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This paper examines the role of the media in representing environmental risks to society, focusing on how environmental realities are constructed via the objectivist and subjective perspectives. This study explores the construction of reality centered on space exploration, namely, the Cassini space probe. In this study, 200 respondents were asked to read four news articles from various sources and comment on the information contained in the articles. Their comments addressed the extent to which the articles were useful in helping them assess their risk to potential plutonium exposure in the event of a launch disaster. A large majority of the respondents noted that while the information presented by newspaper coverage helped to provide insight, the news coverage often left more questions than answers. However, respondents also noted that the information was not sufficient to help draw specific conclusions about their risk of toxic exposure. Rather, this information was considered adequate for making a general assessment of potential environmental hazards in their immediate environment.

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This paper examines the role of the media in representing environmental risks to society, focusing on how environmental realities are constructed via the objectivist and subjective perspectives. This study explores the construction of reality centered on space exploration, namely, the Cassini space probe. In this study, 200 respondents were asked to read four news articles from various sources and comment on the information contained in the articles. Their comments addressed the extent to which the articles were useful in helping them assess their risk to potential plutonium exposure in the event of a launch disaster. A large majority of the respondents noted that while the information presented by newspaper coverage helped to provide insight, the news coverage often left more questions than answers. However, respondents also noted that the information was not sufficient to help draw specific conclusions about their risk of toxic exposure. Rather, this information was considered adequate for makeing a general assessment of potential environmental hazards in their immediate environment.

Introduction

Environmental reality is a consciousness about one's relationship with the physical surroundings. A view of reality, as presented by the mainstream televised or printed press, is used to form a perception of the natural world and help citizens actively engage in the material environment. As a result of the construction of an environmental reality, individuals are able to clearly pinpoint environmental hazards and evaluate their vulnerability to risks, relative to others, on an "internal scale" based on threats and fears of impacts due to toxic contamination. This reality guides our perceptions of the natural world. Those realities guided by an objectivist perspective may not consider the psychological or social impacts of harmful agents introduced into the environment. Thus, failure to include subjective perspectives in reporting constitutes a failure to capture a balanced perspective, which can ultimately lead to biased reporting by the media and inaccurate assessment of dangers in the environment by the community.

When Potential Costs Outweight Potential Benefits

The Cassini space probe was hailed as a human achievement that would reach the outer limits of space. In October, 1997, The National Aeronautical and Space Administration (NASA) launched the Cassini space probe which contained 72.3 pounds of plutonium-238. To date, Cassini represents the largest amount of plutonium the United States has tried to launch into outer space. Amid great protest from the neighboring communities of Cape Canaveral, Florida, NASA

virtually denied the existence of any health risks resulting from exposure to lowlevels of plutonium. This denial occured despite the 1995 Environmental Impact Statement (EIS), in which NASA conceded that accidents that can occur in the late launch stage of the launch will result in some release of plutonium fuel. Furthermore, "…all 'fly-by-orbit' accidents are expected to result in a 32% to 34% release of plutonium dioxide" (NASA EIS, June 1995).

Construction of the Cassini Mission from the Objectivist Perspective

Hannigan (1995) notes that most social scientists have skirted the notion of environmental risk because it reflects an enormous amount of uncertainty. Researchers prefer to deal with more "concrete" research problems instead of tackling the phenomenon of a socially constructed reality. Furthermore, an objectivist perspective assumes there is a knowable world which is ordered and structured. This assumption structures the questions and frames the findings in a manner that appears to leave no subjective interpretation. The expected answers to questions within this paradigm are usually deriveed by using a statistical probability. The objective reality of environmental degradation is usually determined via physical measurements. Using the objectivist perspective, qualitative information is lost and quantifiable phenomena are rarely understood by common citizens. The objectivist perspective cannot be dismissed; however, it must incorporate subjective realities. It is the citizen's intuitive approach that Spector and Kitsuse (1977) argue follows common sense.

The Construction of the Cassini Mission from a Subjective Perspective

The use of the constructionist's perspective as an analytic tool is quite useful for analysis of perceptions related to environmental risks. Questions from a subjective framework address how, why, or the seriousness of an event (Spector & Kitsuse, 1977). The constructionist perspective leads us to examine data which have always been thought to be relevant (see Becker, 1962; Bucher & Strauss, 1961; Freidson, 1970), but which have not attracted systematic attention from researchers (Spector & Kitsuse, 1977). The social constructionist perspective does not dismiss quantifiable data; rather, it includes this information in the overall explanation of reality. This perspective considers claims by citizen claims-makers and the claims-constructing process. Spector and Kitsuse (1977) argue that claims are complaints about the social conditions considered undesirable. Claims are asserted as social facts, prioritized, and organized into story. However, the constructionist view considers not only the claim but also basic facts shaping the claim, warrants or justifications of the claims, and conclusions (Hannigan, 1995). The claims-makers and the claims-constructing process are also vital parts of analysis which asks: Who is the claims-maker? Does he or she represent others? Finally, the claims-making process is essential because it allows us to answer the following questions: 1) Who has the right to make a claim? 2) Is the claim a respectable claim? 3) Who is competing for attention or forging alliances? (Hannigan, 1995). The data used by social constructionists document the development of claims and issues as they are defined, redefined, and passed from one set of participants and characters to another (Spector & Kitsuse, 1977).

Berger and Luckman note that "the world of everyday life is not only taken for granted as reality by ordinary members of a society in the subjectively meaningful conduct of their lives. It is a world that originates in their thoughts and actions, and it is maintained by these" (1966, pp. 19-

20). Thus, they argue that the first task of the social constructionist involves identifying objects a subjective meaning for people in a society. Just as there are multiple objects in society, there are multiple realities. Each object in the social system possesses a unique reality. Humans pass through different environmental realities; the objective experience of environment establishes the reality of life within the context of environmental risks. Transitions from a stable environment to an environment devastated by toxic contaminants cause a type of shock to the perceiver. The reality, once considered the norm, is no longer a valid reality. Multiple environmental realities emerge. "Among the multiple realities there is one that presents itself as par excellence. This is the reality of everyday life. Its privileged position entitles it to the designation of paramount reality" (Berger & Luckman, 1966, p. 21).

Construction of Events from the Media Perspective

Journalists define and redefine reality as a part of their everyday routine (Tuchman, 1978). Ideally, news reporting is a collaborative effort. Reporters negotiate with the sources to depict the "most accurate" story (Hannigan, 1995) by presenting as many angles of the incident as possible. This is not always the case. What the media chooses to represent as "true" can serve as a "millstone weighing down public decision making of environmental topics in a techno-bureaucratic discourse which excludes some interest and non-specific claims-makers" (Corbertt, 1993, p. 83). Gamason and Modiglianii (1989) assert that media constructionists look beyond the newsroom and focus on the process by which the news is constructed on the part of the journalist. The social constructionist approach centers around decoding media text, visual imagery, sound, language production, and other forms of communication (Gamason et al., 1992). Most analysis is accomplished by using frames. Frames (Goffman, 1974) allow us to organize events into social context to ground them in reality. Weber believes that humans create their own sets of circumstances and reality. Geertz highlights, "Believing with Max Weber, that man is an animal suspended in webs of significance he himself has spun, I take culture to be those webs" (1973, p. 5).

When the story context is defined, there is a social context for understanding the "media frame". The "media frame" organizes information; thus, the "media frame" allows consumers to address questions in the form of information organized within the structure of the arguments. The "'media frame' proceeds to ask and later answer the question, What is going on here?" (Benford, 1993, 678). The social constructionist is more interested in the entirety of the event. Often, to get to the hidden meaning researchers have to sift through "...a multiplicity of complex conceptual structures, many of them superimposed upon or knotted into one another..." (Geertz, 1973, p. 10).

Often, the evening news broadcasts and local printed media are the only basis for the interpersonal assessment of environmental risk in many communities. Generally, the media serves its community or wider public. The research of Noelle-Neumann (1981) shows that stories in the media act as a mirror, or a molder, of attitudes of a larger culture. The consumer must be prepared to ask questions and construct a logical sequence of events before concluding whether he or she can live within the environmental conditions.

Environmental Risk in Modern Society

Environmental risks are now at the forefront of the study of disasters. Researchers such as Erikson (1994) contend that the problems associated with environmental risks are more than the consequences of modernization, as Perrow (1992) suggests. However, for Erikson, society has entered an era where environmental disasters pose newly unforeseen risks with disastrous impacts. Beck (1992) maintains that risks in the late modern era are incalculable. Thus, in order for us to understand the essence of risk, citizens are forced to rely on "expert estimates." He notes that, "...the actual consequences [of environmental risks] remain more incalculable than ever" (Beck, 1992, p. 170). NASA claimed that if a catastrophic accident occurred and the Cassini probe incinerated in the atmosphere, it could cause 2,300 deaths over a fifty-year period. The exact wording of the report echoes the potential risks. In fact, NASA asserted that these deaths would be hard to find, "…statistically indistinguishable from the normally occurring cancer fatalities among the world population." In essence, all the potential risks in exploring the moons of Saturn pose an uncalculated risks to humans. These risks are considered a "new species of trouble" (Erikson, 1994), a new threat to the social order. Specifically, Cassini gives rise to the following assessment: "Am I willing to risk negative impacts and disruption to the way of life as I have defined life?" Considering the consequences is the only way Beck foresees society will be able to bridge the gap between estimating risk and understanding the impact of risk exposures. However, the problem lies in the fact that average citizens lack the highly specialized and esoteric knowledge needed to make decisions regarding environmental risk assessment (Irwin, 1995).

The Risk Society

Ulrich Beck's thesis concerning the age in which we live makes two general assertions. Beck (1992) notes that in advanced modernized societies the social production of wealth is accompanied by the social production of environmental risks. In an attempt to gain desired products in a more complex world, we build more complex machines. Thus, within mechanical systems, we build other mechanical components and add them to a structure already encumbered with risks. For example, the Cassini probe was launched into outer space atop a Titan IV rocket. The Titan IV has a greater than 5 percent failure rate (one huge failure in just 19 launches). Allowing such a launch not only signifies an acceptance of the risks associated with mechanical meltdown or fuel leakage of the Cassini, but society is also faced with hazards posed by both the Cassini and the Titan IV--risks imbedded in risks.

When deciding to expand our knowledge of outer space, we must also consider the consequences. All decisions to expand are associated with political, economic, and technology management factors. The interplay of the industrial, military and economic orders conceal natural security risks and hazards with respect to the socially desired goals enveloped in a risk-oriented society. A "good image" develops in the community and the wonderful benefits of development are asserted as the dominant paradigm. The social risk-to-benefit ratio is rarely, if ever, addressed. The central theme of Beck's work does not argue for a postmodern society; rather, it argues for a society entering a second modernity in which the logic of industrial production and distribution has become increasingly tied to the logic of the social production of risk. He notes as his thesis, "Just as modernization dissolved the structure of feudal society in the nineteenth century and produced the industrial society, modernization today is dissolving industrial society and another modernity is coming into being (Beck, 1992, p. 10). In the risk

society, class positions are referred to as risk positions. Beck develops implications for the concept of identity: "To put it bluntly, in class positions being [your place on the 'risk continuum' relative to others in your social group, class, or even society] determines consciousness, while in risk positions, conversely, consciousness [knowledge] determines being. Crucial for this is the type of knowledge, specifically the lack of personal experience and the dependence on knowledge, which surrounds all dimensions of defining hazards" (Beck, 1992, p. 53).

Behind a veneer of happiness, risk increases. Beck argues that at this moment in history, the risk society takes full form because risk is no longer seen as the dark side of opportunity; rather, risk is seen as an acceptable aspect of market opportunities. As the risk society develops, it places those who profit from risk at odds with those who suffer disproportionately from risks (Beck, 1992). There are different components of the risk society; in fact, "The risk society is in this sense also the science, media, and information society" (Beck, 1992, p. 46). Beck is quick to point out the importance of the media as an influential factor in the information society, presenting relevant issues and allows the general public to know the world. Every day different types of risks are presente. The media bring these facts into our living rooms via television for evaluation. This evaluation process helps us determine what level of environmental risk is acceptable.

Acceptable Environmental Risks in a Risk Society

Former Governor of the State of Washington, Dixy Lee Ray, once exclaimed: "Everybody is exposed to radiation...A little more or a little bit less is of no consequence" (Leiper, 1994). Beck (1992) calls such acceptance levels "phony tricks." There are no true, universally acceptable environmental risks that can be generalized to situations. Issues of acceptability are generally historically, lysocial, and geographically oriented to specific issues. Yes, there are general guidelines for specific elements, but there is no such level set for plutonium-238. Any such disaster as a result of fuel leakage, launch explosion, or during fly-by orbiting is said to positively cause environmental degradation and death. In essence, an acceptance level is an invitation to environmental harm. The acceptance level is nothing more than a blank check (Beck, 1992). The primary assumption of acceptance levels is an inherent danger that causes massive public harm if introduced. However, as long as the poisons are released in smaller amounts, then only a few of the disastrous effects will occur. The philosophical argument focuses on when we decided to allow any toxins at all into the environment. The notion of acceptability fulfills the function of a symbolic detoxification (Beck, 1992). Acceptable risk levels are symbolic tranquilizer pills against the mounting knowledge of toxins in the community.

Research Design and Methodology

This study evaluates the role of the media in effectively translating the risks of potential environmental dangers to the general public. To accomplish this task, four articles were selected from *The Miami Herald* (2 articles), *The Philadelphia Inquirer* (1 article) and *The Washington Post* (1 article). These articles were selected on the basis of their coverage of the Cassini mission. The sample size of 200 randomly selected students were asked to read and evaluate the four articles. A brief vignette was presented to the respondents describing the Cassini probe and the

nature of its mission. After reading the articles, the respondents were then asked to answer a series of questions regarding the information contained in the articles and to complete a questionnaire. In addition to the written questionnaire, a second face-to-face interview was conducted with all individuals responding to the open-ended questions and indicating their further willingness to participate in this investigation.

Key Findings

A clear consensus emerged: the information received from the separate news articles did not appear helpful in assessing the extent of possible disastrous impacts posed by the launch. Most often, respondents noted confusion after reading the articles, commenting: "They used numbers that were too confusing" or "I'm not even sure what plutonium - 238 is." Thus, the overall impression was that information in the articles would add little to the assessment of potential risks associated with the Cassini mission. Furthermore, adding to the confusion, the respondents noted that the articles were "written in an ambiguous manner." Thus, not only did the article provide little opportunity for the respondents to get information, but also 42% of the respondents report anxiety when attempting to translate some of the highly technical jargon in the articles. Furthermore, when asked whether the information in the newspaper answered their questions concerning the space probe, a large majority, 82%, said they strongly disagreed that the news reports answer their questions regarding the space mission. When asked whether the information provided in the articles answered their questions concerning the potential health risks, they either 17% disagreed or strongly disagreed that there was enough information to assist in their assessment of potential health consequences if a technology disaster occurred.

However, an overwhelming majority of the respondents indicated that the information in the newspaper coverage would be enough for them to reach a general assessment of the space mission's potential impacts rather than a specific assessment of the mission. Several respondents commented that: "I didn't need to know too much, but what I got was enough to know that this is some dangerous stuff." Other respondents supported this sentiment by commenting: "I can't understand the technical wording, but I can understand that a lot of people will die if an explosion occurred."

Summary and Conclusion

Traditionally, the mass media have been both thanked and blamed for many of the perceptions and beliefs held by members of the general public (Mehta, 1997). In terms of the processing of information, the media play a more vital role than simply providing bits of information. These news agencies set the agendas and construct public attitudes that encourage both consumption and perception formation of environmental risks.

In articulating stories to the public, the media are attempting to provide fragments of reality. In an attempt to assess reality, citizens assemble these fragments to construct an environmental reality. Citizens then place themselves on a continuum of risks (Beck, 1992). Using the news as a source of information provides a knowledge base for understanding one's own risks relative to others.

This study reveals that a majority of the respondents found the materials in the newspapers lacking adequate information to help them reach specific conclusions about the space mission. However, adequate information was provided to help them assess their threat of exposure to toxins in the event of a disaster.

There are two different modes of thought concerning how policy makers and the public determine what is dangerous and what should be done- the reductionist and precautionary perspectives. They are both used to some extent in the policy-making process. However, the public uses one perspective, while the other is used overwhelmingly by industry officials and policy makers (See Hannigan, 1995).

Proponents of the precautionary perspective, usually citizens, argue that scientists must look at substances in a holistic way; scientists cannot ignore interactions between the physical and social aspects of community life. Moreover, if citizens are not sure of the danger, then the substance should not be used (Hannigan, 1995, pp. 80-81) and exploration must not proceed. Citizens hold that if there is reason to suspect that a particular substance or practice endangers the environment or public health, then immediate action to prevent such impacts must be taken (Wynne & Meyer, 1993). Conversely, the reductionists argue that in conducting analysis, scientists should control for variation and look at individual substances separately. If there is no clear evidence of danger, then there should be no regulation. The scientific approach is commonly used when assessing environmental risks; it is the perspective commonly used by policy makers (Hannigan, 1995, pp. 80-81).

Several distinctions clearly separate these perspectives. The precautionary perspective relies heavily on the symbolic interpretation of previous events to understand the likelihood of future events. The precautionary view cannot provide statistical analysis of the likelihood that a problem will occur. In most cases, individuals are not necessarily sure if there will be damage; however, they use knowledge of other disasters and generalize those possibilities to their specific context. The socially constructed environmental reality forms the basis of action and interaction in the natural and social worlds; the perception and potential consequences of risks are real. It is this "unscientific" form of risk assessment that many following a reductionist line of inquiry consider unreliable or without expert authority.

Although advances in the social scientific study of community contamination is increasing, the precautionary principle remains unclear. As earlier noted, the precautionary principle connotes a warning of clear danger. However, there is far more to be considered when we view this perspective. The primary consideration rests in the expression of a number of social-demographic relationships vis-à-vis concepts such as perceived alienation and one's ability to construct one's own reality. In essence, the precautionary principle is about empowerment, fear, and threat of loss.

The more involved in the community's future, the less alienated one feels when confronted with impacts of toxins in the community. The precautionary principle allows individuals to assert their own beliefs and rally together with the one another to plan change. Often there are structural conditions, which cause subjective alienation. For example, disagreements between local, state, and national agencies may cause disagreements within the scientific community, and

corporate/political alliances which may overshadow community interests. Frequently, the interests of politicians fail to match the interests of their constituents' and alienation results when the entire process of shaping the community's future is left up to outside experts. When the interests of government and industry fail to match those of the community, residents are likely to perceive the government agency or company spokesperson as untrustworthy. When the "legitimate source" of information (e.g., scientific community or government officials) is deemed unreliable, the only source of information used to construct an environmental reality may come from sources in the media. Thus, the various media bear a responsibility to provide citizens with the information to not only help form global assessments concerning environmental issues, but also help citizens make specific assessments relative to environmental risks in their immediate environment.

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