statements where no blame was implied or directly stated.

Control was the third coding dimension. This refers to whether the sentence says or implies that the Y2K problem could be controlled. Often this involved actions as well. Usually these were actions taken to "deal with" Y2K problems. These categories were (1) "will be able to control problems," (2) "problems already under control," (3) "uncertain control," (4) "out of control," and (5) "not applicable" for sentences that did not deal with control. The first option, "will be able to control

problems," was used for descriptions of work not yet completed, but with the implication that problems would or could be controlled in time to prevent problems. It included phrases like "will cause few, if any, disruptions," "has started to take actions" (in progress but not completed), "steps are being taken," and "can prevent problems." This category was used regardless of who was taking or recommending actions to fix the problems. It included recommendations to individuals to "buy a repair program," directions ("here's what to do:"), and implied recommendations like "can be downloaded" and "can be fixed." It also included government statements about emergency centers and personnel, including "they want units to be in place in case they are needed." This category was often, but not always, characterized by use of the present progressive tense or future tenses. The second category in this dimension was "already under control — don't worry." This category included action taken and/or completed specifically for Y2K (often described in the past tense). This included descriptions of computer repairs completed or computers replaced, as well as reassurances that things are ready or implied to be ready based on money/time spent on preparations. The category "uncertainty" was used when control over Y2K problems was uncertain. Examples of this include statements like "Russia lags in its Y2K fixes," "financial difficulties may prevent completion of Y2K fixes," "this is a potential disaster," or even statements that leave open the possibility of problems like "there are no *known* glitches." "Can't control" referred to situations that were described as being out of control or impossible to control. The fifth category for control was "Not applicable" or no actions. This category included descriptions of actions taken but not for Y2K, reasons for actions (with the actions described in other sentences), and background information ("they are trained to deal with demonstrations and other situations," i.e. part of their regular training, not specifically for Y2K situations). These sentences did not give any sense of whether control was anticipated.

The fourth dimension was "anticipated impact." Impact was measured as (1) life threatening, (2) inconvenient, (3) no impact, (4) uncertain, or (5) not applicable. Life threatening referred to any catastrophic impact, including the release of nuclear weapons. Inconvenient was used for minor anticipated impact, including statements like "Y2K will cause few, if any, disruptions." No impact was also used for statements like "everything will be fixed" (implying that there would be no impact) and statements explicitly saying nothing will happen. The "uncertain" category included statements like "we are taking security precautions" (implying they might be needed, but not certain), "word that riot teams would be on alert could be intended to deter inmates from engaging in demonstrations" (implies that there could be demonstrations, but not certain), and "we plan to monitor for potential problems." It also included statements directing individuals that "you should do x" (that implied that if you don't there may be problems) and ambiguous statements like "there are glitches in the Russian nuclear system." The fifth category, "not applicable," was

used primarily for background information about the problem ("older companies may have a BIOS that is unable to handle years after 1999") and statements with no mention of (or implication about) outcomes.

The current authors were the coders for this project. Training was carried out over a three week time period. The initial training consisted of discussion about the theoretical dimensions and potential newspaper statements that would represent each of the dimensions. The two coders then coded together several articles not included in the sample, with discussion about reasons for categorizing sentences in particular ways. For the second and third training sessions, coders were asked to code several articles on their own before the session. In the session, the coders compared their answers and discussed discrepancies to reach consensus about the categories. These examples were then added to the coding book for future reference during the coding. When both parties felt comfortable with the coding categories and had achieved a good understanding of appropriate reasons for category choices, they began independently coding the articles in the sample. Both coders coded 20 percent of the *New York Times* articles to check for coder consistency. Intercoder reliability using Cohen's kappa was .83.

Results

The research questions examined the effects of type of country on coverage of Y2K risk. MANOVA was used to answer each of the research questions. The independent variable was country (Japan or the United States). The dependent variables were the categorization of content based on responsibility, blame, control, and impact. To standardize the scores, the percentage of sentences in each article that fell into each of the categories was compared. The means and standard deviations for each newspaper are presented by dimension in Table 1.

First, responsibility for the Y2K problem was analyzed to answer the first research question. Bartlett's Test of Sphericity (701.26, df = 14, $p < .001$) indicated that a MANOVA was appropriate. The multivariate main effects of country on responsibility was significant (Wilks' lambda = .57, F [5, 95] = 14.11, $p < .001$). Two univariate effects were significant: "own government responsibility," F (1, 101) = 29.68, $p < .001$, $eta^2 = .23$, and "no action," F (1, 101) = 60.26, $p < .001$, $eta^2 = .38$. The three remaining univariate effects were not significant: "other government responsibility," F (1, 101) = 4.48, $p = ns$, power = .34; "corporate/business responsibility," F (1, 101) = 1.04, $p = ns$, power = .17; and "individual responsibility," F (1, 101) = .00, $p = ns$, power = .05. Comparison of means revealed that the Japanese newspaper had a greater proportion of responsibility placed on their own government as compared the United States newspaper. Comparison of means also revealed that the U.S. American newspaper had a greater proportion of Y2K coverage that did not designate anyone as responsible than the

Japanese newspaper. The answer to research question one is that the United States newspaper coverage did attribute responsibility for solving Y2K problems differently than the Japanese newspaper coverage, with less coverage of their own government's responsibility than the Japanese newspaper and more coverage that did not designate responsibility than the Japanese newspaper.

The second research question asked about the dimension of blame. Because of the few number of cases where any blame was attributed (n = 3), no difference in the attribution of blame was found.

Control over risk was the third dimension addressed in the research questions. Bartlett's Test of Sphericity (807.75, df = 14, $p < .001$) indicated that a MANOVA was appropriate. The multivariate main effects of country on control was significant (Wilks' lambda = .71, F [5, 96] = 7.82, $p < .001$). Three univariate effects for control were significant: "can control," F (1, 100) = 15.12, $p < .001$, eta2 = .13; "under control," F (1, 100) = 12.41, $p < .001$, eta2 = .11; and "not applicable," F (1, 100) = 26.07, $p < .001$, eta^2 = .21. The two remaining univariate effects were not significant: "can't control," F (1, 100) = .01, p = *ns,* power = .05, and "uncertainty," F (1, 100) = 1.71, p = *ns,* power = .25. Comparison of means revealed that the *Yomiuri Shimbun* had a higher proportion of both "can control" and "under control" than the *New York Times*. The *New York Times* had a larger proportion of coverage that did not involve control than the *Yomiuri Shimbun*. The answer to research question three is that the two country's newspapers did express control over the Year 2000 problem differently with the Japanese newspaper expressing more control over the problem than the United States newspaper.

The fourth research question asked about the dimension o*f* impact o*f* the Y2K problem. Bartlett's Test o*f* Sphericity (1122.87, df = 14, $p < .001$) indicated that a MANOVA was appropriate. The multivariate main effects o*f* country on impact was significant (Wilks' lambda = .61, F [5, 96] = 12.28, $p < .001$). Three univariate effects for impact were significant: "no impact," F (1, 100) = 25.54, $p <$ .001, eta^2 = .22; "uncertain impact," F (1, 100) = 8.01, $p < .01$, eta2 = .07; and "not applicable," F (1, 100) = 42.97, $p < .001$, eta^2 = .30. The two remaining univariate effects were not significant: "severe impact," F (1, 100) = 1.74, p = *ns,* power = .26, and "inconvenience," F (1, 100) = 3.69, p = *ns,* power = .48. Comparison o*f* means revealed that The *Yomiuri Shimbun* had a higher percentage o*f* coverage that portrayed impact as uncertain than the *New York Times*. The *Yomiuri Shimbun* also had a larger proportion o*f* articles that portrayed no impact than the *New York Times*. The *New York Times*, conversely, had a larger proportion o*f* coverage with no mention of impact than the *Yomiuri Shimbun*. Based on this analysis, the answer to the fourth research question was that the Japanese newspaper coverage did differ from U.S. American coverage in its portrayal of the anticipated impact of the year 2000 problem. The Japanese coverage expressed both uncertainty and confidence in a lack of impact more than the U.S. American coverage.

Discussion

The results of this study show that in three of the four analyzed risk perception dimensions, country made a difference in coverage of the Y2K problem. When the Japanese and the United States coverage was compared, differences were found in control over the problem, responsibility for solving the problem, and the anticipated impact of the problem.

Findings related to responsibility for the Y2K problem were somewhat different from what might have been expected in the literature. Although U.S. Americans have been described as having a more internal locus of responsibility, in the newspapers there was no significant difference in the responsibility attributed to individuals as might have been expected. This finding may have been due to the large proportion of U.S. background coverage. In the dimension of responsibility, as well as in those of control over the problem and Y2K impact, the United States newspaper had significantly more coverage in the categories labeled not applicable (i.e. where there was no mention of responsibility, control, or impact). Much of what was included in these categories was background material about the situation. This material is consistent with the literature that describes Americans as having more internal locus of control and locus of responsibility. They may want more background material in order to feel in control and able to make individual decisions based on knowing about the situation, rather than accepting outside (external) control and responsibility. The Japanese articles placed more responsibility on the government for solving Y2K problems. This is consistent with the literature and the concept of external locus of control. The Japanese may be more trusting of the government to take care of the problem for the citizens.

Perceived control over Y2K problems and their potential impact in the Japanese media was different from that of the U.S. American media and partially supports the concept of external locus of control. Messages in the Japanese media emphasized that the problem was under control or in the process of being controlled. This framing may have been a strategy on the part of the government to reduce anxiety about the Y2K issue, resulting in significant coverage anticipating no problematic impact. In spite of this, however, a large percentage of the Japanese articles reflect uncertainty about the impact, revealing a lingering concern about the problem. This may be in contrast with the feelings of trust and expectation that the government will solve the problem.

The fourth dimension, blame for Y2K problems, is an area that warrants additional study. Although little evidence for blame was discovered in the newspapers studied, additional media might give more evidence for blame attribution. In addition, investigations about the reasons for lack of blame attribution would be a valuable contribution to the literature. Some of the difficult in finding blame attribution in these articles might be specific to the nature of the Y2K problems.

The nature of the Y2K problem as both a human-made problem and as a problem shared by all countries provides some insight into the process of a potential risk being perceived as a risk. Unlike natural disasters or public health concerns (e.g., food poisoning), there was time to observe the unfolding and framing of a specific problem. As the problem was defined in the public, the media played an active role in contextualizing the concerns and potential outcomes. Theoretically, the current study can add to our understanding of risk perception and the media in other contexts. First, this study confirms the cultural nature of risk perception. While Y2K was a problem both in the United States and Japan, the risk was framed somewhat differently by the media in each nation. Second, while the current study does not provide causal data, the results support the connection between psychological dimensions of control (Sue & Sue, 1990) and cultural dimensions of risk. From a social constructionist perspective, this study also reinforces the role of media outlets that serve as structures that help to create and sustain a system of relationships (Giddens, 1984) that may encourage individuals to downplay potential disasters.

Limitations of the Current Study

One limitation of the current study is due to the nature of Y2K risk. As mentioned earlier, this was a very different type of potential catastrophe than other man-made or natural disasters. Y2K may have been perceived differently from other risks for this reason and as a result, the findings may not be applicable to other risks. However, due to increasing dependence on technology, there may be future risks that follow the patterns of Y2K. The current study also included analysis of only one type of media. Newspapers were an appropriate form of media to study for insight into our research questions; however, analysis of other media might give a fuller picture of the issue of Y2K risk perception.

Directions for Future Study

There are a number of potential directions for future study of Y2K and risk perception. One direction would be to study Y2K coverage after December 31, 1999. After this date, there was no longer an active risk, but the post-hoc public analysis of how the potential risk was handled might give additional insight into the cultural dimensions of risk. In addition, a study of agenda setting about Y2K could reveal themes related to risk in the two countries as the risk grew closer. Including other countries' newspapers in the study might expand understanding of locus of control and responsibility. Third, the analysis of Y2K might also be analyzed in contrast to a study of another potential risk to see if the assessment of different risks follows the same patterns. Finally, as media outlets become increasingly consolidated and the growth of the internet provides opportunities to access media

sources outside of their home country, study of potential changes in risk construction portrayal over time might provide insight into cultural change.

Although the Y2K problem is over and we have not experienced any major adverse effects, this potential crisis is an excellent case study to learn more about publicly expressed ideas about technological risk and construction of risk perceptions. Further studies of Y2K risk perceptions should include additional countries as well as other media sources to further develop understanding of this man-made risk. Differences between Japanese and U.S. portrayal of Y2K are valuable both because of their implications for our understanding of general cultural differences as well as differences in risk perception in the media.

References

CVETKOVICH, G., & EARLE, T. C. (1992). Environmental hazards and the public. *Journal of Social Issues*, 48(4), 1-20.

DAKE, K. (1992). "Myths of nature: Culture and the social construction of risk". *Journal of Social Issues*, 48 (4): 21-38.

DEARING, J. W. & ROGERS, R. M. (1996). *Agenda-setting*. Thousand Oaks, CA: Sage.

DOUGLAS, M. (1992). *Risk and blame: Essays in cultural theories*. New York: Routledge.

DOUGLAS, M. & WILDAVSKY, A. (1982). *Risk and culture : an essay on the selection of technical and environmental dangers*. Berkeley, CA: University of California Press.

The Sankei Shimbun (1997). "The first lawsuit in the U.S. related to the computer year 2000 problem". August 14: 4.

FOTHERGILL, A. (1996). "Gender, risk, and disaster." *International Journal of Mass Emergencies and Disasters*, 14, 33-56.

FUKUMOTO, A. (1998). *Disaster beliefs and self-construals*. Unpublished paper.

GIDDENS, A. (1984). *The constitution of society: Outline of the theory of structuration*. Cambridge: Polity Press.

GILL, D. A. & PICOU, S. S. (1998). "Technological disaster and chronic community stress". *Society & Natural Resources*, 11, 795-816.

KLEINHESSELINK, R. R. & ROSA, E. A. (1991). "Cognitive representation of risk perceptions: A comparison of Japanese and the United States". *Journal of Cross-Cultural Psychology*, 22, 11-28.

MCDANIELS, T. L., & GREGORY, R. S. (1991). A framework for structuring cross-cultural research in risk and decision making. *Journal of Cross-Cultural Psychology*, 22(1), 103-128.

MCMXCIX lifestyle video (Production company) (1998). *Y2K: The year 2000 problem*. [Film]. (Available from MCMXCIX lifestyle video, PO Box 473673, Charlotte, NC, 28247).

NEWSPAPER ASSOCIATION OF AMERICA (2000). Top 20 U.S. daily newspapers by circulation. Available: www.naa.org.

NISHIKAWA, A., BALSZ, C. G., & FERRARI, J.R. (1999). Age-related comparisons for ethnic identity by Japanese and Americans. *Psychological Reports*, 84, 862-864.

The Yomiuri Shimbun (2000). "No chaos in the world". January 3: 2.

PEAR, R. (1999). 92 percent of Federal computers ready for 2000. *The New York Times*, April 1: A 20.

RENN, O., BURNS, W. J., KASPERSON, J. X., KASPERSON, R. E., & SLOVIC, P. (1992). The social amplification of risk: Theoretical foundations and empirical applications. *Journal of Social Issues*, 48, 137-160.

ROBERTS, M. S. & BANTIMAROUDIS, P. (1997). Gatekeepers in international news: The Greek media. *Harvard International Journal of Press/Politics*, 2, 62-77.

SAKRUAI, N. (1998). *Jikosekinin towa nanika* [What does responsibility mean to Japanese?]. Kodansha gendaishinsho, 140. Tokyo:Kodansha.

SUE, D. W. & SUE, D. (1990). *Counseling the culturally different: Theory and practice* (2nd Ed.). New York: Wiley Interscience.

SHIMADA, N. (2000). "8.5 billion dollars (U.S.) spent in the U.S. for Y2K". *The Yomiuri Shimbun*. January 5: 17.

The Yomiuri Shimbun (2000). Available: http://www.yomiuri.co.jp/subscribe/index.htm.

WEBER, R. P. (1990). *Basic content analysis* (Sage University Paper Series on Quantitative Applications in the Social Sciences No. 07-004). Newbury Park, CA: Sage.

WILLIAMS, S. & WONG WEE VOON, Y. (1999). The effects of mood on managerial risk perceptions: Exploring affect and the dimensions of risk. *Journal of Social Psychology*, 139(3), 268-288.

YAMAGISHI, K., KITANO, M., MORINAGA, E., IWAMURA, T., MATSUBARA, T., & NAGAE, N. (1999). Perception of dioxin and other risks in Japan:

Replication and extension. *Perceptual and Motor Skills*, 88, 1009-1018.

The Yomiuri Shimbun (2000). "Y2K preparedness in foreign countries". January 1: 2.

Table 1: Percentage Means and Standard Deviations by Newspaper and Category of Article

	The Yomiuri Shimbun		*The New York Times*	
	M	*SD*	*M*	*SD*
Responsibility for Solving Y2K Problems				
Own Government	41.74	38.95	9.42	16.53
Other Government	.89	3.39	3.14	9.55
Corporate/Business	21.69	30.84	16.34	21.01
Individual	5.55	10.86	5.57	10.81
No One	29.38	24.11	65.62	22.80
Blame				
Manufacturer/Employees	1.00	7.07	.24	1.55
Purchasing Company	.00	.00	.00	.00
Individual	.00	.00	.00	.00
No Blame	99.00	7.07	99.76	1.53
Control Over Y2K Problems				
Can Control	31.30	31.71	12.37	14.77
Can't Control	.43	3.07	.38	1.26
Under Control	23.04	22.43	9.97	14.34
Uncertainty	11.67	20.48	16.65	17.92
Not Applicable	33.44	26.73	60.09	25.96
Impact				
Severe	.00	.00	.32	1.70
Inconvenient	.13	.94	1.12	3.52
No Impact	27.00	28.67	4.01	11.64
Uncertain	36.67	26.02	23.19	22.05
No mention	36.32	28.09	70.57	24.63