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Risk Communication: A Cross-Cultural Dialogue

by

Christina Lindsay ©

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the requirements for the degree of Master of Arts.

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ABSTRACT

While many disciplines and fields of study have contributed solutions to the acknowledged problems with risk communication between experts and the public, considerations of the cultural aspects of such communication have, generally, been limited to ethnicity and nationality. Through a case study of the information used in personal health risk decision-making, this research uses an anthropological perspective to consider communication between experts and the public as a cross-cultural communication process. The concept of the cultural identity is used to recognize similarities and differences in information needs between and within the subcultures of experts and the various publics. Risk communication can then be designed which strengthens the areas of commonality and explicitly addresses the potential problems of the differences. Data was obtained through a series of focus groups held with volunteers from various publics. The results show that the participants are dissatisfied with the current health risk information communicated to them by experts, and need information that fits in with their personal knowledge and experiences, and is within the context of their everyday lives.

Keywords: risk communication; risk management; anthropology of risk; personal health risk; applied anthropology

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1. INTRODUCTION

THE ISSUES

There are acknowledged difficulties with the communication of risk, as with any other type of communication. Misunderstandings and disagreements frequently occur. The literature of risk studies, and particularly of risk communication, contains much advice, from several fields, as to how these problems might be overcome. Technical writers suggest using visual displays and writing clear headings; science communicators proclaim the use of plain language in explaining scientific concepts to the public; and from cognitive psychology come mental models, which represent how the public thinks about risk, to be used in determining the content of risk messages. Despite all these rules and guidelines for communication, problems still exist.

Risk communication is usually a one way monologue between experts and the public, with the public assigned the role of the passive audience. The information transmitted is usually scientific and technical information, with the intent to change the public's behaviour or to initiate a certain action. There are models of risk communication which propose a two way dialogue, but these do not generally offer practical suggestions of how to accomplish this.

There is general agreement that experts and the public do think about risk differently. However, examination of these differences has been limited to cognitive or social differences. There has been little consideration of cultural differences between these two groups; there has been even less consideration of any similarities which may also exist. The role of culture in risk studies so far has been primarily limited to considerations of nationality or ethnicity, rather than of subcultures or of worldview, beliefs and knowledge. Anthropology has more to offer, though, than considerations of culture. The anthropological perspective of context and the focus in anthropological research of talking to and observing people offer a fresh approach to the study of risk.

This chapter provides an overview of my research project. The issues surrounding the problems with risk communication are discussed to identify the focus of my research.

The main theories of the research project are presented, as are the larger context of the research and an overview of how the research was conducted. The final section of this chapter describes the organization of the thesis itself.

THE RESEARCH PROJECT – THEORY, CONTEXT AND PRACTICE

The research statement of this project is that risk communication between experts and the public should be considered to be a cross-cultural dialogue. The underlying premise that experts and the public are of distinct subcultures introduces an anthropological view to risk studies, which provides a different perspective for developing risk communications.

To discuss the subcultures of experts and the public, I introduce the concept of cultural identity, composed of many social and cultural elements such as education, socioeconomic status, gender, beliefs and knowledge. Recognizing similarities and differences in the cultural identities of groups, particularly of experts and the public, can aid in the design of risk communications by identifying potential problem areas – differences – and highlighting areas of strength – similarities.

I study one element of culture, that of information needs. I define information needs as the information, knowledge, experiences and beliefs that an individual wants to receive from, or to contribute to, a risk communication. Information needs are dynamic across situations, contexts and time, and are influenced by other cultural elements, both durable and transient, such as personal interest, knowledge, and even the role the person plays in the risk communication process. Identifying the information needs of the participants in the communication process, and incorporating them into the development of the risk message, will contribute towards the design of useful and effective risk communication.

Accepting experts and the public as being of distinct subcultures leads to the consideration of communication between them as cross-cultural communication – communication across groups, possibly subcultures of a larger culture, with differences in cultural elements. I was able to draw on theories and models from the fields of anthropology and communications research to develop a model that recognizes communication as a two way, interactive exchange of information between people of distinct subcultures. The inclusion of information needs in this model provides a framework both for identifying people's information needs and for including these needs in the risk communication process.

My research is part of an interdisciplinary project of the Eco-Research Chair in Environmental Risk Management at the University of Alberta. The project is to develop A Citizen's Guide to Health Risk in Canada (the Guide) – a publication which will provide access to reliable mortality information. The final format, content and audience for the Guide remain to be determined. Simon Thomas, a Civil Engineering graduate student, is compiling information, as part of his Masters thesis which will be available and suitable for inclusion in the Guide. The aim of the Guide is to assemble reliable mortality statistics into a readily accessible form and to explain the uncertainties in the studies or procedures which produce this information.

My involvement in the project arose from the questions of what kinds of mortality information should be given to the public and how this information should be presented. The question arose: is the information being considered for presentation, in terms of type and format, what the public needs. My research moves beyond the scope of the mortality information the interdisciplinary project is evaluating to consider what kinds of health risk information the public uses in making decisions about personal health risks. The results of the research will be used in the development of the Guide.

To identify the information needs of the public, I held a series of focus groups with members of the public who had volunteered to take part in this research project. The only criteria for participation was an interest in information about health risks. The focus groups were structured to provoke conversations at different levels of detail – there was a general discussion about health risk information, a review of health related articles from the local press, a review of specific health messages and an opportunity for the participants to design their own health risk communications. The results of these limited focus groups can not, of course, be extrapolated to the general public, but they do provide a range of, and context for, elements of information needs and an awareness of the limitations of the usefulness of scientific and technical risk information in people's decisions about personal health risks.

ORGANIZATION OF THE THESIS

There are 5 substantive sections to this thesis. Chapter 2 provides a review – in three parts – of the current literature on risk, culture and communication. The first part of the review examines the literature within the risk field and identifies its shortcomings; the second part reviews research from the fields of anthropology and intercultural communication to address these shortcomings; the final part brings together theories and models from the entire review to present the framework of risk communication as a cross-cultural communication process that is used in this research project.

Chapter 3 presents the research questions and details the research methods used. The experience of using focus groups as a qualitative research method is described and the methods used to analyse the data are also given.

Chapter 4 presents the analysis of the data obtained from the focus groups. The results from the general discussions and from the review of articles are organized into five categories. These are the source of the information, the kinds of information, credibility, presentation and decision making. The findings of the review of specific risk messages are presented in the context in which they arose, as are the risk messages designed by the participants. The final stage of the analysis identifies four themes which cross the categories of data, namely personal knowledge and experience, information within context(s), relevance and control and balance.

Chapter 5 is a discussion of the research. In the first part, the results of the data analysis are discussed with respect to the theories and models of the literature review and to the framework used for the research. The second part contains an evaluation of the utility of focus groups as a research method.

Chapter 6 contains the conclusions of this research project. Following a brief summary of the key points of the research is a discussion of what the research can add to the field of risk studies. The limitations of the research are then discussed. Recommendations are given for including in risk studies the findings of my research by amending an existing model of risk communication. Recommendations for the development of The Citizen's Guide to Health Risk in Canada are also detailed. The chapter ends with a brief overview of directions for future research.

2. RISK, CULTURE AND COMMUNICATION: A LITERATURE REVIEW

SCOPE AND FOCUS

The focus of this literature review is the social and cultural considerations of risk communication. Thus it examines risk communication as an inherently social process and investigates current research concerning the risk communication process. Two key questions have emerged – what is risk and what are the social and cultural dimensions identified with it?

A critical source of information regarding the field of risk studies is the *Journal of Risk Analysis*, a publication of the Society for Risk Analysis. Although risk studies are now an area of research in their own right, the field has drawn scholars from diverse disciplines. Although there is wide-spread agreement that there are social dimensions to risk, cultural considerations are primarily limited to cross-national comparisons of risk perception, risk management practices or risk communication. Anthropology, of all the disciplines, has focused the most intellectual attention on understanding the phenomenon of culture. Few anthropologists, however, are represented in the risk literature.

Rather than concentrating on the contribution of anthropology to the risk literature, therefore, it is necessary to focus on what anthropology *could* contribute. Cross-cultural communication studies provides a useful meeting point for this study of how anthropological studies of culture and cross-cultural communication can be combined with communications research. Theories of culture and cross-cultural communication in conjunction with models of risk and risk communication have been essential in the formulation of my research framework and a working hypothesis for field research.

THE DIMENSIONS OF RISK

Risk, from its origins around 3500BC, where it took the form of educated guesses about heavenly risks, through gaming theory in the seventeenth century which established risk as a probability, has emerged in the later part of this century as a wide-spread concern which affects our lives (Berger 1994; Covello, McCallum and Pavlova 1989). "No other society in history has been as sensitized to risks, dangers, and threats to life and limb as our own" (Laudan 1994, 1). Our society's concern is such that health and environmental risk has become a field of research in its own right. The concepts of risk in the field of environmental and health risk studies differ from our common and intuitive understanding of risk and the understanding of risk in such fields as finance and business. The views of risk and risk studies throughout this thesis refer to environmental and health risk, and show that the concept of these risks is a relatively recent cultural construct in our technological society.

The Concepts

Hrudey states "The need to adopt a common understanding of environmental risk terms is often overlooked because the terminology of risk has become so popular with society and among the technocracy" (1994, 1). Within risk studies, there is no single definition of risk. Dictionary definitions of risk include:

> **Risk**: noun **1.** hazard, danger: exposure to mischance or peril **2.** the chance or hazard of commercial loss, specifically in the case of insured property or goods. (Shorter Oxford Dictionary 1964).
> **Risk**: noun **1.** the possibility of loss, injury, disadvantage of destruction: contingency, peril or threat **2.** someone or something that creates or suggests a hazard or adverse change; a dangerous element or factor – often used with qualifiers to indicate the degree or kind of hazard (Websters Dictionary 1986).

Risk is usually associated with, and as a result of, technology and is considered to be harmful to human health and safety and to the environment (Morgan 1993). Unlike the business world in which it is possible to have a positive risk, in risk studies, risk always has adverse effects.

In the field of risk studies, both the quantitative and qualitative aspects of risk have always been recognized. The inaugural conference of the Society for Risk Analysis in 1981 was titled "The Analysis of Actual versus Perceived Risk." One of the earliest publications in the field (it appeared in Volume 1, Number 1 of the Society for Risk Analysis journal) claimed that rational decision-making requires a clear and quantitative way of expressing risk (Kaplan and Garrick 1981). The authors present ideas for a uniform conceptual and linguistic framework for "quantifying and making precise the notion of risk" (11). They define risk as the possibility of loss and hazard as the source of danger which can cause the loss. The qualitative aspects of risk are considered in that risk is subjective and relative to the observer. "Risk depends on what you do and what you know and what you do not know" (12). This leads to the idea of risk as a perception - perceived risk . Kaplan and Garrick challenge the term "perceived risk" as it suggests the existence of some other kind of risk - absolute risk. They state that absolute risk is always somebody else's perceived risk. However, Kaplan and Garrick state that there is a quantitative aspect to risk, which they present as a set of triplets in answer to three questions: what can go wrong? how likely is it to go wrong? and, if it does happen, what are the consequences?. Risk is thus probability and consequence. In this definition, probability is used in the subjectivist sense of a degree or belief or confidence, rather than in the objectivist view of frequency. This definition of quantitative risk includes the idea of the uncertainty in the number given for the probability, as the calculation is based on the current state of knowledge.

The quantitative definition of risk as presented by Kaplan and Garrick can be considered to be subjective in that it describes a state of knowledge. However, the authors consider the definition to be "absolute and objective" as, although it depends on the information available, any "[t]wo rational beings given the identical evidence must assess the risk identically" (22). This triplet of risk is used throughout the risk literature in discussions of quantitative risk. In considering toxicity and the human health risks of chemicals in the environment, risk can be defined as "the likelihood, or probability, that the toxic properties of a chemical will be produced in populations of individuals under their actual conditions of exposure" (Rodricks 1992, 48). Leiss and Chociolko (1994) consider risk to be the measure of both the hazard to health or the environment from exposure to a substance and the probability of its occurrence.

Actual risk, thus, is not an absolute measurement of risk, but is an estimate of potential loss. Actual risk is measured or, more correctly, estimated, by the scientific processes of risk assessment and analysis; this is generally the risk as referred to by scientists and risk experts. It is usually presented numerically, for example, 1 in 100,000. Kaplan and Garrick state that a single number is not a large enough concept to communicate the quantitative aspects of risk and should be used with caution.

From the beginning of risk studies, there has also been an awareness that there are some elements of risk which cannot be measured and quantified. However, this aspect of risk has been assigned varying levels of importance. As previously discussed, Kaplan and Garrick (1981) acknowledge that there are some qualitative considerations of risk, such as uncertainty and relativeness to the observer. Over time, the idea of the qualitative aspects of risk evolved into a recognition that not only were there aspects of risk which could not be measured, but that these aspects were subjective and dynamic, and differed extensively from the quantitative aspects of risk. This lead to the current widely-accepted belief that some elements of risk are objective and measurable and that others are subjective or perceived.

'Perceived' risk has come to refer to the public's (people who are not scientists nor experts) understanding of risk, and is qualitative and dependent on many social and cultural elements. People's perceptions of risk are 'intuitive risk judgements' which they rely on to characterize and evaluate hazardous activities and technologies (Slovic 1987, 280). A dichotomy of risk, actual versus perceived, was thus introduced to risk studies and gave rise to an equivalent dichotomy of 'expert' and 'public'. Risk assessment, based on science, measures (estimates) actual risk; to examine perceived risk, risk perception has become a field of research in its own right. "When popular attitudes and understanding about risk diverged appreciably from the predictions and explanations of experts, policy makers became attentive to the social dimensions of risk" (Krimsky 1992, 5).

Sandman's work (1991) continues the dichotomy of actual and perceived risk, although his "Risk = Hazard + Outrage" formula brings them together as complementary elements of risk, rather than opposed. Hazard is the estimated risk assessment from risk analysis and outrage is everything that is relevant to a layperson about risk, except how likely it is to be harmful. Expert risk assessment (actual risk) focuses on hazard and public risk assessments (perceived risk) are a product of outrage. Outrage itself consists of a series of dichotomous components of risk including voluntary/involuntary, familiar/exotic, dreaded/not dreaded, fair/not fair and under individual's control/outside one's control. Sandman claims that efforts to explain the hazard part of risk are unlikely to succeed as long as outrage is high, and so risk managers must decrease the public concern about small hazards by working to decrease the outrage.

The work of both Slovic and Sandman is cited extensively in the risk literature, thus preserving both the dichotomy of a measurable risk in opposition to a subjective view of risk, and the idea of actual risk or hazard as being the true risk. Fisher states that the term outrage "has drawn attention to the complexity of risk perceptions and judgements, but it seems to have reinforced many scientists' notion that these other risk dimensions reflect only emotion and irrationality" (Fisher 1991, 175). However, Otway and Wynne (1989) state that risk perception research has provided some general, valuable insights to risk studies. One such insight is that risk *is* defined differently by laypeople and experts and that "it is perfectly normal and rational for people to view technologies and risk in terms of how their lives are affected, that there is no 'right' definition of risk" (141).

Recently, there has been movement to reconcile these two opposing views of risk. Cvetkovich and Earle (1992) call for the integration of the objectivist view that risk is only a physical characteristic, with the constructivist view that risk assessment reflects human judgements which are influenced by psychological and social factors. However, the two views of risk may not be as disparate as indicated. Slovic (1987) claims that risk perceptions can be measured and quantified. He introduced the psychometric paradigm to elicit and quantify public perceptions of the risk of chemicals on human health. People's perceptions of risk are plotted on a graph, one axis of which is the measurement of dread (controllable risk vs uncontrollable risk) and the other axis is known (observable risk vs non-observable risk). By plotting a point for each specific risk, a scatter diagram is produced, showing groupings of risks in each of four quadrants. Slovic's studies show that, using this model, perceived risk is quantifiable and predictable.

The objectivity of actual risk is challenged by several scholars in the risk field. Fischhoff (1989) argues that there is no conflict between actual and perceived risk because, although actual risk does exist, no one knows what it is. He states that everything we know about risk is a perception: actual risk evaluations (e.g., one in a million) contain some element of judgement on the part of the scientists who produce them. The conflict is really between two sets of risk perceptions: those of the "scientists performing within their area of expertise and those of everyone else" (270). Bradbury (1989) terms this the "social constructivist" view of risk. This view emphasizes that the process of risk identification and risk evaluation cannot be value-free, as the scientists' judgement involves the balancing of conflicting evidence. The possibility of a standard of absolute risk is explicitly denied. In acknowledging that all risks are perceived, these definitions remove the dichotomy of actual and perceived risk and the concept of an absolute risk. The view that all risks are perceived, however, does not lend itself to practical application in risk assessment, risk management and risk communication. This is addressed by Hrudey and Light.

In considering environmental risk, Hrudey and Light (1996, 3) use the term "real risk" rather than actual or absolute risk, and state that the claim that all risks are perceived may appear to "discount the importance or the existence of observable realities in nature." The authors recognize that risk is subjective and cannot be measured in any direct or tangible sense. However, they state that risk does have real components - hazard, consequences and time frame - which are observable and measurable. The composite concept of risk is not real, but is inferred from the real components by using "some combination of theory, empirical observation, analysis of evidence, experience and intuition" (5). Hrudey and Light suggest the use of "inferred risk" rather than perceived risk to reflect the inductive logic used in obtaining the risk estimate.

While this definition of risk removes the dichotomy between actual and perceived risk in a way that has practical use, it does not address the issue of the uncertainties inherent in the real components. Although hazard, consequences and timeframe are observable and measurable, the measurements of these components are not necessarily absolute or actual. These measurements, as are any others in the scientific world, are based on the best available knowledge, skills and technology. Judgements and values, such as what timeframe to consider, how to define the hazard and whether funding is available to develop the technology to perform more detailed measurements, will influence the measurements obtained. The concept of inferred risk is useful in that it emphasizes that risk, as a concept, is subjective. However, it should also be acknowledged that even the 'real' components of risk are in themselves estimates of reality. With this acknowledgement, the real components of risk provide a reliable basis from which to infer risk.

The above discussions show how terminology is important when considering risk. Throughout the discussion of the risk literature in this chapter, I continue the widely practised use of "actual risk" to refer to the risk as measured in the risk assessment process and "perceived risk" to refer to the public's view of risk.

Social and Cultural Dimensions

Although the dichotomous definitions of risk still persist, the acceptance of perceived risk has introduced considerations of social and cultural dimensions to the study of risk. "Risk, although it has its roots in nature, is inevitably subject to social processes" (Krimsky 1992, 5). It is useful here to distinguish between culture and society, two terms which I use extensively throughout this thesis. Culture, within anthropology, lacks a single widely accepted definition. For this review of the risk literature, I use a broad definition of culture, to show as many of the various cultural considerations within the risk field as possible. The concept of culture is addressed in more detail later in this chapter.

A common current textbook definition of culture states that culture is the "customary manner in which human groups learn to organize their behaviour and thought in relation to their environment" (Howard 1993, 17; Keesing 1981). There are three aspects to such a definition of culture: behavioural - how people act and interact with each other; cognitive - the views people have of the world; and material - the physical objects that people produce and use. Society, or social systems, is the pattern of social interaction itself, an "ongoing process of interactive behaviour, whose persistent form we call social structure; an actual existing network of social relations" (Geertz 1973, 144).

There is an extensive body of research on the social dimensions of risk. The issues addressed by social theorists include risk and cultural theory (Rayner 1992), the concepts of risk (Renn 1992), and risk and knowledge (Wynne 1992). A major contribution of the social sciences to risk studies has been the recognition that risk is not an independent, context-free construct but that it exists as part of complex social processes. Leiss and Chocliolko (1994) define risk in the standard way of hazard plus exposure, but add a statement that technology is usually deliberately induced by some social actor to realize an incremental net benefit.

There are many contexts of risk. The unifying thread is that risk is not an independent, stand-alone concept: information about risk cannot, and should not, be developed and communicated without concern for the surrounding social world. In spite of this awareness, some risk information is still presented as context-independent data. The Book of Risks (Laudan 1994) is an attempt to put the risks of everyday life in perspective . Laudan presents pages and pages of risks as numbers, organized into such categories as travel risks (the odds that an aircraft will fall on you and kill you sometime this year is 1 in 25,000,000), risk of crime (the risk that a man will end up in prison sometime in his life is 1 in 40), and risk of sin (alcohol is implicated in 44% of accidental deaths). The data and calculations which support the numbers are not explained and the sources listed in the back of the book are not cross-referenced to the data provided.

A narrow idea of context is found in Fischhoff's (1990) recommendations for how long-term environmental risk data are created and presented. He calls for knowledge of all significant issues surrounding the risk to be developed, and for the presentation of all basic issues relevant to managing a risk before the presentation of the details. However, this context is limited to the scientific and technical domain. Kasperson and Palmlund (1987) recommend similar types of contextual information. These include comparisons with other risks, with the benefits of the activity or technology, of ways in which the risk can be reduced and the resources required to do so.

The social context of knowledge is discussed by several scholars. There is agreement that what people know about risk is conditioned by background facts. How people interpret a given set of facts about risk depends on many factors, including trust in the information provider, their organizational affiliations, their prior experience with similar risk situations and their power to influence the source of the risk (Jasanoff 1993). Cultural theory argues that risks are defined, perceived and managed according to principles that adhere in particular forms of social organizations (Rayner 1992). In his study of communicating scientific information to sheep farmers in Northern England about the nuclear fall-out from Chernobyl, Wynne (1991b) compares the formal and rigid system of knowledge of science to the informal and flexible system of knowledge of the farmers, and addresses issues of trust and credibility. He looks at knowledge of risk in these different contexts and shows that situational knowledge can be used to supplement scientific knowledge.

There has been some consideration of the cultural contexts, in an anthropological sense, of risk. Research which has explicitly considered culture has primarily been concerned with national or ethnic studies and comparisons. Jianguang (1994) examined the Chinese public's perceptions of natural environmental hazard risks. He concludes that Chinese perceptions of risk are similar to those of Europeans and North Americans but that different characteristics are observed. Jasanoff (1993, 29) states that cultural (i.e., national) variation in the political process "not only appears to influence the way decision-makers select among competing interpretations of data but also their methods of regulatory analysis and their techniques for coping with scientific uncertainty." One result of this is that evidence sufficient to trigger action in one country may fail to do so in another. She contrasts risk assessment in Great Britain and the United States and suggests that the differences found are the product of the different political processes. Covello and Kawamura (1988) draw similar conclusions in their comparison of the environmental risk management approaches in Japan to those in the United States. They conclude that the Japanese approach is largely based on a cooperative model of risk management with a strong emphasis on negotiation and consensus building. The American model is confrontational with a strong emphasis on rigourous scientific analysis and open adversarial processes.

A few scholars have explicitly considered other concepts of culture. Early in the study of risk, Douglas and Wildavsky (1983) proposed that risk is a culturally constructed phenomenon, rather than a physical entity which exists independently. People's ideas about the world, including perceptions of risk, come from human experience, but the experience differs among groups. Different forms of social organization influence the way we take or avoid risks. Risk perception is, thus, a social and cultural process. Concentrating in the area of environmental risk assessment, they identified concerns that have appeared in later works: that risk judgements are essentially social and cultural, rather than scientific and that scientists are as divided on the issue of risk as are the public.

Anthropologists and sociologists have suggested that social responses to risk are determined by cultural belief patterns (Renn 1992). These belief patterns shape the cognition of individuals and social organizations to adopt certain values and to reject others, which, in turn, influence the perception of risk and benefits. Renn's view is supported by Vaughan and Seifert (1992, 119) who state that "individuals vary not only in policy preferences and responses to environmental hazards but also in underlying belief and value systems that influence several aspects of the environmental decision-making process." Drawing on the anthropological work of Douglas, Dake (1992b) compares cultural biases — shared values and beliefs — to contemporary world views — a person's way of responding to controversies over science and technology. Using cultural theory, he argues that these two dispositions are compatible and guide the perception of risk at both the individual and collective levels.

Various surveys have been conducted to elicit worldviews, attitudes and opinions about health risks of risk experts, scientists and the public. Kraus, Malmfors and Slovic (1992) conducted a survey in the United States in which members of the Society of Toxicologists and the public were questioned about basic toxicology concepts, assumptions and interpretations such as dose-response relationships and attitudes towards chemicals. The study showed large differences between the toxicologists and the laypeople, and differences between toxicologists working in academia, industry and government. This study was replicated and extended in Canada and was motivated by the premise that different assumptions, conceptions and values underlie much of the discrepancy between expert and lay views of chemical risks (Slovic, Malmfors, Krewski, Mertz, Neil and Bartlett 1995). The respondents in the survey were questioned directly about their worldviews or orienting dispositions, categorized as hierarchy, egalitarian, fatalism and individualism. This survey also found differences between the public and the toxicologists, and found that the technical judgements of toxicologists were associated with their affiliation (industry, government or academia), their gender and their worldviews. A similar study based on that of Slovic et al., but directed only at the general public, was carried out in Alberta, Canada (Jardine, Krahn and Hrudey 1995). Questions were related to health risks and were asked about attitudes, opinions, worldviews, knowledge and beliefs. The results of the Alberta survey supported the results of the other surveys.

Plough and Krimsky (1987) criticize the current wave of risk communication research for preserving the dichotomy between expert judgement of risk and lay perception of risk. They ascribe this dichotomy to the practice of using opposing, isolated cultural elements to distinguish actual and perceived risk (e.g., voluntary/involuntary). To oppose the current technical rationality of risk studies, they argue for a concept of cultural rationality in which risks are personalized, focused on particularity and appeal to folk wisdom. While technical and cultural rationality are presented as a dichotomy, ironically in contradiction to the authors' criticism of the risk literature, the elements within show the differences in the consideration of risk within each context. Figure 1 shows the elements of technical and cultural rationality.

Technical rationality	Cultural rationality
Trust in scientific methods, explanations; evidence	Trust in political culture and democratic process
Appeal to authority and expertise	Appeal to folk wisdom, peer groups and traditions
Boundaries of analysis are narrow and reductionist	Boundaries of analysis are broad; include the use of analogy and historical precedent
Risks are depersonalized	Risks are personalized
Emphasis on statistical variation and probability	Emphasis on the impact of risk on the family and community
Appeal to consistency and universality; risk independent of context	Focus on particularity; less concerned about consistency of approach
Where there is controversy in science, resolution follows status	Popular responses to scientific differences do not follow the prestige principle
Those impacts that cannot be uttered are irrelevant	Unanticipated or unarticulated risks are relevant

Figure 1 Technical and Cultural Rationality of Risk (Plough and Krimsky 1987)

Considerations of culture may be implied rather than considered explicitly. In his work on risk communication with the National Research Council, Fischhoff (1989) states that the risk communication is one component of a complex social process which involves individuals. He looks at social dimensions of risk communication but cultural considerations are implied. Fischhoff states that experts and the public are speaking different languages, are solving different problems or even disagreeing as to whether there is a problem, see the facts differently, and disagree over what is feasible in setting priorities and comparing risks. These differences can be considered to be cultural differences of language and worldview, and are discussed below.

Acknowledging that there is no single accepted definition of risk and understanding the different concepts and elements of risk is crucial to examining the processes of risk – risk assessment, risk management and risk communication. These processes use different views of risk and often fail to make these differences explicit.

RISK PROCESSES – AN OVERVIEW

Risk assessment and risk communication, mentioned in the section above, require explanation. I provide here a very brief overview of the processes discussed in the risk literature, primarily to situate risk communication as a risk process. There is no widely accepted term for the entire process of dealing with risk, although risk management is sometimes used. I have broken the process down into risk assessment, risk management and risk communication. Although this categorization is commonly used, there are many disagreements about the boundaries of each process, the responsibility for them, and when they should be performed.

The "Red Book" (National Research Council 1983) was instrumental in establishing widely accepted definitions for the processes of risk assessment and risk management. *Risk assessment* is the "use of the factual base to define the health hazards of exposure of individuals and populations to hazardous materials and situations" (3). Risk assessments may contain processes of hazard identification, dose-response assessment, exposure assessment and risk characterization. This definition encompasses more than the quantitative measurement of risk by including qualitative expressions of risk such as "summary judgements on the existence and overall magnitude of the public health problem" (18). However, the definition does not include analysis of perceived risk.

There is general agreement that risk assessment attempts to bring together all available scientific information to provide scientific estimates of health and environmental risks (Leiss and Chocliolko 1994; Rodricks 1992; Morgan 1993). The information may include estimates of risks and of uncertainties in measurements, and descriptions of analytical techniques and interpretive models (National Research Council 1989). Risk assessments present a numerical estimate of the likelihood of an effect.

The Red Book defines *risk management* as the process of "weighing policy alternatives and selecting the most appropriate regulatory action, integrating the results of risk assessments with engineering data and with social, economic and political concerns to reach a decision" (3). Risk management has been identified with other forms of management in that it is concerned with the distribution of current resources to shape some desirable future state (Ruckleshaus 1990). The National Research Council applies this concept to the management of risk. "The evaluation of alternative risk control actions, selection among them (including doing nothing), and their implementation" (National Research Council 1989, 322). This is sometimes expanded to include the monitoring and evaluation of the effectiveness of the process (Leiss and Chociolko 1994).

How this is translated into practice seems to depend on where a person, or more commonly, an agency stands. Ruckleshaus in his position as ex-head of the Environmental Protection Agency interprets this as adjusting environmental policies "to obtain the array of social goods – environmental, health-related, social, economic and psychological – that forms our vision of how we want the world to be" (Rodricks 1992, 222). In studying the human health risks of chemicals in the environment, Rodricks interprets risk management to be the "process where decisions are made about whether an assessed risk needs to be reduced to protect the public health, and the means that should be used to achieve the desired reduction" (1992, 182). Morgan (1990) identifies four important institutional structures that have evolved to implement risk management procedures: tort and common law, insurance, voluntary standard-setting organizations and mandatory government stands and regulations. Risk management is usually discussed as the task of an agency or organization to manage risks on behalf of society, or at least segments of the population.

Risk communication can encompass most forms of communication within the process of risk assessment and risk management, though it is commonly used to refer to communication of risk messages from risk experts to the public. The communication of risk information is often treated as a subsidiary activity of risk management and not integrated throughout the whole risk process. "What most risk management models chiefly lack is any indication as to where and how communication flows – especially communication between the agency and the public – are supposed to occur during the risk management process" (Leiss and Chociolko 1994, 45). There is an extensive body of literature concerning risk communication, which I now review in detail.

RISK COMMUNICATION

The risk literature acknowledges that the communication of risks, of any kind, is fraught with misunderstandings and disagreements. Not only has research been conducted to identify these problems, but there are also scores, if not hundreds, of publications drawn from different disciplines, offering solutions, ranging from how to design visual displays to modelling how the public thinks about risk. In this section, risk communication is examined as a social and cultural process. The goals and objectives of risk communication, who is communicating, how the communication takes place and what to communicate are discussed. The question of why risk communication is difficult is then addressed. The critique of the risk literature is placed at the end of this section, rather than throughout the discussions. The elements of risk communication are intertwined and interdependent, and a full critique cannot deal with each element in isolation.

Goals of Risk Communication

The goal, or objective, of any risk communication is key to the design and development of both the risk message and the communication process (National Research Council 1989). As such, establishing the goal should be the first step in the risk communication process, as this will strongly determine who is communicating what to whom and how. Within the literature, the objectives of risk communication are often discussed in general terms such as "help achieve understanding by the public" (Johnson and Petcovic 1987, 355), and communicating information and educating the public (Mileti and Fitzpatrick 1992). However, I found explicit consideration of goals and objectives within the (limited) literature dealing with the evaluation of risk communications. To evaluate the effects of a communication, the goals of that communication must be known. Fischhoff (1989) gives four goals of risk communication: to inform and to educate; to invoke behaviour; disaster warnings and emergency information; and for joint problem solving and conflict resolution. These goals, in one form or another, are generally agreed upon in the literature.

Information and education is to advance knowledge and understanding about risk issues in general (Rohrmann 1992; Rowan 1991a). More specifically, it can be to better educate the public about risks, risk assessment and risk management and to educate them about specific risks and the actions taken to alleviate them (Keeney and von Winterfedlt 1986). Risk communication will be "most successful and efficient when it is directed towards correcting those knowledge gaps and misconceptions that are most critical to the decisions people face" (Read, Bostrom, Morgan, Fischhoff and Smuts (1994, 971).

To change behaviour, of an individual or of society, is a frequent goal of risk communication. McGregor, Slovic and Morgan (1994) evaluate a brochure designed to communicate, from a scientific perspective, information about health risks from electromagnetic (EMF) fields. The goal of this risk message is to change people's beliefs about EMF and, consequently, their behaviour. The encouragement of personal risk reduction measures may be the direct goal of risk communication (Keeney and von Winterfedlt 1986; Rohrmann 1992; Rowan 1991a) in contrast to the goal of just providing information which *may* influence behaviour change. To change behaviour is a difficult task which requires the recipients of the information "to not only understand the message but also to accept it as relevant to their personal circumstances" (Fischhoff, Bostrom and Quadrel 1993, 199).

Motivating action in emergencies (Rowan 1991a) and giving warnings of disaster are straightforward goals with few alternative interpretations. This goal is usually a combination of the first two. For example, the Seveso directive in Europe requires that "the public likely to be affected by an accident must be informed on the nature of the risk and on the best way to act in the event of an accident" (Eijndhoven, Weterings, Worrell, de Boer, van der Plight and Stallen 1994, 87).

Fischhoff's fourth goal of joint problem solving and conflict resolution does have several different variations in the literature. Keeney and von Winterfeldt's goals of increasing mutual trust and credibility and of resolving conflicts and controversy corresponds to Fischhoff's goal. In contrast, however, so does "gaining agreement" (Rowan 1991a, 309) and "[determining] a range where a lack of consensus prevails as to the acceptability of the risk" (Kasperson and Palmlund 1987, 155). Rohrmann's (1992) goal of facilitating cooperative conflict resolution supports Fischhoff's discussion that joint problem solving involves the public in resolving health, safety and environmental controversies.

Several additional goals are discussed in the risk evaluation literature. For risk communication initiated by the government, one of the goals presented is "to persuade those concerned that the actions decided on by the government are appropriate and equitable" (Kasperson and Palmlund 1987, 144). Keeney and von Winterfeldt (1986, 421) provide one of the few goals associated with gaining rather than disseminating information, "Improving the understanding of public values and concerns."

The goals of risk communication are determined, if they are defined at all, by those initiating the communication. The goals refer to what those people want to accomplish and will be judged, again if at all, against the standards they set. *There is very little consideration of what the goals of the audience, with respect to the risk communication, may be*. The overall risk communication goal of the National Research Council (1989) is one of the few to consider the needs of more than those who provide the information. The Council determines success in risk communication as "the extent to which it raises the level of understanding of relevant issues or actions, and satisfies those involved that they are adequately informed within the limits of the available knowledge" (26).

When considering or determining the goals of a risk communication, ethical considerations of the communication must be addressed. Morgan and Lave (1990) state that the goals of risk communication can be overt or covert, and the risk communicators may not even care how the information is used. They suggest that ethical problems can arise when there is a mismatch between the objectives of the communicators and of the recipients of the risk message. The objectives of the recipients may be to broaden general understanding, to obtain information for use in a particular decision "whose basic structure is already in place", or to structure a risk decision (356). Ethical problems are least likely to arise when the primary goal of the recipients is general edification. Morgan and Lave present a matrix of the ways in which risk communication is used by the public versus the ways in which risk communicators want the information to be used, and highlight the interactions in which ethical problems may arise.

Whether or not the goals and objectives of the risk communication are explicitly established at the beginning of the process, the next major consideration is who is involved in the communication.

Who is Communicating?

The immediate answer to this question arises from discussion of the concepts of risk. The distinction of experts and public identifies the two groups involved in risk communication. However, the dichotomy itself begs the questions 'who are the experts?' 'who are the public?' and 'who decides?'

Experts

Throughout the risk literature, the word 'expert' is used extensively and usually without definition. The experts of risk are those who know about actual risk, and are, therefore, people with knowledge of the scientific and technical aspects of risk. The term experts, however, needs not be limited to these few. Expert status is a negotiated, provisional social status. Rifkin (1990) states that "Expert status denotes that measure of authority we grant to individuals based on our impression that they have specialized knowledge, skill and experience that may help us" (156). This is a reflection of the definition from Krimsky (1984) who proposes that people become experts when they have demonstrated their proficiency to a peer group. These definitions of expert do not, however, limit expert status to those involved in science and technology.

> "Using the same criteria for selecting value experts might lead one to philosophers, politicians, psychologists, sociologists, clergy, interveners, pundits, shareholders or well-selected bystanders. Thus one might ask 'in what sense', whenever someone says 'experts' or 'public'" [Fischhoff 1989, 271].

Indeed, different societies select their own brand of specialists and experts. Within our society, however, Western science has authority, "Within our technological culture, we have nourished and advanced the idea of scientific and technical elites" (Krimsky 1984, 246). Experts are usually those who generate the knowledge and are thus distinguished from those for whom the knowledge is applied. Specialized skills and knowledge are brought into the risk field by scientific and technical experts (Krimsky 1984). They bring a theoretical framework which includes concepts, laws and expectations and are familiar with a body of literature on which to draw. These experts have causal knowledge and an ability to frame testable hypotheses and use a process of inquiry that enables them to collect, organize and interpret data. On the practical side, these people are usually proficient in the use of specialized instruments, the tools of their trades.

It is, however, not necessarily knowledge or skills that distinguish experts from non-experts: language may be the distinguishing factor (Leiss and Chocliolko 1994). Experts use the 'language' of technical risk found in scientific risk assessments, while the non-experts use the 'language' of perceived risk. The groups involved in the risk communication are situated within the expert sphere or the public sphere by the language each normally speaks. Parties such as the government who speak both languages may be situated across both spheres. Although this model shows the domain of technical risk to be separate from the domain of perceived risk, the authors do recognize that membership in these domains may be dynamic. "However, any party can occupy either side of the line; the sole criterion is what language it chooses to speak *on a specific occasion*" (37, my emphasis).

Leiss and Chocliolko's model reflects a key component in the consideration of expert - that of context, including time. The role of expert is not a permanent assignment: people who are experts in one field, or on specific occasions, may be considered to be members of the public at other times and in other situations. Membership in the group of experts is thus dynamic. In fact, experts should not even be considered as a homogeneous group. Studies have shown that there are differing perspectives among experts, influenced by such factors as professional affiliation and worldview. For example, toxicologists in industry, rather than those in government and academia, were much less likely to agree to the assertion that there is no safe level of exposure to a cancer causing agent (Kraus, Malmfors and Slovic 1992). These toxicologists also had the most favourable attitudes towards chemicals and chemical risks. The affiliation of the toxicologists can be correlated with other factors of experience, such as time spent doing research (Slovic, Malmfors, Mertz, Neil and Bartlett 1995).

However defined, labelling people as experts immediately places them as distinct from, and sometimes in opposition to, the rest of the world, variously called non-experts, laypeople, or, as commonly seen in the risk literature, the public.

The Public

The public, or laypeople, are usually defined by what they are not. They are not experts and they are therefore not familiar with the knowledge and language of actual risk. The public is the 'other' group involved in risk communication. Throughout the risk literature, the public is often considered to be a single, homogeneous group. This is highlighted by titles such as Translation of Risk Information for the Public (Arkin 1987), Overcoming False Public Beliefs (Bader 1993) and Communication of Public Risk (Mileti and Fitzpatrick 1992). A few scholars have explicitly recognized that there is no one public. "The public is not a single monolithic entity; there are many publics each with its own interests, information needs, concerns and priorities" (Covello 1989, 13). The diversity of the public as audience is also considered by Upton (1989) with the recognition of disparate groups, for example teachers, scientists, and physicians, who may receive the risk information. Fischhoff states that "there is no all purpose public any more than there are all purpose experts" (1989, 271).

In response to research on the frequently occurring disagreements between laypeople and the technical experts, Vaughan and Nordenstam (1991) have considered the variability of environmental risk perceptions within the non-expert population. They state that culturally based attitudes and values can influence people's general orientation towards risk. It is reasonable to expect that "factors differentiating individuals on the basis of shared experiences, values and beliefs relevant to risk evaluation will be associated with non-equivalent perceptions in many situations" (29). The authors identify ethnicity as one such factor. Curtis (1992) also considers ethnicity. She states that sensitive sociocultural groups must be identified in the risk analysis process, and the principles of cultural relativism must be incorporated into risk studies. She presents, from an anthropological perspective, the types of risk impacts that might be perceived by native North Americans.

Studies of cross-cultural risk communication consider culture as nationality or ethnicity and so do divide the homogeneous public, but on the basis of geographic or political boundaries. A cross-cultural comparison of the reporting of the Sudan floods of 1988 was undertaken by Ayish (1991), who explored how the disaster was reported two newspapers – the Times of London and Al Ahram of Egypt. These two newspapers represent different political, national, socio-cultural and journalistic arenas. Within these boundaries, however, the public is once again considered as a whole. Also in a study of cross-cultural communication, Rogers (1992) examines risk communication between the United States' Army and the native Polynesian Cultures in the Pacific Ocean. His analysis indicated that, although the native cultures and the U.S. army both spoke the same language, they failed to establish a common framework or a shared meaning for effective risk communication. However, all through the risk literature, there is implicit discussion of various publics. This is not acknowledged as consideration of the public per se but of the public's assigned role in risk communication, that of the audience,

Who is the Audience?

By definition, 'audience' refers to those who will receive (read, see, hear) the risk messages. In most of the risk literature, it is assumed that the audience is the public. Risk communication is commonly defined as "the process of conveying to interested parties the outputs of the various stages of risk assessment and risk management" (Rowan 1991a, 302). In this view, risk communication is a process of having the experts inform the public about technical risk. In contrast to this, there is some recognition that there may be several different audiences for a risk message. However, "only rarely are attempts made to characterize target audiences by their sociodemographic characteristics, knowledge of the subject, primary sources of information, attitudes, perceptions, concerns and preferences" (Covello, McCallum and Pavlova 1989, 13). The process by which risk information should be communicated is a large part of risk communication research. "Audience" implies a one way communication process from those with the information to those who will receive it. This view is inherent in many of the models of risk communication found in the risk literature.

Models of Communication

There is much advice on how to communicate risk and many models of risk communication, both explicitly described or implicitly assumed. Most of the models assume that the public is the audience, the recipient, of the communication, and give rules and guidelines for effectively transferring risk information from the experts to the public. Callaghan (1989) identifies key factors for reaching target audiences as: the message must be technically accurate and consistently conveyed; the channels used must be appropriate for the audience; and the spokesperson must have credibility within the audience. Covello, Sandman and Slovic (1991) give guidelines which include accepting and involving the audience as a legitimate partner, being honest, open and frank and speaking clearly and with compassion. A multi-disciplinary research group developed the risk communication program for introduction in the Netherlands of the Post-Seveso directive (Eijndhoven, Weterings, Worrell, de Boer, Van der Plight and Stallen 1994). This risk communication was successful within its mandate, but the communication process was largely one-way and the goals and set-up of the activities were only minimally influenced by the active cooperation of the public.

In contrast to these one-way models of communication are those models which consider risk communication to be a two-way, iterative flow of information. Some models show only experts and the public as parties in this dialogue (e.g., Fisher 1991; Mileti and Fitzpatrick 1992). However, other models recognize that there may be many groups involved in the risk communication. Leiss and Chocliolko (1994, 35) consider risk communication as "the flow of information and risk evaluations back and forth among academic experts, regulatory practicioners, interest groups and the general public." A similar definition of risk communication comes from the National Research Council which states that risk communication is "an interactive process of exchange of information and opinion among individuals, groups and institutions" (1989, 322).

Rowan (1991a) describes a diagnostic problem-solving approach to risk communication which identifies the factors of effective communication as credibility, awareness, understanding, agreement about solutions and enactment of effective response. She gives a framework to provide bases for anticipating likely obstacles to these factors and to provide a guide for overcoming or reducing these difficulties. The elements of the model are a description of the goals of the risk communication (e.g., motivating action in an emergency), a list of the probable obstacles (e.g., a disbelief that self and family will be affected), and a set of principles for overcoming these obstacles (e.g., explain why no immediate environmental cues of the risk are observable).

Fisher (1991) presents a model of perspectives for communicating about risk, which shows a spectrum of risk communication from a one-way monologue to a two-way dialogue (Figure 2). The model presents a method for examining the elements of risk communication, rather than a set of rules to follow.

Informing Audience			Empowering audience
One-way communication			Two-way dialogue
Telling them what has been decided or done	Giving them information about estimated risk magnitudes	Giving them information about estimated risk magnitudes	Finding out what their concerns are
Telling them what to do	Letting them interpret it and decide on their own	Helping them interpret it without interjecting bias	Including their concerns in risk assessment
		Letting them decide on their own	Helping them interpret the results and helping them use ways to affect the decision

Figure 2 Perspectives of Risk Communication (Fisher 1991)

The left side of the model corresponds to the technical model of risk (Rowan 1994) which stresses the education of the public to the expert's view of risk. The other end of the spectrum is representative of the democratic model which emphasizes understanding and legitimating others' concerns. Moving towards this end of the spectrum is the aim of risk communication.

Effective dialogue should involve the public as fully legitimate participants and will result from listening to, not just eliciting, their needs (National Research Council 1989). Regardless of which model of risk communication is used, the audience has a role to play in the communication process. That role is often predefined and limited by all the elements of risk communication discussed so far.

The Role of the Public/Audience

Fischhoff (1989, 282) describes two extremes of risk communication. At one end lies the inactive public, "dociley waiting for the transmission of vital information from those who know better". At the other extreme, communication is an interactive exchange of information and the public shares responsibility for the social management of risk. The role of the public is thus linked to information: at one end of the spectrum, they just receive information, and at the other end of the spectrum they may be also asked to provide it.

At first sight, Keeney and von Winterfedlt (1986, 418) seem to consider the audience by stating that "risk communication is an exchange of information" and that the information exchange could be enhanced by improving the interactions of the information transmitters such as the science writers, community leaders and members of the public. However, by stating that one of the goals of risk communication is to "better inform the public about the specific risks and actions taken to alleviate them" (420), the authors also view the public just as receivers of the information. This view is compounded by the suggestion that the results of risk analyses should be presented in terms that make sense to laypeople and that allow them to learn and gain experiences with the risk information. Examples of this view are presented within a study of the communication of contaminants in native Canadian country food (Usher, Baikie, Demmer, Nakashima, Stevenson and Stiles 1995). The research presents a series of case studies of the risk communications between the authorities and the aboriginal groups. The authors state that "While the message changed, the approach remained the same: outsiders identified the problem, determined the risk to health, decided what course of action, if any, should be followed and told the community members what to do" (iv).

Terminology also limits the role of the public in the risk communication process. The right-hand side of Fisher's model (Figure 2) presents a two-way dialogue of communication but is headed by the title "empowering the audience". Audience refers to the public, as experts do not need to be empowered in current risk communication processes. It is difficult to establish an equitable two-way dialogue without acknowledging that the public is not always the recipient of, but is sometimes the source of, information.

The six propositions for public participation proposed by Kasperson (1986) show how risk communication efforts may be effectively structured and implemented to include the public. The propositions are well established in the literature and experience of citizen participation and can be applied to risk communication. They include considerations of credibility and trust, differences in expectations and differing communication strategies. The model recognizes the need for an improved understanding of the social dynamics of risk communication in the context of actual controversies and community process. The implementation of these propositions in the design of risk communication will begin to address the issues of redefining the role of the public/audience through public participation. However, the ability to change the role of the public/audience may not be within the scope of risk communication. Problems arising from the institutional and political systems, such as legal issues of liability, the dispersion of responsibility and unbalanced access to information, are examples of this (National Research Council 1989).

The audience as providers of information, rather than recipients, *is* considered in many of the risk models, including those of one-way communication. This new role, however, is limited by the kinds of information the public/audience are asked to provide and the reasons for the acquisition of that information. Covello (1989) discusses the need to find out people's knowledge, attitudes, activity patterns, beliefs and values. Covello, McCallum and Pavlova (1989) give guidelines and principles for considering how people are thinking and behaving, and acknowledging and responding to their emotions and feelings. "It is impossible to develop an effective message without detailed, in depth knowledge and understanding of the characteristics of the target audience, including their knowledge, attitudes, perceptions, behaviour, belief, values, needs and concerns" (11). Sandman (1991) stresses the importance of examining people's outrage associated with any given risk. Fisher (1991) advocates finding out what the audience's concerns are.

At best, the risk communicators want to design risk messages that address the concerns of the audience: "Let people know that you have understood what they have said and address their concerns" (Covello, Sandman and Slovic 1991, 68). Morgan (1993, 27) states: "The essence of good risk communication is very simple; learn what people already believe, tailor the communication to this knowledge and to the decisions people face, and then subject the resulting message to careful empirical evaluation". At worst, the aim of acquiring this knowledge is to design communications which will manipulate the audience's behaviour to that desired by the experts. For example, Mileti and Fitzpatrick (1992) acknowledge the importance of recognizing the public and personal factors which affect the public's risk perception. They, however, use this information to design a risk communication which "maximizes the probability of sound public response and results in accurate public perceptions of risk .. [and] behaviour that is proportionally appropriate to the risk being faced" (24). Recognizing the importance of the audience's concerns does not necessarily mean asking the members to express them. Martin and Sanders (1994), in their case study of students in two technical writing courses, conclude that communicators should fully consider the concerns of the reader. This should be done, however, by the writers "putting themselves in the place of the audience" (153).

Some scholars do recognize that the audience has more to offer to the risk communication process than feelings and concerns. Covello, McCallum and Pavlova (1989) claim that each of the participants in the risk communication process, including individual citizens, are an important source of information about risks, risk assessment, risk management and risk communication. In principle four of his six general principles for risk communication, Upton (1989, 28) states that "a communication can be most effective when it reflects an understanding of what the public wants to know". This is supported by the National Research Council (1989, 176) which claims that the best procedures for formulating risk messages have "involved interactions with recipients that [have] elicited the recipient's perceptions and needs". The Council states that risk communicators need to understand what quantitative and qualitative information the recipients in the risk communication process need to know to make critical decisions. Peters (1993, 298) echoes this by stating: "The focus should not be explaining science to people looking for information on environmental risks, but to answer their questions." How to do this is often not described. Otway and Wynne (1989) cite the difficulty of dealing with the apparent instability of the public's demands for risk information. In addition there are problems with the public as the recipients of information. It is difficult to design risk messages for an audience whose perceptions of risk are inconsistent and where strongly held beliefs are hard to modify (Leiss and Chocliolko 1994).

There is another kind of information that the public is asked to provide – their perceptions of risk. As before, this role assigned to the audience should be examined in the light of what use is made of the information. Several scholars posit that misunderstandings in risk communication are due to the different understandings of risk by experts and the public (Slovic 1987; Fischhoff 1989). Accepting that the public understands risk in a different manner to experts and scientists has lead to research into understanding and measuring these perceptions of risk in order to design effective risk messages. Slovic's psychometric paradigm to measure perceived risk, discussed earlier, measures risk perceptions with respect to the factors of dread and whether the risk is known.

A body of research from faculty and past and present students at Carnegie Mellon University is concerned with the issue that "people can be hurt by inaccuracies in their risk perceptions" (Fischhoff, Bostrom and Quadrel 1993, 184). The research seeks to present people with the information they need in "a form which fits their intuitive ways of thinking" (Morgan, Fischhoff, Bostrom, Lave and Atman 1992). The work offers a research method to describe systematically a layperson's degree of understanding about health risk issues, including both quantitative and qualitative assessments. This produces a "mental model" which captures the person's knowledge of a specific risk. An "expert model" of the risk is created by combining the knowledge of a diverse group of experts and represents how the experts think about the risk. By comparing the two models, the layperson's concepts of the risk are analysed as correct, incorrect, peripheral, evaluative or background. Ideally, the use of mental models identifies any beliefs about nature, held by an individual, which are inconsistent or false. Risk communication can then be designed to correct the incorrect perceptions and to fill in the missing knowledge, and so will bring the layperson's mental model of the risk more in line with that of the experts. However, a contradiction is introduced when examining a person's beliefs about risk and the bases for those beliefs. Although actual risk cannot be known, there are reliable bases for forming beliefs about risks, such as mortality statistics or facts such as the existence of gravity. It is against these that the layperson's mental model is judged for correctness. Determining whether a belief that a risk is important to an individual cannot be assessed as correct or incorrect, but only as inconsistent with the acceptable evidence.

How people think about science is also of interest to risk communicators. Rowan (1991b) introduces the concept of "naive theories." Rowan recognizes that scientists, journalists and the public have conflicting notions about the kinds of science useful to mass audiences. She claims that people tend to develop tacit, but resilient, intuitive naive theories about aspects of the physical, biological and social world, especially the aspects with which they are in constant contact. These naive theories may be in contradiction to the known facts of science and so are obstacles to understanding scientific ideas and have to be overcome in the communication of science. This idea is echoed in the evaluation of a brochure designed to communicate electromagnetic field health risks (MacGregor, Slovic and Morgan 1994). Respondents "appear to have held personal theories that predisposed them to expect harm from electric and magnetic fields, thus causing them to become more concerned when presented with speculative arguments" (827). Dake (1992a) proposes "myths of nature" which are also in accord with Rowan's naive theories. Dake describes the myths of nature as social constructions of how the world works, based on held values, and states that they strongly influence the perception of risk. He argues that a better understanding of the myths of nature and the conflicts that can occur over them can help answer questions related to the expert-public difference in risk perception.

Instead of providing rules for science communication, Wynne (1991a) examines the public's understanding of science. He draws a distinction between three such levels of understanding – intellectual content, research methods and organizational forms of ownership and control – and claims that all three levels are necessary for a rounded public ability to use and act maturely in relation to science. Understanding the role that the public/audience is to play in the risk communication will aid in determining what information will, or should, be communicated.

Trust and Credibility

The importance of trust in risk communication should not be underestimated, even though the term is never really defined in the risk literature. There seems to be an assumption that there is a standard everyday meaning of trust which is commonly used and understood. A useful definition of trust, to consider when reading the risk literature, is that trust "is to have a belief-informed and action-influencing attitude towards...the discretionary power others have over one's own interests and well-being" (Baier 1994, 104). Trust is necessary for successful risk management. In all forms of communication, trust plays a major role in the acceptance of the information communicated and in the credibility of the communicator. However, risk communication frequently involves the communication of information about potential personal harm to a public that is sometimes fearful, hostile or sceptical - the public is inherently distrustful even before the risk communication takes place. Experts castigate the public for behaviours they judge to be based on irrationality or ignorance and the public feel antagonistic toward industry and the government (Slovic 1993).

Trust should be held by all parties in the risk communication. "It is entirely reasonable for socially responsible experts to want to be trusted, to feel that they deserve to be trusted and to resent the fact that they are not trusted" (Sandman 1990). It is also reasonable for local citizens to withhold their trust and to insist on relying on their own judgement instead.

Trust is difficult to acquire and easy to lose, the opposite of distrust. Slovic gives four underlying reasons for this: negative (trust-destroying) events are more visible than positive (trust-building) events; negative events carry much greater weight than positive ones; sources of bad (trust-destroying) news tend to be seen as more credible than sources of good news; distrust, once initiated, tends to reinforce and perpetuate distrust. Trust is created slowly, but can be destroyed in an instant.

Credibility of risk information is a combination of expertise and trust, as perceived by the recipients of the communication. The accuracy of the messages and the legitimacy of the process by which the risk message was determined affect the credibility of a message and its source (National Research Council, 1989).

In risk communication, trust is frequently unrelated to the actual technical or quantifiable assessment of hazard (Slovic, 1993). Slovic (676) states that "it is now evident that public perceptions and acceptance of risk from nuclear and chemical technologies are not much influenced by technical risk assessments." He ascribes the limited effectiveness of the risk communication efforts to reduce the public's opposition to nuclear waste plants to the lack of trust between the public and the nuclear experts. He states that this is indicative of a crisis of confidence, a profound breakdown of trust in scientific, governmental and industrial managers of nuclear technologies. Covello, Sandman and Slovic (1991) agree and state that trust and credibility can be undermined by numerous factors, including the public perception that government agencies are inappropriately biased in favour of particular risk management policies or approaches, that experts and officials in government agencies have lied, presented half-truths or made serious errors, and that government officials have mismanaged regulatory programs.

It is difficult for scientific, governmental or institutional agencies to achieve trust and to maintain such a level of trust. Kasperson (1986) states that trust is multi-dimensional and that the believability of risk information is closely related to institutional trust and credibility. Institutional trust comprises, at a minimum, a judgement of competence of the agency and of individuals, the agency to be seen as unbiased, a confidence that the agency cares about those it serves, and an assurance of the legitimacy of the process by which the information was obtained and by which decisions will be made. This corresponds with Baier's (1994) belief that knowledge of the actions, intentions and abilities of the trust bearer is a necessary condition in developing trust.

The question of whether trust is in fact deserved is seldom addressed in the risk literature, although the historical legacy of previous risk communication or management efforts can influence trust in an agency (Kasperson 1986). If a particular risk has been mismanaged in the past, distrust may greet attempts to communicate similar risks. Such situations involving low levels of social trust require an explicit recognition that the short-term goal should be to convey the risk messages as efficiently as possible and that the long-term goal must be to recover social trust. Even when trust has been established, individuals or the community may exercise their right to withhold their trust. In such cases, experts must presume distrust while helping the community exercise its autonomy wisely. Providing the community with the information necessary to do this should be encouraged and facilitated as a crucial component of building and maintaining mutual trust (Sandman 1990).

What to Communicate

Content

What information to include in a risk message is, to a large part, determined by the goal of the communication, who the audience is and the design of the communication process. As risk communication is initiated by the experts, these decisions are also made by them. Kasperson (1986) states that there is a growing imperative that those possessing special knowledge of risk will communicate it to potential risk bearers. Intertwined with the authority of experts is the authority of the knowledge they generate.

Arnstein (1969) presents a model of citizen participation which highlights the links between authority and communication. The model is a ladder which presents a typology for representing the extent of a citizen's power in determining the end product of a process. The model was developed for application to U.S. Federal programs, but can be applied to many other arenas, including risk communication. The ladder illustrates that "there are significant gradations of citizen participation" (217). The levels, or rungs, of participation, while primarily addressing issues of authority and responsibility, also reflect the communication processes, at each stage of participation, between the 'haves' and 'have-nots'. Figure 3 shows the ladder of participation. Arnstein does recognize that the haves and have-nots are not homogeneous groups and she presents the ladder as a simple abstraction.

Level 1 of the model, the bottom rung, represents the least citizen participation. Levels 1 and 2, manipulation and therapy, represent non-participation where the objective of the powerholders is to educate or 'cure' the participants of their views. This is one way communication from those in power to citizens, of the information that those in power want to give.

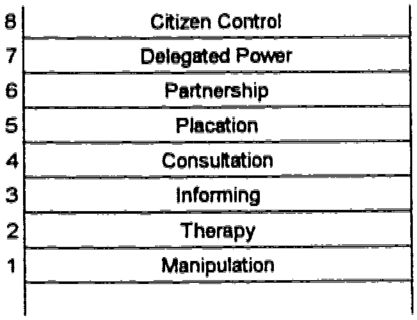

Figure 3 Ladder of Citizen Participation (Arnstein 1969)

Level 3, informing, is also a one way flow of information, but this information may be about rights, responsibilities and options, and the recipient of this information can chose whether to use it. However, there is no channel for feedback and no process for negotiation. Consultation, level 4, begins to develop conversation between those in power and the public. The opinions, concerns and ideas of the have-nots are invited, but there is no assurance that these will be taken into account in any decision-making process. Level 5, placation, allows a few, chosen citizens to advise, but the powerholders still have the right to decide. Partnership, level 6, is the start of citizen's participation in decision making processes and allows enough authority to enable the citizens to negotiate with the powerholders and to share planning and decision making responsibilities. Partnership relationships may be initiated by the citizens themselves, and may lead to level 7, delegated power. At this level, the citizens have the majority of the votes and the powerholders need to negotiate to resolve any differences. The topmost rung is citizen control, in which the citizens have full managerial control of the process. Levels 5 to 8 require a two way communication process between the citizens and the powerholders, which involves, to varying degrees, an exchange of information.

Arnstein's model of citizen participation has some similarities to Fisher's model of perspectives of risk communication (Figure 1), but considers public participation explicitly and extensively. The first column of Fisher's model, telling the audience the information or decisions, relates to the first two rungs of the ladder of participation. The other extreme of

Fisher's model, the two way dialogue which empowers the audience, can be identified with the fourth level, consultation, of Arnstein's model. It is in the top half of Arnstein's ladder that the issues of the authority and responsibility of citizens come to the fore. By relating, at best, to a level just halfway up the ladder, Fisher's model does not, and does not have to, explicitly address these issues.

In risk communication from the government to the public, Somers (1989) identifies the types of information which should be given. The scientific bases of risk assessment should be made clear and the limits of scientific knowledge should be acknowledged. There should also be a simpler, though not simplistic, explanation of the scale and context of risk. The view that the public should understand science is echoed by Shortland who poses the question "What then is it to be scientifically literate?...It is to feel the confidence that an individual feels when he or she has grasped an issue, satisfactorily solved a problem or answered a pressing question...In a word, to be scientifically literate is to become an active and effective citizen" (1989, 312).

Writing from the point of view of scientists presenting scientific information about risk to the public, Roberts (1989) also examines the need to explain the analytical processes of risk assessment to the public. This includes analyses of the decision-making process, the uncertainties of risk analysis, and the various checks in place to confirm that objectivity is maintained. There are acknowledged problems with the production of technical risk information and uncertainties in the production of scientific data and in its evaluation – the data is often incomplete and theories are complex (Leiss and Chocliolko 1994; Keeney and von Winterfedlt 1986). The study of uncertainty is a focus of risk studies. In acknowledging the uncertainties involved in the practice of epidemiology, Taubes (1995) states that it is relatively straightforward to tell a big risk from a little risk, but it is hard to distinguish a little risk from no risk at all. "Many epidemiologists concede that their studies are so plagued with biases, uncertainties and methodological weaknesses that they may be inherently incapable of accurately discerning such weak associations" (164). A letter in response to Taubes article states that "the relation between coffee consumption and coronary disease may not be completely settled, but the danger is minimal. The uncertainty is whether as much as five cups per day is a weak risk factor or not a risk factor at all" (Trichopoulos 1995, 1325).

There have been attempts to describe the different types of uncertainty. Rowe (1994) identifies four categories of uncertainty: temporal - in the future and/or past states; structural - due to complexity, including that of the systems and of the interaction parameters ; metrical - in measurement, including the interpretation of observations and measurement; and translational - in explaining uncertain results. He states that uncertainty is "essentially the absence of information, information that may or may not be obtainable" (743). This definition, however, does not address a critical distinction of uncertainties: what is not known because it has not been measured versus what is not known because we do not know it is there.

Peters (1993, 294) states that "scientists tell the public what they want them to know". This can also be applied to experts communicating risk information. An illustration of this is a project designed to help women decide what to do about the threat of sexual assault (Fischhoff 1987). When asked, women said that they wanted to know the most effective protective strategies for the smallest personal price, and they wanted to know what to do if actually assaulted. The researchers then examined the extensive literature on sexual assault and found seven hundred different strategies for dealing with assault. Most of the strategies were ill-defined and imprecise, and did not reflect what the women wanted, and needed, to know. This is one of many examples of risk communication in which members of the intended audience of the communication were not consulted about the information they needed.

The ideal of science is to uncover the reality of nature and to reveal fundamental truths by considering any relevant source of knowledge (Hrudey 1996). However, as with any human endeavour, in practice this goal is not always obtained and the distinction between the ideal of science and the practice of science is not always made. The authority of scientific and technical knowledge may be misused to preclude consideration of any other form of knowledge, and be set up in opposition to other knowledge. 'Other' knowledge can be useful in the risk process and should be communicated. Krimsky (1984) claims that there are some categories of technical problems where a significant contribution can be made by non-experts. He calls these contributions 'folk wisdom' and states that they can form a complementary or an antagonistic relationship to technical expertise. He identifies the four major areas of non-expert contributions to technical knowledge: problem identification and causal awareness; traditional, intergenerational knowledge; evaluative understanding, including cultural elements and community needs and intuitive and particularized knowledge and direct experience. Wynne's (1991b) study of sheep farming in Cumbria, England after the fallout from Chernobyl illustrates this. Wynne recognized that the farmers have an "extensive informal yet expert knowledge about the habits of sheep, the local physical environment and farming practices and decision-making" (57). The risk communication process did not allow the farmer's knowledge to be integrated with the more abstract and formal scientific knowledge to "create an effective framework of response." (58).

Presentation

After, or even along with, the decision on what to communicate comes consideration of how to present the information. There is a great deal of advice in guides for effective risk communication which draw knowledge and experience from several fields including psychology, cognitive studies and business, but particularly from communications theory. These risk communication guides can be interpreted as etiquette books for risk communicators, giving tactical problem-solving advice on how to transmit a message credibly (Otway and Wynne 1989).

The guides present advice on the mechanics of risk communication which ranges from the specifics of designing visual displays to broad guidelines for improving the audience's understanding of the risk message. Considering visual displays, Sandman, Weinstein and Miller (1994) suggest using a risk ladder to show risk comparisons, with the lowest level risks on the bottom rungs and the highest level risks at the top. Their studies have shown that perceived threat and intended mitigation vary with the location of the risk on the ladder. Risk communicators can design risk ladders to emphasize particular risk characteristics. An alternate visual display is used by Weinstein, Sandman and Hallman (1994) in an effort to stop the public worrying unnecessarily about low probability risks and events. To help people understand small probabilities such as 1 in 10,000, the display shows 10,000 dots on one page, and 1 dot on the facing page. The reliance on such guides to solve risk communication problems has been criticized in the risk literature. "Public authorities have sometimes mistaken communication support materials, such as pamphlets, posters and videos, for solutions to be used in combination with person to person communication" (Usher, Baikie, Demmer, Nakashima, Stevenson and Stiles 1995, v).

Atman, Bostrom, Fischhoff and Morgan state that "the information should be presented with appropriate text structure and reinforced with textual aids (e.g., section headings)" as established in general communications research on text comprehension (1994, 779). In a often cited publication, Covello, Sandman and Slovic (1991) give seven principles for effective risk communication, and guidelines for providing and explaining risk related numbers and statistics. The guidelines suggest the use of measurements such as 'deaths per million of population' and 'deaths per ton of chemical produced.' The authors advise the use of graphs, charts and other visual aids as well as the use of examples and anecdotes to give concrete images to abstract risk data. Along the way, they discuss transformations of scale, the use of whole numbers and simple fractions, and the need for risk information to be comprehensive and clear but not oversimplified.

There are examples from the health field (Tonn, Goeltz, Travis and Phillippi 1991). In dealing with uncertainty information delivered by a physician to a patient, the authors call for the construction of a standard medical language explaining uncertainties, which is natural to both physicians and patients. The uncertainty language would be anchored to events common to the American culture. The results of this study suggest "the existence of filters that may hinder the ability of the patients to translate risk messages in an unbiased manner" (224).

These discussions of risk communication have shown it to be a complex social and cultural process. It is no surprise that many scholars acknowledge that there are problems with risk communication. Indeed, most of the risk communication literature is devoted to presenting solutions in the forms of rules, guidelines and models. The elements and problems of risk communication are intertwined with each other and with the processes of risk assessment and risk management. A critique of the risk literature must consider these relationships.

DISCUSSION OF THE RISK LITERATURE

Looking at risk literature as a whole, my overriding concern is of the lack of attention to context – including, but not limited to, the contexts of the risk message, the audience and risk communication as a field of research. I will discuss the various elements - unexplained assumptions, dichotomies, questions of authority and responsibility, the legitimacy of knowledge and culture as nationality - that contribute to my concern.

There are many *unexplained assumptions* in the risk literature. Even keeping in mind that the literature is, in general, written for audiences that have some knowledge of risk studies, there are still some underlying, basic assumptions which are seldom made explicit, or even acknowledged as assumptions. These include what is risk, who is communicating, what is being communicated, what an expert is, who the public is and the public as audience.

The risk literature is filled with *dichotomies* which place two elements in opposition. Sometimes the elements are groups of people such as experts versus the public, and sometimes they are concepts such as actual risk versus perceived risk or hazard versus outrage. The two sides of these relationships are usually mutually exclusive, either one side or the other must be chosen. The division, however, is not usually between two different elements, but between an element and its negation, or between an element and the rest of the world: experts versus non-experts, scientific knowledge versus all other kinds of knowledge. The separation of relationships into opposing elements has several repercussions. First, it does not reflect the real world where people are rarely members exclusively of one group. They may overlap between groups or be members of neither. Second, setting up artificial oppositions gives authority to one of the elements. This is especially true where the dichotomy is defined by an element versus everything else.

Thirdly, the dichotomies are presented as static: there is no recognition of the dynamic nature of the elements in different contexts and over time.

Both the underlying assumptions and the prevalence of oppositions contribute to *questions of authority and responsibility*. Risk communication is assumed to be from experts to the public, with the experts selecting or designing the communication process. This results in their determination of the role of the public in risk communication, which limits the public's authority. From the models of risk communication previously discussed, at worst the public are passive recipients of scientific and technical risk information, at best they are consulted about their concerns. There is little consideration of public involvement and responsibility in risk decision-making or even in the design of the risk communication message or process.

The important issue here is not so much that the public is assigned the role of audience nor that its responsibility and authority are limited by this role, but that these issues are seldom made explicit or even discussed in the literature. Several possible reasons for this spring to mind. The main body of risk literature is produced by the experts, those whose authority is ensured by that role; the risk communication models used generally assign a passive role to the public; or it may be because to involve the public in the risk process is a political action and would require a change to governmental and institutional approaches.

Linked with issues of authority and responsibility are questions of the *legitimacy of knowledge*. "The belief in the omnicompetence of science has been steadily gaining ground throughout this century in this [Western] culture..." (Nader 1996, 24). Within the risk literature, the scientific and technical information of the experts is generally considered to be more objective and more true than the knowledge of non-experts, regardless of the quality of the science which produced the information. The legitimacy of knowledge is not always evaluated by its relevance, consistency and coherence, but sometimes by its source. Scientific knowledge is sometimes considered to be more legitimate than any other form of knowledge, including personal knowledge, and the "myth of the 'inferior other' is deeply incorporated in our cultural practices such that 'just plain folks' collude in their self-identification as incompetent 'others'" (Nader 1996, 15). In a study evaluating the impact of risk messages about radon, Bostrom, Atman, Fischhoff and Morgan (1994, 794) state: "We defined a subject as having consistent and accurate knowledge [about the risk of radon] if that subject's responses to every question on a particular topic agreed with the expert model." The public's knowledge is taken into consideration mainly to model their perceptions of risk or to find out their concerns; it is generally not used in decision-making or even in risk communication. Along with the superiority of scientific knowledge comes the belief that, if only the public had access to and understood this knowledge, then they would change their risk-taking behaviour. This view fails to accept the value of non-scientific information and ignores the need for the integration of all forms of knowledge to provide frameworks for considering risk. This lack of appreciation of other forms of knowledge is reflected in the lack of processes in risk management and communication for the inclusion of such knowledge.

The concept of culture found in the risk literature is primarily that of *culture as nationality*. Cross-cultural risk studies have compared risk management processes and people's perception of risk in different countries. These studies have looked at 'the public', but now the public is divided by political or geographical boundaries. There is emerging recognition of other elements of culture. This has followed, and has possibly been influenced by, the realization that there is not one generic public – there may be many such different groups. Along with the social dimensions such as age, gender and socio-economic status, come cultural considerations such as beliefs, language, world view and knowledge. However, many models of risk management and risk communication have yet to fully incorporate, or even recognize the value of, these considerations.

All the concerns presented so far relate to the *context of risk*. This is not to say that risk is always presented as being independent of context, but rather that narrow contexts of risk are often found and are not usually described. Situating a risk within a solely technical context of, for example, comparisons to other risks ignores other diverse contexts such as personal relevance, the goal of the communication, and social and cultural elements. An important context that is ignored is that of *time*. Many of the risk theories and risk communication models assume the world and hence people's daily lives, to be static. Even those that recognize the element of time assume that, throughout the duration of a risk communication, things will remain the same. This is rarely the case. The experts and the public, the goal of the communication, the social structure of the audience, the membership of the audience, and even the nature of the risk itself, are just a few of the elements which can be dynamic. Risk communication models which encourage dynamic two-way dialogues and then assign the role of audience forever to the public, reflect this static world view.

Within the risk literature, risk communication is often presented as a discrete field of research. It is not usually considered within the context of general communications studies. This has served to emphasize the distinctiveness of risk communication from other communications processes while the similarities are not considered. Much relevant communications research has, therefore, not been brought into the field of risk communication. The basic idea of communication consisting of a source, a receiver, a message and a channel has been incorporated, but the communications field has much more to offer. Many of the concerns and problems within risk communication have already been addressed in other communications research. Considerations of the diversity of the audience, of communications as an exchange and of the alternating roles of sender and audience would address some of these concerns.

The concerns with the risk literature echo the common agreement that there are many problems with risk communication. To address these concerns, I expanded my literature review to examine other fields of research, in particular anthropology and cross-cultural communication, for what they could contribute to the consideration of the social and cultural aspects of risk. By looking at different ideas of culture and communication, I was able to address most of my concerns and to build on some of the current theories and models in the risk literature.

CULTURE AND COMMUNICATION

Culture and Cultural Identity

Within Anthropology

An alternate way of viewing culture other than the broad concept (combining behavioural, cognitive and material aspects) used in the literature on the social and cultural dimensions of risk, is to separate the material from the ideational. Materialist theories centre on the problem of adaptation to the material constraints of the environment, and consider elements such as energy systems and objective and specific artifacts. In contrast, ideational theories of culture reject the idea of culture as something concrete, whether this be artifact or behaviour, and assume that cultures should be understood as systems of thought. (Winthrop 1991). Culture refers to what people learn, rather than what they make or do (Keesing 1981).

There are several ideational theories of culture. Scholars of ethnoscience equate culture with cognition, providing systems of classification that structure the understanding of the social and natural worlds. In this view, "culture is a set of standards that seem to be authoritative" (Goodenough 1970, 101), and is reduced to an individual's knowledge of rules and typologies. Structuralism considers culture as systems of contrasting signs which are expressed in diverse domains such as language and myth. These systems of signs, however, all reflect the underlying structures of the human mind. In this view, developed in the main by Levi-Strauss, culture is not a pluralistic concept which distinguishes one society from another, but is ultimately a single, global system of signs. As such, culture is an entity in its own right, independent of human action. A third ideational theory of culture is symbolism as found in the work of Geertz (1973). In this definition, culture exists only in the meaningful interaction of social life, and all acts and events are potentially meaningful. Culture is not a cause to which events or institutions may be attributed but a context within which they may be made intelligible. It is through behaviour as social action that culture is articulated and so, in this way, culture is a context within which behaviour can be understood (Nanda 1994). In contrast to Goodenough's view that culture exists in individual minds, this theory states that cultural meanings are public and so transcend their realization in individual minds (Keesing 1981). An alternate view of culture is presented in the work of Bourdieu (1977) who focuses on the power of individuals to generate cultural forms in the construct of everyday life. This view considers culture as a process and not as an entity, in that culture is constantly created and renewed. Bourdieu states that most cultural knowledge is not theoretical or explicit, but tacit and learned through practice.

The ideational views of culture as systems of thought may prove useful models in the consideration, of this research, of the kinds of information that people use when making decisions about personal health risks. However, a culture is always a composite, a "strategically useful abstraction..." created as an analytical simplification (Keesing 1981, 72). It is necessary, therefore, before deciding which concepts of culture are useful, to step back and consider the aims and needs of applied anthropology.

Aims of Applied Anthropology

Applied anthropology is a tool with which to translate ideas into action and then to determine the impact of these actions on the real world (Chambers 1989). Applied anthropology does not challenge the basic assumptions which underlie anthropology by proving that they are right or wrong, but is concerned with their operational validity. This is not to say that findings from applied anthropological research cannot be fed back into theoretical research in the field, but that the bases of applied research must come from the discipline itself. However, the focus of applied research may be such that additional elements must be taken into account.

Culture is generally identified and considered at the level of society, even though society itself is a cultural construct. "It has been taken for granted that such a group exists or can be defined with precision" (Banks 1969, 19). Even so, delineating the boundaries which separate one culture from another is not straightforward. Applied anthropology is becoming a new sort of anthropology. - a move from the anthropology of the human condition to an anthropology of issues (or problems) that applies cooperation between action and planning (Messerschmidt 1981). Van Willigen (1993, 8) states that the domain of application of applied anthropology "includes the methodology that maps the relationships between information, policy and action, and the context of application, which includes the knowledge relevant to a particular problem area and work setting". Frequently, the issues are within our own complex societies. In examining the policy setting of applied anthropology, Chambers (1989, 183) states that "...the significant setting that begs understanding is not a single cultural unit, it is the stage upon which a particular human problem becomes meaningful to all those groups of people who have an interest in its resolution". However, a concern with applied anthropology is a "loss of concentration on a specific cultural unit to an examination of segmented groups within our own society" (Mach 1993, 99).

The study of anthropology is usually of shared cultural processes and differences between groups. However, applied anthropologists generally explore relationships between cultural processes as they arise within, as well as between, groups (Chambers 1989). This interest in variations within groups can help the anthropologist to avoid stereotypical assumptions and to avoid the delineation of normative culture. This aids an awareness that people often make judgments on the basis of personal and group tradeoffs, willingly exchanging one value for the opportunity to pursue another.

Within applied anthropology, durable cultural elements such as ethnicity and religious affiliation are important, but not sufficient, categories of possible cultural differentiation; more transient group affiliations, such as context and situation, can be of equal importance. However, the difficulty arises in deciding which cultural elements are to be considered durable and which as transient. For example, where does socioeconomic status fall? Despite this difficulty, which may be only a matter of definition, this approach allows for the study of the cultures of groups which are formed for relatively short time periods and for specific purposes.

Several elements arise from the discussion of the aims and needs of applied anthropology. Applied anthropology research is often conducted within complex societies with groups which are smaller than a cultural unit and whose affiliations may be transient, depending on context or situation. Considering the variations within these groups, as well as those between groups, will include the idea of personal and group tradeoffs in the consideration of the culture of such groups.

What, then, can anthropology offer to deal with these needs? This discussion raises questions which are not easily answered within the literature and research of anthropology.

Cultural Identity

Anthropologists have researched groups smaller than cultural units and within complex societies. In these complex societies, groups often form because of specific circumstances. Anthropology considers such groups as other than cultures which, however, share some aspects of the same culture. "Subculture" is often used to designate a cultural pattern that is shared by a group of people and is significantly different from the dominant culture, although it does share some aspects of that culture (Keesing 1981). Modern nations contain many subcultures, based on region, religion, occupation, social class, ethnicity, age and lifestyle. The question arises whether these subgroups can ever be considered as cultures in their own right. Some applied anthropologists claim that they can. Rollwagen (1980) supports the idea of culture at a level other than that of society. "Thus, societies have a culture but units smaller than societies...are said to be a 'subculture' of that society. The implication, of course, is that the proper relationship between culture and society is one of exact equivalency, and that units smaller than a society, therefore, have something less than culture" (374). Latour and Woolgar (1986) examine the culture of scientists in the laboratory. In looking at the organizational culture of a British Columbia coal mine, Rouse and Fleising (1995) identify two distinct cultures, that of management and of the workers. They define culture as having three levels - artifacts and creations, values and basic assumptions - and investigate the interpretive frameworks of the everyday work worlds of the two groups. In addition, they identify several subcultures - workers in the plant, workers on the hill, plant supervisors. These are variations within the groups of the two dominant cultures. This research reflects the transient group affiliations discussed above. While the groups of management and of miners will exist throughout the lifetime of the mining company, the individual memberships within those groups may change.

Regardless of whether a group is a culture, the cultural identity of such a group can be studied. Geertz defines cultural identity as "identification with and perceived acceptance into a group that has shared systems of symbols and meanings as well as norms and rules for conduct" (1973, 113). A psychocultural framework expands this definition to refer to either the identity of an individual in relation to their culture or as a reference to collective self-awareness that a given group embodies and reflects (Adler, 1988). Mach (1993) views the cultural identity of such groups/subgroups/subcultures as a dynamic, creative process in which symbols organize people's experience and express relations between groups. The process of creation, re-creation, maintenance and change of identity involves both social structural and symbol components. Cultural values can be conceived and communicated only through symbols. He states that cultural models are "a set of commonplace knowledge and understandings of the community, shared by members of that community, that are encoded symbolically in its language" (43). However, partial or even alternate, versions of these models are adopted and invoked by individuals in everyday interaction. An individual's version of the (larger) culture is also discussed by Keesing (1981), who states that culture is an internal model of reality. However, it does not consist of everything an individual knows about the world. Culture is a system of shared elements of socially distributed knowledge.

The relationship of the individual to the cultural model of the group should also be considered. Mach's statement that individuals invoke partial or alternate versions of cultural models is reflected in the concept of personal culture. Personal culture refers to the "individual impression of culture belonging to a particular individual" (Seymour-Smith 1986, 222; Keesing 1981). This approach reflects that a human group should not be studied in terms of one uniform culture shared by all its members, but in terms of the interaction and negotiation between many different individual versions of that culture. This agrees with Giddens' (1984) view that individuals are knowledgeable agents who are capable of accounting for their actions; they are neither "cultural dopes" or mere "supports" of social relations.

The issues of personal reality and culture have also been addressed by Bourdieu (1977) who introduced the concept of habitus as a mediating link between individuals' subjective worlds and the cultural world into which they are born and which they share with others. Bourdieu uses habitus in describing his ethnographic research in Kabylia to talk about, on one hand, the culturally "given" dispositions, interests and the ways of proceeding and, on the other hand, the individual skills and competencies, constraints of resource limitations, personal idiosyncrasies and failings, and the weight of the history of relationships between the individuals concerned and the groups in which they claim membership. Habitus is made up of dispositions of a spectrum of cognitive and affective factors, such as thinking and feeling, which dispose actors to do certain things, and provide a basis for the generation of practices in social life, located in time and space. Habitus exists inside the heads of the actors and only exists in, though and because of the practices of actors and their interactions with each other and with the rest of their environment. Particular life-environments produce structures of tacit dispositions (habitus) through which culturally appropriate practices and representations are generated (Winthrop 1991).

The relationship of an individual to the cultural identity of the group is not solely that of culture, but also involves considerations of social structure. The traditional division of society as an association of individuals and of culture as the sum of their knowledge no longer is useful if an ideational theory of culture is considered and culture is thought of as a system of thought, constructed and reconstructed within the contexts of people's interactions with each other (Ingold 1994). All social life is cultural in that people's relationships with each other are informed by meaning. All culture is social in that its constituent meanings are drawn from the relational contexts of such mutual interaction. Giddens (1984) identifies that actions (the individual) and structure (society) are interwoven in an ongoing activity of social life, and that both the meaningful actions of individuals and the structural features of social contexts must be taken into account. He discusses a "community of identity" among the agents of a group which, at a minimum, need be nothing more than a formal association with the doings of other agents, who do not necessarily have to share all of the same values and commitments.

The division of people into separate and distinct groups, such as experts and the public, is challenged by research in the field of fuzzy logic. The idea of experts and the public as being separate groups arises from current set theory based on conventional Aristotlean logic. A person is either an expert or is not an expert (Law of contradiction) and must be either an expert or a member of the public (Law of excluded middle). Fuzzy logic was developed in the 1970s by Lofti Zadeh and is a set theory of graded concepts in which everything has elasticity (Laughlin 1993). 'Fuzziness' refers to an easing of restrictions upon membership in a category or group – something may be more or less a member of the group. Membership in the group of expert or of the public may be determined by overlapping attributes that form "family resemblances." The members most representative of a group share the most overlapping attributes with other members of the same group and least with members of other groups. In other words, although experts have more in common with other experts than with members of the public, they may share commonalties with the public. Fuzzy logic does not preclude the elements of context and time in group membership. This is in accord with the discussion of Leiss and Chocliolko's model of risk communication on page 22, which suggests that people are members of the domain of experts or of the domain of the public for specific occasions.

Communication

A general definition of communication for use across disciplines is given by Cerroni-Long (1985). Communication is a transfer of information between a receiver and a sender, where a potential receiver is also a potential sender. Communication is, therefore, a (potential) two-way process of information exchange. Communication can also be considered as " a process of using signs and symbols that elicit meanings in another person for whatever intent, or even without conscious intent, on the part of the person producing the symbols" (Sarbaugh 1988, 25); communication is purposeful. Porter and Samovar (1988) state that communication is dynamic, interactive, irreversible and takes place in both a physical and a social context.

Cross-cultural communications literature combines the issues of culture, communication and context. While the concepts of culture found in this literature are not necessarily strictly culture as defined within the discipline of anthropology, they are similar to the ideas of culture identified within applied anthropology. In addition, culture is frequently used in the broad sense of consisting of behavioural, symbolic and material aspects. The use of cross-cultural within this literature does not necessarily refer to communication between cultures, but to communication between subgroups or subcultures of a larger culture, in which some cultural elements are distinct from each other. These elements can be ethnicity or gender or profession or any other "symbol system that is bounded and salient to individuals" (Collier and Thomas 1988, 103). Daniel (1988) considers economic status and looks at communication between the poor and the affluent as cross-cultural communication. Higgins (1991) considers the communication between farmers and non-farmers to be cross-cultural. "[They] do not share the same systems of meaning. Their behaviours are constructed, coordinated and interpreted by different cultural systems" (Higgins 1991, 217). Hall (1973, 165) speaks of cross-cultural misunderstandings "just like the ones that occur between men and women or between accountants and salesmen in the same firm. Usually there is no language barrier and large components of the major culture are shared by the people involved."

The extreme of this view is in considering cultural identity at the individual level. This can be compared to the idea of personal culture or to the concept of habitus discussed previously. At this level, every act of communication could be said to be cross-cultural. (Sarbaugh 1988; Singer 1990). Although the individuals involved in the communication process may (though not necessarily) share the larger culture, their personal culture or habitus is unique. This extreme, however, may have limited practical utility in "public" communication situations, although it does aid in identifying differences and similarities between the communication participants.

There are, however, levels of 'cross-culturality'. In discussing communication between two individuals, Singer (1990) claims that the fewer group identities, or cultural elements, a person shares with the individual with whom they are communicating, the more cross-culturally the person is communicating. Sarbaugh's (1988) model of cross-cultural communication classifies participants in a communication event along a continuum of homogeneity/heterogeneity, which is used to establish, but not measure, the levels of cross-culturality of the communication. The level of cross-culturality is based on the extent to which the participants share elements of culture: worldview, the set of beliefs about the nature of life, the purpose of life and our relation to the cosmos; patterns of behaviour for being a 'good' person', which includes normative behaviours; code systems, which include language and other verbal and non-verbal communication systems; and perceived relation and intent, which includes compatibility of goals, the hierarchy of relationships, feelings towards the other person and whether the perceived intent of others in the communication process is sharing and helping. This taxonomy establishes the critical similarities and differences among participants in a *given communication event at a given* *point in time*. The degree of difference or similarity is important, not just its absence or presence.

In considering communication between groups, Porter and Samovar (1988) present a model of cultural differences, also along a continuum, where the amount of difference between two cultural groups can be seen to depend on the comparative uniqueness of the two groups. However, this uniqueness may depend on which cultural and social elements are examined. They consider as an example a conversation between two farmers, one from China and the other from the United States. They identify social and cultural elements which are subject to variation, such as physical appearance, philosophy, social issues and language. There are also elements, such as farming knowledge and a rural life style, in which the farmers share commonality. The authors state that, across some aspects of cultural patterns, the farmers "may be more closely related to each other than they are to members of their own cultures who live in a large urban metropolis" (34). Sarbaugh (1988) states that within-group variations [of cultural identity or personal culture] may be as great or greater than between-group variations. "One must constantly ask how uniform, how homogeneous are the sets of characteristics within the groups so labelled" (26) .

The review of this literature has presented a view of culture and of cross-cultural communication which can be applied to risk communication. Theories and models from all areas of the literature review can assist in building a framework for my research.

THE FRAMEWORK FOR THE RESEARCH

The framework for my research is an amalgamation of theories and models from the literature reviewed. There are two different models, one of culture and one of risk communication, that interact to form this framework.

In my research into risk communication and information needs, in addition to considering the broad definition of culture as having behavioural, symbolic and material aspects, I will narrow the focus of what is meant by culture and use the ideational view of culture as systems of thought. In particular, I use Geertz's (1973, 144) definition of culture as a "framework of beliefs, expressive symbols and values in terms of which individuals define their world, express their feelings and make their judgments". Culture is created through meaningful social interaction. The focus in this definition on symbols is appropriate in considering the idea of information needs. In addition, the view of this theory that culture exists through social interactions reflects the social nature of communication itself, as does Bourdieu's view that culture is a process created and recreated by individuals in the construct of everyday life.

Considering experts and the public to be of distinct subcultures reflects a standard use of the term subculture within anthropology as a group based on occupation, among other possible differentiations, within the larger culture. However, the statement makes use of Chambers (1989) claim that transient group affiliations can be of equal importance to more "durable" cultural elements. Within risk communication, while there is always a group of experts and a group of the public, the membership of these groups can vary with the context and situation of the communication process. People considered as experts in one communication process may be considered as members of the public in another, and vice versa. Although these subcultures share the culture of the larger group, society, they have their own cultural identity, their own interpretations of culture, their own systems of thought, influenced, in part, by the context of the communication.

Information is symbolic and its meaning is informed by culture. The choice of which information to use, or which information is important, reflects the values of the individual , the group or subculture and of the culture. The choice in our society for the content of risk communications to be scientific and technical information reflects the value that is placed on science and the scientific method. Risk communication itself is the institution by which society has chosen to communicate values of personal and environmental harm, benefit and cost.

For the model of risk communication, Fisher's model of the perspectives of risk communication (Figure 2) is the starting point. To this, I have added the concept of communication as an effective and meaningful exchange of information, which includes the receipt and use of the information from the public by the communicator. This idea is found extensively within the communications literature and to a limited extent within the risk literature (e.g., National Research Council 1989). I draw from Arnstein's ladder of citizen participation to extend Fisher's model and to identify that, for such an exchange to occur, the authority and responsibility of all the participants must be of similar levels. Considering risk communication as an exchange of information immediately poses the question of what information should be exchanged. To address this, I propose the concept of 'information needs.' I use this term to refer to the information, knowledge, data and experiences that an individual wants to receive from, or to contribute to, the risk communication. Including the action of contributing information, as well as receiving information, in this definition emphasizes the two-way dialogue of communication and does not assign the role of audience or receiver to any one individual or group in the communication process.

The models are linked, to form the research framework, through the concept of information needs. The concept of information needs is consistent with Sarbaugh's spectrum of interculturality, and is evident in three of the four elements of culture he considers: as part of worldview, information needs reflect the values and beliefs of the individual and of the society; as part of the code system, information needs encompass the psychological and sociological processes that attach meanings to messages; and in relation to perceived intent, information needs reflect the compatibility of the goals of those involved in the communication.

In summary, the framework considers experts and the public to be of distinct subcultures, and communication between then as a cross-cultural communication process, and that the information needs of the experts and of the various publics may be different. Identifying these differences, and also any similarities, will aid in the design of risk communications which meet the information needs of all participants involved.

3. RESEARCH METHODS

FOCUS GROUPS

The information needs of the experts in risk were identified from reading the risk literature, written by the experts themselves, and in reviewing actual risk messages. While this method of research did not provide an in-depth view of the information needs of the experts, it gave an overview of the kinds of scientific and technical information communicated in risk messages.

The scope of my research was to investigate, in depth, the information needs of the public in making their decisions about personal health risks. I used focus groups as my central research method. Much has been written in different disciplines on focus groups as a research method. There is a variety of opinion on such topics as the goals of focus groups and on how they should be conducted; however, there does seem to be general agreement on what constitutes a focus group. A focus group is an informal discussion group, usually homogeneous in at least one way, brought together in a non-threatening and relaxed environment, by a trained moderator who facilitates a ninety minute to two hour discussion about a selected topic of mutual interest to the group and to the researcher. The hallmark of a focus group is the explicit use of group interaction to produce data and insights that would otherwise not be obtained.

In this section, I discuss the use of focus groups in my research. Appendix C contains a further discussion of focus groups as a research method.

Goal

The goal of the focus group was to find out what information the general public(s) use, and need, in making decisions about personal health issues. I was looking for context, ranges and themes, not "how many" and not necessarily "why" but more "what". The guiding questions I used were:

What scientific and technical information do people use, or need, when making their decisions about personal health risk?

What other information or knowledge do they use?

How should this information be presented?

Looking for Volunteers

The sole criteria for participation in the focus groups was an interest in personal health issues. Elements of cultural identity such as age, gender, education, and socioeconomic status were not used as selection criteria, as the focus of this research was to identify the information needs and not to link them back to specific cultural elements. The participants were self-selecting in that they answered my advertisements and volunteered to take part in the research. This selection mechanism reflects that the audience of the Guide will also be self-selecting in that they will choose to read the publication. While the selection mechanisms may result in different people volunteering for the research project or deciding to read the Guide, the commonality is their interest in personal health risks.

In order to reach a broad, general audience, I placed advertisements for five weeks in a local community paper that reaches all areas of Edmonton, and in a local Arts paper for two weeks. In addition, I placed posters in 7-11 stores, in libraries, in supermarkets, in drug stores at the pharmacy counter and in alternative medicine and health food stores. I relied also on word-of-mouth advertising through networks of friends and acquaintances.

First contact with the people phoning in response to the advertisements provided an opportunity to explain my research and its larger context and also to set the tone for the focus group sessions. I was relaxed and informal, answering any questions about the research or myself without asking any about the respondents background. Most people, however, offered information as to why they were interested in this research topic. In a second phone call with everyone who had volunteered to take part, I set the date and time for the focus group and also explained about informed consent, offering everyone the opportunity to withdraw from the project at any time (no one did). The sample of the informed consent form used is in Appendix C.

There were eight participants in the focus groups (two more volunteered but did not show up). Although most of the participants were unknown to each other, some knew me as I did not rule out acquaintances as possible participants. The participants were split into two groups based on which day of the week they were available. The first group was assigned four people, though only two actually took part, and was intended to act as a pilot group in which the questions were tested and revised if necessary. The results of the first group were included in the findings of this research. The second group had six participants.

Facilitator and Note-Taker

The facilitator for the focus group was my supervisor, Eric Higgs. Dr. Higgs, of course, was familiar with my research but I was confident that he would not bias significantly the questions and conversation. Dr. Higgs had facilitated many seminars, though not focus groups. I served as organizer and note-taker during the focus group sessions. I greeted the participants but tried not to join in with, or interject into, the discussions.

Preparation and Revision

I prepared an agenda for each session, which included a list of questions with supplemental ones in case the groups ran out of conversation, and discussed this with the facilitator. After each session, the facilitator and I reviewed what had happened and revised or planned our strategies for the next group session.

Data Collection

The focus group sessions were taped and then transcribed professionally. I took notes during the sessions on the main points of conversation of each person's contributions as well as my observations of non-verbal language and group dynamics. I recorded any suggestions I had for improvements to the focus group strategy. After each session I made notes about my reactions to the session and what information was obtained.

Content

One and a half to two hours was not enough time to elicit the information I needed, so I scheduled two sessions a week apart with each of the two groups of participants. The first session was designed for general discussion about health risk information, with little prompting from the facilitator. During the first session with the first group, however, the facilitator found it necessary to introduce specific examples of health risks in order to keep the conservation flowing. This practice continued with the second group.

The second session was designed to move the discussion, in stages, to more specific consideration of health risk messages and to end with an opportunity for the participants to design their own health risk messages. The two-session design of the groups enabled the general data obtained in the first session to be compared against that obtained in the second by observing the participants in the practice of criticizing actual risk messages, and to see what new information arose in discussion of specific rather than general health risks.

Discussion in the first part of the second session focused on 5 posters displaying articles from the local press, pamphlets and magazines clippings showing different kinds of health risk information; each poster dealt with a different class of health risks (Examples of these are in Appendix A). The articles on each poster were gathered from local newspapers, from popular magazines and from pamphlets collected from pharmacies. I chose these sources of information based on the discussions in the first sessions and from the results of an Alberta-wide survey of where the Albertans obtain their health information (Jardine, Krahn and Hrudey 1995). The headlines of each article were important in deciding what clippings to include – I included some controversial statements – and in observing what information caught people's attention. The focus was on information in the context of a popular press article.

The second part of the session involved detailed critiques of individual health risk messages. The messages were prepared by Simon Thomas, a graduate student working on The Citizen's Guide to Health Risk in Canada project, and dealt with three different kinds of risk – helmets and bicycles, breast cancer and benzene. The intent of the messages was to provoke conversation – the focus was on individual statements given with no contextual information.

The session ended by drawing the participants back from specifics and providing them with paper, pens and crayons to design their own health risk messages. The first topic given was bicycle helmets and the second topic was of their own choice. This exercise provided a different medium of expression and enabled the participants to consider the visual, rather than solely the textual aspects of risk messages.

Where and When

The focus groups were held in a private room of a local country-style restaurant in the centre of the city. This provided an informal, non-threatening environment (and great desserts). The restaurant has free parking, an important consideration when people are volunteering their time, and was easily accessible by public transport. The groups were held in the early evening, from 7:00 pm to 9:00 pm to accommodate those participants with commitments during the day. The focus groups were held in mid-January, in the middle of a cold spell of -30C weather, but people still came out to the sessions. Rides home were given to those participants who had come by public transport.

The sessions were informal and chatty. Both I and the facilitator were dressed in casual clothes and I used an unobtrusive table microphone, placed centrally on the table, to record the discussion. Providing self-serve tea and coffee throughout the sessions also helped to set the tone of a conversation among a group of people rather than a formal meeting.

DATA ANALYSIS

The nature and depth of data analysis depends largely on the objectives of the research and the purpose for which the data were collected (Shamdasani 1992). Although the strengths of qualitative data "rest very centrally on the competence with which their analysis is carried out" (Miles and Hubberman 1994, 10), it is important not to over-analyse the data (Urion 1995). Data analysis can be considered as three concurrent, interactive and interwoven activities that happen before, during and after data collection – data reduction, data display and conclusion drawing/verification (Miles and Hubberman 1994).

The process of data reduction began prior to data collection with the selection of the research framework, the research questions and the research method, and continues throughout all stages of data analysis. Data reduction is a selecting, focusing, simplifying, abstracting and transforming process, which sharpens and organizes the data. Since the goal of the focus groups was to determine the kinds of information that people used in making personal health decisions, and how information should be presented, I expected to be able to code the data into categories such as type of information, sources of information, presentation of information and issues of trust and credibility of information.

I began the data reduction process by analysing the questions asked by the facilitator during the focus group sessions. I found that more questions were asked about the sources of information than I had planned and so there was extensive data in that category. The rest of the questions fell into one of the other categories. I reviewed the transcripts and referred to the notes taken during the sessions to look for key issues and themes which I coded under one of the above categories. I grouped all discussions on a particular issue together, creating sub-categories of similar issues. My decisions as to which category to place data in were founded on the context of the statement, the intent of the participant in making the statements and on the notes that I took during the discussions.

In analysing the data, (Chapter 4), however, I found that I needed to revise the categories. Much of the discussion about types of information was actually about whether and how people make decisions using the information available – and so I added the category 'decision making'. Issues of trust and credibility were so pervasive, both explicitly and implicitly, that they are considered in a separate category. Within each of these categories, I further divided the data into sub-categories. These categories and subcategories are not discrete. The next stage of data reduction was to look for themes and patterns throughout the discussions. Keeping in mind the admonition not to over-analyse the data, I identified four major themes – personal knowledge and experiences, information within contexts, relevance and control, and balance.

The second major activity is data display, that is to produce an organized, compressed, accessible assembly of the information, which can be used to draw conclusions. The decision to present the information as text was dictated by the requirements of this thesis. However, I decided to present some of the information within the context in which it was given and to include people's own voices as much as possible. The drawings of risk messages designed by the participants are presented together in Appendix B.

The third, and final, major activity of data analysis is conclusion-drawing and verification. In chapter 5, I discuss the findings of my research with respect to my research framework and the literature review, and show how the data supports my research statement. Conclusion-drawing is continued in chapter 6, with the review of the key findings of the research and recommendations for changes to the risk communication process.

4. ANALYSIS OF THE DATA

The data from the focus groups was obtained in three contexts: general discussions of risk, reviewing the posters containing articles and pamphlets addressing various health risks, and then specific risk messages. I combined the results of the first two contexts, as the findings of the poster reviews serve to confirm the information provided in the general discussions. I consider the sources of information, the kinds of information, issues about the credibility of the source of the information and of the information itself, the presentation of the information and elements of making decisions about personal health risks. Within this section, the quotes taken from the transcripts are attributed to individual participants by an identifying number in square brackets, e.g., [3]. Comments made by the facilitator are identified by a [F]. Appendix A contains a selection of the articles and graphs displayed on the posters.

The findings from discussions of specific risk messages are presented separately, as much of the discussion resulted from considerations of the specific risk information dealing with helmets and bicycles, breast cancer and benzene. These results are presented with reference to the messages which evoked them, and quotes have not been identified with individual participants. After analysing the data, I discuss the themes and patterns, namely personal knowledge and experiences, information within contexts, relevance and control, and balance, which emerge from this analysis. The risk messages designed by the participants are given in Appendix B to illustrate the participants' information needs 'in action'.

GENERAL DISCUSSIONS

Sources of Information

The sources of health risk information given by the participants were mentioned explicitly in answer to specific questions, but were also brought up in conversation about other issues. Some of the data were given in response to questions about the *kinds* of information used. The primary sources of risk information are people, institutions, the media, and the mysterious "they".

People

A major source of information are the subjects themselves – their experiences and knowledge and instincts are valuable kinds of information. Information is obtained from other people who may be knowledgeable about health issues through education and training or through experience, or a combination of the two. Medical professionals are frequent sources of health information. Doctors and other medically related people and researchers are often consulted, and so are practitioners of alternative medicines. Friends, family, co-workers and skilled sales staff are further sources of information.

Institutions

Information is also obtained from governmental, medical and educational institutions as well as private industry. Studies from universities and information obtained in university classes have a limited use, as does the information from pharmaceutical companies. Information groups such as the Heart and Stroke Foundation and Statistics Canada are used by several participants. The local City Board of Health was also mentioned as an information source.

Media

Much health information is obtained through the media. Advertisements in magazines and pamphlets from a local grocery store are a popular source, as are consumer reports on specific products. The participants also use magazines ranging from those available in health stores, to "Prevention" magazine, to the "Wellness Letter" published by Johns Hopkins University, as well as local newspapers. Reference and resource books dealing with specific health topics were also discussed. Health information is also obtained from television and from radio. Health programs, nature programs and health segments of the news programs were all mentioned. In these communications of personal health issues, the media are given the role of expert by the participants in the research.

"They Say"

Throughout the discussions, unidentified authoritative sources were frequently referred to by "they say." "They" provide health information which, generally, is considered credible by the participants and has become part of their own personal knowledge. Most of the "they say" information is repeated by the participants as fact.

> "They say butter is no good" [2].
>
> "But, as they say, anything in moderation" [4;6;8].
>
> "They've shown the effects of caffeine on exercise" [6].

"They", however, are sometimes criticised for their information.

> "..but they don't tell you that second bit" [3].
>
> "... it's like fluoridation too, they can't even agree whether that's good or bad for us" [3].
>
> "I find particularly when it comes to food, they change their minds continuously" [8].

References to "they" were often made unconsciously. Sometimes in discussing a particular source or institution, 'they' would refer to the people in charge; at other times, "they say" was stated without consideration of, or reference to, any particular source. One focus group realized that they were referring to 'they' as a source of wisdom and made a joke of it, using "they" sometimes in further discussions purposely. However, despite this awareness, some people continued to use "they say" without consideration of the source.

Even though the purposes of the two data collection methods is different and will result in different data obtained, the findings in this section from the focus groups reflect the results of an Alberta-wide survey of fifteen hundred participants about health risk perception in which people were asked where they obtained most of their information about health risks (Jardine, Krahn and Hrudey 1995). The survey showed that magazines and newspapers, and television and radio accounted for 70-80% of the responses. A discussion of focus groups in comparison to surveys is in Appendix C - Focus groups as research method.

Kinds of Information

We began the focus groups by asking general questions about the *kinds* of information the participants used. However, these questions brought forward mainly information about the *sources* of information. The facilitator moved on to asking about specific health risks which did elicit answers about specific kinds of information. There was little differentiation by the participants as to information currently used and information which would be useful if it were available. The discussion of the articles presented in the posters reinforced much of the information gathered in the first sessions, and added some new types of information.

Scientific and Technical

Much of the information people use is, not surprisingly, provided by scientific and technical studies. In discussing the labelling of food products, people were concerned whether the ingredients are natural and did not like or understand ingredients with long names. "A lot of the things that you read on the label and you don't know what the heck they are anyway" [4]. They look for information relevant to their own interests and find only the first few lines of ingredients useful.

> "I was comparing Libby's beans to the Safeway brand.....And I thought...seven grams compare to nine grams, or whatever it was, and I thought it's cheaper and it's got less fat. But I wouldn't necessarily go through it, oh vitamin B_{12}, oh yeah thirteen micrograms, and this one's got...more kelp. But in terms of something like fat..... just for comparison shopping it does help to have that on there, I find, for me anyway" [6].

> "The first two lines are great, but that little bit at the bottom, I have no idea what's in there. It could be rat poison for all I know" [7].

There was both amusement and concern over the phrase 'may contain' found on some food labels.

> "Or I like `may contain'. How don't they know? What are you getting when you buy that?. Meat and/or meat by-products" [4].

The discussion of bicycle helmets identified the kinds of information that are useful when purchasing a safety product. The features necessary for the product to be deemed safe should be identified as well as information about which of these features are actually present. Although there is confidence in the standards used in rating the product (e.g., CSA), they should be explained.

> "I would take a helmet rating, because I know what went into the rating. But there are...it's quantifiable, you know, the way they expressed it. If you drop a concrete block from six and a half feet onto this helmet, it will not shatter, and it does not crush an egg inside it. It will not cause penetration of, of skull structure" [7].

Everyday Measurements

During the discussions, conversations about numbers related mainly to the measurements provided in risk information. A discussion of drinking water raised information requests for details of the tests run on the water and a list of the contaminents in the water. Levels of contamination and of basic bacteria are required to be in "realizable, quantifiable measurements" [7]. There was strong agreement that measurements such as "parts per million" have little meaning and use.

> "Parts per million. In terms of how it's expressed, to answer the question. Same thing. It doesn't have any measure to me, it doesn't mean anything" [6].

In addition, information should be available about how much of a substance is actually harmful rather than what government regulations allow.

> "What do I have to compare it to? Is that good, bad or indifferent, like that's the problem I have is with reading these things. You know, they might say it's three parts per million, which is three times higher than the government recommended dose. Is it still a good thing or a bad thing. You know, do we trust the government to give us good figures, or have they played them, or you know, I mean, it's all, the human mind cannot conceive of a million anything. It just won't hold that" [4].

> "Yeah, exactly. I mean, if you were to take out parts per million and say this is the recommended, if you were to actually sit down and figure it out you'd say, that's not going to affect me at all" [7].

In response to parts per million as a measurement, there was strong agreement that any information about health risks should be put into everyday terms that people can relate to, whether it be cups of coffee or seconds of life lost per cigarette smoked. The examples given by the focus group members were of "per day" measures rather than cumulative lifetime amounts.

> "Putting it into realizable, quantifiable measurements would help people understand and react sanely to some of the things that are going on. If you do parts per million in something would you conceive of saying well, like you say, eighty glasses of water a day" [7].
>
> "Yeah, that's what I like to know is, is, sort of, like eighty glasses of water a day, is that, you know, or something like that. Something I can look at and say..." [6]
> "What's going to be relative to my lifestyle" [5].
>
> "Like, if I drink this much caffeine, this, three cups of coffee...but some things, you'll say, well Ok, now, how does this affect me in terms of my day to day life and give me...something I can understand, in terms I can understand" [6].

Statistics

Throughout the focus group sessions there was significant discussion about the usefulness of statistics in health risk information. There is some support for the use of statistics.

> "For me I need some figures, some statistics to support...what they said over there. If they just give me one case or two case[s] or a story...I don't expect just a story, I expect...figures, statistics...not to prove but to show that...there's quite significant evidence to support...the statements" [1].

Statistics such as death per year should be put into the information to provide context and perspective; age statistics would be useful as would statistics from activities similar to that being considered, which could be used for comparisons.

Overall, the participants of the focus groups have little, if any, confidence in statistics as they are presented in health risk information.

> "How can you adjust statistics?" [5].
> "Oh, quite easily, easily" [9].
> "There's a reference book called how to lie at statistics" [3].
>
> "And the thing is that they don't, they can, they can leave out information, they can adjust it. I mean, I'm telling you that a lot of stats are like, this is just within a department, and they, you know, a small department. But you know, they, research people had to readjust the numbers until it worked. I don't know how they do these things, and how they get away with doing these things, but they do it" [8].

Personal knowledge and experiences

A common non-scientific or non-technical kind of information used is people's own experiences and knowledge, as well as the experiences of other people. Personal knowledge was often introduced by "I know" or "I believe." Sometimes the sources of the knowledge were acknowledged, "I know it from my brother-in-law..." [2], but they are usually left unsaid, for example "I know it is dangerous" and "In my mind, I know that smoking is quite dangerous" [2]. The source of this knowledge is sometimes the individual themselves. "I certainly know my body well enough. I've lived in it long enough that I know what its telling me" [5]. Information obtained through personal knowledge may be stated explicitly, "I think any kind of stress can hurt you," [2] or may be implied in a more general statement as "I have a more holistic health approach" [5].

The participants used many experiences from their social and professional lives to talk about health issues. General or abstract issues brought up by the facilitator were put into the context of people's lives by recounting personal stories or experiences to illustrate the issue and to explain the participant's own views and opinions.

> "...and you know, I'm not supposed to eat chocolate" [5].
>
> "I've been running around for forty years with about a teaspoon of lead mercury in my mouth, fillings" [7].
>
> "I use a Britta water filter only because its a good storage container to have cold water in the fridge..." [6].
>
> "I was wearing a hard shell helmet when I hit the ground...." [7].
>
> "I never did take a stats course" [5].

> "I eat a lot of butter on my bread at lunchtime and put oil on my potatoes at dinnertime" [1].
>
> "Well, I'm not going to stop driving my car" [8].
>
> "And I mean, we quit smoking" [3].

Personal experiences are sometimes referred to directly as sources of personal knowledge and beliefs, and to explain people's behaviour.

> "I tend to quote studies from the university, only because I'm biased, having gone there" [6].
>
> "I know from personal experiences that applying pressure does relieve pain" [2].
>
> "I have trusted doctors completely and they have failed me many times" [8].
>
> "but I'm just going to say from my own personal experiences with doctors..." [5].

The experiences of other are also used to discuss health issues and are sometimes identified as a source of personal knowledge. "My father, again, being a heart patient, I know a lot about hearts" [8] and " I know someone who smoked for eighty years and he's still smoking" [6].

Common knowledge

Throughout the discussions was the frequent assumption of common knowledge. This is information and knowledge assumed to be widely known and accepted. The source of this knowledge is never acknowledged (maybe it is from 'they') and the information is often stated as a fact or introduced by "everyone knows". This bypasses questions of the source, the context and the credibility of the information and who receives the information and how.

Common knowledge is usually introduced by such phrases as "I think most people believe that" and "Everyone knows....." Common knowledge can be general: "most general public including myself, probably have an idea, a fair clue, about what will leave the right message or the wrong message" [1], and "I tend to question those informations. Unless its very simple, what everyone knows is true" [2]. In most cases, common knowledge refers to specific health information. "I think probably all of us know that too much saturated fat is not that good" [1], and "everybody knows what the basic things are to being healthy" [8].

Details, Details

There was a discussion of raw data versus the bottom line. One participant preferred to receive the data from health studies and draw his own conclusions, "I like to have the raw data, if I cannot find somebody who can explain it to me so that I can understand it. I feel that if my doctor cannot explain to me so that I understand what's going on, he doesn't really know" [7]. Other subjects preferred having someone else filter the information and just state if "it was safe, if it will do the job" [8]. "Yeah, but if I fall, is my head going to be safe?" [6]. During a discussion of the measurement of contaminents in water in parts per million, one participant stated "[It] means more to me when they say these are the ten places in Alberta...that have the best drinking water" [3].

The kinds of information noticed or sought depend also on its intended use. The kinds of information needed to satisfy curiosity are different from that needed for a specific problem or concern. A discussion of food labelling showed that the amount of detail needed on the label can depend on the substance that the person is concerned with.

> "But, I wouldn't necessarily go through it [the label], oh, vitamin B_{12} ,13 micrograms, and this one's got...more kelp. But in terms of something like fat, to be able to look at that, and you figure if you multiply that by nine, it gives you the amount of calories that are in that specific serving" [6].

The Whole Picture

There was criticism that the information given in the posters was, in general, out of context and so possibly skewed, and did not present a complete, or even coherent, picture.

> "Getting more information that is not taken out of context would be very valuable. Virtually every piece I read here and that marvellous 3-D holographic

> cube there, is taken out of context and is so skewed that thing they've got deaths, there's nowhere in there that it's related to actual population at the time. So yeah, if you have ten people and two die, well that's a lot. If you have two hundred people and two die, well that's not that many. Most of these are fairly self-serving releases of information" [7].

Some articles did not give the details of the research being described and questions such as "what's the criteria to measure stress?" and "what is a headache?" arose. In particular, the article associating TV violence with heart failure (Appendix A) generated this exchange:

> "It's kind of like this one down here about TV violence may harm the heart. Well...OK, how do they know that they guy wasn't sitting there and drinking beer and eating potato chips, or whatever..For fifteen years...they just focus in on the fact that he's watching TV, you know, violence on TV" [3].
> "Is he inactive? You know, I didn't read the whole thing" [5].
> "Jogging while watching TV?" [7].
> "Some people ride stationary bikes and watch TV" [3].

It was important to all participants that all information concerning a health risk be presented, even though later discussion revealed that participants felt overwhelmed with the minutia of health risk information. In addition, the practicalities of presenting all the information - the sheer volume of information and the reliability of that information - were not discussed. There was general agreement that both sides of an issue should be presented, and that the bad points as well as the good should be given; the benefits should be placed alongside the side effects or cost.

> "...they'll tell you what's good about something, they won't tell you what's bad about it" [6].
>
> "They are so one-sided that...I always know...one of my criteria in judging information [is]...whether they tend to...provide both sides of the issues. If they do not, and just one-sided, I start to question them" [1].
>
> "And so to me that was a very good source. And they always told you the pros and the cons of each of whatever topic it was, and I just found I got kind of hooked on that for a while" [8].
> "What is, what are the features, about what are the, what are the bad points, they will never ever give them to you. And those are what you need, and I find

> that Dr. Dean Edell will do that to you too. He'll give you the high advantages of fibre not, not the disadvantages" [7].

Local not Global

New kinds of information that arose in the discussions of the posters include a local rather than a global context. Canadian information was preferred to European or American information. The relevance of information to people's lives was echoed in the desire to see interviews with Canadian or Alberta experts with respect to studies conducted in other parts of the world.

> "It's interesting what I find in a lot of articles on how they'll say a certain study's come out, let's say the Journal's reporting, they'll say this is a study reported by some University in the States and they'll give the information then they'll go to maybe one or two sources locally, maybe they go to U of A or they go to some hospital or whatever. And they get two people who are local and then they interview them and sort of get a, like let's say it's something that takes place in somewhere in Europe, well, you're thinking well, that's Europe. I mean what's it what's the situation like in Canada. At least if they talk to let's say a, people who are either within that field working, or studying it. And they usually, and I find that helpful for me cause I think well they've gone and done some research here rather than just reporting on it, they've actually gone out and interviewed people who do that, you know, in our community, so I find that useful, and that seems to be in a lot of cases that's what they'll do" [6].

Positive and Practical

The participants expressed a desire for health risk information that is positive and gives advice about what an individual can do about the health risk. Depressing articles or those that just give statistics or data are ignored.

> "I just sort of skimmed through most of them and none of them really caught my eye cause they're all so negative in saying cancer kills da da da you know, canola helps. The positive ones it's oh, OK, cause it's something maybe you could do about it whereas rather than just quote the gloom, doom and destruction, I mean there's enough of that anyway, we don't need more" [4].

> "It's an interesting point. I think a lot of people feel like that because that's all you hear is gloom, doom and destruction" [6].

> "I do tend to avoid depressing articles, and like you say if there's an article on something that's positive, you think wow. And you tend to pay more attention

> like you know, all this can really help you or it can do something for you. It does catch your eye" [8].

Minutia

Even if all these useful kinds of information are available, some participants feel that there is too much minutia available and that they are bombarded with so much information that they tend to "switch off" and only seek, or even just read information, that is directly needed by them.

> "So when there's some heading like that even though it may be very eye-catching, but I probably won't read it because all that newspaper and some there so much information around us nowadays" [1].
>
> "and then I know it's something that we probably heard it so many times from TV and newspaper and I probably don't want to read that" [2].
>
> "I find...there is so much information about the same topic in front of me, I tend to ignore them" [4].

Credibility

The credibility of health risk information is related both to the kinds of information presented and the source of the information. Mistrust of either can result in the risk message being rejected or ignored.

Sources

The credibility of sources of information was a topic of much discussion, with some disagreement among the focus group participants. Some people trusted doctors and expert medical personnel while others did not.

> "Like if they have a expert like a doctor or a scientist you know like they'll give a comment and I tend to believe it more" [1].
>
> "Some doctor is saying, well I probably tend to believe it" [1].
>
> "But, specifically, for my health, my personal health, I would, just thought I'd, I understood the question to be, I would certainly start with someone medically related. Not, perhaps not my own doctor. Cause, I've had a gynaecologist for years, and I've had two ectopics, and the one, the doctor that I got the most

> information from was a GP that I had used for my daughter in her growing years" [5].
>
> "...but I'm just going to say that from my own personal experience with doctors, I have learned, I used to trust doctors completely. I used to, you know, I mean, I would go there and believe whatever the doctor told me. And as a result of that I have been, you know, in serious trouble a couple of times" [8].

The researchers themselves rather than the medical staff are sometimes credible, although there is a need to understand the motives of the researcher or the biases of the research project. "You know like, I usually tend to believe the researcher than a medical doctor or nurse, you know someone like that" [2]. Friends, co-workers and other people known to the participants are trusted as are skilled sales staff.

How the person looks and behaves when presenting the information affects their credibility.

> "And even the look, you know, the body language and they sound real humble...I tend to believe more...I don't care about...whether they're very arrogant in their speech...but did they look sincere, sound sincere. I tend to believe them" [1].
>
> "Their personality counts" [2].

To establish the credibility of an organization or institution as a source of information, its track record should be known, as well as its reputation within a group of similar organizations. In general, the participants do not trust government organizations.

> "The City of Edmonton? This is the same city that let us sit through two weeks of Lodgepole fall-out. With sulphur dioxide levels that were knocking pigeons dead out of the air" [7].

The source of the publication affects the credibility of the information presented. An example is a tabloid magazine compared to a publication from an established University. If the same information is found in several publications, then the credibility of those sources increases; there are certain authors that individuals trust. In all cases, the source should be seen to be unbiased (or to identify its biases) and to be ethical.

> "After years of watching this stuff and seeing the self-serving mechanisms and releases, I always try to find some indication that they are being ethical and they're not just looking to do a flashy press release so they can put it in their grant applications" [7].

The credibility of any source of health risk information is established by its position and its reputation in the larger sphere of health research.

> "So what builds credibility points?" [F].
> "Showing that they're not doing it [research] in a vacuum. Showing that they're doing it in conjunction within the worldwide study for cancer. And they've gotten brownie points from them or a mention from them that this is a positive thing" [7].

People do not rely exclusively on any one source of information. "I read four or five magazines, different ones. I also compare the books, compare to see [if] doctor A says the same thing like doctor B or C." [2]. An acknowledgement of the possibility of bias in information leads one participant to be "really leery about single sourcing anything. Whether it's political opinion or whatever, because no matter who puts it out they have a bias, or are that way inclined by finance or disposition" [7].

Information

> In answer to the question "What information do you most question?" the immediate response was "Sales pitch" [1]. Another participant agreed.
>
> "I made the comment that I don't trust any information put out by the company itself on their products. Incredibly biased, you know, just like my example with Prozac. The only information I was given was by the company that made Prozac. I mean, you know, talk about biased" [8].

This was closely followed by mention of advertisements.

> "I always got the feeling that they try to sell you something because...when you have an article and then right next to it on the same page, then they have the advertisement of a certain product that's related to that article" [1].

Information is more credible if the details of the research are given along with the credentials of the researcher or research institution. The credibility of contradictory studies is low, and information in the context of how it was obtained and its place in the world is important to establish credibility.

> "You know like you read one that says stress causes heart attacks and the next one says well it doesn't, so what do you believe? And you never know which one is right and which one is, like you said it's out of context so how do you know how to really judge it?" [3].

There is an awareness that information can be skewed or biased, and anything which can be done to alleviate people's fears of this will add to the credibility of the information. One example of this is the credibility of health studies done on animals and projected on to humans.

> "But even so, you've got, I mean, saw them doing studies on rats, and I kind of think how pertinent is that to me?" [6].
>
> "They, they, the dosage that they give these rats is just, you know, to their body weight, is just phenomenal. And it just had no credibility to me" [5].

The major test, however, of the credibility of information is whether it fits in with people's personal knowledge, experiences and beliefs, and with common knowledge. The participants trust their own research and reading and other people's experiences, and use their personal knowledge to evaluate any other information they are given.

Presentation of Information

The language in which the information is given is an important factor. Plain, easy to understand language, without literary licence or jargon, should be used. There was some confusion such the headlines as "Pectin Helps Slip Cancer's Punch" and "Taboo Treats." The information should be presented simply, "To me more simple more better, the simplest the better" [2], but still give a complete picture. "So it could be sometimes too simple, too straight forward, I would start to question it, maybe they did not present both sides of the issues, something like that" [1].

Pictures, diagrams and cartoons should be used to illustrate, or even to fully explain, the health information. Any visual aids should be simple and easy to understand.

In reviewing the articles on [illegible], one participant commented "... the two triangles on it, I'll look at that and I wouldn't even bother... you can't just read it and say how would I get the information out of it" [6]. This was confirmed by another participant, "But something that just sort of catches my eye and is easy to read. If its too much work to figure out I won't bother" [8]. Pictures and headlines can be misleading however. Some participants assumed what an article contained without reading it, based on the picture of fruit and vegetables given.

Participants differed in their acceptance and use of graphs, from not reading them at all to wanting graphs, such as bar graphs and pie charts, which were straightforward and easy to understand. Colour in graphs would make them more accessible and text could be provided to explain what the graphs represent and how they should be interpreted. The "3-D" graph (Appendix A), so named by the focus group members, raised the comment "its fascinating to look at, I wouldn't want to try to figure it out," [7] which resulted in a group discussion about whether 3-D glasses would help when viewing the graph!

Decision-Making

Decision-making is not a category of information that I had predicted, but arose from my analysis of the focus group discussions. Many of the discussions in the focus groups were centred not on what information is used by people in their everyday lives, but on how they use risk information. This category examines considerations, other than the information or its source, that play a role in whether and how people decide to use health information. These considerations include bases for making decisions, the knowledge of the effects of a risk, decisions about quality of life, evaluations of benefits and harm, consideration of alternative courses of action, personal relevance of the information, feelings of invulnerability and considerations of contradictory information.

Basis for Decisions

There was extensive discussion about whether people make decisions based on emotion or intellect. Some participants did not know how they made their decisions, while others were aware that both emotion and intellect contributed to their decisions. In discussing the emotional elements of decision making, there were different reactions to the example of a celebrity presenting his own story.

> "If you're, let's say, talking about AIDS, is it better for a physician to come on TV...and he's the head physician for the AIDS Council of America or whatever. And he comes on and he gives all these statistics, the number of people died in New York City, and the number of projected deaths in the next years. Or to have Magic Johnson come on and just give a very candid talk, with no stats whatsoever, just to provide information saying, look, this is what I did, this is what happened" [6].
>
> "Which, and do you want something in between? You know, one seems like an extreme, which is basically a very heart felt message, and the other is very statistical-oriented. People listen to that. Are they going to be more, do they want to be, have an intellectual basis to making a decision, or do they want to be purely emotional. I think it's a combination for me" [6].
>
> "The ones that appeal to me the most, the ones that drive home the most are not the Magic Johnson's, but like the local heroes types. The ones that, you know, tracking a paper every week and describe their life in general. Cause this is not somebody who's apt to do drugs and women and whatnot. It's just a guy who, [for] whatever reasons, it happened to" [4].

Some participants were aware that the decisions they make may be considered to be irrational. "Even though they give me the information, I still have to put in my own judgement which could be very irrational" [1].

Knowing the Effects

Knowing the effects of a behaviour does not necessarily persuade an individual to change that behaviour. Peer pressure plays a role in influencing health risks, in both positive and negative behaviours.

> "And I mean, we quit smoking because it became looked badly upon, you know. We go to dinner meetings and things like that and we'd be the only people smoking. So we quit" [3].
> "It's not trendy to eat low-fat cheese, but it's trendy to walk around with an Evian bottle. I mean I know people that will, you know, they'll, they'll finish it and then they'll just put regular tap water in it, but it's cool to have that bottle, you know" [6].

> "And unfortunately too, like with kids, a lot of the kids just want a helmet that looks OK and they're focused on the looks, and it's not sort of still like, you know, like it's not cool to wear a helmet" [8].

Addiction also plays a role in determining whether to have a cigarette or to drink a cup of coffee. Several participants realized their addiction to coffee, yet they gave various reasons for not cutting it out.

> "It's like the coffee. It give you a lift, then after a while that lift gone away so you need more coffee for lift and so on. And then you end up drinking too much coffee" [2].

> "I've been drinking coffee every day since I was about thirteen. And I honestly don't know what I would be like if I wasn't drinking it. Maybe I'd be really depressed, and not talkative, but I, I, that's just the way I am. Maybe the coffee doesn't make any, but I don't even know. I've tried giving it up and I've lasted a day and a half. I really enjoy it, and I had to go back to it" [6].

> "The thing is I'd be afraid to try and quit drinking coffee, cause I think it would be a heck of a lot tougher than, like, I think it has more control over me than what I'm willing to believe" [4].

One participant admitted her lack of control over chocolate. "And, you know, I'm not supposed to eat chocolate, and I know it's bad for me, but I'm kind of a chocoholic, so, I'm not supposed to have it.....I need somebody to tell me that I have to give up that habit" [8].

Quality of Life

The personal benefits of a behaviour, as defined by the individual, are sometimes consciously chosen over the potential harm. Eating chocolate, even though it has a high fat content, was mentioned both as an addiction and as a personal choice. In talking about food, many participants admitted that taste and enjoyment often win out over warnings of cholesterol and heart failure, and even over medical advice.

> "I probably go for the taste. I like the taste of butter better, and I know that you know, I won't eat a ton a pile of butter a day, so I don't think you know, like the problem with butter or margarine will affect me that much. So I tend to

> go for the things I enjoy more, than thinking about the risk, you know the health benefits of it" [1].
>
> "But I, that's where it comes down to, some foods I'll say I don't want to substitute the real thing, so I'll, like for, like something like Diet Coke, I don't like the aspartame that I find it leaves an aftertaste in my mouth and I prefer to have sugar" [6].
>
> "Some things that I've tried that are diet or low fat cheese, it doesn't come down to whether it's going to affect me healthwise, it comes down to the taste. And money, is it more expensive? So if I have to spend six dollars for this, and for the same thing that's got fat in it I can get for four, it has better taste, I'll buy the stuff that's cheaper and better tasting" [6].

Benefits versus Harm

The idea of tradeoffs echoes the discussions about quality of life and how people choose to live their lives.

> "And also because I'm that type of person that's...like [to] go for the pleasure and enjoyment...more than the actual risk. Plus I know that you know, there are more benefits from drinking milk than say that little harm...from those additive. So it's not really my concern. I think it's OK" [1].

Some participants avoided physical risks while others went skydiving or roller-blading. The benefits versus harm considerations of physical activities involve considerations such as the seriousness of the potential harm, the amount of security needed by the individual, and are a matter of acceptable degree.

No Alternatives

Having no alternative course of action can result in a decision to not use health risk information. People may know the mortality statistics of travelling by car or by plane, yet have to use both forms of transport. One participant continues to drink milk even though it physically bothers her, as she is concerned abut osteoporosis and is not always able to find alternative natural sources of calcium. Fluoridation is not an option to people who drink tapwater. One participant detailed how she began to drink coffee. "[In] a health institution. [T]hey always served coffee, whether you asked for it or not. You weren't given any choice...And I used to be actually embarrassed that I didn't drink coffee because everywhere you go, coffee or tea is served" [8].

Personal Relevance

Personal experiences, beliefs, interests and knowledge play a major role in decisions of whether and how to use health risk information. A person's attention is drawn to information which is relevant to their own current interests and concerns.

> "And I'm not smoking myself. I probably won't read it. Unless I have to do a paper or research, then I look at it. But...I don't think that's useful to me" [1].
>
> "I would read something [on smoking] just to tell my husband to quit" [2].
>
> "If it seems appropriate to you, you'll read it. If if seems general, you might read it anyway. But if its not about you, you'll just say, Oh well, the heck with it" [6].
>
> "I think I'm probably the kind of person that I'm not going to do anything about it until I'm faced with the problem" [1].

There is an awareness that a person's social circumstances and geographic location influence what health issues are relevant to them.

> "I've lived in Asia for three years, I lived in Britain for three years. Asia was the big eye opener. All your doom and gloom is really quite a local phenomenon. They have a hold different set of doom and gloom in Asia, and frankly don't care a rat's ass about Aids...The big deal is landmines left over from the Vietnam war, that's a biggie, cause twenty five, thirty kids a day step on a landmine. Cholera in Jakarta is the big one, and the fact that somebody found a rat the size of a Volkswagen, and it's not, often it's not presented as doom and gloom" [7].

Information which contradicts or challenges a person's knowledge, or adds something new, can also catch their attention. This exchange occurred when discussing an article about the benefits of eating vegetables (Appendix A).

> "So here's another one [article] about veggies" [F].
> "Oh, for sure, that one I won't read it" [2].
> "What if it said that veggies are bad for the heart" [F].
> "Bad? Then I will read it. That is something different" [2].

Personal knowledge and experiences are also used extensively to test and evaluate new health information, "So I think I'm able to judge by...my own preference...can go by my past experience" [2]. In discussing the number of fatalities from bicycling and drinking, one participant commented, "I can tell you from personal experience that I'm surprised that it isn't higher. Its awfully hard to balance after you've been drinking. I fell off several times" [3]. New information has to fit in with existing knowledge or has to be of such difference that it causes people to question and possibly re-evaluate their own personal knowledge.

The personal knowledge of friends and family members are also used in the evaluation of health information, but may not be the prime criteria for the evaluation.

> "I will listen to them, but certainly may not agree with them because, you know, they have a strong opinion about one thing and I also have a strong opinion. I would usually believe myself...whether its good for me or bad" [1].

People also decide whether information is useful for them by trying it out. "I think it works well. I have tried it several times" [1]. Sometimes, this is the main method by which the credibility of health information is established. "I don't necessarily believe just him [the doctor]. I have to put it in logic and see if it works...in order to accept it or not" [2].

Invulnerability

A feeling of invulnerability also influences which information people choose to use. If an individual considers themselves immune to the effects of a risk, then any information about that risk will not have personal relevance for them. This was discussed in several ways. An "I'm healthy, it doesn't affect me" attitude was brought up by several participants. Coupled with this is a common belief that the harm will happen to someone else.

> "But I just figure, well, you know, I've been doing this for a while, and I've survived, and unless I'm told that I have a particular health risk and I can't eat it [chocolate] because I'm going to really severely, you know, damage myself" [8].

> "So that, I think they always just think, well, it won't happen to me. Or they, they try and convince themselves that it's not going to happen to them. It's going to be somebody else" [5].
>
> "That's not everyone getting cancer, so I probably not I'm not I'm probably the one that won't get cancer" [1].

Feelings of invulnerability are also seen, to some extent, in situations in which some health risk advice is being taken, and so people feel safer and will not take other, equally as important, precautions. "If people feel safer, they will take greater risks" [3]. There were many examples given of this. One participant's father has heart disease and takes pills to reduce his cholesterol, and still eats bacon and eggs. There was conversation about friends who feel protected by the airbags in their cars and will speed on the highways. People have been seen wearing bicycle helmets yet not taking simple traffic safety precautions when riding on the roads.

Contradictory Information

There are diverse reactions from the participants when faced with contradictory information.

> "... cause I find myself paying less and less attention to whatever health information I get, just because there's been so much inconsistency, and contradictory information and so, I don't care anymore, you know, you're telling me all this stuff, I don't care. Like, I'll eat the butter, I'll do whatever, just cause I've had it up to here with your song and dances" [4].
>
> "This week oat bran is good for you, next week, oat bran is bad for you, and this week such and such is good, and I mean, there seems to be no sense of, no absolutes I guess. There's all this minutia that you're bombarded with from the health sources" [7].
>
> "One [book] is called "Listening to Prozac" and the other is called "Talking Back to Prozac", and I read them both from cover to cover. The "Listening to Prozac" tells you what a miracle drug it is and how fantastic it is, and you just think everybody should be on it by the time you've read this book....One saying what a fantastic miracle drug this is. The other one saying what a dangerous, you know, drug it was. And I read them both, and I thought WOW, and it opened my eyes...What opened my eyes the most was that for the first time I realized, hey, you can't take one view, like these two books were like two

> extremes...And I thought, wow, you know you really have to take both ends of it and then make your own, like you got to get all the, like what you were saying, you need to get as much information as possible. Get both sides of the story, cause there's never one side. There's never one side" [8].

Many of the findings obtained from the general discussions and the review of the posters were repeated when specific risk messages were considered.

CONVERSATIONS IN CONTEXTS

Many of the topics raised throughout the general discussions and in the review of the posters were raised again when the participants reviewed specific health risk statements. The statements were concerned with three different health risks – helmets and bicycles, breast cancer and benzene – and were presented without explanation of from where the data was obtained or how it was calculated. This exercise had two goals - to confirm, or not, the information obtained in previous discussions and to show people's information needs 'in action'. These three risks were specifically chosen as the information about them is obtained from different sources and through different processes, with differing degrees of certainty. The results of the reviews are presented here in the contexts in which they arose. Throughout the conversations, the sources of the information were seldom discussed and decision-making criteria were mainly implicit within the discussions about the types of information used and needed. The risk statements given to the focus groups participants are shown at the beginning of each section.

Helmets and Bicycles

The information obtained from the discussion of helmets and bicycles falls into three categories – further information needed, a critique of the information given and the usefulness of the information with respect to personal knowledge and experiences.

The first request for further information was to place the statistics in a local or global context, "It could be anywhere," "On the planet earth?" The statement *about 75% of fatalities [of bicyclists] are from head injuries* prompted queries as "What was the breakdown of the other 25%?" "Were these people wearing helmets?", "Which part of the head [was injured]?" and "Are they sure...were there massive chest traumas as well?"

In 1992, eighty-seven bicyclists were killed; of these:
  seventy were men and seventeen women
  seventy-three involved a collision with a motor vehicle
About 75% of fatalities are from head injuries
Studies of bicycle accidents show that helmets can reduce the chance of head injury from 75% to 85%
Results from the U.S. showed that approximately one third of all fatally injured bicyclists have been drinking alcohol

The statement *studies of bicycle accidents show that helmets can reduce the chance of head injury from 75% to 85%* appears to be a contradiction - a reduction from 75% to 85%. The statement was intended to mean that the chance of head injury when wearing a helmet is reduced *by* 75%-85%, but the wording casues ambiguity. However, the apparant contradiction in the statement was only noticed by one participant, who questioned the term 'reduce' given that the percentage increased. This statement, however, raised additional questions about what constitutes head injuries and where on the head the injuries were. "This doesn't say whether a nosebleed...does that constitute head injuries?" There was also a request for more information about the accidents themselves and whether they could have been avoided.

A need for clarification and definition was also found in the last statement where the participants questioned how much alcohol, in terms if the numbers of drinks, counts as "drinking alcohol". This statement was light-heartedly dismissed because of its non-local (i.e., American) content. "And look at where the figures are taken from. Those Americans are real drinkers."

Participants found the statement about helmets reducing the chance of injury to be confusing; one interpretation given was that it meant that 75% of bicyclists were not wearing helmets. Each focus group discussed this statement and came to a negotiated interpretation. The percentages given in several of the statements raised a discussion of the meaning of and confusion with statistics. One participant interpreted the drinking alcohol statement as "...you stand a better than twice the chance of being fatally injured if you're sober." While causing laughter in the focus group, this highlights a difficulty in the use of statistics. The statement should be interpreted, using conditional probability, to mean that if a bicyclist is fatally injured, there is a 1/3 chance that they had been drinking. The participants understood the statement to read that if you had been drinking, you had a 1/3 chance of being fatally injured.

The participants used their own personal knowledge and experiences to judge the validity of the statements. Some accepted the statements at face value as they know that bicycling is dangerous or they had heard similar facts before. Those to whom the information was not personally relevant did not question the numbers given. One participant was surprised as the statistics did not fit with her image of bicycling, "This blows my mind off because I always have that health image about those people who ride their bicycles."

Breast Cancer

The chance of a woman developing breast cancer over her lifetime is 1 in 9

The chance of a woman developing breast cancer at different ages:
- by 40 — 1 in 250
- by 50 — 1 in 60
- by 60 — 1 in 28
- by 70 — 1 in 16

The chance of a woman dying from breast cancer over her lifetime is 1 in 24

Risk factors which increase the chances of a woman developing breast cancer are:
- Family history (if more than one first degree relative)
- Age at first pregnancy (women who have child over the age of 30 have a slightly greater risk)
- Menstruation (women who start before the age of 12 and have menopause at an older age have a slightly greater risk)
- Diet (further research required, some evidence shows a high intake of fat increases the risk)

Mortality rates for breast cancer in women have remained level for the past twenty five years

The statements on breast cancer did not generate many requests for additional details, but did provoke extensive discussions about the participants' own experiences and knowledge and about the need for information which gives the reader the opportunity to 'do something'. The information given was reviewed and there was a lively, more in-depth, discussion of the use of statistics in health risk information.

The first statement, *the chances of a woman developing breast cancer over her lifetime is 1 in 9* was considered to be too general to provide any useful information, as it did not take into account factors such as genetic disposition. The next statement giving the chance of breast cancer at different ages raised requests to provide a context for the numbers. "How many women are under 40?" and "How many people are there?" The only request for further information generated by the statement showing risk factors was what the ordinary age for menopause is. The number of people dying from breast cancer rather than the mortality rate, would be useful in the final statement. "Does that mean that there are still 1 in 3 people dying, or is it still the same number of people that die?"

The participants' own knowledges and experiences were important in how, or even whether, they interpreted and used the health information given. The first statement was too general to be relevant to most of the group members while the second statement giving age groups aroused more interest. "That's a little more relevant because I'm in my forties. There's some identifiable information. The first one [statement], I'm a woman and I've got breasts. The second one is a little more relevant because there's a determination...by age." The risk factors were also considered to be too general as they only briefly considered genetic traits and dispositions. However, diet as a risk factor was accepted as it relates to information already known.

The main criticism of the information given was related to its lack of usefulness. The statements presented numbers and not advice, "I'm not sure of the purpose of this," "It's useless...," "...there's nothing to do," and the numbers are not in everyday terms such as "smoking one cigarette reduces your life by 32 seconds". Some participants felt that there was little they could do about the risk factors due to their genetic dispositions.

The discussion of the use of statistics in health messages centered on what the numbers actually mean. Most of the participants were confused about chance presented as 1 in 9 or as 1 in 250. This was shown in one participant's attempts to explain their own confusion. "Its like the odds. That study doesn't mean that...the chance of you developing it is one in nine, so does that mean that you are the one in nine people to get it, or the chance is eleven percent of actually getting it?"

The groups considered the first and third statements taken together to provide more information than read separately. However, the statements were recalculated and reworded by the participants to read "If you get breast cancer, you have a 1 in 3 chance of dying from it," which satisfied most participants. This sophisticated manipulation of statistics by the focus group participants was in contrast to the misunderstanding of a similar use of statistics in the discussion of bicycle helmets.

Benzene

This discussion raised many requests for further details, and critiques of the information given as well as issues of relevance and control.

Vehicle emissions are the major source of benzene released into the environment
In the environment. benzene reacts quickly with other chemicals in the air and breaks down within a few days
Studies of occupationally exposed workers have shown associations between benzene exposure and leukemia
On average, cigarette smoke exposes smokers to ten times more benzene than non-smokers
It is not possible to make a rational estimate of the number of fatalities or injuries resulting from typical benzene exposure

In the environment, benzene reacts quickly with other chemicals in the air and breaks down in a few days raised questions such as "breaks down into what, to do what?" and "which chemicals – common or found only in the lab?" The term "*occupationally exposed workers*" in the second statement was not understood and "association" was also questioned, "How strong is the association?" Participants wanted further information about what occupations are affected and asked for actual cases or numbers.

The statement "on average, cigarette smoke exposes smokers to ten times more benzene than non-smokers" was considered to be the most vague statement of the whole exercise and so not of use.

> "so does this mean that cigarette smoke, if the non-smokers are exposed to the smoke burning out of the end, does that mean that there's no benzene in it? Or there's, I guess what they're saying is by inhaling it, you get ten times more benzene in your system than a non-smoker whose not exposed to smoke, or does it mean that if a non-smoker is in the room and you guys all light up..and I'm sitting here, would you get ten times more benzene because I'm not breathing it in or if I'm taking in the smoke, that you're not?"

The final statement was included, even though it would be disputed within the scientific community. The terminology in this statement was also found to be confusing.

When prompted, the participants variously defined "*rational*" as "something that would mean anything to us," "strong" and "putting the risk in context."

The personal relevance of the information about benzene was questioned throughout the discussions. "Don't think it's a problem because they can't make a rational estimate". "There's so many other things to worry about". "If its not determinable, then I can't worry about it". One group's attitude was summed up in one heartfelt statement, "So right at the end, you've spent all this time going ya da da da da, then at the end, its 'oh, we really can't tell anyway', so why'd you waste my time with all this other stuff?"

The review of specific risk messages provided an opportunity to see people's information needs 'in action'. The results of this review validated many of the findings of the general discussions, most notably, the confusion over, and misunderstanding, of numbers and statistics, the participant's need to know the contexts of the information and the use of personal knowledge to judge the validity, usefulness and relevance of risk information.

THEMES

The research data was placed into the discrete categories of sources, kinds of information, credibility, presentation and decision-making detailed in the previous section. However, four themes run across all five categories and provide a general, rather than a detailed, picture of the use and usefulness of health risk information. The themes are personal knowledge and experiences, information in context(s), relevance and control, and balance.

Personal Knowledge and Experiences

Without exception, all participants, and even the facilitator, told of personal knowledge and experiences during the focus group discussions. People as a source of health information, for themselves and for others, were mentioned early in the discussions. Personal knowledge is often introduced by "I know" or "I believe", and refers to knowledge that the individual has acquired and thinks of as credible – the source of such information is usually not mentioned, and may even be forgotten. Personal experiences were used to discuss both general and specific health issues, and sometimes to put personal knowledge into the context in which it was obtained.

People's attention is caught by health information which is relevant to their own interests and concerns, or is such that it strongly contradicts their own knowledge and beliefs. New health knowledge is accepted if it fits in with a person's existing knowledge system or if enough, credible, information is given which causes that individual to reevaluate and then to change their personal knowledge.

Information within Context(s)

Information within context(s) was both an explicit and implicit theme throughout all the discussions in the focus groups. The context in which the information was produced is important. The credibility of the source of the information, the source's position in the larger scheme of similar health research and the details of the studies which produced the information all contribute to this context. The information itself should not be given as if it were context-independent. Enough information should be given to show the "bigger picture" of how the information relates to health issues in general and the "smaller picture" of how it can relate to an individual. This is not to say that the participants were looking for information that would apply to them individually and uniquely; they wanted information to be qualified enough (perhaps with risk factors as in the statements about breast cancer) to provide a context by which to tell if the information were applicable to themselves.

As discussed above, health information has to make sense within the context of an individual's pre-existing knowledge, experiences and beliefs. Some participants rejected information which was contradictory to their own beliefs, while information which supported those beliefs was more readily accepted. Health information has to fit in with an individual's everyday life. It has to relate to their interests or concerns or be of sufficient controversy to get their attention. Health information should be presented in terms of common everyday events (e.g., cups of coffee), and should be presented in plain language and not scientific or technical terms and jargon. An excellent illustration of the context of everyday life, and the practicalities inherent in this context, is found in the discussions in two focus groups, independently, of the effects of enclosing some kind of warning or information leaflet with bicycles and bicycle helmets. Participants in both groups were concerned with the potentially negative economic effects on the merchants selling the bicycles if this were to be enforced.

A significant part of information in context(s) is the consideration of the public's use and understanding of numbers and statistics, as discussed previously. Numbers and statistics are not fully understood and either ignored, misinterpreted or rejected out of hand.

Personal interest or need for health risk information provides an important context in which information is obtained and evaluated. Related to this is a context which is often ignored in the risk literature, that of time. People's interests and needs change over time. While this is related to the issue of relevance discussed below, it also demonstrates a need to consider both the content and the process of risk communication to be dynamic, and to be aware of the changing needs of the participants.

Relevance and Control

Relevance is a subset of both personal knowledge and experiences and of information in context(s), but is presented here as a theme in its own right as it relates to the issue of control. Relevance is an extremely dynamic concept; a person's information needs are not static and change with the individual's concerns, interests and knowledge. Relevant information, however, might not even be read, no matter how well it is presented. Participants complained about the sheer volume and detail of health information available and stated that they tended to ignore much health information. The relevance of information which was too general was questioned as was information which was too detailed.

The issue of control arose many times throughout the group sessions. Information should be directly useful, again a dynamic target, and should enable the individual to "do something about" the health risk(s). The relevance of health information is directly linked to its usefulness in providing the knowledge for people to make changes within their own lives.

Balance

Obtaining useful health risk information is a matter of balancing all the elements of information needs discussed in this chapter. Information needs are dynamic. There are many elements which contribute to the information needs of an individual, ranging from the credibility of the source of the information to personal interests. A change in any one of these can result in a reconsideration of all of the other elements and a renegotiation of an individual's position with respect to their personal health risks. Establishing the balance is not simply the act of examining and evaluating all the elements and putting them together into a coherent whole. As with any decision making process, the balance consists of using the information available at the time and putting it into the context of a person's life to make the best possible decision, for that person, at that time. Not all of the elements will contribute to the information needs for any given context, and for those that do, information may not be accessible or understandable.

This chapter has presented the data obtained from the focus groups – from the general discussions, the review of the articles and the review of specific risk messages for bicycles and helmets, breast cancer and benzene. The categories of source, kinds of information , credibility, presentation and decision-making were used to organize the data. The themes of personal knowledge and experiences, information in context(s), relevance and control and balance were identified running throughout all the discussions. The next chapter reviews the research data with respect to my research statement and the framework for my research, that I presented in Chapter 2.

5. DISCUSSIONS OF THE RESEARCH

I begin this chapter by briefly reviewing the key findings of the literature review (Chapter 2) and of the data analysis (Chapter 4). I then examine how the research data, obtained through the focus groups, support or conflict with the research statement and the framework of risk communication which I used for my research. The chapter concludes with a review of focus groups as the research method used.

The review of the literature within the field of risk studies showed that risk communication has been primarily practised as a one-way monologue of scientific and technical information from experts to the public. When the public is consulted, it is often to elicit concerns or to model how risk is perceived. This information may then be used in designing risk communications to change the public's perceptions of risk to the view of risk of some experts, even though the experts may differ in their views of the risk. While the social dimensions of risk are discussed, to varying extents, cultural considerations are limited to primarily cross-national comparisons. The review of the literature from within anthropology and communications theory provided an alternate view of culture, cultural identity. Cultural identity comprises cultural elements such as ethnicity, gender or education background. Communication between groups with different cultural identities can be considered as cross-cultural communication.

My research statement proposed that risk communication between experts and the public should be considered to be a cross-cultural dialogue. Underlying the statement is the premise that experts and the public are of distinct subcultures. I proposed that one cultural difference between these two groups is of information needs – the information that people want to receive from, or contribute to, risk communication. The research project examined the information needs of some members of the public in making their decisions about personal health risks.

Four themes emerged from the analysis of the data from the focus groups sessions – personal knowledge, information within context(s), relevance and control, and balance. The research participants used personal and common knowledge to evaluate scientific and technical health risk information. This placed the information within the context of their everyday lives. The context within which the health information was produced was also of importance. Common knowledge has the potential to be in tension with personal knowledge, as it may not fit in exactly with an individual's personal knowledge and beliefs. However, because the knowledge is widely known, and commonly accepted, it is believed to be credible. The context of everyday lives determined whether the health risk information was of relevance to the individual and whether they had control over the risk itself or in changing behaviour which contributed to that risk. The participants in the research balanced all the different kinds of information with their interests, everyday lives and information needs to make decisions about their personal health risk issues.

THE RESEARCH STATEMENT

My research statement was that risk communication between experts and the public should be considered as a cross-cultural dialogue. I first examine the underlying proposal that experts and the public are of distinct subcultures and discuss whether communication between experts and the public can be considered as a cross-cultural process. Using the findings from the focus groups, I then examine whether risk communication, as practised within the experiences of the research participants, is a dialogue.

Experts and the Public are of Distinct Subcultures

Fischhoff (1989) claims that problems in risk communication arise because, in part, experts and laypeople are speaking different languages, are solving different problems, see the facts differently and disagree on what is feasible. These are all elements of culture, when culture is considered in its broad definition of consisting of behavioural, symbolic and material aspects. I look at each of these in turn and then present some other cultural elements from scholars such as Wynne, Vaughan and Nordenstam, and Sarbaugh.

The research findings support the claim that experts and laypeople, the public, are *speaking different languages*. Language, in this context, really refers to a code system, of verbal and non verbal codes. Sarbaugh (1988) states that sharing a common code is a necessary condition for communication to occur. The data from the focus groups shows several examples of the lack of a common code. Statistical data given by experts were not readily understood by the participants. This resulted not only in the risk information not being communicated effectively, but sometimes in the participants not bothering to read the accompanying text in the risk message. Some of the participants have taken statistics courses, but this has served to make them question the calculations behind the statistics and to not accept them at face value. Being familiar with statistics led to a partial understanding of the statistical information given in the risk messages. However, this resulted in mistrust, rather than acceptance, of the risk information.

The participants' unease with statistics highlights a critical issue in risk communication - that, by ignoring statistics, the focus group members are ignoring the very information that the experts consider to be the most reliable. There are various degrees of certainty and reliability in the kinds of health risk information available to and provided by the experts. For example, predictive information from toxicology studies is not as reliable as information obtained from epidemiological research. The most reliable information is from direct, statistical inference based on scientific data; properly analysed statistics offer the best source of health risk information. The participants' lack of confidence of statistics was due mainly to the perceived ease of manipulation of such numbers by the experts to meet desired ends. However, some of the participants did also state that statistics, such as age and gender data, which provided context and perspective would be useful.

The language gap between the experts and the focus group members may be over the presentation of and the explanation of the numbers, rather than the data from which the numbers are extracted. The difficulty the participants had in recognising, or maybe even understanding, the idea of conditional probability in the statement on fatally injured bicyclists and drinking, is an example of this. However, the same group was able, unaided and unprompted, to use the idea of conditional probability in combining the statements of the risks of breast cancer concerning the chance of a woman getting breast cancer and the chance of a woman dying form breast cancer.

The numerical information found in risk messages, for example a 1 in 9 chance of contracting breast cancer, was another example of a code not familiar to the people reading the risk communication. Statements such as "ten milligrams of caffeine" were not understood by the research participants. While they wanted information to be presented in quantifiable measures, these measures should relate to their everyday lives. Giving the measurement of milligrams of caffeine in terms of the number of cups of coffee per day would provide an understandable, and relevant, measurement. One of the difficulties in giving such information is that the risk assessment process produces information within the context of scientific knowledge. In contrast, people try to put measurements in the contexts of their daily lives. Another difficulty is in the specificity of the information being provided. 'Milligrams of caffeine' is an objective, straightforward measurement of a substance; the number of cups of coffee depends on factors such as what kinds of coffee and how strong it is. However, these difficulties are relatively slight and a reasonable or average range of the milligrams of caffeine per average cup of coffee and the average number of cups consumed in a day can be given.

The research data also show that it is not only experts and the public who are speaking different languages – it is also an issue between the media and the public. In reporting health risk information, the media acquire the role of experts. The media use a mixture of languages or code systems: statistics and numbers are reported from scientific studies, but the text of news articles are usually in everyday language. In addition, the headlines of such articles are designed to draw the eye and attract attention, and are written by editors who may not have taken the time to understand the content of the article, rather than the authors. This may be done by literary devices such as alliteration or by making a controversial, and sometimes ambiguous, statement. In the review of the articles from the local press, some members of the focus groups had difficulty in understanding such headlines. Although these headlines caught people's attention, they resulted in the article being ignored and not studied. In their model of risk communication, which divides the expert sphere from the public sphere by the language used, Leiss and Chocliolko (1994) place the mass media squarely in the public sphere. I suggest that the mass media should be considered, as the government is, to straddle the boundary between both spheres. This acknowledges that the languages of experts and of the public are found in the popular media, and that this may create difficulty in the public's understanding of the health risk information in this frequently used source.

That experts and the public are *solving different problems* can be seen in examining the goals of risk communication. According to the risk literature, the goals of the experts who develop the risk communication are usually to inform and educate the public, to change behaviour or to initiate a specific action. From the focus group discussions, the primary goal of those receiving the information is to obtain information which can be useful, and relevant to their lives. This provides additional knowledge for decision making or advice on how to change their behaviour. The participants insisted on information that they could do something with.

There was also disagreement as to whether there was, indeed, a problem. Health risk information admonishes people to, for example, quit smoking because it causes lung cancer or to cut down on their fat intake because of the problems of high cholesterol levels. The participants acknowledged the usefulness of such health risk information, including warning labels, and did not disagree that cancer and high cholesterol levels were problems. However, cancer and high cholesterol levels are considered by the experts as problems which can be addressed simply by a change in behaviour. For the participants, a change in behaviour is not necessarily straightforward or simple - there are other complex considerations in deciding whether to stop a risk behaviour such as smoking. The overriding consideration is quality of life. Quality of life takes into account benefits versus harm and evaluates this based on an individual's personal values. Most participants discussed taste and enjoyment as some of the benefits which they consider. One participant chose the thrill of skydiving in spite of the risks, and prior experience, of the parachute failing to open. The taste of chocolate, and the 'buzz' it gives one member of the focus groups outweighed, for her, the risks associated with a food with a high fat content. The research findings clearly indicate that, whether something is a problem or not, for an individual, must be decided by that person within the context of their own life. The context of the participants' lives, however, did not extend to their relationships with society. Within the focus group discussions, there was no consideration of the possible harm to society of individual health risk decisions. In the discussions of smoking and drinking, for example, no one questioned the financial costs to the health care system of people developing lung cancer from smoking. However, the focus of the research was on personal health decisions and no questions were asked directly about private good versus public harm.

Even when an individual agrees with the experts that there is a problem, there may be disagreements as to *what is feasible* to solve that problem. This is directly related to the goals, chosen by the experts, of risk communication. It also reflects the view that, if only the public could understand the real hazard, then they would change their behaviour, for example, stop smoking or wear a bicycle helmet. Considering solely scientific and technical data, this view may have some credibility. However, the research participants use other information in their considerations of health risks. Personal knowledge may include scientific knowledge that has previously been found to be useful by the individual. Another kind of knowledge used is common knowledge which may, or may not, be the same as personal knowledge. Common knowledge is assumed to be widely known and to be true, yet may not be based on an individual's own experiences. These two types of knowledge support Wynne's (1991a; 1991b) claim that the public uses supplementary knowledge, as well as scientific knowledge, to make decisions about risk. He states that this supplementary information may be highly specialized, and indeed the findings of my research show that people use information based on specific experiences to talk about, understand and evaluate the health risk information given to them. Also in keeping with Wynne's observations, that other considerations are likely to be seen as more significant than science, my analysis of the data shows that health information itself is not necessarily the primary factor in an individual's decisions whether to use the information, The credibility of the source, people's interest and concerns, and even whether they feel that they have been exposed to too much information, all contribute to their decision to use, or even to study, the information.

In addition to a variety of non-scientific knowledge, there are other factors which determine whether the recommended solution to a problem is considered feasible by the public. There may be no alternative to the risk behaviour. An individual may not have sufficient finances to purchase a bicycle helmet, there may be no public transport to replace driving a car. Knowing the effects of a behaviour will not necessarily change that behaviour. Addiction may cause people to continue to smoke or to eat chocolate. Peer pressure may result in a child not wearing a bicycle helmet or in someone drinking alcohol. Several participants also mentioned genetic disposition as a risk factor over which they had no control. .

The research data supports strongly that experts and the public *see the facts differently*. This is shown by the different systems of knowledge discussed in the previous paragraphs. The experts rely on scientific and technical data, which are usually presented as facts, even though the data may arise from inferences and interpretations. The research participants used personal and common knowledge which are considered, by the experts, as perceptions. The participants validate health risk information against their own knowledge, experiences and beliefs, to determine if the information is useful or relevant to them. "Truth" is a relative concept, and is decided by whether the information fits in with an individual's pre-tested system of knowledge. In addition, truth is irrelevant if the information is not personally relevant or useful. The terms actual risk and perceived risk, or any synonym of these, were not used at all throughout the discussions within the focus groups. The participants did not consider their concepts of health risk to be any less real or valid than the statistics provided by the experts; indeed, they dismissed much of the scientific and numerical information provided as being of no use or as being incomprehensible.

As I was performing the data analysis, I came to realize why understanding how people think about risks is important, though not for the reasons given in the risk literature. Approaches such as that of Fischhoff et al. (mental models), Rowan (naive theories) and Dake (myths of nature) are designed to correct the public's views of risk by changing these views to that of the experts. To do this, how the public thinks about risk must be understood. Mental models represent a person's view of a specific risk, and naive theories and myths of nature refer to a person's perceptions of science theory. This is not a simple task, even if one accepts the premise. It may be possible to show that elements of the naive theories or mental models or myths of nature are incorrect by comparing them to reliable scientific or technical data. For example, a person's belief that 100,00 people in Canada died of lightning strikes last year is incorrect as it disagrees with the reliable mortality data from Statistics Canada. However, mental models of risk, or naive theories, are developed within and applied to many different contexts, and reflect not just information but also beliefs. People's models of health are based in lifelong knowledge and experiences, and their views of health risk or understanding of science do not exist in isolation and so cannot easily be changed. To change a person's "naive theories" is to challenge their cognitive formations. It is not straightforward to assume that these 'naive theories' are wrong. While people's views of science may be considered to be correct or incorrect based on current scientific knowledge, the same element of judgement cannot be applied to their beliefs. Several of the participants in the focus groups reported personal success with non-bio-medical health systems such as holistic medicine or homeopathy. Western bio-medicine may not be able to explain these alternative health systems, but can they be considered as naive theories?

Within the two groups of research participants, there was *variability* in people's information needs. This was expected as information needs are based on personal experiences, which differ from person to person. Some participants were looking for general health risk information, while others wanted to address specific problems. Some wanted to be given the raw data while others preferred to be told the "bottom line". Vaughan and Nordenstam (1991) discuss this to a limited extent by recognizing that "discussions of variability within the non-expert population itself are uncommon" (29). Although they examine ethnicity as a variable within the public (the non-experts), I believe the argument can be applied to other cultural elements, especially information needs. Indeed, by selecting the static variable of ethnicity, Vaughan and Nordenstam present a one-dimensional view of variability within the public.

The research data suggest an addition to Vaughan and Nordenstam's model. Two more elements of variability should be considered: context and time. Context, as discussed in the "Themes" section of the previous chapter, can include an individual's interests, geographic location and prior experience. Time can be as basic as a person's age or stage in life, or can refer to the urgency with which information is needed. Adding these elements to the model reflects the extensive discussions of context throughout the focus groups, which require risk communication to reflect the dynamic qualities of people's lives.

Variability within experts was also discussed. There were conversations of contradictory health information, in particular one participant's experiences in reading two books, both written by psychiatrists, presenting opposing views of the use of Prozac in the treatment of depression. The reactions of the participants to contradictory information varied from ignoring all the information to finding out all sides of the issue. However, no one was surprised at the existence of such contradictory information.

The claims of several scholars that risk is a socially constructed process and should therefore be considered within a *social and cultural context* (e.g., Douglas and Wildavsky 1983; Plough and Krimsky 1987), are strongly supported by the findings of my research. I have already discused the theme of information in context(s), so I will focus here on Plough and Krimsky's concepts of technical and cultural rationality (Figure 1). This model presents a clear overview of the comparisons between technical rationality – the expert's view of risk – and cultural rationality – the public's view. My research findings of the health risk information used by the participants fits well under the concept of cultural rationality. Although there is not much trust in government organizations in general, the health laws generated by them are trusted, as are groups such as the Heart and Stroke Foundation and the College of Physicians and Surgeons. Cultural rationality recognizes different forms of knowledge. Folk wisdom, peer groups and tradition are forms of personal and common knowledge. The research participants extensively personalized risks by putting them into the context of their own lives and experiences, and wanted to know the impacts to themselves and to their families and friends. There were varied responses to contradictory information, such as ignoring it or seeking yet other sources, which have little to do with the credibility, within the scientific community, of that information. The findings of my research, however, contradict the last statement of cultural rationality, that unanticipated or unarticulated risks are relevant. The risk messages about the health risks of benzene did include a statement that it was not possible to make a rational estimate of the number of fatalities or injuries from typical benzene exposure. This statement was included although there is a wide variety of views within the expert community as to whether the number of fatalities for injuries from typical benzene exposure could be evaluated with the kind of precision needed for the data to be meaningful. This statement was not considered to be useful or interesting information to the focus group participants who "had enough [known risks] to worry about." The participants evaluated information based on personal relevance and utility and were unable to do anything with this information. This also relates to the discussions of the minutia of information, in which some participants felt that there was even too much useful information.

The research findings, and this discussion, has shown that there are cultural differences in information needs between experts and the public. However, can communication between these two groups be considered as a cross-cultural communication?

Cross-Cultural Communication

My research statement proposed that risk communication between experts and the public should be considered as a cross-cultural dialogue. I will address the issue of dialogue in the next section. Here, I discuss whether the communication is cross-cultural.

My research statement is supported by Sarbaugh's (1988) model. The level of cross-culturality of the communication has to be established, and is based on the identification of four elements of culture – worldview, patterns of belief, code system and perceived relation and intent. Considering this model now in conjunction with the data obtained from my research, shows how Sarbaugh's continuum of homogeneity / heterogeneity can be applied, not only to cultural as a whole, but to information needs, which arise from cultural elements. *Worldview* can refer to a person's need for information and the problems they want to solve; *patterns of belief* to systems of scientific, personal and common knowledge found; *code system* to actual language used to represent health risks, be it statistics or everyday terms; and *perceived relation and intent* to the goals of the communication, the relevance of and control over the information, and issues of authority and power. Each of these variables can be evaluated, with respect to information needs, and placed along the continuum, to show the level of cross-culturality of health risk communication between experts and the public. My research provides the identification of the information needs of the participants in the project. From the discussions in this chapter, it is clear that the differences in information needs of these people and of experts will place the two groups in different places along the continuum, thus confirming the communication as cross-cultural.

Dialogue

My research framework established dialogue, based on communications theory, as an interactive and iterative exchange of information in which the participants have similar levels of responsibility and authority. Unfortunately, the research findings show that health risk communication is rarely a dialogue, or even an exchange of any kind. I use Arnstein's (1969) ladder of citizen participation (Figure 3) to illustrate this. In the ladder, dialogue, with increasing levels of authority and responsibility for the public, can be considered to occur in levels 5 through 8 – placation, partnership, delegated power and citizen control.

The data from the focus groups shows that most health risk communication is one way communication. The participants obtained much health information from the popular press, television and radio. Depending on the goal of the risk message, this communication falls under levels 1 through 3 of Arnstein's model – manipulation, therapy and informing.

Even when the source of the health risk information is another person, a dialogue may not occur. One participant's experience with biomedical professionals led her to comment that the doctors did not consider what the patient wanted to know. Communicating with the doctor in this case can be identified with level 4 of Arnstein's model – consultation – in which people's concerns are heard but not addressed. In addition, infrequent visits to the doctor do not allow for extended, iterative communication.

The role of the audience/public in the risk communication process is also an indication of whether the communication is a dialogue. The use of the opposition of 'expert' and 'public', and the assumption that the audience is the public, imply that it is the experts who will initiate the risk communication. Assigning the audience the role of passive receivers of information, as in most of the examples discussed in the focus groups, restricts their involvement in the communication process and removes the opportunity for the development of a dialogue. Two research participants stated that they always volunteer to take part in research such as this project in order that their views and experiences of health issues can be heard.

Another determinant of whether communication is a dialogue is the goal of the communication. The exchange of information within a dialogue should include information on what the participants in the communication process want to receive from that communication – the goal of the communication. The goals of risk communication are usually set by the experts. As discussed in the literature review (Chapter 2), such goals include informing and educating the public, and changing behaviours. The risk communication goals of the participants in the research project were similar to those of the experts – acquiring information about health risks in general, solving specific problems, or finding advice on how to change their own behaviour. However, the difference in the goals is evident when questions such as "informing about what?" and "changing the behaviour to what?" are asked. Even broad risk communication goals, such as that of Covello, McCallum and Pavlova (1989, 5), which talk of producing "an informed public that is involved, solution-oriented and collaborative" assume that these terms are as defined by the experts and the communicators. A dialogue cannot exist without the negotiation and agreement of the goals of the risk communication.

Health risk communication between people known to each other, for example, friends or family members, approaches a dialogue. At the very least, such communication forms a partnership (level 6) which enables the person seeking information to negotiate with the person with the information. It can also be considered as the top rung of the ladder, level 8, citizen control, if an individual's responsibility for their own health is considered as risk management. Participants in the focus groups have each taken responsibility for their own health, including seeking out the health risk information they needed. Conversations within the focus groups on specific health issues were true dialogues – interactive exchanges of information among people with the responsibility for their own personal health and the authority to give and negotiate the information they want to use in making their own decisions about personal health risks.

The research data does not fully support my research statement. Risk communication between experts and the public can be considered as a cross-cultural communication process, and it is useful to do so. However, most risk communication is not yet a dialogue, or even an exchange of information. To change this is outside the control of those assigned the role of receiving the information, and is may even be outside the scope of contemporary risk communication models.

Information needs provide a successful focus for identifying some similarities and differences between the cultures of experts and the public, and for identifying what kinds of information could be exchanged. In addition, information needs can help determine what information is useful and how it will be used, both key components of any risk communication design.

THE RESEARCH FRAMEWORK

Using the foregoing discussions, I review and revise the two models which comprise the research framework. The model of culture and cultural identity is revisited with respect to the elements, identified in the data analysis, which comprise an individual's information needs. For the risk communication model, I add another column to Fisher's model of the perspectives of risk communication and bring in considerations of Arnstein's ladder of citizen participation.

Culture, Cultural Identity and Information Needs, Revisited

By categorizing the research data in the data analysis process, elements of information needs were identified. These elements are:

personal knowledge
personal relevance
everyday measurements
the whole picture
positive and practical information
quality of life
common knowledge
scientific and technical knowledge
statistics and numbers
local rather than global information
credibility
having no alternatives

Although information is informed by culture, this research considers the information needs of individuals, without examining the cultural elements which contribute to those needs. There are several reasons for this:

- The research was to examine the information needs of members of the public and determine whether they are different from the information needs of the experts identified in the risk literature. Examining specific cultural elements was not required for this task.
- The focus groups gave a limited view of the information needs of the 'public' and so a cultural analysis could not be done within the groups. The shared cultural elements of the participants' personal cultures would not necessarily be representative of the larger groups of the public.
- The participants' personal knowledge and beliefs were important in how they chose which information to use and how they used that information in making decisions. This personal information is not considered part of culture as it is not shared. Focusing on the shared cultural elements of the participants would exclude a key component of their information needs. This could be addressed, however, by using Bourdieu's concept of habitus in which an individual's subjective world and the culture they live in interweave to generate culturally appropriate practices. Habitus would take into account both cultural elements and personal knowledge.

This discussion raises the question of whether it would even be useful to identify the cultural elements which contribute to information needs. Could these cultural elements be used to predict what information people would need and find useful? The difficulty is to identify the shared cultural elements of 'the public' - a group, it has been argued throughout this thesis, that is not homogeneous, whose membership changes with the context and time of the risk communication and whose members have diverse information needs. If the intended audience of a risk message could be identified narrowly, then it may be possible to conduct ethnographic research with representatives of that group. For example, if the risk message was intended for women who had breast cancer, then research could be conducted in a women's clinic specializing in treating that form of cancer. However, the results of the research would be applicable to only that intended audience. For a substantial investment of research time, the cultural elements that contribute to the information needs of the public would still not be known with a degree of certainty.

Another question which should be asked is how the information needs of an individual relate to those of a group. This research project examined the information needs of individuals as part of a group – people who are interested in health risk information. There are several ways in which the information needs of a group could be established. The information needs of a group could be considered to be the sum of the information needs of each individual, thus recognizing diversity within the group. This view is used within this research project, in which the research data were presented as a range of information representative of the group. An alternate view could be that the information needs of the group consists only of those information needs common to all, or most, of the members. This view, while being more practical to implement, loses the consideration of the diversity within the group and assumes that there will be commonalities in the information needs of the members of the group.

Chambers (1989) states that applied anthropology explores relationships within, as well as between, groups, and looks for variations as well as similarities. The data obtained from the focus groups show that there were indeed both differences and similarities in the information needs of the research participants. The differences were found mainly in the details of the risk communication – how credibility of information and its source is established, how the health risk information should be presented and the detail and amount of information needed. The similarities between the participants, however, were at a more general or conceptual level, such as systems of knowledge. All the participants used personal and common knowledge in their health risk decision making process, in addition to scientific and technical health risk information, thus making judgments on the basis of personal tradeoffs. As personal knowledge is based, in part, on personal experiences and beliefs, personal knowledge was different for each participant. However, all the research subjects used this system of knowledge. Common knowledge was another system of knowledge used by the participants. In this case, however, the actual knowledge was sometimes shared by several, if not all, of the research subjects. Other significant areas of similarity were the importance of the contexts of information, both of its production and of its use, and the importance in decision making of many factors, such as peer pressure and personal relevance, other than the health risk information itself

Following from this is the question of whether the results of this research are predictive, or at least anticipative. The key to determining this is not in considering the individual information needs of each of the participants in the focus groups, but in looking at the themes and patterns which run across the conversations. Individual information needs such as raw data or "the bottom line", or the particular kinds of information needed to make a decision, highlight the diversity of information needs within the group of participants. The themes identify common concepts, such as personal knowledge and information in context(s), which were used by all the participants, even though the realization of these concepts was different in each. For example, although everyone used personal knowledge and experiences to discuss health issues and to evaluate health risk information, each individual's personal knowledge and experiences are different. Similarly, although the participants requested that risk information be presented in context, different contexts were important to each participant.

The research has shown that information needs influence both how the participants in the focus groups make decisions about personal health risk and the decisions that they make. The intent of this research, however, and the use of focus groups as the research method, was not to develop a predictive model of information needs. However, the themes identified in the research (personal knowledge and experiences, information within context(s), relevance and control, and balance) present concepts which possibly may be predictive, or at least anticipative, of the kinds of information used and needed in personal health risk decision making.

Model of Risk Communication, Revised

The concept of information needs should be incorporated into a model of risk communication which proposes communication as a two-way dialogue. Although Fisher's model [Figure 1] of the perspectives of risk communication refers to societal risk decisions, it provides a suitable model with which to consider personal health risk communication and decisions. I have expanded Fisher's model for the purpose of personal health risk communication by adding two columns to the right side of the model. Figure 4 presents the expanded model, with the addition shown in bold text. I then discuss each of the elements of the new column in turn.

Informing Audience			Empowering audience	**Participants**	**Further Development**
One-way communication			Two-way dialogue	**Two-way interactive and iterative dialogue**	
Telling them what has been decided or done	Giving them information about estimated risk magnitudes	Giving them information about estimated risk magnitudes	Finding out what their concerns are	**Finding out concerns and information needs**	
Telling them what to do	Letting them interpret it and decide on their own	Helping them interpret it without interjecting bias	Including their concerns in the risk assessment	**Including concerns and information needs in risk assessment and communication**	
		Letting them decide on their own	Helping them interpret the results and helping them use ways to affect the decision	**Explaining the information**	

Figure 4 Revised Model of Risk Communication

"Empowering the audience" has been deleted to remove the suggestion that a hierarchy exists in the communication, with one group allowing the other to have some degree of authority or responsibility. Participants has replaced audience to refer to all those involved in the risk communication. This removes the idea of one-way communication to the audience, and the assumption that the public is always the audience. Participants does not assign specific roles to anyone involved in the risk communication, thus leaving the discussion of roles open. The general term 'participants' also does not attempt to assign people to any one group, thus leaving room to acknowledge the variability within the groups of experts and the public commonly considered. This also allows for the recognition of similarities between groups.

The addition of "interactive" and "iterative" to the next element, two-way dialogue, recognizes that dialogue need not be either of these. This introduces the concept of communication from communication theory as an exchange of information and emphasizes direct, ongoing communication. Coupled with the previous element, it presents the idea of the role of audience and of information source alternating between participants.

"Information needs" has been added to "Finding out concerns". This recognizes the legitimacy of different kinds or systems of knowledge. In addition, it introduces the idea of risk communication as context dependent, with time as one context: the participants are involved in risk communication for a specific purpose for a limited time. The dynamic nature of information needs reinforces the changing contexts of risk communication.

Risk communication has been added to the next element. Risk assessment has been retained even though it is outside the focus and scope of this project. This is to retain Fisher's claim that risk communication should be considered to be a part of the risk assessment process. Including the concerns and information needs of the participants in the risk assessment process will enable the process of inquiry and the process of communication to be shaped by the participants.

"Helping them interpret...." in the original model relates to societal risk decisions. I have changed this to refer to personal health risk decision making. "Explaining the information" implies the responsibility of those providing information to explain it to the other participants in the communication process. Inherent in this responsibility is the need for understanding how to give the information by examining how the information will be used by the participants. The most notable change in this element, as compared to Fisher's model, is that it does not contain "helping..." or "letting..." with respect to decision making. The change reflects the right of each participant in the communication process to take all information given, to evaluate it according to their own system of knowledge and beliefs, and to make what use of it they will.

The limitations of, and assumptions behind, any risk communication model must be made explicit. The model described above does not explicitly address issues of authority, power and responsibility, such as who initiates the communication, whose goals of risk communication take precedence and when, or even whether, to communicate. As such, the model does not reach the higher rungs of Arnstein's (1969) ladder of citizen participation: to establish a two way exchange of information, all participants must have equal access to each other. The revised model includes an additional column to acknowledge these limitations and to emphasize that there are opportunities for further developments to the model.

THE RESEARCH METHOD

Any discussion of this research project must include a discussion of the research method used.

The Contributions of Anthropology

The anthropological perspective and approach used in this research project contributed successfully in several ways. The anthropological perspective of holism introduced considerations of the contexts of risk - the context in which the risk information is produced, the contexts in which it is communicated, and the personal and everyday contexts in which people talk about, evaluate and decide whether and how to use health risk information. Using the qualitative research method of focus groups enabled the voices of the participants, as members of the public, to be heard and the information concerning their information needs to be introduced and discussed in their own words and terms. As members of the public, the participants in the research are no longer faceless elements of a monolithic entity - they are individuals whose knowledge, thoughts, ideas and priorities are reported in this thesis. Within this research project, concepts of culture from anthropology were combined with the aims and needs of applied anthropology to provide well-defined ideas of cultural identity and transient subcultures which were successfully used in the research of information needs.

Focus Groups

The research data are. of course, dependent on the method used to obtain them. The information needs of the experts were examined through the review of the risk literature, written by the experts themselves. This method provided knowledge about those information needs, which was mainly limited to the kinds of scientific and technical information which should be presented and the formats and methods of presentation. Although this was enough to contrast to the information needs of the participants of this research, it did not describe any additional, non scientific and non-technical information needs of the experts.

The use of focus groups as the primary research method to examine the information needs of members of the public had some advantages and some limitations for this project. The goal of the focus groups was to find out what information people use and need, in making decisions about personal health issues. In this, the focus groups were successful, eliciting information about the source of information and about the kinds of information used. There was much unexpected discussion about how the participants decide whether to use the health risk information in their decision making process. The focus groups were to provide contexts and ranges of information, and this also was achieved. Similarities and differences of participant's information needs could be identified and even from the small numbers of participants involved in the focus groups, it was possible to identify four common themes (personal knowledge, information within context(s), relevance and control, and balance). This provided enough data to support my research statement.

The group dynamics of the focus groups, as widely discussed in the literature, did play a role in what information was obtained. Initially, in answer to questions about the kinds of information used, participants talked about the source of the information. This prompted a thread of conversation which, while not in direct answer to my research questions, provided important and relevant data. The role of the facilitator was to ensure that the research questions were presented and answered fully, while providing the opportunity for conversations in response to the participant's interests and understandings.

Most of the participants in the focus groups learned about the research project from the advertisement in the local community newspaper. The volunteers' first contact with the project was a telephone conversation of fifteen to twenty minutes, with the researcher, in which the details of the project and issues of informed consent were discussed. Most participants volunteered personal information and asked for details of the researcher's educational and professional background and motivation for conducting this research project. This first contact was useful in establishing, for the participants, a context for the research, the credibility of the researcher and for setting the informal tone for the focus groups.

The location of the focus group sessions, a private room in a small country style restaurant, enhanced the informal atmosphere which contributed to the participants considering the sessions as conversations rather than structured meetings. This setting, however, might not be suitable for research in which a structured, more formal, arrangement is expected. The sole criteria for participation in this project was an interest in health risk information and this was enough to establish a common bond between the participants. Throughout the discussions, information about people's backgrounds, such as education and profession, was given often to explain their knowledge and beliefs. As this information was not explicitly requested, it was not used to provide demographic statistics of the participants. Indeed, within this research, this information is relevant only in that it contributes/influences people's information needs; how elements such as education or profession might do this is outside the scope of this project.

The number of participants in the groups also affected the data obtained. The first group had only two members. Two others scheduled to be part of the group did not show up. This enabled both participants to discuss fully their views and opinions, but it provided a limited opportunity for conversation. This resulted in the facilitator asking many questions directly to prompt responses. In contrast, in the second group of six people, there were many interactions and the conversations flowed well. However, there was not the same opportunity for everyone to contribute fully. This was due, in part, to the limited time available, but also to the dynamics within every group, in which participants who are more comfortable in that setting or are more eloquent will speak the most. The extensive literature on focus groups recommends between four and ten participants. From this research project, I would recommend four or five. Conducting two sessions with each group was a successful strategy. A week between the general discussions of the health risk issues in the first session and the second session, enabled the participants to consider the issues in some depth. Critiquing the articles on the posters and the specific risk message on bicycle helmets, breast cancer and benzene in the second session provided two benefits: to confirm the data obtained in the first session, and to see people's information needs 'in action'. Ending with an opportunity for the participants to design their own risk communications generated unstructured discussions about risk communication and ended the sessions on a light-hearted note.

It was useful to conduct the first focus group session as a pilot project. The planned strategy to provoke general discussion by such broad open ended questions as "What kinds of health information do you use?" did not work very well; the participants needed a situation on which to focus. The facilitator was able to improvise by introducing the issues of low fat cheese and of food labelling. This amended strategy was used with the second focus groups. This highlights the need to have a facilitator who is able to respond to the needs of the participants and is able to improvise within the boundaries of the research questions.

The data obtained through the use of focus groups as the research method for this project provided the information I needed to apply to my research statement. In addition, this data can provide a base of information from which future research, such as surveys or structured interviews, can be developed.

The research data of the health risk information needs of members of the public in making their personal health decisions, obtained through the successful use of focus groups, and the consideration of the information needs of the experts, obtained through a review of the risk literature, supports, in the main, the research statement that risk communication between experts and the public should be a considered to be a cross-cultural dialogue. The discussions of culture, cultural identity and information needs highlight the ties between information needs and cultural identity and reinforce the need to consider the cultural dimensions of risk. The revised model of risk communication shows how information needs can be incorporated into the risk communication process. Recommendations for the development of The Citizen's Guide to Health Risk in Canada and directions for further research, arising from the discussions within this chapter, are detailed in the next chapter.

6. CONCLUSIONS

In this chapter. I present the conclusions of my research project. The key findings of my research are followed by recommendations for the development of The Citizen's Guide to Health Risk in Canada. The chapter ends with an overview of directions for future research.

THE KEY FINDINGS

The findings of my research support the research statement that risk communication between experts and the public should be considered to be a cross-cultural communication process. The central premise that *experts and the public are of distinct subcultures* is demonstrated with respect to issues of language, problems being solved, and the knowledge used when considering risks. Information needs, the information that individuals want to give to or receive from the risk communication process, were introduced as a factor of cultural identity. Considering experts and the public to be of distinct subcultures leads into consideration of *risk communication as a cross-cultural communication process.*

To establish a framework for considering risk communication, theories and models from communication studies and from anthropology were combined with concepts of risk, and risk communication theories and models from risk studies. The framework provided an alternate perspective of risk communication which included considerations of context and of risk communication as a two way exchange of information – a dialogue. Using the qualitative research method, from the social sciences, of focus groups enabled the information needs of some of the public to be ascertained.

The research data supports the view that, in general, experts and the public do see risk differently. The information needs of the experts are based primarily on scientific and technical information, and those of the research participants on personal knowledge and experiences and on common knowledge. These differences in information needs highlight cultural considerations of risk information.

For the research participants, risk information itself is not the primary factor in determining whether individuals read or use the information in their decision-making on personal health risk issues. The credibility of the source of the information and the personal relevance of that information were important factors. Information needs are more than the content of the risk message and the method of its presentation. Elements of information needs which influence risk decisions include considerations of the quality of life based on an individual's personal values, the relevance of the information to the individual, the credibility of the source of the information, which includes whether information from that same source has been useful in the past, and the context(s) in which the information is produced and in which it is to be used. Personal knowledge and experience is a key context and plays a major role in risk communication. The research participants spoke of risk in terms of their own lives and experiences and used their personal knowledge to evaluate and validate any risk information they received.

Variability within the public was demonstrated by the different information needs of the individuals in the focus groups. Variability among experts was acknowledged within the focus groups by discussions of contradictory information from experts and people's reactions to this situation.

CONTRIBUTIONS TO RISK STUDIES

Considering risk communication between experts and the public to be a cross-cultural communication process provides, to risk studies, a different perspective for approaching the design and the process of risk communication.

1. Explicitly considering culture, as defined and used within the discipline of anthropology, in risk studies strengthens the ties of anthropology to the field of risk studies and acknowledges the contributions that the anthropological perspective can make

to contextualise risk. The contexts include people's own words, feelings and ideas when they discuss personal health risks and health risk information in the context of their own lives. Anthropological research methods of talking to people and observing them will ensure that experts and the public do not remain faceless entities but are considered both as individuals and as groups in their own right. Introducing the concept of subcultures provides a mechanism through which the similarities and differences, between and within these groups, can be studied, and acknowledges the transience of the membership of the groups of experts and the public.

2. Considering experts and the public to be of distinct subcultures introduces an idea of culture expanded from that of nationality or ethnicity used in risk studies - that of distinct subcultures within the same larger culture. The cultural elements of these subcultures may be transient and influenced by situational context and time. This enables practitioners of risk studies to recognize the complexity of culture beyond that of national or political boundaries, and to consider groups of the same nationality or ethnicity as distinct. It is expected that there will be differences between groups with distinct cultures, but there may also be similarities.

3. Information needs provides a focus with which to identify not only the similarities and differences between the groups of experts and the public, but also within each of these groups. The similarities in information needs can be used to identify areas of commonality which can be strengthened, and the differences to identify areas of potential conflict or misunderstanding. Risk communicators can use the knowledge of information needs to design risk messages which are understood by, and useful for, all the participants in the communication process.

4. Considering the information needs of the public changes the role of the public in the risk communication process. It ensures that the public are not just passive receivers of information, but are also sources of information. This has two major repercussions. Firstly, it is not just the public who is the audience – the experts must be the audience when the

public is providing the information. This leads to risk communication as an interactive process, in which the role of information source and information receiver alternates between the experts and the public. At the very least, the experts must ask the public for their information needs. The second repercussion relates to the legitimacy of knowledge. Identifying the information needs of the public gives some legitimacy to the responding information, and consequently to people's perceptions of risk. While not challenging the common use of the term expert to refer to those with the scientific and technical information about risk, this introduces the idea that people with alternate systems of knowledge may be experts with respect to their knowledge.

5. Considering risk communication as a cross-cultural communication process assists in removing the distinctiveness accorded, within risk studies, risk communication. This also serves to reinforce the similarities of risk communication to other kinds of communication. Incorporating theories and models from anthropology and communication studies with those from the risk field itself has opened up two different fields of research. There is an extensive body of literature in cross-cultural communication which deals with the solution of communication problems once they have been identified. The key is to identify problem areas, and this is what the anthropological focus of this research project offers risk communication studies. Indeed, the strength of this approach lies also in its ability to identify areas of similarity which can be strengthened to contribute to successful risk communication.

LIMITATIONS OF THE RESEARCH

As with any research project, there are limitations to what was, and could be, accomplished.

1. The framework of risk communication used in my research does not provide solutions to the problems of risk communication. It provides a perspective for identifying

potential problem areas and areas of commonality which can then be addressed in the design of risk communication.

2. Determining the information needs of the public does not necessarily mean the public will have authority and responsibility within the risk communication process. Knowledge of the information needs can be used just to ensure that the scientific and technical risk information is presented in a language and in a format that the public understand. This knowledge can also be used to decide what information is needed to 'correct' or to overcome people's perceptions and theories of risk. Unless the public has authority within the risk communication development process, the experts will still decide what information to include and how to include it. For the public to gain this authority, either the experts would have to assign it, or the public would have to initiate the risk communication and negotiate issues of authority with the experts.

3. The process of finding out the information needs of the public can be achieved, however without a two-way exchange of information, or even a two-way communication. The benefits of communication as a two-way exchange of information are then lost. My research project illustrates this. There was no direct communication between the experts and the public. I acted as liaison and will take the results of the research, the information needs, back to the experts. My research method cannot be considered to be a dialogue.

Arising from the findings, contributions to the risk field and limitations of the research are recommendations for the development of The Citizen's Guide to Health Risk in Canada.

RECOMMENDATIONS FOR THE DEVELOPMENT OF THE GUIDE

The recommendations given here are specifically for the development of the Guide and are in addition to the recommendations detailed in the previous chapter, Discussions of the Research, for changes to the model of risk communication.

1. The goals of the Guide should be established, perhaps with reference to Arnstein's ladder of citizen participation. From this, the role of the audience or recipients in the development of the Guide can be determined. The goals of the Guide will also influence to what extent, and even whether, the information needs of the audience are to be included in the design and content of the Guide.

2. The information needs of the developers of the Guide should be established - what information do they want to include in the Guide and what information do they need to get from the intended audience?

3. The information needs of the focus group participants in this research project should be examined to see if the kinds of information which could be included in the Guide satisfy them. If not, then alternate audiences of the Guide should be considered.

4. The process of identifying information needs should be repeated with any individuals or groups identified as potential users of the Guide.

5. The outcome of recommendations 1 and 2 will influence the method of further research of information needs. If the developers of the Guide and the intended audience are to establish a dialogue, then an alternate research method should be considered. However, if a dialogue is not desired, or necessary, then the continued use of focus groups to identify information needs is recommended.

DIRECTIONS FOR FURTHER RESEARCH

There are several directions for future research. These directions are not mutually exclusive and could be considered together.

1. Continue research into the cultural considerations of risk communication, and focus on the distinct subcultures of experts and the public. The issues of cultural identity of individuals and of groups can be addressed by research from the field of cognitive anthropology. The usefulness of information needs in determining cultural differences, and vice versa, can be further examined, with identification of the social and cultural elements which contribute to people's information needs and how information needs are influenced or determined by these elements. The elements of information needs can be further identified, as can any other cognitive elements, such as quality of life. Using the findings of my research as a base, further investigation into the information needs of the public could be conducted. The data obtained through the use of focus groups provides a base for developing further, more quantitative, research projects such as surveys or structured interviews.

2. Develop guidelines for putting into practice the recommended model of risk communication of personal health risk information. At the moment, this is just theory without a practical application – something I have noted as a shortcoming of the existing risk literature. Research could concentrate on how to incorporate the public in the risk communication process and could make use of the research already performed in the area of citizen participation. The model of risk communication could then be expanded to consider public participation and responsibility in the other risk processes of assessment and management.

3. Examine research from other areas for inclusion in risk studies. Continuing to consider risk communication as a cross-cultural communication process opens opportunities to utilize the extensive research in the field of communication studies to aid in solving the problems of risk communication. Research can be carried out to bring theories and models from cross-cultural communication into the field of risk studies.

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APPENDICES

A. ARTICLES USED IN THE FOCUS GROUPS

Cigarette deaths to hit 10M a year

Edmonton Journal Sept. 20, 94

The Associated Press
London

Deaths from cigarettes are likely to more than triple over the next quarter century to 20 every minute around the world, scientists warn in a new global survey.

The findings are in a book *Mortality from Smoking in Developed Countries 1950-2000*, to be published today by scientists at
Britain's Imperial
Research Fur
Organization
Cancer Societ
"Worldwide
killing three m
year, and this n
ing," Richard P
at the Imperial
Fund, said Mond
"In most count
yet to come. If c
patterns persist, t
the young smokers
middle or old age
about 10 million
from tobacco — on
three seconds," Pet
The new survey
most comprehensive
the world's smokers
trends in smoking-rel
since the 1950s and
deaths into the next
previous study by
authors two years ago c
1960s through the 1990s.
Sixty million deaths h
caused by smoking si
1950s, the investigators
They predict smoking wil
million people a year by 2

Kids' hearts at risk if adults smoke in home

The Associated Press
Edmonton Journal Nov. 16, 94
Dallas

Parents' cigarette smoke dramatically lowered "good cholesterol" in non-smoking children and teenagers with high cholesterol levels, U.S. researchers reported Monday.

These children run a sharply higher risk of heart disease if their parents — or grandparents who live with them — are smokers, the study found.

"Getting these people to quit smoking is apt to be beneficial for the children and grandchildren — not just the patient," said Dr.
Ellis Neufeld, a blo
at Childr

lesterol, but said the reduction is likely to be substantial.

Neufeld and his colleagues studied 103 children with high cholesterol. Thirty-three of them came from homes with a parent or grandparent who smoked.

The children, two to 18 years old, were given tests to determine their HDL levels. The level averaged 38.5 in children exposed to secondhand smoke, compared with 44 in children not exposed to smoke.

The researchers found that about half of the children exposed to household smoke had
evels below 35, which is
tably low, Neufeld said.
that result had been
the researchers tried
g they could think of to
her it might be due in
fferences in die
ther

BLOWN AWAY

A cigarette lit by an Ontario man nearly became his last when the propane-powered car he was driving blew up. Reuben Guay, a municipal employee in suburban North York, was in stable condition in hospital late Monday with burns to his face and hands after being airlifted from the scene of the early-afternoon explosion. Guay, 29, had just put fuel in a city station wagon and was driving down a street when he lit a cigarette and an explosion blew out the car windows. "The car catches on fire, he bails out, and the car continues westbound," said Const. Jim Titmarsh. The man was able to pick himself up off the road and walk to the side. The station wagon grazed a tow truck and veered across
three lanes be
a

'Crackpot' study gets non-smokers hot

Edmonton Journal Sept. 2, 94

The Canadian Press
Montreal

A study that calls smoking an
economic boon because it kills
off people before they become
a health burden is riddled with
errors and is offensive to any
thinking person, an anti-
tobacco lobbyist said Thursday.
David Sweanor, of the Non-
Smokers' Rights Association,
said that if Imperial Tobacco
had any sense it would have
ripped up the report and paid
the autho
ever prod
"This
that will
take wh
bly low
tobacco
so mu
longer

The report, written by free-
lance economist
Vidal, says anti-sm
rarely consider t
in health costs d
mature death of s
"A person who
cancer at age 70 w
pitalized later
disease," it notes.
The report
sioned in June.
Michel Descote
man for Imperi
study wasn't to be.
Sweanor said a
as Vidal's could b
lobby's b

Pectin helps slip cancer's punch

Knight-Ridder Newspapers

We literally may be able to slip
cancer's punch. Pectin the
natural fruit fibre that makes
jelly jell, can prevent the spread
of cancer in laboratory rats by
making cancer cells too slick to
stay in one place, researchers say
in the *Journal of the National Cancer Institute*. "If we had a pill
that prevented cancer from
spreading, then about 90 per cent
of all cancers could be curable,"
report said, adding that "You
health food store.

buy ordinary pectin and expect it
to work."

Pumping pumping

Anything body builders can do
you can do — if not better, than at
least as profitably for your
health. So says muscleman
Arnold Schwarzenegger, who
runs an annual bodybuilding
competition. "If you don't have
the need to be the top champion
in the world, and you want to lose
five inches around the waist, then
you will get that and with much
less training," he says.

Veggies good for the heart — study

Reuter
Boston
Edmonton Journal Feb. 2, 95

Mom always said eat your vegetables, they're good for you. Now

clearly that there is a relationship," said Jacob Selhub, chief author of the study and professor of nutrition at Tufts University in Boston. "As homocysteine levels increase, there is an increased risk of clogged arteries — especially among men."

In an editorial in the journal, Dr. Meir Stampfer of the Harvard School of Public Health and Dr. Rene Malinow of the Oregon Regional Primate Research Centre, said the study, combined with other work, suggests it is time for researchers to conduct an experiment to see if folic acid and B-vitamins can actually reduce the risk of heart disease.

Researchers said that in the meantime it would be "prudent to ensure adequate dietary intake" of folic acid.

The Selhub team agreed that a test of the treatment should be done on elderly people, whose homocysteine levels are above average.

In all, 1,042 patients who were part of a 43-year-old research project known as the Framingham Heart Study were examined for signs that heart disease had narrowed the arteries in their neck. Those with the highest homocysteine levels were found twice as likely to have narrowed neck arteries as those with the lowest blood concentrations of homocysteine.

Stampfer and Malinow said the study suggests a large proportion of the population, "perhaps 40 per cent," is not consuming enough folate to keep homocysteine levels low.

But they also cautioned that it's still possible heart disease may be the cause — not the result — of high homocysteine levels.

That would mean controlling homocysteine levels through diet or nutritional supplements would have no effect.

Cancer patient says prayer plays role in treatment

MARY ROURKE
Los Angeles Times
Aug. 18, 95
Edmonton J.

Dr. Howard Fuerst never considered himself a particularly religious man — until he learned of his inoperable cancer four years ago.

Doctors gave him two years to live.

Fuerst, a 72-year-old retired internist in Hollywood, Fla., recalls how his wife and children immediately put him on the roll call of prayer groups across the country. Fuerst helped the groups along by praying for himself, as part of a self-taught fitness program.

"I'm convinced prayer has a significant place in treatment," he says. "I've lived twice as long as was expected."

His recovery process hasn't been entirely ethereal.

He followed his doctor's recommendation and had chemotherapy. He is faithful to a nonfat, non-dairy, vegetarian diet. He meditates, meets with a cancer therapist and prays.

The result is a home-grown, eclectic, custom-made treatment program that is part of the massive self-help movement now affecting every aspect of American culture.

Fuerst is convinced that "patients have got to take charge of their own care.

"Dig through the books," he advises. "It's your life. Drop everything and do what needs to be done."

TV violence may harm the heart

Reuter Edmonton Journal Mar 24/95
Durham, N.C.

Watching violent movies and TV shows may overwork the heart and suppress the immune system, say preliminary results from a study released Thursday.

That effect could boost the risk of heart disease and other illnesses, said researchers from Duke University medical centre.

The researchers found indications that violence in the media might have a physical, rather than simply psychological, effect on viewers and that women may be at higher risk.

"These are preliminary b
provocative findings suggesti
that 'violence has biologi
effects — not just behavioral o
— on the cardiovascular syst
which have the potential for
tributing to heart disease."
Dr. Redford Williams, profess
behavioral medicine at Duk

The Duke study compared
ical response to violent and
violent material.

Forty subjects, includi
women, posted higher bloo
sures and heart rates when
television scenes of physi
lence against a victim of th
sex.

In another study, urine
taken from the sam
were found

Sunburn protects from cancer

Ottawa Citizen Aug 29/95

New research suggests burn is 'mass suicide' of sun-maimed cells

The issue: Researchers have held that a simple sunburn can be linked to skin cancer later in life.

What's new: A new study suggests a sunburn may be a mass suicide of cells damaged by the sun's UV rays so they will not become cancerous.

that only repeated sunburns over-
response.

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le

Vitamin may cut heart attacks

Associated Press
Bar Harbor, Me.

A simple vitamin deficiency could cause 30 per cent to 40 per cent of the heart attacks and strokes suffered by men each year, a researcher reported Monday.

This startling disclosure, emerging from a few dozen new studies, means that vitamin supplements might pre-
many of those heart
billions of dol-

iodine is adde
vitamin D is added to milk
prevent other deficiencies.

Folic acid is found in green leafy vegetables such as brussels sprouts, spinach and lettuce, and in many fruits, including apples and oranges. It is also available in most common multiple vitamin supplements, Hall said.

About 400 micrograms of folic acid a day seems to be enough to lower homocysteine to a safe level, Hall said, protecting against heart attacks, strokes and birth

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High-fibre flaxseed may prevent cancer — scientist

The Canadian Press
Edmonton Journal Mar 21/95
Toronto

An ancient Egyptian grain may hold the key for using fibre to fight breast cancer, a University of Toronto researcher told a major cancer conference Monday.

Lilian Thompson's work with flaxseed was buttressed by a new U.S. study which also sug ed
high-fibre, low-fat
reduce breast canc o

However,
women
stuff

fibre flaxseed: it causes gas, she told scientists at the 86th annual conference of the American Association for Cancer Research.

About 7,000 cancer researchers, doctors, patients and drug company representatives are in Toronto for the four-day conference. Almost 4,000 research papers are being discussed.

Thompson is one of a number of scientists probing the links between diet and cancer.

Many suspect high-fibre diets help prevent cancer. But no one has been able to figure out why.

Thompson is believed to be the first to experiment with flaxseed — also known as linseed — a high-fibre grain grown since the hey-day of ancient Egypt.

She said the grain helps the body produce a substance called lignans. In experiments with rats, Thompson found that lignans from flaxseed sharply reduced breast cancer tumors.

"After seven weeks we found that tumors in rats were over 50 per cent smaller and that fewer new tumors were appearing," she said.

Women underrate risk of heart attack, study says

The Canadian Press
Toronto

Most Canadian women fear breast cancer will kill them, but they are more likely to die from a stroke or a heart attack.

That's the finding of a survey of 1,000 women. It was released here Thursday.

Dr. Anna Day, chief of medicine at Women's College Hospital, the hospital that commissioned the
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28.1 per cent.

Heart disease and strokes were linked to more than 37,000 deaths of Canadian women in 1992. That's about eight times the number of breast cancer deaths.

About 17,000 women develop breast cancer each year.

"Breast cancer is very scary," said Day.

"Women can live with it for many years and so, women see a lot of it."

Day also stressed that she expects more women will die from lung cancer than from breast
cer this year.
hospital

Taboo 'treats' cut stress — poll

Tobacco, soft drink, candy companies take aim at puritanical views

The Canadian Press
Toronto

A group of cigarette, soft drink and chocolate-bar makers says a new survey they sponsored backs up their contention indulging in "treats" helps cut stress.

The international poll by the Associates for Research into the Science of Enjoyment suggests, among other things, that most Canadians feel they should be allowed to do whatever they enjoy, in moderation.

It suggests most people already have enough health-related information to decide whether it's wise to smoke, drink or sip a coffee.

The poll was sponsored by a consortium of companies, including Coca-Cola, Kraft General Foods and tobacco giant Philip Morris.

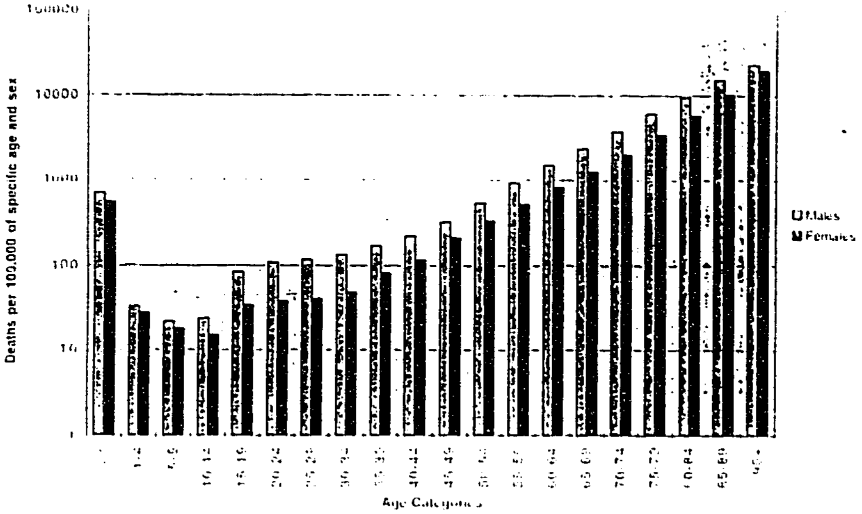
They are trying to restore balance to the discussion of healthy lifestyles, and remind people indulging moderately in "naughty-but-nice" products cuts stress and doesn't hurt your health, said spokesman John Jordan.

"There's been an awful lot of ... almost puritantical views espoused to say you shouldn't do anything that's even moderately bad for you," Jordan said. "That creates lots of pressure for people."

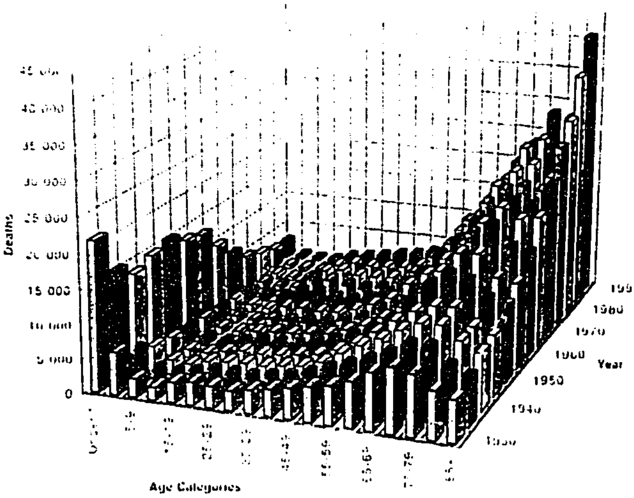
The pollsters interviewed 5,000 people in 16 countries — including 300 in Canada.

after cream "

Deaths per 100,000 - Canada, 1992



Age and Number of Deaths in Canada, 1930-1990

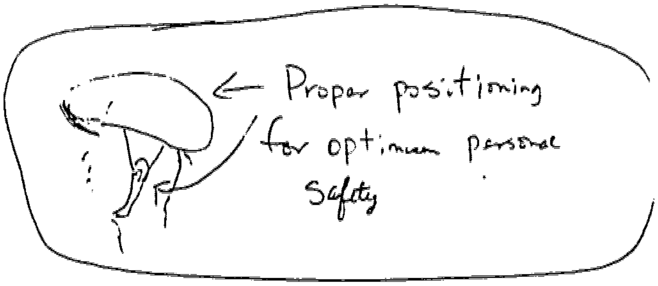


B. PARTICIPANTS' OWN RISK MESSAGES

helmet + short pamphlet comes w/ ea. helmet

WARNING:
READ THIS PAMPHLET
CAREFULLY ON HOW TO
EFFECTIVELY WEAR YOUR
HELMET.
IT COULD SAVE YOUR
LIFE.

signed letters

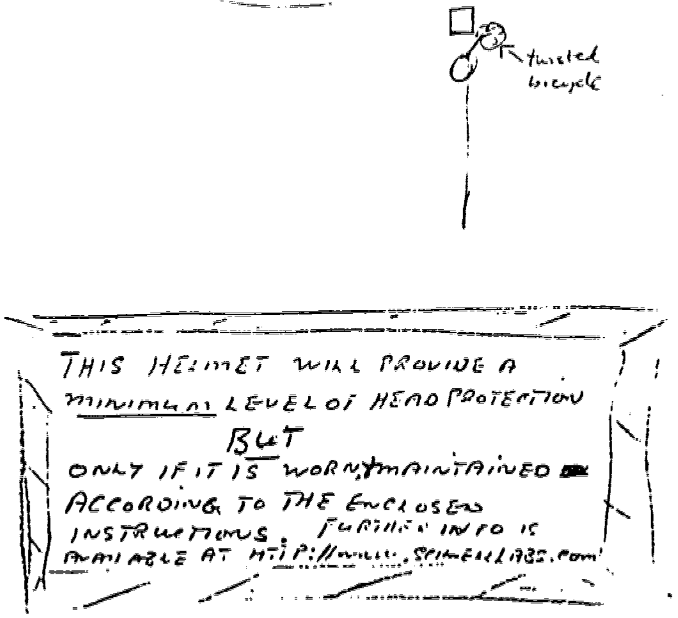


← Proper positioning for optimum personal safety

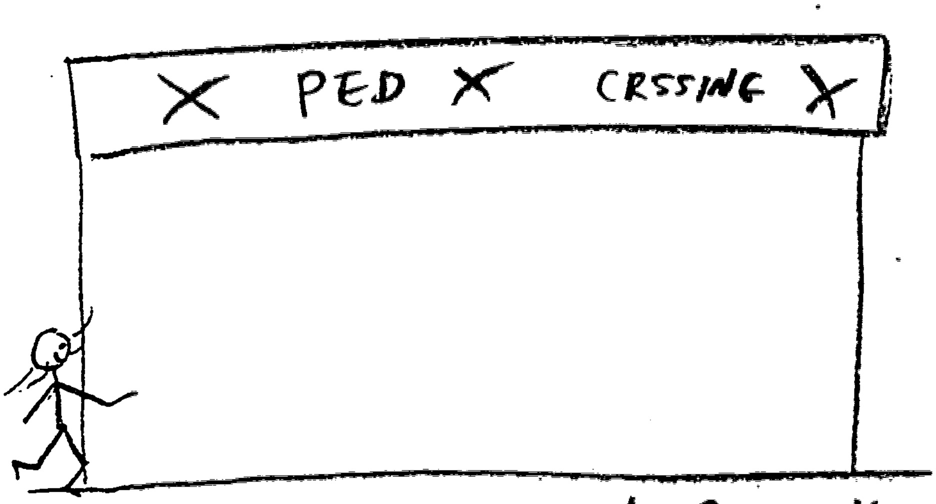
Affixed to front of helmet - in easy view

Does this picture look familiar?

Bicycle is not
an amour can
Be careful.



THIS HELMET WILL PROVIDE A
MINIMUM LEVEL OF HEAD PROTECTION
BUT
ONLY IF IT IS WORN+MAINTAINED
ACCORDING TO THE ENCLOSED
INSTRUCTIONS. FURTHER INFO IS
AVAILABLE AT HTTP://www.SPIMELLABS.com



Look both ways, even at Crosswalks!
Wait for all vehicles to stop!!

A message to
~~our dear customers~~
consumers

This product
contains a ingredient
that could cause
a minor stomach
discomfort to

A message to
Consumers

This product contains
______ which have
all the goodness
but not the calorie
of fat. However
Some animal studies
suggested —
may cause minor
stomach discomfort.

WARNING

THE POLITICIANS YOU HAVE ELECTED HAVE ABSOLUTELY NO QUALIFICATIONS TO MAKE THE DECISIONS THEY MAKE ON A DAY TO DAY BASIS. MOST LEGISLATION IS MADE ON THE BASIS OF BIAS AND PARTY POLICY.

C. FOCUS GROUPS AS RESEARCH METHOD

During and after World War II, focus groups were used to study the persuasiveness of propaganda (Swenson, Griswold and Kleiber 1994). Focus groups as an established research method originated in market research as a video– or audio– taped small discussion group. Within market research, focus groups are classified according o the knowledge that is being sought. Exploratory groups seek to generate hypotheses, clinical groups are to discover insights into the participant's unconscious knowledge, and phenomenological groups investigate the participant's common-sense conceptions and everyday explanations (Morgan 1988). Focus groups in market research are used primarily to test or to evaluate a product. Participants are presented with an item and asked to comment on their thoughts, feelings and opinions about it. Focus groups are now becoming a popular qualitative methodology in business, in the social sciences, and with political campaign managers.

The goal of focus groups is to elicit perceptions, feelings, attitudes and ideas. The groups do not generate quantitative data and information that can then be extrapolated to the general public (Bers 1989). Focus groups generate hypotheses rather than assert their representativeness by asking 'why' and not 'how many'.

Focus groups should be used when there is a need to know about a group's attitudes and values (Bertrand, Brown and Ward 1992). They are useful when exploring new approaches and when little information is available. A wide range of ideas and opinions, sometimes in depth, can be obtained in a short time. Focus groups are effective when the goals of the research are general and require data that are not in the participant's 'top-of-the-mind' (Byers and Wilcox 1991). "The boundaries of what can be done with focus groups as a principle means of data collection are relatively open" (Morgan and Spanish 1984, 263).

There is disagreement over the advantages and the limitations of focus groups. One of the major points of contention is the effect of group dynamics on the information obtained. By definition, the interactions among the participants are the key to the success of the focus groups. These interactions can highlight participant's attitudes, priorities, language and frameworks of understanding (Kitzinger 1994), and can show what happens when people take differing individual experiences and attempt to make collective sense of them (Morgan 1988). A focus group provides an opportunity for the participants to engage in interaction and to express ideas in an unstructured, spontaneous manner. The flexibility of the agenda allows for exploration of topics and issues that emerge of importance to the group. As with any group, however, the group dynamics also limit the information obtained. The structure of the focus group sessions constrains the interaction of the participants: turns may be short and a few members may dominate, requiring the facilitator to intervene (Agar and MacDonald 1995).

There is also disagreement over the effect of group participation on an individual's willingness to give information. Participating in the group can encourage full and open conversation about embarrassing subjects by releasing inhibitions (Kitzinger 1994; Byers and Wilcox 1991). A person's views and opinions can be affirmed by other members of the group. Conversely, speaking within a group could encourage the participant's conformity to the responses which are perceived to be socially acceptable to the rest of the group (Byers and Wilcox 1991).

The financial cost of a focus group should also be considered. The group can be held in a short space of time, with a small staff, with limited financial resources (Bertrand, Brown and Ward 1992). On the other hand, the cost of the facilitator fee, the facility rental, recording and transcribing the conversation, and participant incentives can be significants (Byers and Wilcox 1991).

Facilitator

Proper choice of a facilitator or moderator for the focus group is crucial and, as with any discussion of this research method, there are dissenting views of this. Some scholars, in fact, argue that it is possible to hold unmoderated focus groups. Morgan (1988) claims that the facilitator could be the researcher themselves, though Urion (1995) states that, although the researcher should be present at the focus groups, the facilitator should be someone more distant from the research .

The role of the facilitator is a difficult one. The facilitator must balance the group interactions by ensuring that the discussion does not stray too far from the point of interest, yet must not rule out topics that may seem unrelated. There must be a balance between the research topic and the themes and issues that emerge within, and are of importance to, the group. The facilitator typically follows an unstructured interview agenda and guides the discussion only when necessary, maintaining an emotional distance from the group yet having empathy with it. The facilitator should refrain from contributing their own views and experiences to the discussion, but should generate a relaxed environment, ensure confidentiality and promote openness (Smithers 1995). This may seem an impossible task, especially in a group that meets only once. "Successful facilitators are adept at setting a group of strangers at ease, at establishing a comfortable environment that encourages discussion, at probing to uncover feelings and attitudes that enrich the understanding of why people behave as they do, and at listening carefully" (Bers 1989).

Participants

The selection of the participants for a focus group depends on the research question(s) and on the research population. Advice on how many people to include ranges from four or six to eight to ten people. The number of participants may depend, however, more on finding willing volunteers and on the space available to hold the session, than on any ideal number. Participants are usually homogeneous, although this can mean anything from being of the same culture to having a similar level of familiarity with the research topic. The criteria used to select the participants is influenced by the target research population, and volunteers may be pre-screened to ensure that they meet these criteria. In his research into the communication of radon in the home, Golding, Krimsky and Plough's (1992) criteria for selection of the participants were owning a home and residing in Worchester county. The participant's in Agar's groups to investigate the effects of the drug LSD were all young former LSD users (Agar and MacDonald 1995).

The members of a focus group may be complete strangers, they may be a pre-existing group or they may be a combination of the two. Pre-existing groups bring a shared culture to the research and so enable the information obtained to be placed within a social context (Kitzinger 1994). However, they also bring established group norms, to which the members of the group may feel bound. The composition of the focus group is important as it can influence what is said and what is not said. Kitzinger used pre-existing groups in her AIDS media research, while the homeowners in the radon study were strangers to each other. In Agar's study, some of the participants knew each other previously.

Data Collection

There are a limited number of practical ways to record the data collected in a focus group. The sessions can be taped – either audio or video – and transcripts made. Alternatively, or in addition, notes can be taken throughout the session. The notes may include the main points discussed as well as observations about group dynamics, gestures and non-verbal language, and the general 'atmosphere'. The notes can be augmented from memory after the session, and both the researcher and the facilitator can add additional notes on their thoughts and feelings on how the session went. For analysis, the notes and transcripts can be combined into one document or left separate.

Focus Groups and Anthropology

Focus groups are a valuable alternative qualitative research method for use in anthropology. They can be used as a stand-alone research method to study attitudes and opinions in a qualitative manner. They offer a different type of discourse than an informant interview – that of public rather than private, and peer rather than interviewer. However, focus groups may not allow enough space for an individual to speak, and may sacrifice the ability to pursue people's attitudes and experiences in depth for the opportunity to observe them in interactions (Morgan 1988). In relation to participant observation, the topic in focus groups is introduced by the facilitator, rather than by the informant. There is a tradeoff between the ability to observe naturally occurring interactions and the ability to pursue the researcher's own topic of interest.

The strength of focus groups as a research method, however, is in their use with other established qualitative research methods. Focus groups "provide an opportunity to encourage triangulation in research" (Morgan and Spanish 1984). Used in support of informant interviews, focus groups enable the examination of social processes in action. They can be used before interviewing to develop an interview agenda grounded in the participant's understanding of the topic (Kitzinger 1994). Similarly, they can be held prior to survey research to assist in developing questions in words that correspond to the participant's own approach to the topic (O'Brien 1993). Focus groups allow individual to respond in their own words, using their own categorisations and perceived associations" (Shamdasani and Stewart 1992, 30). Focus groups can be used after participant observation for comparison between the observations made in the field and those that "might have been experiences if the research had occurred in another setting" (Morgan and Spanish 1984). The setting of focus groups, however, is not necessarily a cultural setting as indicated by Kitzinger, but an artificial, negotiated territory which may not correspond to any given cultural context.

Focus Groups and Surveys

Focus groups and surveys are two very different methods of data collection which different purposes and strengths. Focus groups produce patterns and contexts, and surveys produce statistically valid responses.

Focus groups are an emic method in which the data arise in a natural form which is only minimally imposed by the facilitator (Shamdasani and Stewart 1992). Focus groups are useful when the phenomenon is not well understood. Surveys are etic and represent the researcher's imposed view of the situation. The response categories used by the respondent have been generally prescribed by the researcher and may or may not be those with which the respondent is comfortable or familiar. Surveys are useful when the phenomenon is understood and a greater theoretical and empirical structure is built around it.

The purpose of focus groups, as discussed previously, is to expose underlying attitudes, opinions and behaviours and to generate 'thick', qualitative data through the explicit use of group interaction (Byers and Wilcox 1991). Priority is given to the respondent's own hierarchy of importance in their language and concepts and their frameworks for understanding the world. The data is analysed with respect to the concepts and ideas brought forward by the participants. Focus groups are useful for asking "what kind...". Surveys are usually administered to a large enough number of respondents to ensure a statistically valid sample size. The results can then be extrapolated to the general population. The questions on surveys are usually closed and require the respondent to choose their answer from predetermined categories. There is not usually an extensive opportunity for the respondent to answer in their own words or with their own concepts.

Data obtained from focus groups, however, can contribute successfully to development of surveys. Focus groups can provide evidence of how the participants typically talk about the topic in question, with reference to both the language used and to the concepts discussed. Survey questions can be developed in these terms (Morgan 1988;. Focus groups can also identify the topics of interest to the participants which may be included in the survey to present a more complete picture. In addition, participants in the groups can provide qualitative examples of their own experiences and perspectives which may shape the researcher's choice of problems to be addressed in the survey (O'Brien 1993). Surveys can be pretested within focus groups. The group discussion of the survey questions and the range of responses can identify if the participants fail to understand any of the survey. Corrections can then be immediately explored with the group. Focus groups can also be conducted for exploratory aspects of analysis collection after the survey data has been collected. This is especially useful when there are some survey results which are puzzling to the researchers.

In summary, focus groups and surveys are used for different data collection purposes, but can be used successfully in combination to ensure that the survey is meaningful to both the researcher and to the respondents.

D. ETHICS

UNIVERSITY OF ALBERTA

CERTIFICATION OF ETHICAL ACCEPTABILITY

FACULTY OF ARTS HUMAN RESEARCH ETHICS COMMITTEE

APPLICANT'S NAME: Christina Lindsay

APPLICANT'S DEPARTMENT: Anthropology

APPLICATION TITLE: Risk Communication: A Cross-Cultural Dialogue

The application noted above was reviewed by the Faculty of Arts Human Research Ethics Committee. The committee was constituted and the decision was rendered as specified in the University of Alberta Policy Related to Ethics in Human Research (September 1, 1990). The committee reviewers for this application are listed below.

This is to certify that the project and/or procedures outlined in the application were found to be acceptable on ethical grounds and to be generally in accord with policy guidelines as laid down by this University for such research involving human participants.

Date: OCT 31, 1995

L. Fedigan

Dr. L. Fedigan, Associate Chair
Human Research Ethics Review Committee
Department of Anthropology

Reviewers for this application:

✓ G. Beattie (Anthropology)

✓ R. Gruhn (Anthropology) Ruth Gruhn

✓ A. Palmer (Anthropology)

✓ I.S. MacLaren (Canadian Studies)

/ddb

C:WP51\ADM\Ethics-F

Interviewer: Christina Lindsay.
Department of Anthropology
University of Alberta
Edmonton, Alberta, Canada
T6G 2H4

Interviewee: ____________________________

Date: ____________________

As the Interviewee, I have been fully informed of the following points before proceeding with the interview:

1. My participation in this research is completely voluntary and I understand the intent and purpose of this research.

2. Upon my request, I understand that my identity will be kept confidential and that I have the right to withdraw from this research at any time.

3. I know that I may refuse to answer any questions and that I may withdraw at a later date.

4. I am aware that others will be reading the results of this research and that this research will eventually be published.

5. Additional conditions for my participation in this research are noted here:

6. I will receive a copy of this contract.

Signatures.................... Interviewee ____________________________

Interviewer ____________________________

C:\WP51\DCCS\ADM\E.CONS\FRM

CURRICULUM VITAE

CHRISTINA LINDSAY

EDUCATION

1994-1996	M.A. Anthropology	University of Alberta
1993-1994	Undergrad. Anthropology Courses	University of Alberta
1977-1980	B.Sc.(Honours) Computer Science	University of Warwick, England

PROFESSIONAL EXPERIENCE

1996	Research Associate, Eco-Research Chair in Environmental Risk Management	Alberta, Canada
1982-1994	Independent Systems and Business Consultant	Alberta, Canada
1980-1982	Systems Consultant	Alberta, Canada
1976-1977	Programmer	London, England

PRESENTATIONS OF THIS WORK

A Citizen's Guide to Health Risk in Canada: A Cross-Cultural Dialogue

Society for Risk Analysis Annual Conference, Hawaii	December 1995
Research Revelations, University of Alberta	February 1996
Graduate Student Award Night, University of Alberta	April 1996

Taking Cross-Cultural Communication Seriously (in collaboration with Dr. E. Higgs and Ms. G. Gibson)

Society for Risk Analysis Annual Conference, Hawaii	December 1995

Focus Groups and Anthropology: promise and Practice (in collaboration with Ms. G. Gibson)

Alberta Anthropology Student Conference	February 1996

ACADEMIC AWARDS AND DISTINCTIONS

Research Assistant Scholarship, Eco-Research Chair in Environmental Risk Management University of Alberta	September 1994-May 1996
Province of Alberta Graduate Scholarship	May 1995-May 1996
J. Gordin Kaplan Graduate Student Award	1995

FUTURE PLANS

1996-2001	PhD in Science and Technology Studies	Cornell University, USA