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Risk communication and maritime safety legislation

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RISK COMMUNICATION AND MARITIME SAFETY LEGISLATION

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DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

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ABSTRACT

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A maritime disaster is a risk event. Every time a major risk event occurs, the international community vouches for either greater stringency in the existing legislation or adoption of an altogether new one. The International Maritime Organisation, however, continues to be seized with a host of flag states that are perpetual stragglers when it comes to giving effect to these conventions.

In the midst of this frenetic activity of treaty making, this dissertation pauses to ponder on the asymmetry between the adoption and implementation of the maritime conventions. It adopts a novel approach by looking at the myriad theoretical approaches to risk, and the recent integrative social amplification of risk framework.

The framework is placed in the maritime perspective by a cross-national survey of the populations and maritime administrations, content analyses of the media that crystallise their risk perceptions, and an introspection of the work of pressure groups that also influence risk perception in a large measure.

The study concludes that the existing, IMO evaluation of self-assessment by flag states and voluntary IMO member state audit scheme are necessary but not sufficient tools to ensure effective flag state implementation. A Bayesian network of risk communication emerges based on the conviction that an optimum risk perception level is the key to effective implementation of maritime safety legislation.

KEYWORDS: Content Analysis, Risk Communication, Risk Perception, Social Amplification of Risk Framework, Social Survey.

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LIST OF ABBREVIATIONS

ADN	Anchorage Daily News
BBC	British Broadcasting Corporation
BIMCO	the Baltic and International Maritime Council
BSE	Bovine Spongiform Encephalopathy
CMB	Code Matrix Browser
CNN	Cable News Network
COMSAR	Sub-committee on Radio-communications and Search and Rescue
CRB	Code Relation Browser
DE	Sub-committee on Ship Design and Equipment
ELM	Elaboration Likelihood Model
FOEI	Friends of Earth International
FSA	Formal Safety Assessment
FSI	Sub-committee on Flag State Implementation
HLA	Helicopter Landing Area
IACS	International Association of Classification Societies
ICCL	International Council of Cruise Lines
ICFTU	International Confederation of Free Trade Unions
IEC	International Electro-technical Commission
ILO	International Labour Organisation
IMO	International Maritime Organisation
INMARSAT	International Maritime Satellite Organisation
ISO	International Standardisation Organisation
LDC	London Dumping Convention
LSA	Life Saving Appliances
MARAD	Maritime Administration
MCA	Maritime and Coast Guard Agency
MEPC	Marine Environment Protection Committee
MORI	Market & Opinion Research International
MSC	Maritime Safety Committee
NGO	Non Governmental Organisation
NYT	the New York Times

OPA 90	Oil Pollution Act of 1990
RSCG	Research Survey and Consumer Group
SAF	Self Assessment Form
SARF	Social Amplification of Risk Framework
SOLAS	International Convention for the Safety of Life at Sea
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Council on Trade and Development
VIMSAS	Voluntary IMO Member State Audit Scheme

CHAPTER ONE

Introduction and Overview

> *Fish may die or human beings; drinking water or swimming in rivers or lakes may cause diseases; we may run out of oil; the global temperature may rise or fall; all these effects will not cause any societal effects unless society communicates about it. Society is sensitive to the natural environment, but it operates as a closed system. Society observes nature and environment through communication. Communicating meaning is the only means for initiating responses...*
>
> (Luhmann, 1986, p. 63 cited in Renn, 1991, p. 287)

In 1868, immediately upon his election as a Member of the Parliament, Samuel Plimsoll is known to have begun a campaign for government legislation to protect seamen who were drowning by the thousands each year on ships around British shores. But the effect was seen only in March 1873 when *The Times* joined his campaign by publishing a story about fifteen seamen imprisoned for three months for refusing to go on board the ship *Peru*. This ship, which sailed from Cardiff with a new crew, sank in the Bay of Biscay taking three men with her. The Parliament was eventually forced to pass the Unseaworthy Ships Bill into law in 1876. [1] (http://www.plimsoll.com/history.html)

History is replete with regulations made in response to particular incidents. In the mid nineteenth century, public opinion became aroused by unscrupulous operators who purchased rotten-timbered 'coffin' vessels, insured them, and sent them out into commercial trade, criminally overloaded and undermanned. This led to the Merchant Shipping Act of 1871 in Britain. (Haine, 1983, p. 25)

[1] The law requiring that vessels bear the load line freeboard marking was soon known as the "Plimsoll Mark" and was eventually adopted by all maritime nations of the world.

More recently, the sinking of the *Titanic*, the grounding of the tanker *Torrey Canyon* off the UK coast, the flooding and capsize of the Ro-Ro ferry *Herald of Free Enterprise* off Zeebrugge, Belgium in March 1987, and the *Exxon Valdez* oil spill in Alaska all provoked a public outcry which led to new regulations. (Gold, Chircop, & Kindred, 2003)

The Exxon Valdez incident sparked off demands in the U.S. for double-hulled tankers (Hutchinson, 1993, p.27). The threat that an object (the Brent Spar) is being intentionally sunk to the ocean floor created a vociferous reaction from the people more than two thousand nautical miles removed from the site. Apparently, risk communication has always played an important role in the development of maritime law.

Risk communication inevitably draws attention to the contemporary mass media because the media constitute the source of much of the public's information. Newspapers, television, radio, and news magazines mediate the messages that reach the public. Disasters such as the Chernobyl and Bovine Spongiform Encephalopathy (BSE) have been studied in depth for their media coverage and consequent influence on public perception. Yet, there are hardly any comprehensive studies in media influence on public perception of risk due maritime disasters.

Shipping is international in character. The forces that make it so significant in economic and allied terms also make it the subject of national and international political intervention. According to the comment at the conclusion of the Rochdale report of 1970, 'the [shipping] industry … inevitably operates within a complicated world pattern of… policies of governments'. (Stopford, 1997, p.7)

Equally complex is the regulatory framework for shipping. There is no supreme legislative entity that makes laws and no international court that tries cases against them. The regulatory framework consists of an *ad hoc* mix of rules and regulations

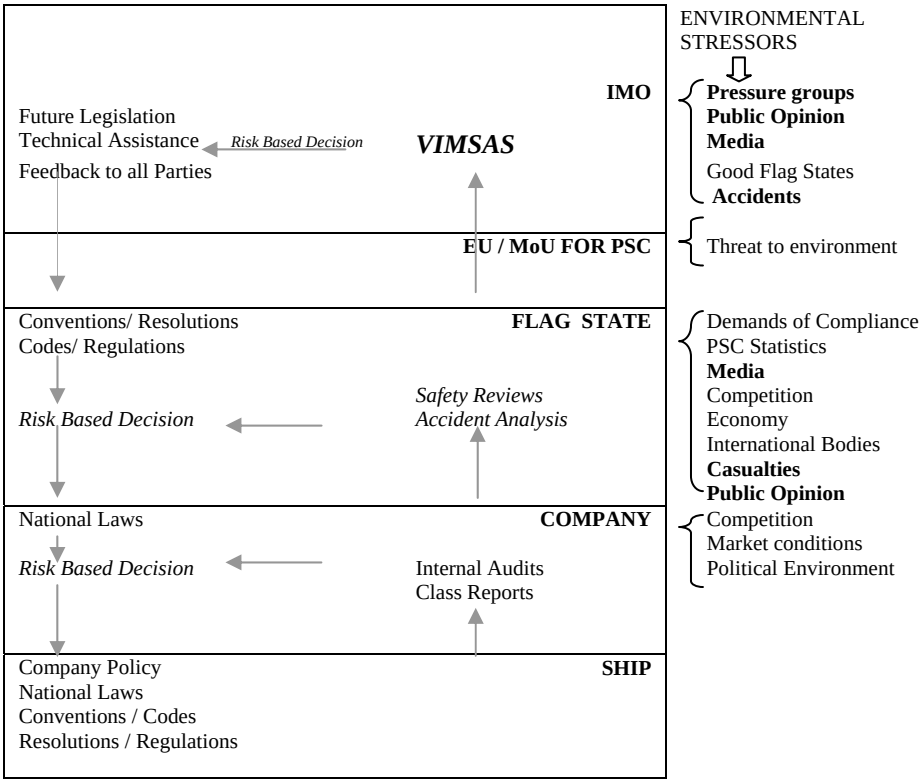
enacted and enforced by three different regulatory authorities; the classification societies that make rules for ship construction and maintenance, the flag states that regulate all aspects of the commercial and operational performance of a ship, and coastal states that regulate 'good conduct' of ships in its territorial waters. While nations may have their own set of maritime laws, they participate in treaty making or conventions at the International Maritime Organisation (IMO), the International Labour Organisation (ILO), and the Shipping Committee of the United Nations Council on Trade and Development (UNCTAD). These are then transformed into domestic legislation post ratification. (Stopford, 2005, pp. 423-454)

The IMO is an intergovernmental organisation comprising 166 member States (2006). But, unlike the other United Nations Organisations, thirty-six inter-governmental organizations[2] participate in its proceedings under agreements of co-operation as also sixty-three non-governmental organizations that hold consultative status.[3]

These are only the obvious complications. The environmental stressors postulated in the application of the model developed by J. Rasmussen (Mejia, 2005, p. 5; Rasmussen & Svedung, 2000) provide a precursor to the many influencing variables. Regulatory rule making is clearly a consequence of risk communication at the many nested levels of decision-making.

[2] These include *inter alia* the EC (Commission of the European Communities), Helsinki Commission (The Baltic Marine Environment Protection Commission), Commonwealth Secretariat and INMARSAT.

[3] These include amongst others Greenpeace, Friends of Earth International (FOEI), International Association of Classification Societies (IACS), International Electro-technical Commission (IEC) and the International Organisation for Standardization (ISO).



Source: An adaptation from Mejia, 2005, p. 5.

Figure 1.1. Nested levels in IMO's risk based decision-making and legislative process.

Any attempt to understand risk communication and its consequent impact on legislation necessitates an empirical assessment of the public consumption of the media, their awareness of maritime issues, and perception of risk from shipping activities. But perception being a social construct, a balanced view is achievable only through an insight of people across different countries with varied forms of governance and located in diverse continents.

The public perception of risk as portrayed by the media is picked up by the administrations and voiced at the IMO. But, there are the pressure groups in the form of inter-governmental and non-governmental organisations that influence treaty making at the IMO. Thus, the perception of the IMO as a collective entity of member governments and its constituent pressure groups needs to be ascertained for any understanding of risk perception.

Social research on risk perception is characterised by serious fragmentation. The diverse approaches lie on a continuum between individualism and collectivism; or viewed from another dimension, between the realist and constructionist. Therefore, the current state of knowledge about risk perception would merit detailed deliberation. A comprehensive and systematic understanding of the social experiences of risk would be incomplete if the recent integrative approaches, such as the social amplification of risk framework, were not to be reviewed in a work on risk perception.

A study of the interplay between controversial risk issues, media coverage, and public opinion would need in-depth content analyses and studies of media effects. A device would be needed to reduce the content of newspapers to sets of statistics that can be compared. Mass communications research offers the tool of *content analysis* for the purpose.

Having gained an insight into the public perception of risk, a perspective of the IMO and the pressure groups that participate in its functioning rounded up with the results of content analysis of media coverage of a major maritime disaster, it then remains to unravel the social amplification of risk in the maritime context and its implications for the maritime administrations.

CHAPTER TWO

Background to Risk Research

Social science research over the last two decades has generated substantial knowledge on the risks arising from technological advances and economic activities and the ways in which people assess, respond and communicate those risks. Major disasters such as Bhopal, Chernobyl and Challenger Space Shuttle as also the Exxon Valdez and Erika while presenting with '*new species of trouble*' have contributed significantly to the body of scientific knowledge on risk perceptions and consequent decision-making. Social research on risk, however, remains seriously fragmented between the myriad theoretical perspectives and methodological approaches (Taylor-Gooby & Zinn, 2006, p. 397; Pidgeon, Kasperson, & Slovic, 2003, p. 2). This chapter dwells on the competing approaches to risk.

2.1 Evolution of Risk Research

The onslaught of risk issues is ever increasing. Rationality of any debate on risk issues is rather far-fetched and so is clarity of information. Scientific judgement prevails where scientific decision-making fails (Bacon, 1997). The risks from major chemical processing installations in the 1970s and 1980s are a case in point. These prompted psychometric studies[4] on public perceptions of risks[5] in parallel with the

[4] Psychology is the single largest contributor to the wealth of social science literature on risk perception. Early psychological work, during the 1950s and 60s, focused on risks associated with gambling. It lacked ecological validity and real-world relevance. The dissatisfaction with the gambling paradigm lead to the pursuit of more valid approaches in Behavioural Decision theory. (Weyman and Kelly, 1999, p. 4)

[5] Perception describes sensory phenomena related to sight, sound, touch, smell and taste. The word perception used here refers to various kinds of attitudes and judgements. (Slovic, 2000c, p. xxxvii)

progressing scientific studies so as to estimate their incongruence with objective risk levels. At about the same time, the UK Health and Safety at Work Act of 1974[6] laid the foundation for risk-based regulation. The 1987 EC Framework Directive on Health and Safety continued the trend. It required *a priori* assessment of risks preparatory to determination of control measures. Similar legislative focus, requiring actions proportionate to the risks, has been adopted in many countries. Risk research has consequently evolved over time into a multidisciplinary mould encompassing sociology, psychology, economics, ethics and the governance of risk. (McQuaid, 1998)

2.2 Competing Approaches[7] to Risk

Risk approaches may be classified in many different ways based on theoretical and methodical perspectives. Risks may be understood as real and having an independent existence or as a social construct on the ontological scale. Understanding of risks may result from processes within the individual, such as influencing perceptions and cognition or from factors external to the individual viz., the socio-cultural factors. Alternately, risk perceptions may be seen at the level of particularity along a continuum as residing anywhere between an individualism and collectivism. The distinction would then lie in an understanding of risk perception through either discrete individual people or irreducibly social entities. (Taylor-Gooby & Zinn, 2006, p. 407)

Viewed from another aspect, the scientific approach represents a probabilistic function. In contrast, an understanding of risk based on characteristics unrelated to probabilistic assessment such as social and cultural values is representative of a

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Strictly speaking there is no such thing as risk perception. 'Risk perception' was coined by technologists' consequent to observations of public reactions to new technologies that were often disproportionate to their estimates. (Recchia, 1999, p. 8)

[6] See http://www.healthandsafety.co.uk/haswa.htm for the bare Act.

[7] It is observed that the terms approach, theory, model, perspective and framework are all used interchangeably in risk literature.

contextualist formulation. Thus, according to Thomson and Dean (cited in Gaskell & Allum, 2001, p. 9), the realist-constructionist continuum may also be seen as a continuum between the probabilistic and contextualist models. A two-dimensional grid of 'ontology' *vis-à-vis* 'particularity' would best serve to portray the relative placement of these psychological and sociological approaches to risk research.

Source: Taylor-Gooby & Zinn, 2006, p. 407.

Figure 2.1. Psychological and sociological approaches to risk.

2.3 Genres of Risk Research

Risk Research is progressing on a wide range of perspectives. The identified themes of risk research include objective versus subjective perceptions, the psychometric tradition, the social amplification of risk framework, culture, trust, and affect approach (Taylor-Gooby, 2004). Pidgeon categorises social science research in risk perception into two broad schools, the psychometric approach and cultural theories of risk (Williamson & Weyman, 2005, p. 5). A discussion on the different genres ensues.

2.3.1 Cognitive/ Learning

The cognitive/learning and empiricist psychometric are two approaches in mainstream psychology. Cognitive/learning is founded on humans being rational choosers. The latter has no theoretical presuppositions. It relies on questionnaire surveys and other empirical methods to arrive at any conclusions.

Rational action in everyday life is consensus by deliberate choice. Economic theory on the other hand, refers to it as maximisation of utility. This concept is typical of psychological work. A complex hierarchy of means and ends, multiplicity of motives and cross-influence in actors is thus implicit in cognitive research.

Rational behaviour[8] is expected post assessment of outcomes. Weyman & Kelly term it as the 'value-expectancy model'.[9] Experimental and observational research, however, proves the contrary. Behaviour and risk perception are found to be largely unrelated. People are often found sensitive to theoretically irrelevant factors. (Taylor-Gooby & Zinn, 2006, p. 398) This issue is addressed through cognitive illusions, social learning, mental modelling and the more recent emotional and affective factors.

The value expectancy approach is criticised for its lack of attention to contextual factors in risk perception.[10] Also, incongruence is evidenced between judgements of personal vulnerability and risk to society. (Williamson & Weyman, 2005, p. 7)

[8] The expectation of rational behaviour is based on the premise that humans are intellectually gifted creatures. As economist Frank Knight said, "We are so built that what seems reasonable to us is likely to be confirmed by experience or we could not live in this world at all" (cited in Slovic, Fischhoff, & Lichtenstein, 2000, p. 35).

[9] Perhaps the best-known expectancy value model (mark the interchange of the words 'value' and 'expectancy') is the subjective expected utility model of behavioural decision theory by Edwards in 1954. According to this theory people invariably make a behavioural choice that is likely to lead to a favourable outcome. In scientific terms, the selection is an alternative with the highest 'subjective expected utility' (SEU). (Fishbein & Ajzen, 1958, p. 30)

[10] Social and group effects in relation to individual decision-making are of special concern.

2.3.2 Heuristics

A heuristic is a mental process. Heuristics comprise simple and general rules that humans apply to resolve complex situations that involve a high degree of risk taking or uncertainty. Tversky and Kahneman in their seminal work on the errors of human judgment, its causes and consequences concluded that people use 'rules of the thumb' or heuristics when thinking about uncertainty and related issues.[11] People estimate the likelihood of a risk event based on the ease with which instances of those events are brought to mind (availability heuristic), the similarity to the class of event it is perceived to represent (representativeness), and a judgment anchored on an initial value adjusted to the prevailing circumstances (anchoring and adjustment) (Tversky & Kahneman, 1974, pp. 1124-1131; Slovic, Fischhoff, & Lichtenstein, 2000, pp. 37-39). These cognitive heuristics or 'cognitive illusions' are analogous to perceptual distortions and shape peoples' risk judgments (Taylor-Gooby & Zinn, 2006, p. 398). Bounded rational individuals apply these to make judgments of risks.

It is posited that, rather than a thorough evaluation of the options, affective judgments could occasionally determine people's choices. Affect is a constituent of every perception. Finucane et al. (2000) proposed that affect heuristic is a part of the process of making judgments. An affect is tagged to every event in the memory. Together they form an 'affective pool' that aids as a mental short cut in decision making for any newly experienced event.

2.3.3 The Mental Models Approach

It is fundamentally cognitive and rooted in the psychology of the individual. The idea that mental models are small-scaled representations of external reality is traced back

[11] Their approach sparked off extensive judgment and decision research, and associated empirical methods. Daniel Kahneman received the Nobel Prize in Economic Sciences in the year 2000 for his Prospect Theory of Decision-Making under Uncertainty.

to Kenneth Craik.[12] Typically, researchers employ qualitative interviews to infer lay models.[13] Comparing these with expert understanding of the issues helps identify discrepancies. (Weyman & Kelly, 1999, p. 26) Models help in understanding the world. Fischoff et al., however, reasoned that an erroneous model might lead to fallacy of understanding (Taylor-Gooby, 2004, p. 4). In fact, as psychologists say, people tend to employ 'fundamental attribution error' when thinking about risks.[14] According to Pidgeon, development approaches to risk stand to benefit from mental modelling. (Taylor-Gooby & Zinn, 2006, p. 399)

Recent experimental work points to emotional judgment overriding rational judgment in the event of time pressure or uncertainty. The plausible 'affect heuristic' is being equally explored. Slovic sees affect and cognitive heuristics as operating in concert. The end result is an increasing complexity in risk judgment. (Taylor-Gooby & Zinn, 2006, p. 399)

Nonetheless, strands of criticism persist. Does expert knowledge hold objective status? By an extension of Cultural Theory, isn't expert judgment of risk also subject to cultural considerations? (Williamson & Weyman, 2005, p. 9) Can the theory be treated as being unified and consistent? What is the validity of lay knowledge of risk issues in the context in which most people encounter them? And, how trustworthy is expert opinion? (Weyman & Kelly, 1999, p. 26; Taylor-Gooby, 2004, p. 4) That leads to an investigation of trust.

[12] The intuitive idea that mental representations are similar to the reality they represent dates back to *circa* 400 BC. The Greek philosopher Aristotle then tried to formulate laws for the rational part of the mind while believing in another part for its intuitive reasoning. (Segal, 1991)

[13] A related approach is the Laddering Methodology that elicits participants' concerns and their interrelations through semi structured interviews (Williamson and Weyman, 2005, p.8).

2.3.4 Trust

Abraham Lincoln wrote in a letter to Alexander McClure, "If you *once* forfeit the confidence of your fellow citizens, you can *never* regain their trust and esteem" (emphasis added). Trust is amongst the most fragile of all perceptions. Trust, intuitively, is important for all forms of human social interaction. Numerous surveys have corroborated the fact that the public is wary of judgments on risk issues by anyone in authority, be it scientific, political or financial (Slovic, 1993; Slovic 2000b). An example is the public mistrust noted in the UK House of Lords' report on Science and Technology (Committee on Science and Technology, 2000).

When asked to rank various sources[15] for trustworthy advice on the BSE[16] affair, 57 percent expressed confidence in 'independent scientists', and only 17 or 18 percent in civil servants and 'government scientists'. Similarly, 63 percent of this sample of 1,015 adults surveyed by Market and Opinion Research International (MORI)[17] in the spring of 1999 said they trusted scientists generally to tell the truth. In a related enquiry on who would be trust worthier to offer advice about pollution, they ranked independent scientists (60 percent) way ahead of government scientists (23 percent) or government ministers (6 percent). (Hargreaves & Ferguson, 2000, p. 3)

Trust issues in risk research emerged from the discrepancy between expert and lay perceptions of risk and its communication. It serves to integrate the psychological and socio-cultural approaches to risk. It contributes to the cultural factors in Slovic's basic psychometric model. Poortingo and Pidgeon (2003) examined trust in five risk

[14] In other words, they tend to think of the cause of a particular outcome as the result of individual human acts, rather than the result of a larger mechanical, political, or social system (Wilkins & Patterson, 1987 as cited by Wilkins, L., 2001, p.168)

[15] Frewer (2003, p.127) cites application of the elaboration likelihood model (ELM) developed by Petty and Cacioppo to the study of source characteristics' influence on risk communication. For a detailed discussion of the study see Frewer, Howard, Hedderly et al., 1997.

[16] Bovine Spongiform Encephalopathy (BSE) or mad cow disease is a chronic, degenerative disorder affecting the central nervous system of cattle.

domains using measures that identify confidence in competence, values and political and implementation processes. Consequently, they extended the framework for analyzing the factors underlying trust. (Taylor-Gooby, 2004, p.15)

Studies suggest considerable influence of domain on trust. Differences in trust are variously related to the risk issue at hand (Weyman & Kelly, 1999, p. 30), cross-national differences (Viklund, 2003), and the yet to be explored, institutional differences. Poortingo and Pidgeon (2003), on the contrary, identify similarity in trust levels *par* domains.

Trust relates to the knowledge of risk. A survey in four west-European countries reiterated the tendency of higher correlations when levels of self-reported knowledge were low (Viklund, 2003, pp. 736-737). Judgment of risks, and in turn their acceptability, is based on trust in institutions or experts. This is the causal theory of trust. The associationist view, however, proposes acceptability as fundamental to the determination of both trust and risk judgement. (Taylor-Gooby, 2004, p. 17)

2.3.5 Psychometric Approach[18]

How safe is safe enough? To answer this fundamental question Chauncey Starr in 1959 analysed historical and current risk and benefit data based on the assumption that society arrives at an optimum balance between the two by trial and error. Fischoff and colleagues overcame concerns regarding the assumption and data collection in Starr's approach by using questionnaires to ask people directly about their perceptions of risk. This 'psychometric model'[19] was published in a seminal

[17] Market & Opinion Research International (MORI) is the largest independently-owned market research company in Great Britain. See http://www.mori.com/about/ for further information about the company.

[18] Where reference is made to the psychometric approach within this thesis it refers to the risk research framework initially developed at the University of Oregon, in the USA.

[19] The model began with nine and later grew to 18 explanatory scales. Traditionally, three factors were found to suffice explanation of around 80% variance in risk perceptions; New-Old, Dread, and Number Exposed. The fourth factor, Unnatural and Immoral Risk was a subsequent addition. For a detailed discussion of the Psychometric Model refer Sjöberg, 2000, pp. 3-5.

paper by Fischoff et al. in 1978. The taxonomy of risks defined by the model aimed to identify those risks which people fear and those which they will tolerate i.e., their 'expressed preferences' (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 2000). Unfortunately, early applications of the model revealed systematic differences between lay and expert risk judgements. (Weyman & Kelly, 1999, p. 7)

Further research on the identification of the finite number of underlying factors revealed two governing risk dimensions. It established that public's perception of risk is driven by dread[20] and ignorance,[21] and moreover, that risk perception drives risk policy (Sjöberg, 2004, p. S47). In some cases, the number of individuals exposed[22] contributes to the risk perception. This model has served as the basis for extensive work on risk communication.

The psychometric approach has been questioned for its apparent lack of methodological comparability between studies. It is criticized for failing to provide specific information on how people reason about risks. Its ability to integrate new information into peoples existing knowledge, beliefs and perceptions is considered improbable. (Weyman & Kelly, 1999, p.9)

The psychometric model, in its traditional three-factor form,[23] explains only a fraction of the variance in perceived risk. Rather, it has been questioned for its importance of the newness factor and, its versatility on several accounts. The few factors explaining about 80 % variance don't necessarily imply accountability for perception to the same extent. The scales are considered to have missed out on 'interference with nature'. Mean ratings were analysed though individual ratings should theoretically have been of interest (Sjöberg, 2000, p. 4). The use of structured questionnaires with pre-defined issues has also come in for criticism (Weyman &

[20] *Dread Risk* (or control factor as labelled by some researchers) is believed to the most important dimension. It relates to the hazard's catastrophic potential.
[21] Also termed as *Unknown Risk*, it reflects people's knowledge of the hazard.
[22] It relates to the number of people likely to be affected, should the event occur.

Kelly, 1999, pp. 8-9). Rohrmann brought out the inadequate representation of cultural factors. The basic model has consequently expanded over time. It employs both qualitative and quantitative methods over wider samples. It embraces social, cultural and affective factors measuring individual perceptions and provides summing up in terms of world-view, gender and trust. (Taylor-Gooby, 2004, p. 7)

2.3.6 Cultural Theory

According to Frewer, risk perception cannot be reified independently; it is rooted in the individual's social system (Williamson & Weyman, 2005, p. 9). Culture, by definition, is the sum total of the customary beliefs, social forms, and material traits of a racial, religious, or social group. It is that set of shared attitudes, values, goals, and practices that characterizes any grouping (Merriam-Webster, 1993).

Douglas and Wildavsky conceived the Cultural Theory of risk perception[24] in the process of understanding the basic principles by which people see themselves and others and its resultant influence on their interaction. Their theory envisaged four types of people concerned with distinct hazard types or world-views[25] (Sjöberg, 2000, p. 5). An analysis of cultural influence could be made either in terms of the distortion or consolidation of an individual's risk perception on account of social construction (Taylor-Gooby, 2004, p.11). Douglas identified a central distinction between self and others across all societies. Studies by Douglas on pollution reinforced the significance of boundaries at the level of the individual body and then, by extension, to the body politic. The self/ other distinction explains the French government's approval for recycling of the decommissioned aircraft carrier Clemenceau at Alang in India despite excessive residues of asbestos aboard.

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[23] See footnote 16 ante.

[24] A more specific conceptualisation of the context is the 'workplace context' as suggested by the growing body of empirical evidence. It relates to the physical risks in high hazard environment. The methodology of estimation of individual attitude to measure social phenomena is debatable. (Weyman and Kelly, 1999, pp.22-23)

[25] Societies are distinguished as hierarchal, egalitarian, fatalistic and individualistic in a 'grid-group' model based on social roles and strength of commitment (Taylor-Gooby & Zinn, 2006, p. 402).

In contrast with Douglas' model operating at the level of social group, Slovic begins with the lay/ expert distinction and progressively includes cultural factors in explaining their risk perception variance (Taylor-Gooby, 2004, p. 12).

The principal criticisms of the cultural theory from various quarters include its limited empirical basis, its lack of dynamism inhibiting its change over time and an oversimplification (Williamson & Weyman, 2005, p. 9). Interestingly, Sjöberg's surveys on risk perception of X-ray diagnostics alongside domestic nuclear power proved that attitude associated with risk sensitivity is a crucial factor in risk perception. It further attributed the failure of the cultural theory to its abstract construction of the social context and the many variables (other than solely social context) influencing risk perception (Sjöberg, 2000, p. 9). A structured questionnaire survey by Marris et al. produced similar results. Tansey et al. and Rippl, however, question the results of both the survey methods. Taylor-Gooby (2004, p. 12-13) opines that Sjöberg fails to engage with much cultural analysis and that the structured questionnaire approach as a methodology is debatable.[26] Wilkinson (2001) views the contrasting theories of Beck and Douglas as necessary, yet by no means sufficient to account for the phenomenal complexity in people's risk perception and response.

2.3.7 Risk Society Perspective

Risk society[27] perspectives have influenced sociology for over 15 years. Contrary to Douglas and Wildavsky's cultural theory, it analyses risk perception and response from a disjointed culture point of view. Beck[28] suggests that perceived risk generates an unceasing reflexive response emanating from the interactive engagement between the perpetrator and victims of risk. The reflexivity may lead to a new understanding or behaviour that in turn would generate further reflexive response. In a risk society,

[26] Rippl, nevertheless, argues in favour of the cultural theory based on theoretical concepts for its explanatory power as opposed to the psychometric tradition founded on empirical methods.
[27] Luhmann defines society as, "a social system that consists of meaningful communications – only of communications and of al communications" (King & Thornhill, 2005, p. 12).
[28] Ulrich Beck's *Risk Society* (Mythen, 2004) is the seminal work in this sphere with regard to environmental risks.

according to Beck, everyone is equally at risk. (Hargreaves & Ferguson, 2000, p. 25). Beck visualises risk society as second modernity. It's the phase that follows industrial society or first modernity. In risk society, the 'manufactured risks' increasingly allude the risk control mechanisms of industrial society (Mythen, 2004, p. 16).

Giddens, as opposed to Beck, focuses at the individual level. He argues on a decline in expert trust owing to reflexivity in individuals that sustains a high risk awareness level in them. Wynne questions the superiority of expert knowledge over lay knowledge, particularly in the light of the stakeholders' increasing quest for their own specialist scientific resources. Wynne's study revealed that government appointed scientists did not possess the Cumbrian hill sheep farmers' understanding of the sheep behaviour and local environmental conditions.[29] Their consequent failure to predict the outcome of Chernobyl radiation on the sheep financially damaged the sheep farmers. (Taylor-Gooby & Zinn, 2006, p.403)

2.3.8 Governmentality Perspective

This model has its origins in the Frenchman, Foucault's work published in 1991. Whatever be the social scientists outlook of society, there is no denying that the framework of social control encompasses institutional authority alongside a socio-cultural identity. Governmentality was introduced by Foucault to study the 'autonomous' individual's capacity for self-control and its link to various forms of institutional authority. An important strand in Governmentality analyses state responses to disjunction in modernity identified by risk society theorists. It is argued that Foucault's model of control, and consequently its explanatory power, refers to the past and is not concerned with the emergence of the contemporary postindustrial subject. (Lianos, 2003, p.413) The Governmentality perspective is believed to be overly reliant on a top-down approach.

Media constitute the source of much of the public's awareness of risks. Thus, a discussion of risk perception inevitably draws our attention to the contemporary mass media.

2.4 Risk Perception and the Media

Media are often believed to influence risk perception. But, how and to what extent does media influence risk perception? Is risk perception attributable to the media at all? What distinguishes media content from other information sources so as to influence the people's perception? Media contribute towards society's construction of reality. Its function is to represent the public. (Luhmann, 2000, p. 102-105) In reality, however, the power relations within, and the information entering and exiting media decide exactly *which* risks shall become the focus of public concern. (Mythen, 2004, p. 80; Hargreaves & Ferguson, 2000)

Both the media and its audiences, by their very nature, deny any understanding of the media. The media is not a monolith. It includes a multitude of television channels, newspapers, periodicals and, increasingly, internet content. Further, every news organisation operates in its own political culture (Lichtenberg, 1991, p. 159). People, they understand qualitative statements, not quantitative measures. More importantly, their opinions are not always formed on the basis of available information. (Wåhlberg & Sjöberg, 2000, p.37)

Kepplinger and Mathes having studied media coverage of the Rhine river pollution concluded that the media do not portray reality accurately. The media's overemphasis of the river pollution despite its actual decline fundamentally changed public perception. (Lichtenberg & MacLean, 1991, pp. 161-162)

[29] Precise details are not relevant here, but the reader is urged to access this account as a fascinating and exemplary account of the interplay between officialdom and farmers, and between scientists and locally well-informed citizens.

No existing risk perception model is specific to media influences. Cohen's moral panic model (cited in Mythen, 2004, p.76) illustrates the linkages between institutional stigmatisation, media amplification and public perceptions of risk.

Few theories, if at all, directly address the question of media influence on risk perception. Bandura's social learning theory remained popular for nearly two decades since its conception in the 1970s until its results were explained by other theories. Other psychological factors considered to be contributing to risk perception include availability, Kahneman and Tversky's heuristics or representativeness,[30] and Tyler's impersonal impact[31] hypothesis. Gerbner's social amplification theory[32] and cultivation theory account for risk perception as well. They do not qualify as psychological theories, though. (Wåhlberg & Sjöberg, 2000)

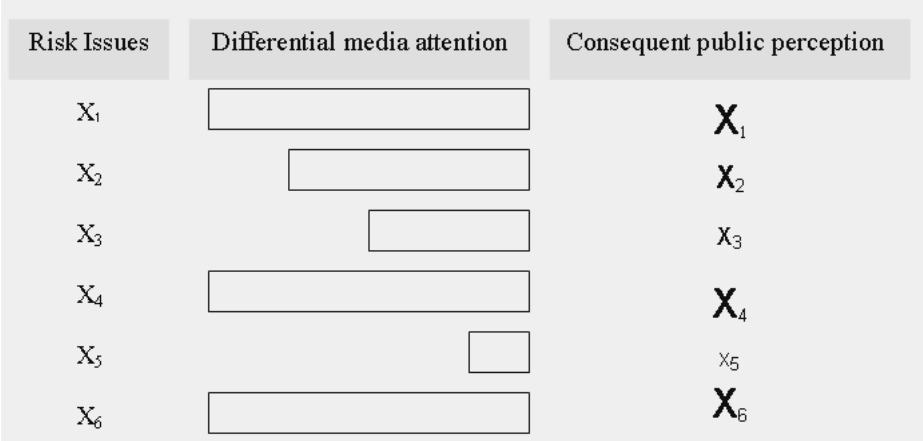
How is knowledge arising out of a risk event suppressed or covered over by participation in the output of a mass media? The explanation for society's collective behaviour lies in the concept of schema. The structural coupling of the mass media communications and its psychically readable simplifications generates schema. The process is circular and relies on psychic anchoring. Thus, the images of oiled birds, dead fish, or a shoreline oiled by an Exxon Valdez in faraway Alaska produces causal scripts in domains that are inaccessible to the human experience. The structural couplings between the individual and society and the schemata and scripts of ecological concerns generated by the media trigger a response in proportion to each individual's own schematisation. (Luhmann, 2000, pp. 107-116)

Audiences are envisaged as victims; to be manipulated by hidden persuaders and subliminal seduction. This is the bitter truth about media influence. The media, by necessity, select and process facts for presentation. Its inherent systematisation

[30] The probability of an event is determined partly by its similarity to population of known events and the process that generated it.
[31] It refers to the differing impacts of risk information at perceived societal and personal level.
[32] It attributes criticality to direction of steady contribution rather than size of an affect.

affects the interpretation of its communication. The media shapes people in the process of informing them. Audiences work upon texts in complex and different ways, just as much as texts work upon audiences. (Bell, 1991)

McLuhan envisages media as extensions of the human form and that these extensions just as the skin, the central nervous system, the hand or the foot, affect the entire psychic and social being (Berger, 2005, p. 131). The link between media agenda and public perception of risk is best described by Donald McCombs and Malcolm Shaw's agenda setting model of media affects (Watson, 2003, p. 128). Public perception of risk is directly proportional to its emphasis in the media; what media amplifies is enlarged in public perception.



Source: Watson, 2003, p. 128.

Figure 2.2. McCombs and Shaw's agenda setting model of media effects.

Risk perception could be affected by availability, but is lessened by impersonal impact. General risk perception is more easily changed than personal risk perception. (Wåhlberg & Sjöberg, 2000, p.31) Klapper's threefold differentiation of media effects provides, by analogy, a distinction of risk perceptions between 'conversion', 'minor change' and 'reinforcement'. (McQuail, 2005, p.465)

To quote an example of media influence on risk perception, when the North Sea Oil rig Piper Alpha caught fire in 1988, its owners Occidental Oil were perceived as an efficient and caring company. Efficient media handling helped mask its fallacy, but only until the company's poor safety record came to light in the ensuing public enquiry. (Hart, 1991, pp. 87-88)

A brief discussion of risk communication is apt at this juncture, in keeping with the chronological order of research between risk analysis, risk perception and risk communication, in that order.

2.5 Risk Communication

Communication is a reality *sui generis* (Luhmann, 2002, p. xvi). According to Luhmann, an informal exchange of views between individuals is termed interaction and, not communication. Communication, in its simplest terms, is a synthesis of information, utterance and understanding (King & Thornhill, 2005, p. 11).

Why discuss risk communication? "It does not, of course, emerge *ex nihilo;* it grows directly out of the work of risk analysis and risk perception" (Lichtenberg & MacLean, 1991, p. 157). The study of risk communication relates theory and findings from risk perception studies to the formulation of policy, the legislative framework for dealing with hazards, the key question of public involvement in decision making about hazards and risks management, and environmental management. (Recchia, 1999, p. 10)

Risk communication itself is reflexive and consequently, universal (Luhmann, 2002, p. xxx). It originates from White's work on risk perception followed by that of Fischhoff and Slovic. [33] In the late 1980s their findings began to be applied to risk

[33] White worked on natural hazards in the 1940s. Fischoff and Slovic worked in the 1970s on technological hazards.

communication (Lofstedt, 2003, p. 417). It is observed that discourses on risk communication follow two paths, the larger one being campaigns aimed at generating awareness. These influence perceptions about a hazardous activity such as that of a nuclear power plant. Communication consequent to the occurrence of a risk event is the other.

According to Sharlin (cited in Wåhlberg & Sjöberg, 2000, p. 37), communication of risks impacting at the individual level or rather a micro perspective creates greater concern amongst people than a macro perspective.

Different models purport to explain the communication process. The 'canonical model' by Massimiano Bucci as applicable to science and the media is the most basic of them all. That soon evolved into the 'continuity model'. (Hargreaves & Ferguson, 2000, pp. 8-9)

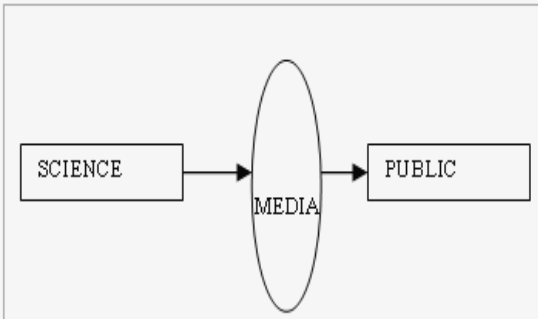


Figure 2.3. The Canonical Model
Source: Hargreaves & Ferguson, 2000, p. 8

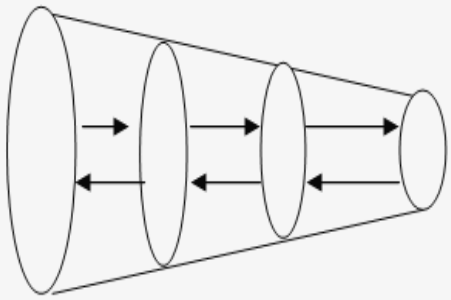
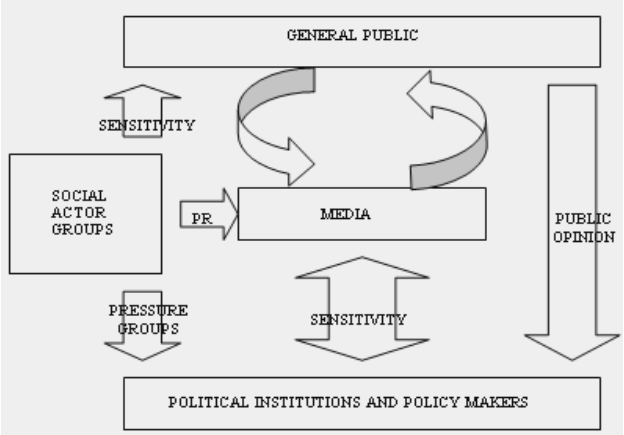


Figure 2.4. The Continuity Model
Source: Hargreaves & Ferguson, 2000, p. 9

Professor Durant put forth a two dimensional map before the House of Lords Select Committee consequent to a study of the genetically modified food controversy in 1999. (Hargreaves & Ferguson, 2000, pp. 10-11)



Source: Hargreaves & Ferguson, 2000, pp. 10-11.

Figure 2.5. The Durant Model.

Incidentally, risk communication has been traditionally unidirectional, apprising lay people of probabilistic, rational, and scientific risk information. Its basis on scientific knowledge was questioned due to empirically observed differences between lay opinion and expert knowledge. Also, it was criticized for undermining lay knowledge and perspective. (Weyman and Kelly, 1999, p. 9) Alternative to the one direction approach of the expert informing lay audience is Fisher's (1991) empowering audience perspective outlined in figure 2.6.

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 the risk assessment
		Letting them decide on their own	Helping them interpret the results and helping them use ways to affect the decision

Source: Fisher, 1991, p. 173.

Figure 2.6. Perspectives for communicating about risk.

Yet another spectrum could be alternate to that depicted in figure 2.6. It has, alerting people to a risk at one end and reassuring them about a risk at the other. The methodology would depend on the type of risk. Little is known about the difference in approaches required to handle either of the two. Gerbner, perhaps, has provided the most comprehensive model of communication identifying the process of an event from origin to reception.[34] (McQuail, 1975)

Newspapers are one of the primary sources of risk communication. People rely on newspapers as a regular source of information; yet inherently distrust the print media due perceived inaccuracy of reporting. Information gained from other printed material and inter-personal interactions, however, is treated as credible. A case study of an environmental assessment process in Ontario – in which this paradox emerged – led to the conclusion that people are more effective a risk-communication tool than the print media. (Wakefield & Elliot, 2003, p. 225)

2.6 Conclusion

Risk perception is too complex a phenomenon to be ascertained in totality by any single existing model. Each genre of risk research has contributed in part to the growing body of knowledge on risk perception. People today, live in a risk society as if it were. Their awareness of risk is more than ever before.

Public's perception of risk is driven by dread and uncertainty. It constitutes affect and cognitive heuristics. Culture defines its coding. Risk perception is largely influenced by media coverage of risk issues.

Lay perception differs from expert understanding of risk. Consequently, the public is wary of expert judgments on risk issues.

[34] See Watson (2003, pp. 34-35) for an elaborate description of Gerbner's model.

CHAPTER THREE

The Social Amplification of Risk Framework

Risk investigation is dual in nature; both scientific and cultural. Its technical conception failed to explain concerns disproportionate to the risk. It focused narrowly on the probability of events and the magnitude of their consequences and often failed to inform societal choices by omitting, neglecting or underestimating risk characteristics. A decade of research produced no comprehensive theory explaining the various facets that shape the public experience of risk.

The social structures and processes of risk experience, the resulting repercussions on individual and group perceptions, and the effects of these responses on community, economy and society comprise a phenomenon in themselves. The framework paper[35] by Kasperson et al. (1988) terms this phenomenon the 'social amplification of risk'. This chapter discusses their initial conceptualisation of the elements, structure and processes that make up the phenomenon.

3.1 Genesis of the Conceptual Framework

Consequences of risk events extend far beyond direct harms. Judgements of risk management process, its perceived fairness and the possibility of a scapegoat frequently will determine the indirect impacts. Yet, the technical assessment of risk typically models impacts in terms of direct harms through systemic neglect of higher order impacts. Conventional risk analysis is confounded by an asymmetry between expert and lay assessments of risk and varied responses amongst different people. At

[35] The framework paper has not been without criticism. Kasperson responded to many of the critiques in a subsequent paper in 1992. (Kasperson, Kasperson, Pidgeon, & Slovic, 2003, p. 36)

times, societal focus may alter the focus and scope of risk assessment. Social amplification provides the much needed corrective mechanism. It was offered not as a fully developed theory of social amplification of risk (SARF) but as a fledgling conceptual framework[36] to guide ongoing efforts at explaining risk events and their impacts. At the outset, the logical status of risk and the notion of signal amplification as represented in the SARF deserve deliberation.

3.2 The Logical Status of Risk in the Social Amplification Framework

Risk is considered the root element of SARF. It is viewed in part an objective threat of harm to people and in part a product of culture and social experience. (Kasperson, 1992, p. 154) However, risk as an objective threat of harm to people falls in the ontological domain. At the same time it is subject to interpretation as a worldly element filtered by social and cultural factors. Thus, it lies in the epistemological domain as well. Further, the object of amplification in SARF and its origin still remain unknown. This dichotomy is attempted to be resolved by individually explicating the two domains of risk and, thereafter, combining them into an internally consistent metatheoretical framework. (Rosa, 2003, pp. 49-51)

3.3 The Concepts of 'Signal' and 'Amplification'

That risk events might hold a 'signal value' was first proposed by Slovic, Lichtenstein, and Fischhoff (Slovic, 2000). They attributed a higher signal value to risks in the upper right hand sector of the classic dread / knowledge factor space while suggesting its link to the potential for second-order effects.

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[36] The theoretical foundations of SARF are developed in five principal publications (Kasperson, Renn, Slovic, et al. 1988; Renn, 1991; Kasperson, 1992; Burns, et al. 1993, and Kasperson & Kasperson, 1996 as cited in Kasperson, et al., 2003)

Signal amplification occupies a niche in the overall structure of the social amplification of risk. Kasperson et al. (1988) draw upon the communications theory for their notion of amplification. In communications theory, amplification denotes intensifying or attenuating signals during its transmission from a source, through intermediate transmitters, to a receiver. This source-receiver metaphor serves as a heuristic framework for analysing risk communication processes.

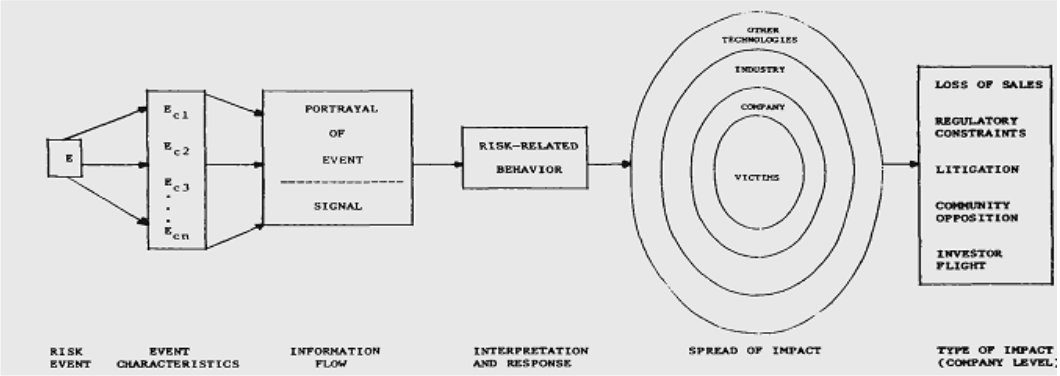
The transmission of risk messages, however, is more complex than its electronic metaphor. The receiver always interprets messages in a socio-cultural context, invariably linking the source to the signal to arrive at inferences about their inter-relations. Each message may contain factual, inferential, value related, and symbolic meanings. The symbols trigger the attention of potential receivers and shape their decoding processes.[37] Amplification may arise from any message component. It may occur during both transmission and reception.

Rayner criticises the SARF for its implied existence of a 'true' risk, 'distorted' by the social processes of amplification. Rip argues that the metaphor of amplification has an implicit semantic bias towards intensification of risks. The processes and contexts that may lead to either 'over-reactions' or 'downplaying' of risks by people were, however, discussed extensively by Renn. (Rosa, 2003, pp. 49-50)

3.4 The Structure of SARF

Risk, according to the framework article by Kasperson et al. (1988) has no true or distorted values. Its nature and magnitude is determined by social amplification comprising the information system and characteristics of public response as depicted in figure 3.1.

[37] For example, the credibility of a message varies with the source. Scientific opinion will be viewed as more credible than that of a journalist.



Source: Kasperson et al., 1988, p. 182.

Figure 3.1. **A simplified representation of SARF.**

The information system may amplify risk events in two ways:

(a) By intensifying or weakening signals (risk information) received by individuals and social groups; and

(b) By filtering the multitude of signals (risk attributes) and their importance.

The signals that arise through direct personal experience or social contact are processed by social and individual amplification stations. These include inter alia the risk scientists, risk management institutions, media, public agencies, pressure groups, opinion leaders, and personal networks.

The social amplification stations generate and transmit information via direct conversation, letters, telephones, media, etc. Individual recipients also act as an amplification station for risk related information.

Kasperson et al. (1988, p. 181) hypothesised the following seven key steps to amplification:

(a) Filtering of signals;

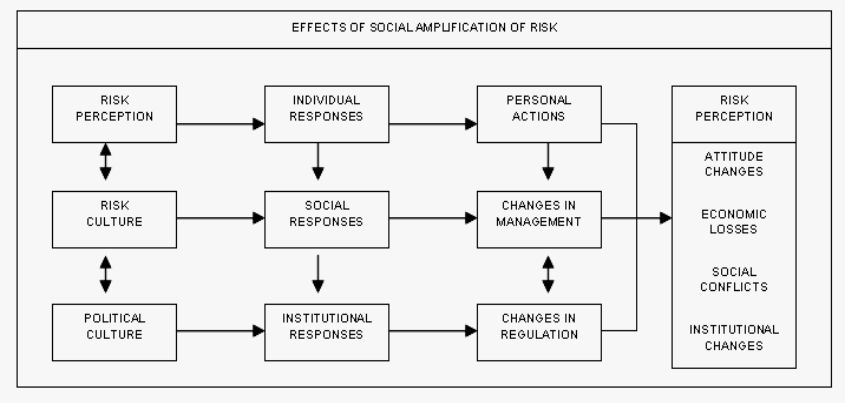
(b) Decoding;

(c) Processing of risk information;

(d) Attaching of social values to the information;

(e) Cultural and peer group interaction resulting in signal interpretation and validation;
(f) Formulation of behavioural intentions leading to risk tolerance or opposition; and
(g) Group or individual action to accept, ignore, tolerate, or change the risk.

Secondary impacts will arise as a consequence of behavioural responses brewed by social amplification of risk. These include inter alia enduring perceptions, impact on local commerce, social disorder, changes in technology, training and education, and enhanced legislation.[38]

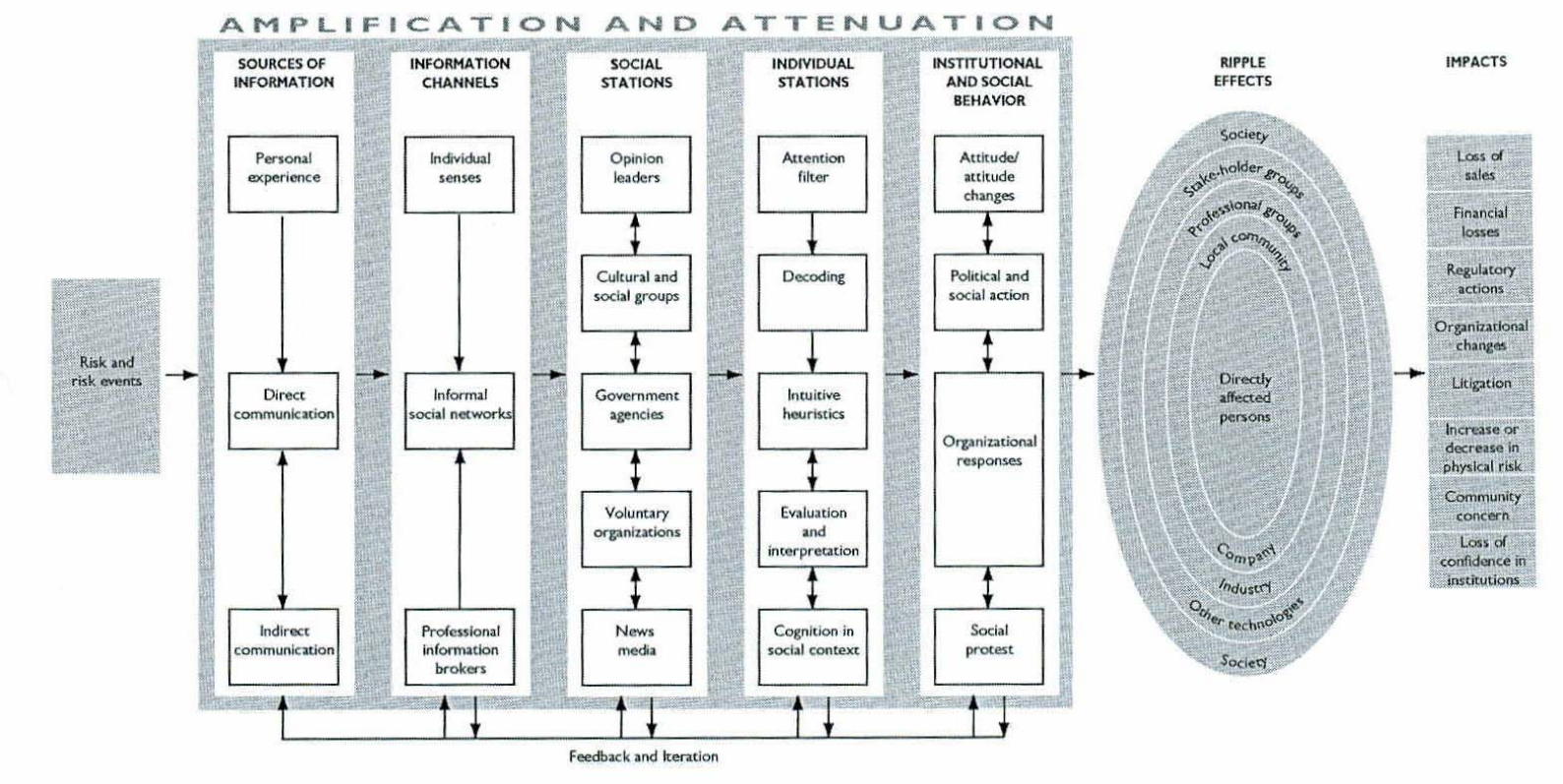


Source: Renn, 1991, p.288

Figure 3.2. Effects of social amplification of risk.

Individuals and social groups perceive these secondary impacts. Amplification occurs yet again to produce third order impacts. Its propagation to distant communities is analogous to a 'ripple' with each order of impact either amplifying or attenuating the risk signal. This rippling of impacts constitutes an important element of risk amplification. A greater detail of the hypothesised stages of social amplification is depicted in figure 3.3.

[38] The most dramatic recent example of secondary social amplification effects in the maritime context are the consequences of the terrorist attacks of September 11, 2001 in the United States. Its secondary effects include the International Code for the Security of Ships and Port Facilities (IMO, 2003) and the Suppression of Unlawful Activities Act (IMO, 2005), and even denial of shore leave to seafarers at US ports.



Source: Kasperson et al., 2003, p. 14.

Figure 3.3. The social amplification of risk framework.

According to Leschine (2002, p. 64), social attenuation of risk is missing in the framework. Consequently, it is not considered robust enough to embrace under-response. Initial concerns over too little attention being paid in the framework to social stations were allayed by subsequent empirical work, particularly on the extensions of the psychometric model. (Kasperson, 2003, p. 41) Its simplistic one-way communications model is also debatable in the light of the knowledge that risk communication is definitely a two-way dialogue.[39]

3.5 Risk Amplifiers

The social amplification of risk as conceptualised by Kasperson et al. (1988, pp. 184-186) involves two principal amplifiers – the transfer of information about the risk or risk event i.e., informational mechanisms, and the response mechanisms of society.

3.5.1 Informational Mechanisms

Social amplification is rooted in social experience of risk – direct personal and indirect, secondary. An experience of a major risk event heightens risk perception.[40] At the same time, it offers a better perspective. Thus, direct personal experience could serve to amplify or attenuate a risk.[41] In the absence of personal experience, risk learning may occur through media or social contact.

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[39] See discussion on risk communication at chapter 2 section 6.

[40] Heightened risk perceptions may not necessarily lead to secondary impacts and rippling, as concluded by a statistical analysis of 128 hazard events in a collaborative study between Clark University and decision research. (Kasperson et al., 2003, p.18)

[41] The imprisonment of Captain Mangouras, master of the ill-fated Prestige amplified the risk of criminalisation of seafarers. For a study of recent international cases of criminal sanctions used against seafarers see http://www.bimco.dk/upload/bimco_public_study_10_march_2006_web.pdf. A Joint IMO/ILO *Ad Hoc* Expert Working Group on the 'Fair Treatment of Seafarers in the Event of a Maritime Accident' was established in 2005 to work on the development of appropriate guidelines for endorsement by IMO and ILO. The IMO Assembly and the ILO Governing Body vide IMO resolution A.987(24) of December 2005 states that both ILO and IMO are seriously concerned about the need to ensure the fair treatment of seafarers in view of the growing use of criminal proceedings against seafarers after a maritime accident. Guidelines developed by the Working Group have been adopted by the 91st session of the IMO's Legal Committee in April 2006 and subsequently by the ILO governing body. (IMO News Issue 2, 2006, p. 5)

Risk amplification is proportional to the volume and symbolic connotations of the information, the degree of dispute on the available knowledge, and the extent of dramatisation.

The channels of information are equally important. Risk information flows through the news media and informal personal networks. Media influence risk perception through dramatisation[42], and disproportionate coverage. Interpersonal networks lead to divergent risk perceptions with a potential for amplifying or attenuating signals.[43]

While Sjöberg (1999) supports the view of proportionality of risk amplification to media coverage expressed in the framework article, Kasperson et al. (2003, pp. 40-41) point out the complexity of the interrelations between media coverage and public perceptions as also the stage two amplification processes revealed by empirical research.[44]

3.5.2 Response Mechanisms

Interpretation and response comprises the second stage of social amplification. Kasperson et al. (1988, pp. 185-186) hypothesised four strands of response mechanisms; a simplifying mechanism based on heuristics and values, the social and political agenda, the significance or 'signal value' of a risk event, and its negative imagery or 'stigmatisation'[45].

[42] Dramatisation of risks and risk events in the media has been studied in depth. The specific effects of volume and content of media coverage, however, remain unexplored due to the circularity and close interrelations between the media and the social amplification process components. (Kasperson et al., 2003, p. 22)

[43] A study by Trumbo in 1996 (cited in Kasperson *et al.*, 2003, p. 18) using peoples judgements along the dread/knowledge dimensions concluded that, among amplifiers, concern over risk is driven more by interpersonal communication than by mediated communication.

[44] See figure 2.2, McCombs and Shaw's agenda setting model depicting the proportionality.

[45] In ancient Greece, 'stigma' referred to a tattoo engraved on an individual perceived as posing a risk to society (Encyclopaedia Britannica). Today, the concept is generalised to technologies, places, and products that are perceived to be dangerous.

A significant feature of a stigmatised event is the violation of a natural standard either because of its abnormality or its discrediting consequences. Extensive media coverage has caused stigmatisation of places. Environmental stigmatisations of the French Riviera and the Alaskan coastline in the aftermath of the Amoco Cadiz and Exxon Valdez oil spills are vivid examples. (Kasperson et al., 2003, pp. 27-28)

3.6 Causes of Amplification and Attenuation

Risk is amplified if it is new and possibly catastrophic, it is not understood by experts, and the managers are either not in control or concealing its hazards.[46] On the contrary, risk is attenuated if played down by the media, not matching with the public's concerns, is well understood and perceived as manageable. (Kasperson et al., 1988; Flynn, Slovic, & Macgregor, 2002) Highly attenuated risks are described as 'hidden hazards'.[47] They grow in effects virtually unnoticed until attaining disaster proportions. Their untended build up is attributed to their intrinsic nature and the socio-cultural environment in which they occur. (Kasperson et al., 2003, p. 23)

It is opined in some quarters that social amplification offers a limited explanation of the empirically observed situations contrary to expected outcomes. The rather rapid fading or perhaps a failure of emergence of public interest in risk events is yet to be reasoned out. (Leschine, 2002, p. 64)

[46] The Exxon Valdez incident provided all the ingredients necessary for social amplification. It was indisputably catastrophic. The death of one thousand sixteen otters, 36,460 marine birds and one hundred fifty-one bald eagles was the most deadly in history. Exxon played out a lesson in futility: *no amount of money spent or personnel deployed can control a large oil spill*. The industry was clearly proved incapable of dealing with catastrophic oil spills. (Davidson, 1990, pp. 293-315) Yet, it made every attempt to hide the facts from the American people. (Davidson, 1990, pp. 294; Frost,1989, p. A1)

[47] The hazards that attenuate risks are classified into five type's viz., global elusive, ideological, marginal, amplification-driven and value-threatening hazards. Each aspect is associated with differing causal agents and processes.

3.7 Organisational Amplification and Attenuation

Risk agenda is increasingly set by large organisations. Understanding amplification dynamics, therefore, calls for an insight into their social aspects such as self-interest, inter-relations and thumb rules in contrast with the scientific outlook of risk. Freudenburg (2003) identified the long and short term, and broader contextual factors associated with organisational risk management that lead to social amplification of risk. Thereupon, organisational attenuation of information was attributed, amongst other factors, to under-estimation of risks. Turner, in a study of 84 major accidents in the United Kingdom, identified information difficulty in organisations. The study concluded that a hazard (typically an ill-structured safety problem) was allowed to incubate until a trigger event ended in disaster. Janis traced organisational failure at managing risks to groupthink. Its premise is a collective close-mindedness of a highly cohesive policy making group that makes incomplete searches for new information coupled with a biased appraisal of available information. (Kasperson et al., 2003, pp.27-30)

The double-hull mandate by 535 elected members of the US Congress playing the role of naval architects and, more recently, the accelerated single-hull phase out by the European Union (Gray, 2000) are vivid examples of groupthink. These mandates were agreed upon despite the knowledge that both still water hull bending moments and stress levels for double hulls are close to design limits. (National Research Council, 1998)

3.8 Risk Amplification and Trust

It is reasonable to expect amplification and attenuation mechanisms to be influenced by the underlying constructs that determine trust and distrust in information sources (Frewer, 2003, p. 126). The original framework article (Kasperson et al., 1988, pp. 185-186) hypothesised four mechanisms – heuristics and values, social group

relationships, signal value, and stigmatisation – in the second stage of amplification. Social trust in responsible institutions was subsequently identified as its fifth component (Kasperson et al., 2003, p. 31). Distrust that arises out of recreancy[48] (Freudenburg, 2003, p. 106) heightens risk perceptions.[49] The public will react strongly as a consequence of the perceived unacceptability of risk (Löfstedt & Horlick-Jones, 1999). Trust is the *sine qua non* of amplification dynamics, highly inter-related with the other framework components.

Pressure groups merit consideration here on account of their central role in social amplification processes, particularly if their perceived expertise on the risk in focus is trusted. Their active media pursuit promotes amplification or attenuation through dissemination of the risk information and its 'in-depth' processing. Frewer (2003, pp. 129-130) postulates that, the more polarised the debate between the pressure group and the dominant institution the greater is the public trust in the view promoted by the pressure group and higher the amplification.

3.9 Social Amplification in the Context of Oil Spills

Each large oil spill has its own social milieu and unique environmental consequences. Spill-risk being a social construct, the risk signals perceived varies from one incident to another and is not necessarily related to the environmental consequences. (Leschine, 2002, p. 67)

The 1967 Torrey Canyon spill off the southern coast of England was the first environmental disaster to receive media attention[50] worldwide. The US Corporation

[48] The word comes from the Latin roots *re-* (back) and *credre* (to entrust). It denotes failure of experts or specialised organisations to carry out the responsibilities they have been explicitly or implicitly entrusted with.
[49] Frewer (2003, p. 127) has proposed the elaboration likelihood model (ELM) by Petty and Cacioppo may be utilised to estimate the effects of source credibility on amplification or attenuation of risk perceptions.
[50] The Santa Barbara oil well blow-out two years later, led to the concept of the 'issue-attention cycle' by Anthony Down.

(Union Oil) owned Liberian flagged vessel spilled more than 35 million gallons of crude oil. Union Oil sought refuge in international law (or rather in its loopholes) to shy away from responsibility.[51] Untraceable third parties and an unaccountable nation contributed to its shield. The government and industry failed to respond adequately. It reflected the failure of a social and institutional system. Dead birds and oiled shoreline were relatively insignificant. The calculus of harm owed itself to social amplification of risk. (Leschine, 2002, p. 66)

The Exxon Valdez debacle occurred in March 1989 in Prince William Sound, Alaska. 10.8 million gallons of crude was spilled in the incident. (Davidson, 1990) The amplification of risk in its aftermath is attributed to the failure of the best technology at the hands of the best people. The unilateral Oil Pollution Act of 1990 (OPA) was an impact of the ripple effect described in Slovic's social amplification of risk framework.

In contrast, we hardly hear of the 1974 Metula spill today though it is considered the most environmentally damaging spill of all time, surpassed in volume only by the Torrey Canyon. A spill one and a half times the cargo lost from the Exxon Valdez was left to nature (Medred, 1989). The Metula is a typical case of risk attenuation.

The spill caused by the Israeli Air Force's bombing of the Jivyen power station, south Beirut during the ongoing war is the largest ever in the Mediterranean. The spill amount, 'equivalent to a tanker sinking and 20,000 to 30,000 tonnes reaching the shoreline', is comparable to that from the Exxon Valdez. . But, according to Ignarski (2006) in Lloyd's List, the histrionics of maritime pollution and theatre of contradictions are conspicuous by their absence. This is yet another example of risk attenuation.

[51] As the stranded vessel had to be sunk by an Royal Air Force bomber to limit environmental damage, Union Oil could then have limited its liability to the ridiculously nominal sum of 50US$, the value of the lifeboat salvaged after the bombing.

3.10 Predictive Power of SARF and the Layering Method

Prediction *is* a goal of SARF beyond doubt. While stage I of the framework reflects a degree of predictive power, stage II as noted by Pidgeon (Breakwell & Barnett, 2003, p. 81), remains a hypothesis resting primarily on anecdotal rather than empirical evidence. SARF does identify a number of variables. However, these variables would need to be hierarchically structured and defined by complex 'relational rules' if the framework is to be empowered for prediction. Also, amplification processes are hard to be seen if the configuration of factors is portrayed at merely any one moment. Therefore, the time dimension would have to be incorporated as well to achieve predictive power.

The layering method is an integrative, multi-dimensional technique for capturing data and identifying relationships. It was developed for informing risk communication in the United Kingdom consequent to the 'BSE crisis'[52]. In this method, data focusing on individual actions, attitudes or emotions are layered on atleast two levels for analysis. A time dimension is inevitably included for systematic focus. A juxtaposition of changes in the layers of data across time then permits both coterminous and sequential change. (Breakwell & Barnett, 2003, pp. 81-85)

3.11 Conclusion

SARF finds criticism in many aspects (Taylor-Gooby & Zinn, 2006, p. 401):

(a) It does not contribute to theory;

(b) It fails to recognise the complexity, interaction, and sometimes, conflict between theories; and

(c) It finds difficulty in accommodating Bourdieu's notion of 'habitus'.

[52] The BSE crisis may be considered an archetypal example of social amplification of risk with an avalanche of press coverage and a collapse of public confidence in those who manage the safety of British beef. The EU subsequently banned export of all British beef and beef products. (Breakwell and Barnett, 2003, p. 85)

Critiques are of the view that SARF is too general and that, it may not lead to any new insights. Kasperson in his 1992 paper, however, cites three potential contributions of the framework (Kasperson et al., 2003, pp. 38-39):

(a) To integrate competing theories and hypotheses;
(b) To locate fragmented empirical findings in an overall framework; and
(c) To generate new hypotheses on the inter-relations of the identified components.

To conclude, the social amplification of risk framework, “like a net… is useful for catching the accumulated empirical findings and like a beacon, it can point the way to disciplined inquiry” (Rosa, 2003, pp. 48-49).

CHAPTER FOUR

Population Analysis

4.1 The Design of the Questionnaire Survey

4.1.1 Approach

The adequacy of a research method depends on the purpose of the research and the questions being asked. (Siedman, 1998, p. 5)

A process investigation such as *Risk Communication and Maritime Safety Legislation* calls for qualitative analysis. But the rich tapestry of qualitative enquiry is woven together from many threads of differing texture, colour, length, and purpose. (Patton, 1990, p. 65)

Considerable debate may arise on whether such an inquiry is better placed exclusively within the realms of grounded theory,[53] or case studies,[54] or a hybrid of the two strategies within the qualitative approach. (Creswell, 2003, pp. 14-15)

4.1.2 Areas of Observation

A conscious decision was, nevertheless, made to adopt a 'pragmatic approach' (Patton, 1990, p. 89) and questions were posed to the sample population in the following matters of interest:

- their reading habits
- their source of news

[53] It aims to derive a general, abstract theory of a process, grounded in the views of the participants in a study.
[54] It explores in depth an event, an activity, or a process.

- the manner and extent to which they are influenced by the media
- the manner and extent to which they are influenced by NGO propaganda
- their awareness of environmental disasters
- their perception of risk from shipping
- their view of oil tankers
- their perception on the safety achieved by double hull tankers, and
- their perception on the adequacy of existing maritime safety legislation.

Apart from the areas of observation or events, a discussion about participants and site would typically include three other aspects as identified by Miles and Huberman; the *setting* identified for research, the *actors* or participants, and the *process*. (Cresswell, 2003, p. 185)

4.1.3 Participants and Setting

Students being prosumers[55] (Srivastava, 2005, p. 19), make ideal participants. As regards to the setting, an ethnographic influence is inevitable. This was overcome by choosing student populations at universities around the globe including China, Egypt, Germany, India, Sweden, and the United Kingdom.

4.1.4 Process

While interviewing research[56] is undoubtedly a powerful way to gain insight into issues, it is time consuming and cost inhibitive (Seidman, 1998, pp. 5-7). The possibility of personal interviews was evidently ruled out, given the limited time frame for completion of the dissertation and the intention to survey student populations across a range of countries.

[55] Prosumers pick up their opinions and spread them through the population quite like a virus. They tend to be believed by their peers more than, say the media, from where they picked up their ideas.

It was opined that the questionnaire format is particularly suited to the intended sample size exceeding a hundred students and speaking a language that is not necessarily understood by the researcher.

4.1.5 Design of the Questionnaire

The questionnaire adhered to the conventional norms of drafting (Oppenheim, 1992, pp. 100-149). The purpose was clearly stated. Confidentiality and anonymity were assured. Multiple choice questions were invariably provided with an option to render an alternative answer. Wherever perceived as necessary, an option was provided to make the open ended statement, 'can't say' or 'no response'. For each variable, the questions were posed using the funnelling technique.

4.1.6 Respondent Demographics

A total of 198 respondents (n=198), comprising both men and women of all ages, participated in the questionnaire survey. Of these, 159 participants were drawn from seven educational institutions located in six countries. The remainder 39 were common residents of the city of Malmö from the randomly chosen 200 people[57] that were mailed the questionnaire. Overall, the participants represented 28 countries from four continents.

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[56] Qualitative research has never been counted amongst the dominant spheres of educational research, and research methodology based on interviews has been subjected to many a paradigm wars in the 1970s and 1980s until the 1990s. (Seidman, 1998, pp. 5-7)

[57] The 200 addressees were randomly selected from *ENIRO* telephone directory (2005 edn.) for Malmö city. It is of interest to note that, in addition to the 39 responses, 22 questionnaires were returned blank by the recipients'.

Table 4.1. Respondent Demographics.

Country	Description	Number of participants	Code used in graphs
China	Shanghai Maritime University	31	Chn
Egypt	Arab Academy of Science and Technology	12	Egp
Germany	Hochschule Wismar Department of Maritime Studies	29	Ger1
Germany	Ernst Moritz Arndt University of Greifswald Philosophical Faculty	17	Ger2
India	Hindustan Institute of Marine Technology	25	Ind
Sweden	World Maritime University	33	WMU
United Kingdom	University College London	12	UK
Sweden	Residents of Malmö city	39	Swe

4.1.7 Maritime Background of Respondents

One fifth of the surveyed population were civilians. Overall, 68 of the respondents i.e., a third of the population did not have a maritime background.

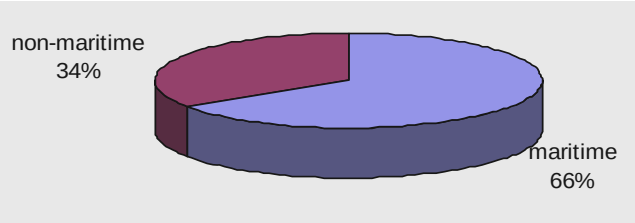

Figure 4.1. Background of respondents.

4.1.8 Response Analysis

The questionnaire *per se* consisted of 32 questions in five domains followed by a keyword choice. The questions aimed at determining the quantum of influence of the factors related to risk perception and the respondents' perception of risk of select issues. A copy of the questionnaire and a description of the underlying strategy in posing the questions in each domain are placed at Appendix 1 and 2 respectively. The ensuing discussion dwells on the most significant results of the survey.

4.2 Analysis: Factors Influencing Risk Perception

4.2.1 Media Dependence

Media coverage sets the agenda and determines risk perception. Coverage in a mass media is an influencing factor provided it is the primary medium of information. This asserts the importance of determining the media habits of the survey population.

Newspapers, television, Internet, and periodicals are the possible mass media through which risk signals are likely to be communicated to the people. Figure 4.2 depicts an overview of the media habits of the population.

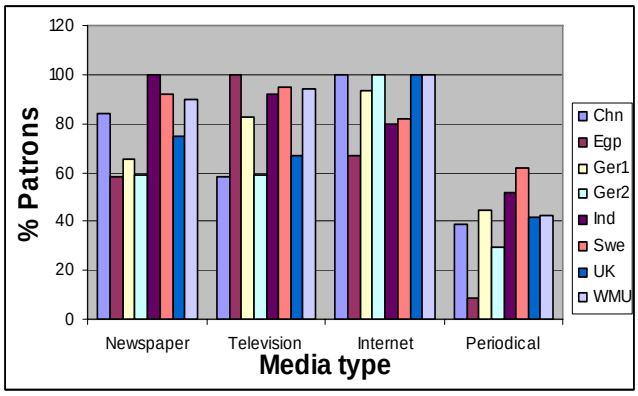

Figure 4.2.
Media-wise distribution of patrons for the countries surveyed.

The media habits were found to be particularly distinct in each country. The survey was as much about mapping the differences that give them their distinct identity as much about discovering the threads of commonality across civilisations. The significant amongst the characteristics are discussed below.

China is characterised by an exceptionally high dependence on the Internet.[58] Restrictions inhibit their access to international news media on the television. India, on the other hand recorded cent percent readership of newspapers.[59] Maritime

[58] See results of Euro RSCG survey (Srivastava, 2005, p. 19) for media consumption habits in UK, India and China amongst 24,000 people polled in 12 countries. The survey corroborates the finding that, in China, people prefer to get their news from the internet.
[59] According to Srivastava (2005, p.19), India continues to trust the daily newspaper more than the electronic media.

periodicals serve as the primary news resource complementing its remarkably low internet access.[60]

Al-Jazeera is Egypt's primary television channel.[61] The 'agenda-setting function' of the media and the 'framing effect'[62] were observed in their unanimous rejection of the Iraq campaign and support for the Iranian nuclear programme. Its low consumption of international media is attributed to language constraints.

Germany was highly critical of the Iraq campaign, and quoted America as a bigger threat than either bird flu or AIDS. The typical social construct is validated by Tumber and Palmer's study (McQuail, 2005, p. 380) which concluded that the earlier Iraq war was treated differently between the USA, UK, and Germany and even more differently in the Arab world.

In yet another example of social construct, Sweden expressed a greater concern for religious fundamentalism rather than bird flu or AIDS. It's readership of national newspapers and news periodicals is amongst the highest.[63]

Overall, a negligible fraction of the population reads an international newspaper or watches an international news channel on the television. Atleast 10% rely exclusively on local or regional newspapers and a quarter of the population depends exclusively on regional or local television channels. People are twice as likely to gain information about a risk event from a local channel rather than a national or international news channel.

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[60] According to Jain (2006, p. 20) India had approximately 40 million internet users in the year 2005-06 and an expected growth rate of 54% year on year.

[61] In terms of brand awareness, Al-Jazeera is one of the three top names - along with CNN and the BBC - in the world of TV news (Whitaker, 2004). The Bush administration, however, views it as particularly biased.

[62] See McQuail (2005, pp. 378-380) for a description of the framing effect..

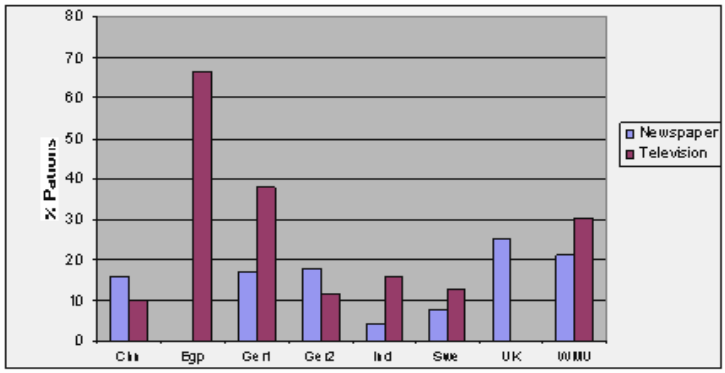


Figure 4.3. **Exclusive dependence on local media.**

A relatively higher dependence on the internet was observed in comparison to the newspaper and television. The Internet is the principal source of information on maritime affairs. However, the television is most likely to provide an awareness of maritime disasters and it serves as an exclusive source for about a fifth of the population.

Incidentally, nature and environment ranks lower amongst the news interests than politics, economy, or sports. Only a third of the population maintains a specific interest in the subject. Thus, it is only when a marine disaster occurs that attention is focussed on pollution and consequences to the marine environment.

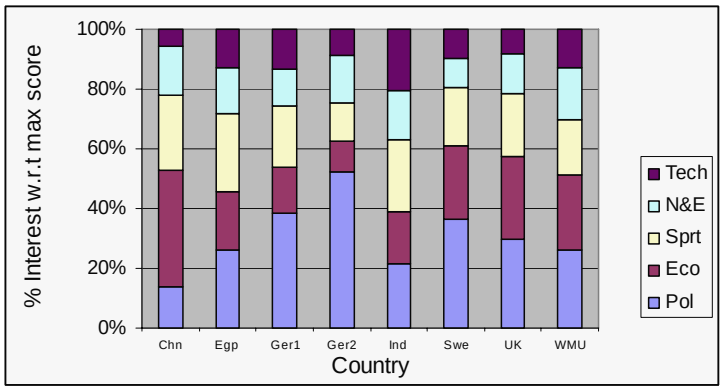


Figure 4.4. Country-wise proportion of interest in different news subjects.

[63] There is a distinct north-south dimension in European newspaper reading. In northern Europe, people read a lot more than in the south. In 1995, the ratio of circulation figures per 1000 inhabitants between Germany and Sweden was 320: 479. (Bus & Ostbye, 1998, p. 17)

4.2.2 Media Sources for Maritime Topics

An interest in maritime topics would depend on the relation of the field of study or occupation to the maritime industry. Proximity of residence to the coast would be a contributing factor as also any past association with a maritime disaster.

The relative proportion of dependency on the different media was as follows:

Newspaper: Internet: Television: Periodical :: 72:102:63:44

Thus, the population depend most on internet and least on periodicals. The dependence on newspaper is marginally higher than that on television. Whilst there is little or no exclusive dependence on newspapers for maritime topics in five of the eight segments, India recorded the highest dependence at 12%. Exclusive dependence on the internet is highest in China (33.33%). Malmö polled highest exclusive dependence on the television viz., 10.26%.

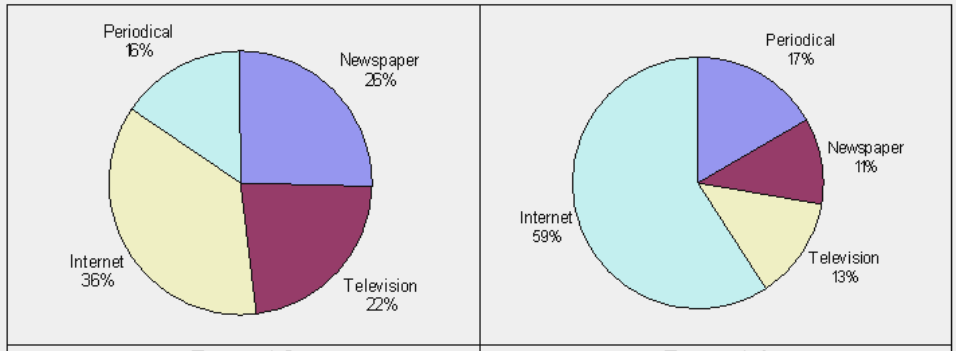


Figure 4.5. **Relative dependency on media.**

Figure 4.6. **Relative exclusive dependency.**

Risk perception that owes to higher dependence on the internet will be governed by the types of sources accessed. A balanced perception is more likely if multiple independent sources are referred. According to Srivastava (2005, p.19), lay audiences are increasingly giving up on the 'official media' and moving on to web logs and other sources on the internet. A dependence on newspapers and television, that is known to be national or regional, will only serve to generate greater concern for local issues.

The impact was seen in people's awareness of maritime disasters in a later question; local incidents were recalled in a greater proportion, than major disasters that occurred elsewhere.

4.2.3 Maritime Information Resources

Readership of exclusive maritime information resources [64] reflects how well informed the audience is expected to be. Germany1 reflected the highest readership of exclusive maritime resources (65.51%) followed by China (58.06%). Egypt and Sweden, on the other hand, recorded the lowest figure of approximately 8% each. Figure 4.7 summarises the findings of the survey.

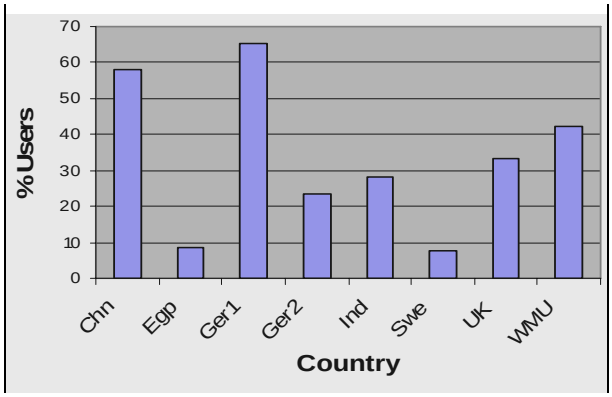


Figure 4.7.
Readership: Maritime resources

The readership of exclusive maritime resources was directly proportional to the respondents' occupation or field of studies. Nevertheless, poor readership could result in adverse consequences. A maritime administration's lack of awareness of the emerging risk issues discussed at the global level, for example, would impair its decision making process. Similarly, an industry well informed of a particular risk's cost benefit analysis from studies elsewhere would be initiated into investing in enhanced technology.

[64] Lloyd's List Fairplay would be a typical example.

4.2.4 Media Sources for Maritime Disasters

The level of society's awareness of a maritime disaster is an indicator of the social amplification of that risk event. The survey was launched at a time when the sinking of the Egyptian ferry Al Salam 95, with the loss of approximately one thousand lives was being widely covered in the media.

The 16.67% non-awareness (of the sinking) in Egypt itself was testimony to the fact that not everyone will be aware of a maritime disaster, even if it were a local or regional incident. Nevertheless, overall awareness of disasters was highest in Egypt (83.33%) followed closely by Germany (79.31%). Disaster recall was least in China (34.78%). Further, all those recall pertained to local incidents. The recall probability of an international incident was highest in Germany2. Respondents in China, Egypt and Sweden indicated a greater likelihood to recall a local or regional incident.

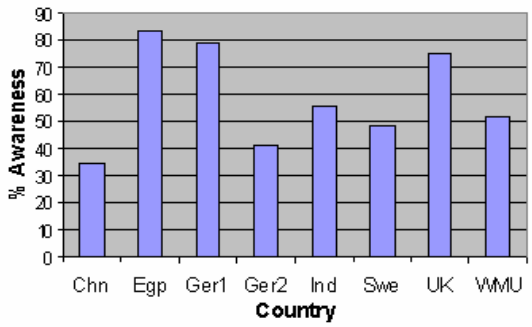


Figure 4.8. Disaster recall.

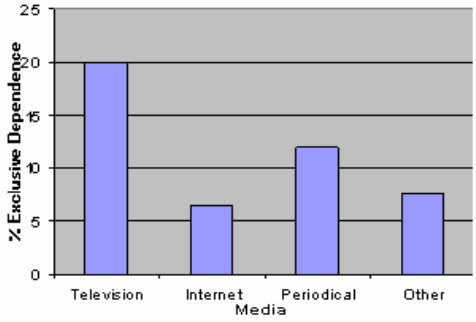


Figure 4.9. Source of awareness.

The television emerged as the most likely source for news of a maritime disaster and the internet, half as likely. As exclusive sources, the internet served 6.56% of the population and the television nearly thrice as many (19.19%). Periodicals did not serve as an exclusive source in any of the segments except India (12%).The radio, a colleague or a friend were other exclusive sources. Television being the major source of information for maritime disasters, risk perception is influenced by local issues, unless social amplification generated awareness of disasters in distant locations.

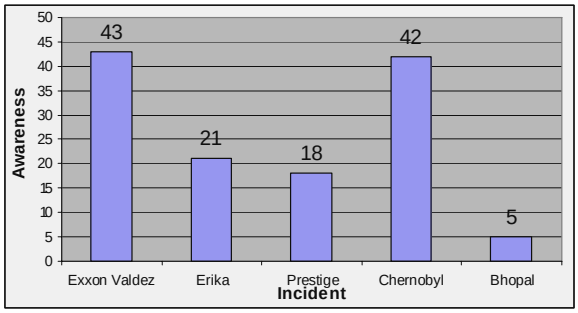
4.2.5 Disaster Recall

The social amplification and attenuation of risk events was established by administering the question on disaster recall.

The Exxon Valdez, recalled by 43 respondents comprising 21.72% of the total population (n=198), was the highest quoted incident. It was mentioned across all segments, except China. The Erika and Prestige were cited about half as much as the Exxon Valdez oil spill. The 42 respondents that recalled the Chernobyl did not include any Indian. This number nearly equals that of the Exxon Valdez. Ironically, Bhopal, a tragedy of similar proportions was recalled by a mere five respondents from China, India, and Sweden.

Thus, the Exxon Valdez and Chernobyl had been subject to social amplification whereas, the Bhopal gas tragedy had been attenuated as illustrated by figure 4.10.

Figure 4.10.
Awareness of major disasters.



The respondents in China reflected chiefly on local issues such as the recent Song Hua river pollution.[65] Exclusive mentions were found of the Pallas by Germany1 (~14%), depletion of the Brazilian rain forests by Germany2 (~18%), and of the adverse effect of greenhouse gas emissions by Sweden (~11%). Yet another issue that was purely local and bothered the respondents in Sweden was the Hallandsåsen.[66]

[65] Typhoon, sand storm and extinction of the antelope constituted the other recalls.
[66] It's a mountain tunnel project underway north of Helsingborg, Sweden that has been mired in 'environmental' controversy for nearly a decade now.

4.2.6 Environmental NGO Awareness

NGO's are represented as environmental stressors in the Rasmussen and Svedung (2000) model on risk-based decision-making. The environmental NGO's are known to exert influence on the national administrations[67] and at the IMO[68]. But, there would be no influence if the mass media did not propagate their agenda. The mass media picks up its messages from the public in the complex web of risk communications (Hargreaves & Ferguson, 2000, p.11). Thus, part of an NGO's success lays in getting risk messages across to the lay audience. Hence, determining the public awareness of NGO, their campaigns associated with risk events, and the source of their information, constituted an essential component of the survey.

Germany recorded the highest awareness of environmental NGOs followed by the WMU and Sweden. Greenpeace was specified by a third of the respondents.[69] It was also noted that atleast 15 percent of the surveyed population did not distinguish between an industry NGO, environmental NGO, and inter-governmental organisation.

Only 21 of the 198 respondents comprising 10.6% of the population cited an incident in support of their answer indicating awareness of an environmental NGO. Greenpeace was remembered most for its initiative related to the Brent Spar oil platform. The Exxon Valdez oil spill and the associated environmental action were second most recalled. The two recalls in India were both Clemenceau.

[67] An example is the Indian judiciary's prohibition of recycling of the *Clemenceau* at Alang due large residues of asbestos onboard. The decision was a direct consequence of the campaign by Greenpeace.
[68] Moderate NGO influence on national administration was acknowledged by the delegates to the 81st session of the MSC when surveyed for this dissertation.
[69] The other organisations specified included inter alia the Worldwide Fund for Nature (WWF), Friends of Earth International (FOEI), Deutscher Naturschutzbund, and the Swedish Society for Nature Protection.

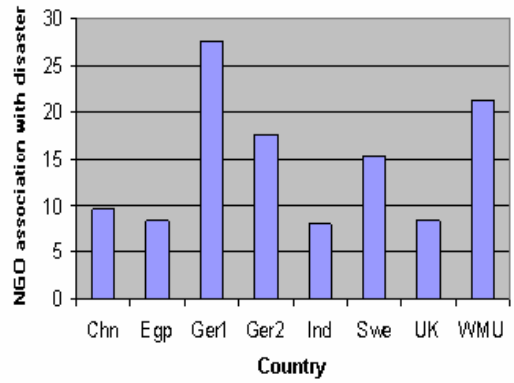


Figure 4.11. **Percent of population that associate an NGO with its work post disaster.**

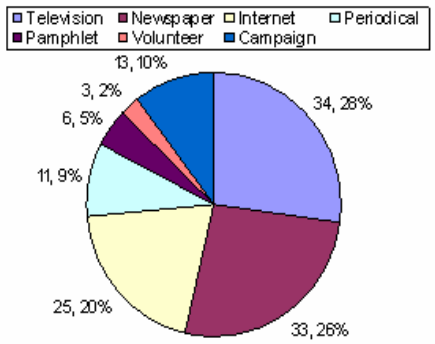


Figure 4.12. **Mean relative attribution of sources to NGO awareness.**

As figure 4.12 depicts, television and newspaper emerged as the largest sources of information on NGO in nearly equal proportions.[70] In China, however, internet polled as the greatest source by a margin exceeding four times that of the other sources. Moreover, nearly 62% of the dependence on the internet is exclusive.

4.3 Analysis: Risk Perception of Select Issues

4.3.1 Attributability of Blame for Maritime Disasters

It was sought to establish the relative attributability of the disasters between the inefficiency of the government (G), deficiency of technology (T), negligence of the owner or operator (N) and lack of stringent legislation (L). Respondents polled negligence on part of the owner or operator as the highest contributing factor (32.32%). Deficiency of legislation polled the least; a mere 3.53%. The ratio of attributability accorded by the respondents was G: T: N: L **::** 21: 17: 64: 7, or to put it approximately, G: T: N: L **::** 3: 2: 9: 1.

[70] Respondents were required to indicate the source of their awareness of the work of the NGO. A multiple choice of seven alternatives was offered with an option to specify a source other than those

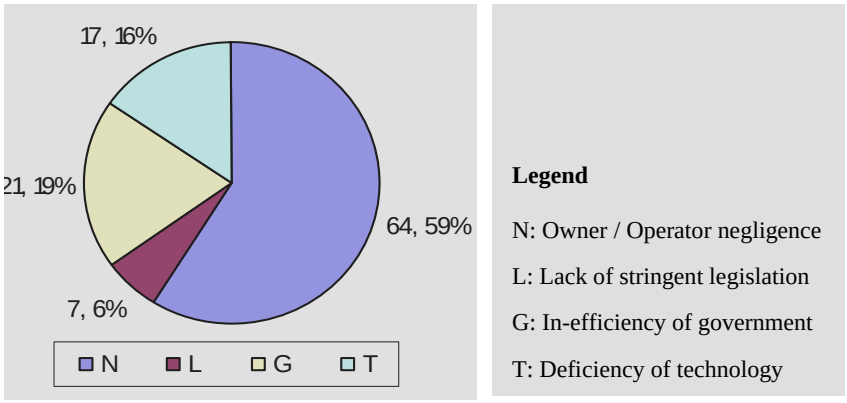


Figure 4.13. Disaster Attribution

This psychometrically established ratio makes an interesting revelation; people hardly regard that deficiency of legislation contributes to marine disasters. Article 94 of the United Nations Conference on the Laws of the Sea (UNCLOS) 1982 lays down in explicit terms the duties of the flag state towards ships flying its flag. The Round Table of international shipping associations[71] (2004) produces the Flag State Performance Table with the aim of contributing to the maintenance and enforcement of essential standards of safety, and environmental and social performance by flag states. Considering the views of the IMO and the industry as expert opinion, it is observed that the lay perspective is quite at variance with the expert opinion. The people invariably attribute maritime disasters to the negligence of the owners and operators. The intense public reaction against the Exxon Corporation in Alaska (Davidson, 1992) was proof of this perception. Similarly, furious relatives had all the more reason to storm the Al Salam Maritime offices in Egypt. It was the third time that a ferry owned by the company had sunk (Salah-Ahmed, 2006).

4.3.2 Disaster Prevention Options

listed. The alternatives were television, newspapers, internet, periodicals, pamphlets, NGO volunteer members, and public campaign by NGO.

[71] The Round Table comprises the BIMCO, Intercargo, International Chamber of Shipping, International Shipping Federation, and Intertanko.

Together with the perception on attributability of blame, it was also sought to establish public perception on the best way to prevent marine environmental disasters. The proportion of respondent preferences between administrative vigilance (AV), enhanced technology (ET), responsible owner/ operator (RO) and stringent legislation (SL) was AV: ET: RO: SL **::** 40:38:70:53.

Thus, performance by the owner and operator in a responsible manner is perceived to be the most effective option. A responsible owner/ operator polled 25% higher than stringent legislation, and 40% higher than administrative vigilance. Legislation was rated 33% higher than administrative vigilance.

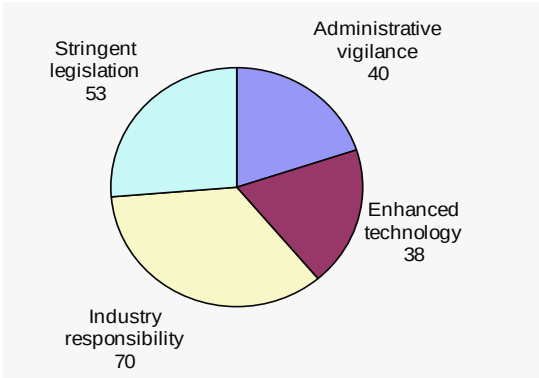


Figure 4.14.
Public perception of remedy against disasters.

By recognising administrative vigilance as a flag state duty and owner/operator as the industry, the asymmetry between the public perception and the work of the IMO is readily apparent. The IMO lays a strong emphasis on flag state responsibility towards its ships, resorts to treaty making to enhance maritime safety and, thereafter, seeks effective flag state implementation. Whereas people perceive it is for the industry to self-regulate and act in a responsible manner, the industry (Round Table) itself and the IMO maintain the view that the ships are as good or as bad as the flag States choose them to be. As it is often said, “there are no good or bad ships, only good or bad *flags*”. Therefore, expert (IMO) agenda is at variance with the public perception. This is a very important corroboration with the theory of risk perception.

4.3.3 Risk to Environment

Human activities are causing harm to the environment in a number of ways. Global warming (GW), air pollution (AP), ground pollution (GP), water pollution (WP), marine pollution (MP), and loss of bio-diversity (LB) are amongst the principal concerns in focus. Each is equally harmful and threatening and it would be scientifically impossible and absurd to rate one over the other. Nevertheless, respondents managed to rank these concerns with relative ease based purely on their perceptions.

Compilation of the responses revealed a striking similarity of aggregate perceptions across all segments. Global warming was indicated as posing the highest risk; a result of media coverage and social amplification (Baron, 2005, p. 12). Air pollution was next. According to relative scores, water and marine pollution were placed third and fourth respectively. Together with lack of people's interest in news pertaining to nature and environment, it reiterated existing knowledge that marine environment is in focus only when disaster occurs.

4.3.4 Safe Design

The Exxon Valdez though not the biggest spill in history, certainly led to the longest lasting environmental clean-up operation ever. The United States Oil Pollution Act of 1990 forever changed the liability regime for oil spill incidents. Legislation on double hull tankers was introduced. Soon, thereafter, the phase-out plan for the single hull tankers was accelerated consequent to the Erika and Prestige incidents.

Thus, it came as no surprise that 99 of the 198 respondents comprising precisely half the surveyed population expressed awareness of safe ship design for transportation of oil. Of these, 88 specified the double hull or occasionally, the double bottom design. It was amazing to note six participants in Malmö over the age of 70 quoting the double hull design, including an 89-year-old woman.

4.4 Conclusion

Interest in marine environment was latent until disaster occurred. A balanced perception was far from likely until regional television remained the primary medium. A framing bias may be expected.

Very few incidents qualified to influence ‘global’ amplification of risk. Most were amplified within a narrower social construct limited to a nation state or region.

Risk perception mirrored media coverage, or rather media consumed. Domestic media prevailed and so did risks emanating from domestic concerns. Thus, while the Exxon Valdez or Chernobyl were universally acknowledged risk events, a vast majority of the people in every social construct were anxious about their own unique set of risk events such as pollution of the Song Hua River in China, accidents on river Rhine in Germany, or the Hallandsåsen in Sweden.

Social amplification generated risk awareness. Barring exceptions of the Brent Spar and Clemenceau, environmental NGO’s did not significantly influence the public perception of risk as they did at the level of the national administrations or the IMO.

An asymmetry of risk perceptions existed between the lay audience on the one hand and the IMO and industry on the other. People perceived it was for the industry to self-regulate, if disasters were to be reduced. They hardly saw legislation as playing a role in enhancing maritime safety.

In conclusion, the findings validated two theories on risk perception, its proportionality to the mass media consumed and the lay-expert incongruence.

CHAPTER FIVE

Content Analysis

Perhaps, the first well-documented case of content analysis occurred in eighteenth century Sweden. The incident involved a collection of 90 hymns of unknown authorship, entitled *Songs of Zion*. The state censorship cleared the collection. Yet, a controversy arose soon thereafter. It was viewed as contagious, aiding the dissidents and undermining the orthodox clergy of the Swedish state church. Incidentally, the scholars set out to establish whether the songs were truly carriers of dangerous ideas. A content analysis of the religious symbols appearing in the collection and its comparison with the German study of the outlawed Moravian Brethren ultimately resolved the issue. (Krippendorf, 1980, p. 13)

Content analysis, as a class of techniques for mapping of non-numeric data into a matrix of statistically manipulable symbols emerged during the Second World War. Laswell, Berelson, George, and other content analysis pioneers were then commissioned by the US government to perform propaganda analyses. They typically produced matrices of word or phrase counts. Thus, content analysis is a measurement and not an 'analysis' in the usual sense of the word. It uses a set of procedures to make valid inferences from messages (Weber, 1990, p. 9).

The measurement or interpretation could be made either in terms of the researcher's theory or the media author's standpoint. A representational analysis that attempts to classify, tag or retrieve the intended meanings of the author (Roberts, 2001, pp. 2697-2698) is intended to be performed in this chapter.

According to Krippendorf (Stemler, 2001), six questions must be addressed in every content analysis:

(a) Which data are analysed?

(b) How are they defined?

(c) What is the population from which they are drawn?

(d) What is the context relative to which these data are analysed?

(e) What are the boundaries of the analysis?

(f) What is the target of the inferences?

5.1 Defining the Software for Content Analysis

There are several different worlds of software development, and different rules apply to each of them. They are sometimes intersecting, often not. Shrink-wrap, internal, embedded, games, and throwaway are the five worlds distinguished from each other (Spolsky, 2002). Content analysis lies within the realm of internal software since it is designed to work in one situation on one company's computers.

Further, software's for content analysis divide into three functional categories. One set of programs perform dictionary-based content analysis.[72] The others either contain development environment [73] or annotation aids.[74]

The software is primarily determined by the nature of the research questions. Nevertheless, the choice of appropriate software is influenced by its complexity, the languages it runs on, its proprietary nature, established user base, and most importantly, its functioning on the Windows operating system. The *MAXqda2* software was chosen owing to its versatility and its revolutionary visual

[72] It involves word counting, sorting, and simple statistical tests.
[73] It is more similar to high-level text-specific programming languages rather than to free-standing content analysis packages.
[74] It is intended as an electronic version of the set of marginal notes, cross-references and notepad jottings that a researcher will generate when analyzing a set of texts by hand.

representation features in the form of Code Relations Browser[75] and Code Matrix Browser[76]. (http://www.maxqda.com/2_funktionen.htm)

Mass media texts are *polysemic*, i.e. open to multiple interpretations by audiences. The class of the audience, its education level, race, religion, and ethnicity as also the presence of oppositional discourses govern its effects. Thus, any perception of risk communication can be gained only by an integrated approach involving the use of content analysis with other research such as audience studies. (Nuendorf, 2002)

As opposed to the humanist approach[77] that looks backward from media content to try to identify what it says about the society and the culture producing it, this dissertation research adopts the behaviourist approach by looking forward from the media content and attempting to identify its effects. But, contrary to its reliance mostly on quantitative content analysis leaving qualitative analysis to the humanists (Macnamara, 2003, p.3), this dissertation uses both qualitative and quantitative analysis to overcome the limitations of each, as is done by many social scientists.

The inductive-deductive dichotomy is decisively overcome by a deductive design of the research. It is admitted that exploratory work was done before establishing the coding scheme to identify the issues. Nevertheless, all decisions on variables, their measurement and coding rules were defined before commencing with the observations (Nuendorf, 2002, p.11). The *a priori* design of the content analysis is thus presumed to clear the test of objectivity/ intersubjectivity.

[75] The Code Relation Browser (CRB) is a visualization of the relations between codes, i.e. of the co-occurrences of codes assigned to segments of text.
[76] The Code Matrix Browser (CMB) is a revolutionary tool of MAXqda2 that offers a way of visualizing which codes have been assigned to which texts. The matrix provides an overview of how many text segments from each text have been assigned a specific code.
[77] Shoemaker and Resse categorise content analysis into the behaviourist and humanist tradition.

5.2 Defining the Content for Analysis

Media reports are known to concentrate on rare but dramatic hazards and often fail to report the more common yet serious risks (Soumerai, et al., 1992 cited in Wåhlberg & Sjöberg, 2000, p. 33). This explains the media coverage of the Exxon Valdez and the Air France Concorde disasters. The Exxon Valdez oil spill shocked the American public; dominating the news media for weeks (Paine, et al., 1996, pp. 198-199). Thus, the Exxon Valdez incident is an appropriate choice for content analysis.

The headline is a hook and casts the impression intended by the media. The content of the headline can influence risk judgements (Lichtenburg & MacLean, 1991, p.161). This justifies the restriction of the coding to the headlines.

770 headlines/ articles relating to the Exxon Valdez incident in two of America's leading news media, the New York Times and Alaska Daily News, were downloaded from their respective archives. The folders containing these headlines were then imported into the *MAXqda2* software in 'rich text format' and manually coded.

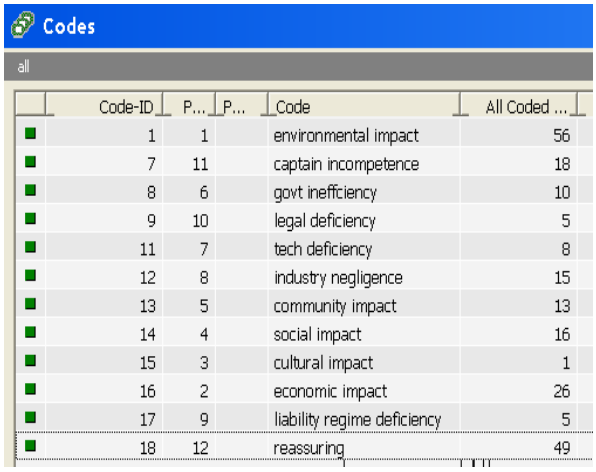
5.3 Defining Code Categories

Coding is at the heart of content analysis. Its objectivity (Stempel, 1989) and reliability are critical to achieving the same results when applied by different persons. The questionnaire survey determined the respondents' perception of relative attributability of the incident to the inefficiency of the government, deficiency of technology, incompetence of the captain, and deficiency of legislation. The identified perception was further corroborated with the respondents' ranking of keywords. The impacts discussed in the media may be classified under environmental, economic, cultural, and social impact (U.S. Department of the Interior, 2001). At times, the media messages may be reassuring. Hence, the perception variables together with the classification of impacts were included to constitute the code categories.

5.4 Content Analysis: New York Times

The New York Times (NYT) is read by millions of readers[78] worldwide including the United States. It carried 390 reports on the Exxon Valdez either as lead articles, or weekly summary or a letter to the editor between March 25, 1989 and March 25, 1990. Each article was individually retrieved from the New York Times archives online (http://select.nytimes.com/). They vividly depicted the impact of the incident, and its aftermath either on the environment, economy, society, culture or community. They dwelled on the deficiency of the liability regime and the incompetence of the captain in numerous ways. Nonetheless, some articles were of a reassuring nature.

The frequency of the various codes in the screenshot at figure 5.1 is the result of the software content analysis of the NYT headlines. It is seen that the NYT focussed on environmental impact twice as much as the economic impact. The coverage of environmental impact was over thrice that of the impact on the society. Culture and the local community received less than a third of the attention. Interestingly, the ratio of articles on environmental impact to reassuring ones was 8:7. This, however, does not take into account the weight that may be attributed to each article.



Code-ID	P...	P...	Code	All Coded ...
1	1		environmental impact	56
7	11		captain incompetence	18
8	6		govt ineffciency	10
9	10		legal deficiency	5
11	7		tech deficiency	8
12	8		industry negligence	15
13	5		community impact	13
14	4		social impact	16
15	3		cultural impact	1
16	2		economic impact	26
17	9		liability regime deficiency	5
18	12		reassuring	49

Figure 5.1. Code frequency: NYT Headlines

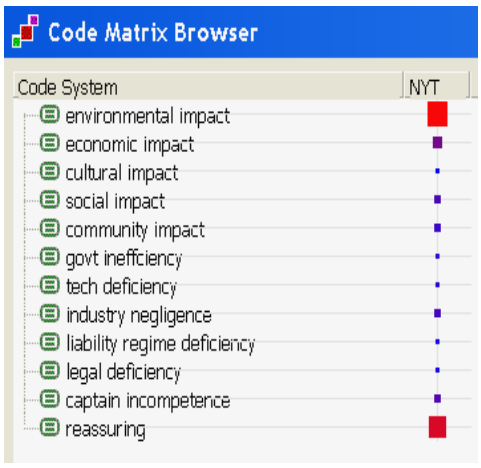


Figure 5.2. CMB: NYT Headlines

[78] In 1989, the daily circulation figure for the New York Times was 1.09 million and for Sunday it was 1.64 million. (Source: ABC Audit Report for the New York Times for the 12 month period ended September 30, 1989.)

The Code Matrix Browser (CMB) screenshot at figure 5.2 provides a visual representation of how many text segments from each text have been assigned to each of the specific codes. The Code Relations Browser (CRB) at figure 5.3 provides a visualisation of the concordances of the codes assigned to segments of the text.

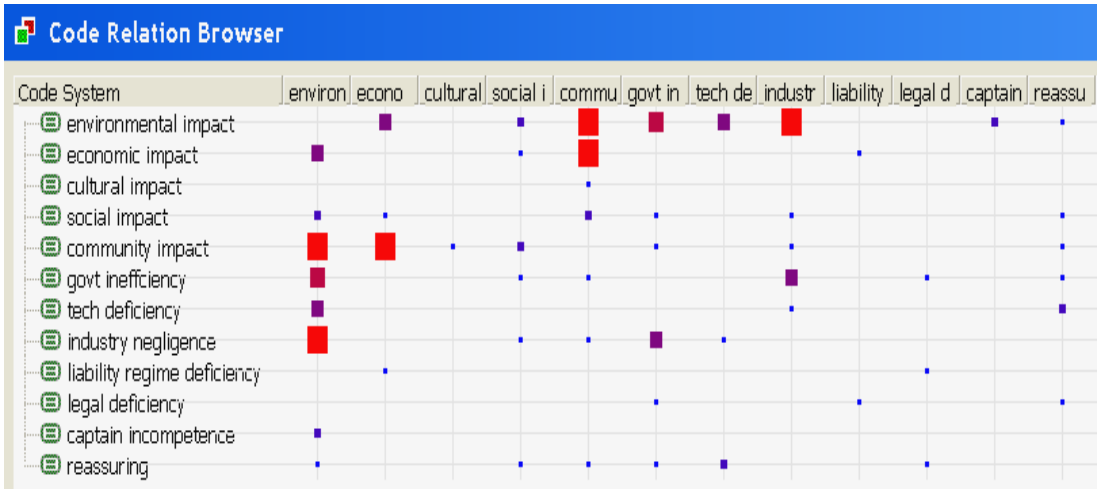


Figure 5.3. Code Relations Browser: NYT Headlines

5.5 Content Analysis: Anchorage Daily News

The audience studies by way of questionnaire survey established that about 60% of the population logs onto the internet for information. In fact, 16% of the population depends exclusively on the internet for news pertaining to maritime topics. This calls for a content analysis of the *online* news resources on the Exxon Valdez incident.

The Anchorage Daily News (ADN) is one of Alaska's leading newspapers. It has an equally established online edition. ADN published 380 articles on the Exxon Valdez incident online (www.adn.com/evos/stories) between March 1989 and December 1998. Just as the NYT, each of the 380 articles was individually retrieved from the internet.

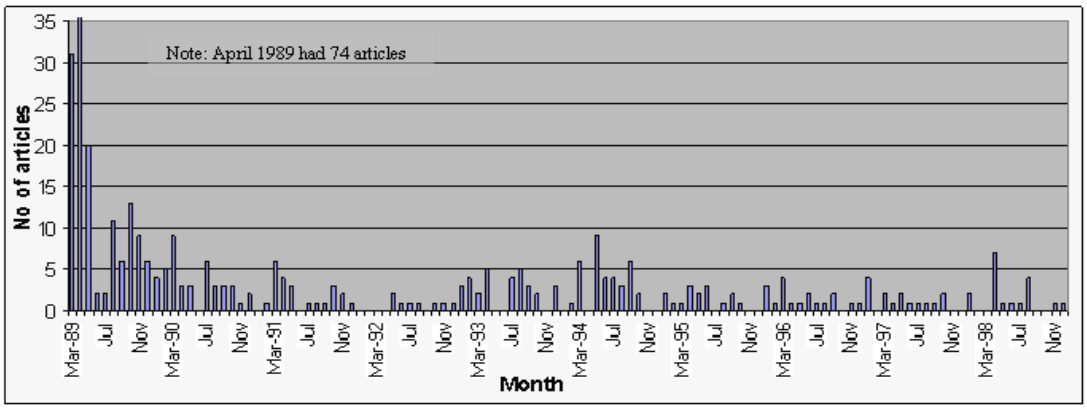


Figure 5.4. **Monthly frequency of articles in Anchorage Daily News online.**

The series of stories on the Exxon Valdez were carried under seven subject heads as portrayed in the graph below. According to the groupings, the focus on legal battles was the highest. Considerable attention was paid to the captain's competence and the impact on life. The ship *per se* received nominal coverage.

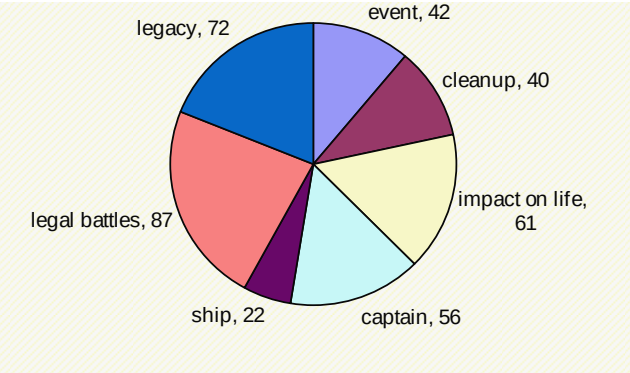
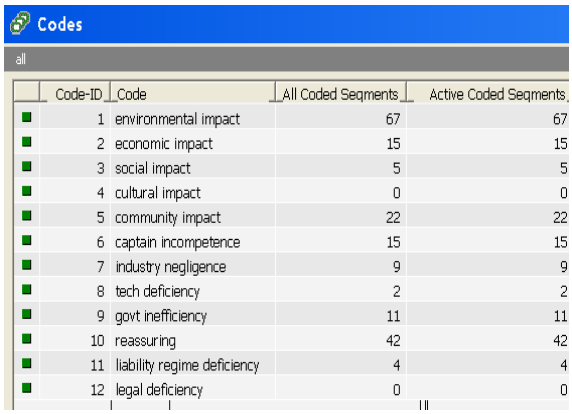


Figure 5.5.
Topic wise coverage of the Exxon Valdez incident by ADN online

The headlines of the 380 articles were manually coded and analysed using the *MAXqda2* software. The codes were identical to those utilised for the content analysis of the New York Times' articles. The windows screenshots of the resultant code frequencies, Code Matrix Browser and Code Relations Browser are reproduced at figures 4.6 to 4.8 respectively.



Code-ID	Code	All Coded Segments	Active Coded Segments
1	environmental impact	67	67
2	economic impact	15	15
3	social impact	5	5
4	cultural impact	0	0
5	community impact	22	22
6	captain incompetence	15	15
7	industry negligence	9	9
8	tech deficiency	2	2
9	govt inefficiency	11	11
10	reassuring	42	42
11	liability regime deficiency	4	4
12	legal deficiency	0	0

Figure 5.6. Code frequency: ADN Headlines

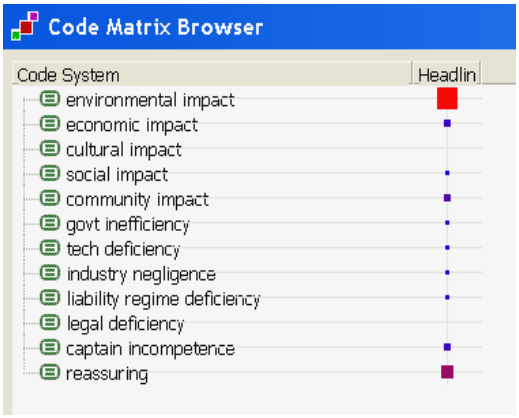


Figure 5.7. CMB: ADN Headlines

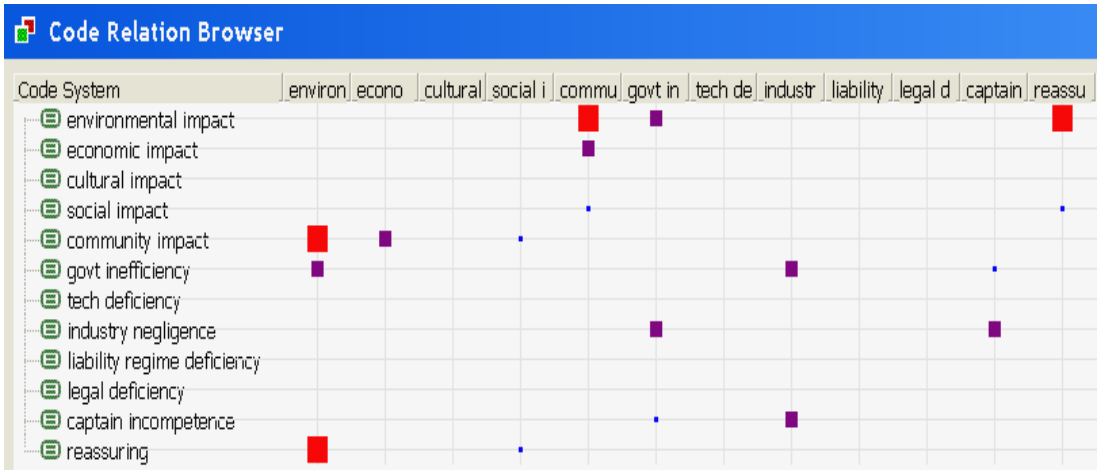


Figure 5.8. Code Relations Browser: ADN Headlines

5.6 Comparative Analysis: NYT v/s ADN

The principal focus of ADN online – environmental impact – matches with that of the New York Times. However, the second important subject was 'economic impact' for the NYT and 'community impact' for the ADN. This is explained by the fact that Anchorage Times has always been catering to a regional audience. The New York Times, however, reaches out to a wider audience with a broader set of news preferences. Nevertheless, the value of $r = 0.94$ worked out by *excel* indicates a 'very strong correlation' between the code frequencies for the two news resources.

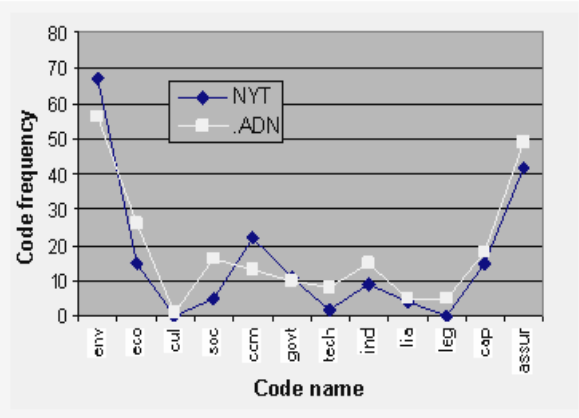


Figure 5.9.
Code frequency plot: NYT v/s ADN

5.7 Correlation of Results: Keyword Choice and Code Frequencies

Impact on the marine environment and pollution of the beaches emerged as principal issues of concern above all else from the respondents' choice of keywords in the questionnaire survey. The code frequency in content analysis also established that both, the New York Times and Anchorage Daily News had focused intensively on the environmental impact of the Exxon Valdez oil spill. Thus, public perception of risk from oil spills is directly proportional to media coverage of the incidents.[79] This validates the earlier discussed, McCombs and Shaw's agenda-setting model of media effects (Watson, 2003, p.36) in the maritime context.

5.8 Conclusion

Substantial efforts went into the manual coding and software analysis of the 770 headlines. The process could be continued to code and analyse the individual articles. It would yield similar results. The intent was to ascertain the messages conveyed by the mass media. Predictably so, the results obtained for the Anchorage Daily News reaffirmed those for the New York Times.

[79] It is acknowledged that the audience surveyed was not necessarily the same as that exposed to the Exxon Valdez coverage.

Without a qualitative analysis tool such as the *MAXqda2* software it would be a Herculean task to analyse the vast amounts of data. Content analysis software is an essential aid to convert qualitative data to quantitative, for further statistical interpretation. It yields objective, systematic, and qualitative description of the manifest content of communication. (Stempel, 1989)

The foregoing content analysis established atleast two of the four parts in the paradigm for communication research:

WHO says WHAT to WHOM with WHAT EFFECT?

Firstly, the message in both the mass media – NYT and ADN – was loud and clear. The focus was firmly on environmental impact. A subdued attempt was, however, made to provide a balanced coverage through reassuring messages, albeit with a much lower frequency and weight.

Secondly, the media undoubtedly crystallises the public perception of risk. The maritime sphere is no exception. Environmental impact was the main agenda for the media in the aftermath of the Exxon Valdez spill. The respondents surveyed, voiced precisely the same concerns.

CHAPTER SIX

MARAD Perspective

The MARAD perspective was gained at both the individual and collective levels through a questionnaire survey of the senior management staff at the Maritime and Coast Guard Agency of the United Kingdom and the delegates attending the 81st session of the Maritime Safety Committee at the International Maritime Organisation respectively.

The questionnaire (Appendix 3) complied with all the theoretical requirements described in a previous chapter. It contained 12 multiple-choice questions and an invitation to append any comment on risk communication and the media not covered in the questionnaire. The first question sought the number of times the respondent had been a delegate to the Maritime Safety Committee meeting and the concluding part, personal information.

6.1 Response Summary: IMO MSC Delegates

Responses were obtained from 36 delegates attending the 81st session of the Maritime Safety Committee at the International Maritime Organisation. The delegates represented 16 nationalities, as listed at Appendix 4. 24 of the respondents had been a delegate at more than 5 sessions of the MSC. Only three of were attending for the first time.

The public interest in maritime safety issues was rated as moderate to high by 69.44% of the delegates.

The trend in public interest is definitely not perceived as decreasing anywhere in the world. 10 delegates considered the public interest in maritime safety issues to be steady. 25 of the delegates comprising 69.44 % of the surveyed population perceived the trend in interest as increasing.

The rating of public awareness in maritime safety issues was a bell curve with peak polling for moderate awareness by 12 delegates making up 36.11 % of the surveyed population. High and poor awareness levels polled almost equally at 10 and 9 delegates, comprising a mean 26.39 % of the total population. A little more than a tenth of the delegates rated public awareness of maritime safety issues as very high.

The opinions on trend in media coverage of maritime safety issues was divided with 19 and 16 delegates perceiving the trend as increasing and steady respectively. The one remaining delegate had expressed no opinion.

None of the delegates polled rated the content of media reports on maritime safety issues to be very high. The proportionality of rating was nearly balanced in the range *high* through *moderate* to *poor* being 12:13:11 respectively. Thus, the overall average may be taken as *moderate.*

The perception of faithfulness of representation of media reports on maritime safety issues also depicted a balanced proportionality of rating aggregating at *moderate*. However, one delegate rated the faithfulness of representation as *very high* while one delegate had no opinion.

Three delegates did not respond to the question of impact of media reports on maritime safety issues. One delegate considered the influence to be high yet varying between positive and negative depending on the circumstances. Two were of the opinion that media reports are counter-productive. A distinct majority of 26 delegates

comprising 72.22 % of the total population considered that media reports had a positive influence on maritime safety issues.

One delegate held no opinion on the influence of pressure groups on his administration. Three delegates held opinions at opposite ends of the spectrum at very high and poor influence respectively. The quantum of influence of pressure groups on maritime administrations was found to be high to moderate with 17 and 15 delegates (i.e. 88.89 % put together) polling high and moderate respectively. This establishes the fact that pressure groups exert considerable influence on maritime administrations.

The trend in influence of pressure groups was reflected as increasing and steady by an equal number of maritime administrations, each aggregating about 44.44 %. However, three delegates perceived the trend as decreasing.

Two delegates chose not to express opinion on their administration's approach to the media. Else, the proportionality of rating was Proactive: Active: Passive :: 6:20:7. Thus, overall the administrations maintain an active approach with respect to the media.

Media reports are perceived to have atleast a moderate influence in decision making of their administration by 31 i.e. 86.11 % of the delegates. Of these 13 delegates or rather over a third rated the influence as high or very high.

6.2 Response Summary: UK MCA

Responses were obtained from eleven officials either heading or representing the different branches of the United Kingdom Maritime and Coast Guard Agency at Southampton. The survey questionnaire used was the same as that for the IMO delegates, except for the exclusion of the first question.

MCA officials believe that, “maritime safety is a low priority until it hits the news”. “Disasters such as the Herald of Free Enterprise have made the public aware of maritime issues.” Interest also “depends upon where they live, i.e. near the coast or inland.” The proportionality of rating of public interest in maritime safety issues was Moderate: Poor :: 6:4.

The trend in interest was rated between steady and increasing in the ratio 5:4. The increase was attributed to “increase in passenger vessel incidents” and “more and more people getting to understand water sports and beach holidays, etc” while the steadiness of interest was justified due “insufficient media coverage” of maritime safety issues. The proportionality of rating of public awareness matched with that of their interest in maritime safety issues at Moderate: Poor :: 6:5.

Opinion on media coverage of maritime safety issues was highly divided. Those who held the view that the trend was increasing (four of them) believed it to be “a part of increasing [media] interest in general environmental issues”. An equal number opined that the trend was steady. Half as many opined that coverage was, in fact, declining. One respondent stated that media coverage was “variable depending on the number of deaths, amount of pollution and availability of pictures” to go with the article.

Eight of the eleven respondents from the MCA gave a moderate rating to the media reports on maritime safety issues. “The story comes first, the truth second” and “[the media] tends to sensationalise maritime accidents” were amongst the reasons cited for rating it poor.

The faithfulness of representation of media reports on maritime safety issues was rated between poor and moderate in the ratio 5:4. One official stated that he could render no firm opinion since the representation “depends on media friendliness of the issue” and one rated them “high if they understand the issue”.

Opinion on impact of media reports on maritime safety issues was divided with three each polling positive influence, no influence and counter-productive options respectively. The positive influence was conditional – “if it increases awareness of issues”. There was also the view that “the ones interested are aware and those not, have no interest”.

Eight respondents rated the influence of pressure groups on the administration as moderate as opposed to only two that acknowledged it to be high. The “introduction of pollution prevention measures” and “NIMBY policy for port development” was cited as effects. The trend in the influence of pressure groups on the UK MCA was adjudged between steady and increasing at respondent ratio 5:4. The influence was “particularly [increasing] with regulation of leisure crafts”.

The proportionality of rating for MCA’s approach to the media was, Proactive: Active :: 6:4. However, one respondent considered the approach passive. The media reports were perceived to moderately influence the decision-making in the MCA by over half the respondents. The remainder held diverse opinions. Besides, it was expressed that, “[both] MARAD and media tend to follow political outcomes rather than modal and safety issues”. Moreover, “the shipping community is interested in maritime safety issues because it affects them. The general public becomes aware only when the media has an interesting story to tell them”.

6.3 Correlation of Opinions

The MCA perspective was ascertained to determine a sample administration’s correlation with the collective perspective at the IMO. The correlation was determined quantitatively by plotting the scores of each option for all the questions, except question 1. The graph is reproduced below. Rather than plotting the absolute frequency, yet another option would be to calculate the relative frequencies for each of the multiple choices for all the questions and then plotting them for a comparison.

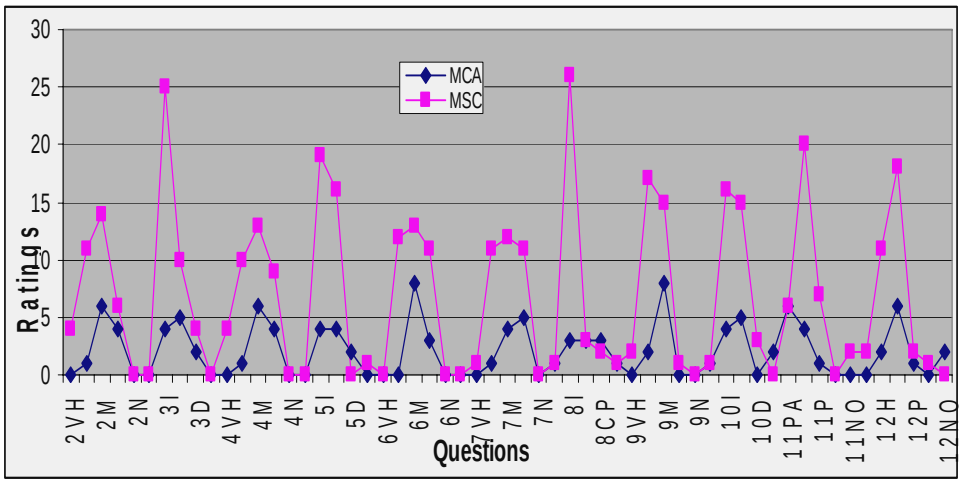


Figure 6.1. UK MCA v/s IMO MSC ratings from questionnaire survey.

The correlation worked out by *excel* is 0.67. Thus, in statistical terms, there exists a 'considerably strong correlation' between the opinions collated at MCA and the IMO.

6.4 Conclusion

The questionnaire survey of 36 respondents comprising 16 nationalities at the 81st session of the IMO and the eleven heads or representatives of branches at the UK MCA in Southampton yielded critical insight of the SARF constituents.[80] Public interest in maritime safety issues is moderate but steadily increasing in keeping with the media coverage. The content and faithfulness of media representation is at best moderate. The MCA were divided in their opinion on the impact of media. However, the IMO delegates believed the influence to be positive. Administrations acknowledged the considerable influence of pressure groups and its steadily increasing trend. Their approach towards the media is by and large positive. Decision making in maritime administrations is influenced, albeit moderately, by media reports too.

[80] The 16 nationalities were treated as a homogenous entity for the purposes of this largely quantitative analysis. A qualitative analysis in the context of their social construct is expected to lead to equally interesting revelations that are beyond the scope of this study.

CHAPTER SEVEN

Pressure Group Perspective

Pressure groups comprise a component of the SARF. Non-governmental organisations (NGOs) participate in the work of several international organisations including the International Maritime Organisation (IMO). Sixty-three NGOs hold consultative status with the IMO as of date. Their considerable influence in the decision-making of the maritime administrations was acknowledged by delegates to the eighty-first session of the Maritime Safety Committee. The Brent Spar and Clemenceau incidents involving Greenpeace substantiate that finding. The case study of the repealing of the requirement of helicopter landing area for non-ro-ro passenger vessels demonstrates the industry influence on risk perception at the IMO.

7.1 The Brent Spar and Clemenceau: Positive Influence

The decommissioned French aircraft carrier *Clemenceau* purportedly laden with hundreds of tons of asbestos that could not be recovered set course for recycling at Alang Ship-recycling Yard in India in December 2005. However, intense media campaign and pressure from NGOs such as Greenpeace (2004) in the light of the Basel Convention[81] and EU Regulations bore down on the Government of India. Finally, the judiciary played a key role in banning[82] the entry of the Clemenceau in

[81] The Basel Regime is the Basel Convention, the Basel Ban Amendment and the Decisions made by the Conference of the Parties (COPs). Also some elements of the EU Waste Shipment Regulation (EEC 259/93) can be considered as being part of that Basel Regime.

[82] Order of the Supreme Court of India, Civil original jurisdiction, writ petition No 657 of 1995, New Delhi 14 October 2003, page 42-45.: Amongst others: Order no 1 on ship breaking: "Before a ship arrives at port, it should have proper consent from the concerned authority or the State Maritime Board, stating that it does not contain any hazardous waste or radio-active substances […]. Order no 2: "The ship should be properly decontaminated by the ship owner prior to the breaking […]."

Indian waters.[83] The French judiciary followed suit and blocked its transfer to India on February 15, 2006.[84] Greenpeace (1995) is also known for its positive role in the *Brent Spar* case. Its successful risk communication campaign prevented Shell Oil from dumping the oil installation contaminated with toxic and radio-active sludge in the North Atlantic Ocean. In both cases, the NGO played a positive role.

7.2 Helicopter Landing Area: Unconstructive Influence

The 1995 SOLAS Conference introduced *inter alia*, vide regulation III/28.2, a requirement for passenger ships over 130 metres in length to be fitted with a helicopter landing area (HLA). The regulation was primarily in response to the loss of the Estonia. The International Council of Cruise Lines (ICCL), however, represented against implementation of the regulation on ocean going overnight cruise ships citing amongst other reasons, its adverse economic impact on the industry (MSC 68/9/1). Following representations, the Maritime Safety Committee agreed to instruct the sub-committees on ship design and equipment (DE) and radio-communications and search and rescue (COMSAR) to reconsider the 1995 SOLAS amendment in respect of non-ro-ro passenger ships.

Subsequently, Norway (a major stakeholder in cruise shipping) and ICCL submitted a Formal Safety Assessment (FSA) study on the subject for consideration by COMSAR 3 and DE 41.[85] Concurrently, Italy reported its FSA study results of HLAs on non-ro-ro passenger ships to the sixty-ninth session of the MSC.[86] An intersessional correspondence group that reviewed the two FSA studies opined that the conclusions were far too dependent on assumptions about some of the uncertainties in the risk calculations and needed further review. (MSC 70/14)

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[83] On January 6, 2006 the Indian Supreme Court ruled that the ship is an illegal transport due to the hazardous materials, including 500 tonnes of asbestos, on board. The ship was ordered to stay out 200 nautical miles away from India until a final decision is taken.
[84] See http://www.defencetalk.com/news/publish/printer/printer_6063.php for a timeline of the saga.
[85] See MSC 69/14/6, COMSAR 3/9/13 and DE 41/INF.2
[86] See MSC 69/14/7 and MSC 69/INF.31

In the deliberations that ensued at MSC 70 while considering the report of the working group that re-examined the FSA studies, Sweden strongly urged that no change in the SOLAS regulation on HLA be made. Germany, Denmark, Finland and Ireland and the ICFTU[87] supported the view of Sweden. France too expressed strong reservations on the issue, being opposed to any decision based purely on cost effectiveness[88] of implementing the regulation on cruise ships.

MSC 70, nonetheless, endorsed the conclusion of the group and SOLAS regulation III/28.2 was restricted to ro-ro passenger ships vide IMO Resolution MSC 91(72). This, one of its kind, resolution is diametrically opposite to the recognised principles of improving safety of life at sea. The decision was at the behest of a non-governmental organisation – the ICCL.

7.3 Conclusion

Gerard Peet (1992, p. 17) having studied the effectiveness of environmental NGOs concluded that they hold more than 'some influence' (but less than 'substantial influence') at the Marine Environment Protection Committee (MEPC) of the IMO. [89] The study also observed greater influence of industry-related NGOs than that of the environmental NGOs. The influence was largely proportional to the effort. The success of the ICCL at the MSC in 1998 corroborates the findings of Peet.

It is concluded that the work of an NGO could serve to either heighten or, occasionally, attenuate the risk perception of an individual maritime administration or the collective opinion of states at the IMO with a consequent impact on safety legislation.

[87] International Confederation of Free Trade Unions (ICFTU).
[88] The FSA study by Norway and ICCL had worked out a conservative implied cost of US$ 12 million for averting a fatality.
[89] Peet conducted a questionnaire survey of delegates attending the 31st session of the MEPC at the IMO and the 14th Consultative Meeting of Contracting Parties to the London Dumping Convention.

Risk amplification post Estonia incident lead to the adoption of SOLAS regulation III/28.2, requiring HLA for all passenger vessels. However, subsequent attenuation influenced by the self-serving FSA study of a pressure group had caused the regulation to be repealed, restricting the HLA requirement exclusively to ro-ro passenger vessels. Needless to say, this is an exception rather than the norm.[90] The example is merely illustrative of the possibility of attenuation under the influence of a pressure group.

[90] The repeal of SOLAS regulation III/28.2 is not an isolated case of pressure group influence. In the recently concluded MSC.81 the stowage temperature performance standard of life saving appliances required vide paragraph 1.2.2.2 of the Life Saving Appliances Code was amended from the broader range of -30^0C to $+65^0$C to a lower spectrum of -15^0C to $+40^0$C. Thus, for ships trading in tropics, apparently there is no guarantee against damage in stowed life saving appliances even if the appliances fully complied with the requirements of the Life Saving Appliances (LSA) Code.

CHAPTER EIGHT

Concluding Discussions

Ever since its inception, the International Maritime Organisation (IMO) is striving to achieve safer shipping and cleaner oceans. It is doing so by adopting conventions. A member state, if party to the conventions, is responsible for the safety and pollution prevention standards laid down in these conventions. However, some flag states are found lagging in implementation.

A spate of accidents occurred at the close of the 80's.[91] These were promptly attributed to administrations' lack of expertise, experience and resources required for implementing the Conventions. The sub-committee on Flag State Implementation (FSI) was consequently established in 1992, to help governments in implementing, and more importantly, enforcing the IMO instruments.[92]

Subsequently, member governments were urged[93] to participate in a self-assessment of their performance to identify weaknesses in discharging responsibilities as a flag state. The self assessment form (SAF) received at the IMO was to be analysed at three levels,[94] of which the second level related to identification of problems

[91] These included such disasters as the Herald of Free Enterprise, Scandinavian Star, Dona Paz and the Exxon Valdez.
[92] The decision on its formation was adopted at MEPC.33 in November 1992 and a month later at MSC.61. The work of the sub-committee materialised in the Interim Guidelines to Assist Flag States adopted vide A.740(18) that were later revoked and replaced by A.847(20) Guidelines to Assist Flag States in the Implementation of IMO Instruments.
[93] See Assembly resolution A.881 (21) Self Assessment of Flag State Performance.
[94] FSI 10.

encountered by the state in effective implementation of safety legislation. Unfortunately, member state response was not very encouraging.[95]

Concerned over the continuing lack of effective implementation on part of certain states, the Council at its eighty-eighth session approved the concept of an IMO Model Audit Scheme intended to provide a comprehensive and objective assessment of effectiveness at administering and implementing the key IMO technical treaties. The Voluntary IMO Member State Audit Scheme (VIMSAS)[96] was established as a tool to achieve harmonised and consistent global implementation of IMO standards.

Despite the introduction of these tools, effective implementation of treaties appears to be far fetched. Thus, expertise, experience, and resource are not the only constraints as identified by the IMO.[97] The answer lies elsewhere.

The governments of democratic states represent the collective will of the people. Nothing contrary to public perception can ever be implemented. The varied manner of implementation of the IMO recommendation on places of refuge[98] is a vivid pointer to the issue.[99] It denotes the prevailing risk perceptions. Thus, risk perception assessment is the missing link that inhibits effective flag state implementation of maritime safety conventions, as represented in figure 8.1.

[95] As of FSI 11 (January 2003), 50 initial SAF's and 16 updates were received at the IMO.
[96] The scheme was adopted at the 24th session of the IMO Assembly *vide* resolution A.974. The Code for the Implementation of Maritime Safety Standards (A.973) was also adopted at the same session.
[97] See proceedings of MEPC.33 for a detailed discussion.
[98] Res.A.949 (23). Guidelines on places of refuge for ships in need of assistance. Complementary to these guidelines is EU Directive 2002/59/EC.
[99] Denmark has designated and published a list of 22 places of refuge, 14 for ships posing a high risk of pollution and 8 for low risk vessels. Germany and the UK have designated places of refuge but decided against its publication, while France and Sweden have established principles for designation on case to case basis.

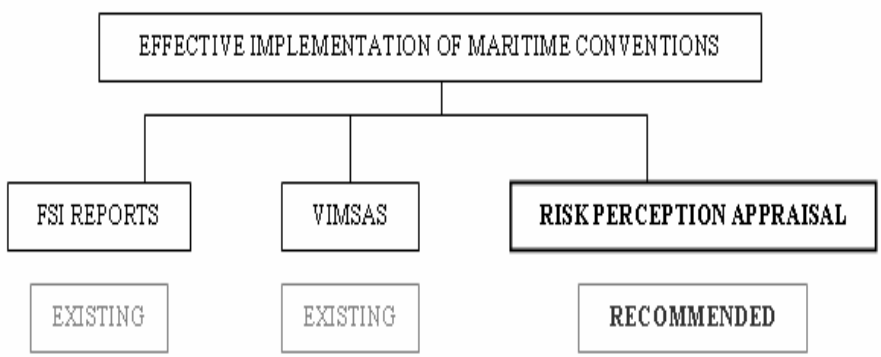

Figure 8.1. Risk perception appraisal as a tool for effective flag state implementation.

Risk perception appraisal by each member state is proposed as a tool for effective implementation of existing conventions. While FSI reports and the recently introduced VIMSAS are existing management tools to aid effective implementation, risk perception is considered equally important, if not more than the other tools.

The risk perception appraisal from the member states could include as a minimum, population analysis using the psychometric paradigm and a content analysis of the media preferred by its populace. The lead media could, for example, be the newspaper reports in India, popular news websites in China, and leading television channels in Sweden, being primary media consumed by the masses in those states.

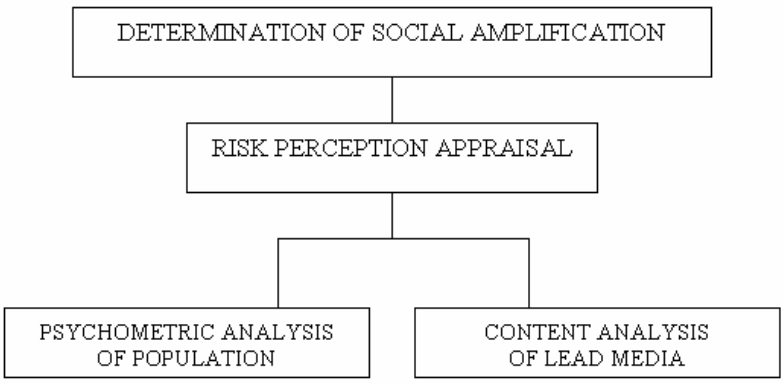

Figure 8.2. Methodology for determination of social amplification.

Risk analysis and risk perception precede risk communication. An asymmetry of lay-expert risk perceptions is presently observed. Risk perception assessment is critical to the success of implementation of the maritime conventions. Adoption of conventions or risk communication efforts in isolation[100] will not achieve the desired effective implementation levels in all the member states. The risk perceptions of the people are positively required to be taken into account. People are not tuned in to the BBC or the CNN. They are not referring to the exclusive maritime resources as well, not even all those in the maritime profession. It's the local television channels or newspapers that comprise the media habits of the masses. They perceive the industry as being responsible for *its act*. The masses need to be apprised of the risk issues. Awareness comes through amplification. Media is a catalyst for amplification. So the underlying principle is to amplify an issue to the extent that people attain an optimum awareness. Global warming may be cited as an example.[101] In a similar vein, if people's perception of risk to the marine environment is heightened it will reflect in their relative ranking of marine pollution amongst other environmental concerns. Simply put, "*Optimise peoples risk perception and rest assured of a smooth and effective implementation of related legislation*".[102]

That's precisely the methodology adopted currently in the United States. A constant hype about terrorist threat has been maintained since 9/11. In the prevailing atmosphere of heightened risk perception, people have even consented to State intrusion in their private lives; be it listening in on their conversations or monitoring their surfing activities on the internet. In the absence of the amplification of risk, no free-minded American citizen would, perhaps, have ever consented to such a fundamental breach of privacy.[103]

[100] Horlick-Jones, Sime and Pidgeon (2003, p. 283) in their study of social dynamics of environmental risk perception concluded that, "any risk communication 'agency' (whether government, business, or NGO) needs to monitor 'global' and 'local' discourses relating to the matter to be communicated".
[101] Awareness was very low until it was brought up at the Kyoto Protocol. (Baron, 2005)
[102] This is the most significant conclusion of this research.

At this juncture, a distinction needs to be made between global amplification of risk and social amplification of risk as understood in the SARF framework. The Exxon Valdez, Chernobyl and the Erika may be regarded to have attained global amplification of risk status. However, the Song Hua river pollution in China, Rhine river pollution in Germany, and the Hallandsåsen in Sweden may qualify as having attained the status of socially amplified risks. On the other hand, the Bhopal gas tragedy, Metula oil spill in Brazil, and the Dona Paz in the Philippines qualify as socially attenuated risks.

This is where the NGOs come in. They are presently restricted to influencing the national administrations and deliberations at the IMO. People associate them strongly with the Brent Spar and the Clemenceau. Should the NGOs take up critical local issues, people will begin to associate them and relate their work within their states to such specific causes to save the marine environment. The media will pick up the issue and through the metaphorical ripple effect, a social amplification may be reasonably expected to occur. The governments will then be forced to act.

It is not only for the NGO to act as an amplifier. In the triad of actors, between the national administration, industry, and the neutral NGO, the amplifier would be other than the actor against whom the campaign is launched for exerting pressure. Thus, the Roundtable (2004) exerts pressure on flag states by publishing the flag state performance table. The flag state has numerous tools[104] at its disposal to ensure quality of ships that fly its flag. The NGO acts as a proactive watchdog over both the flag state and the industry. Mass media is the vehicle available to any actor that desires social amplification through communication of the risk to the people.

[103] Drawing an analogy, a worldwide phenomenon of threat to marine environment would generate risk awareness and heighten risk perception allowing implementation of related regulations.
[104] Survey and certification is an example.

To summarise the discussion, risk perception appraisal is rather an estimate of the social amplification of risk. The member states should be required to estimate the prevailing social amplification of an unimplemented issue using a defined model. The solution, thereafter, would lie in generating sufficient amplification through risk communication so as to allow smooth implementation of legislation or alternately, attenuate amplified risk by enacting a new legislation.

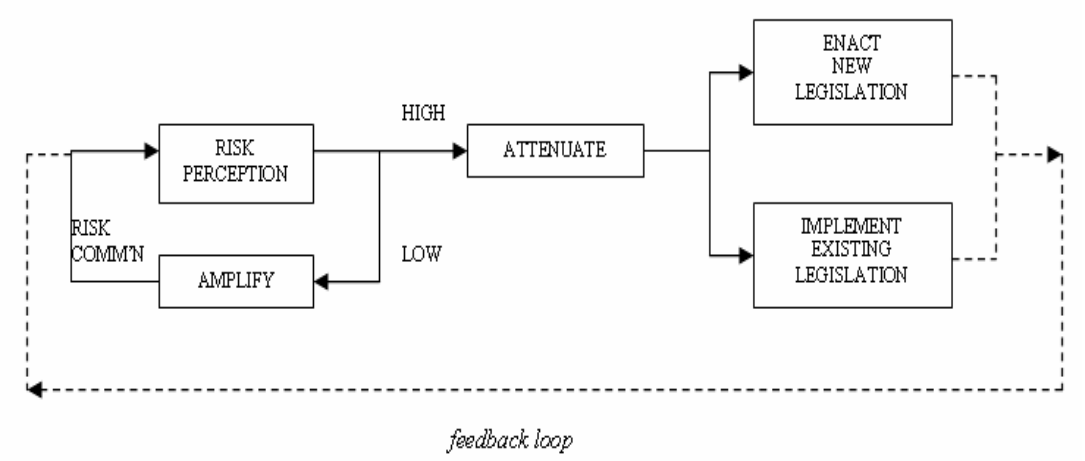

Figure 8.3. Bayesian network: Risk communication and maritime safety legislation.

So what should be the role of the IMO? Every risk that is attenuated alienates the corresponding population from the IMO. Therefore, there is a need to identify the principal risk perceptions of member states and integrate them into the work programme of the IMO. The efforts of the IMO with regard to the working practises and environmental standards at ship recycling yards (Dimakopoulos, 2005), safety regulations for non-convention vessels (Williams, 2000) and the initiation of joint anti-pollution action plan for Lebanon in co-operation with the United Nations Environment Programme (IMO, 2006) are examples of work in this direction.

There should be no waiting for the administrations to raise the matter and seek assistance. Action should preferably be *suo moto*. Creation of an expert body on risk perception is the preferred approach. The risk perception appraisal of member states shall feed into the flag state's self-assessment at the FSI.

The orientation *of the industry, for the industry, by the industry* as if it were, needs to be realigned to a focus *of the people, for the people, by the people* at the inter-governmental institution. A win-win partnership of the aforesaid triad at the IMO – member states, industry and NGOs – to maintain an optimum risk perception at all times will ensure a greater degree of flag state implementation of the maritime safety conventions.

A final word on the social amplification of risk; high and low are relative terms. How high a risk perception qualifies as high enough to allow effective implementation of say, a decision on places of refuge? SARF suggests no scale for its measurement or prediction. There exists a need to develop a predictive model of SARF.

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Questionnaire

Personal Declaration

Sir/Madam,

I am a master's degree student at the World Maritime University in Malmö, Sweden and writing a dissertation entitled, "*Risk Communication and Maritime Safety Legislation*".

It is known that much of our thinking is influenced by the media. Conversely, it is also acknowledged that the media mirror's social perceptions. The survey aims at studying the dynamics of risk communication between the media and the society it caters and the legislative spin-off consequent to maritime disasters.

I will be much obliged should you complete the questionnaire below to the best of your belief and knowledge. The filled-in questionnaire will be treated with the strictest confidentiality and used purely for academic purposes.

Thank you.

Yours sincerely,

AHebbar

NOTE: THIS QUESTIONNAIRE CONTAINS 30 QUESTIONS IN FIVE DOMAINS LABELED 'A' TO 'E'. PLEASE READ THE QUESTIONS CAREFULLY BEFORE ANSWERING THEM.

A MEDIA DOMAIN

Your interaction with the media

1. Does news interest you? O Yes O No (*Tick (✔) one*)

   If yes, please rank top three subjects amongst the following that interest you most?
   Sports / Politics / Crime / Economy /
   Fashion / Nature and environment /
   Technology / Terrorism / Any other (*Please specify*)

   Rank one _____
   Rank two _____
   Rank three _____

2. Do you read any newspapers in print? O Yes O No (*Tick (✔) one*)

   If yes, please specify their names **AND** how often you read them?

   _____
   _____
   _____

3. Do you watch television? O Yes O No (*Tick (✔) one*)

   If yes, please specify the channels/programmes you watch **AND** hours per week?

   _____
   _____
   _____

4. Do you access the internet? O Yes O No (*Tick (✔) one*)

   If yes, please specify three reasons for accessing the internet?
   i. _____
   ii. _____
   iii. _____

5. Do you access the internet for news? O Yes O No (*Tick (✔) one*)

   If yes, please specify the news sites you visit **AND** how often you visit them?
   _____
   _____
   _____
   _____

6. Do you read news periodicals? O Yes O No (*Tick (✔) one*)

   If yes, please specify the periodicals **AND** how often you read them?
   _____
   _____
   _____
   _____

7. Do you refer to the media for maritime topics? O Yes O No (*Tick (✔) one*)

   If yes, please specify the media type. (*Tick (✔) alternatives as appropriate*)
   O Newspaper
   O Internet
   O Television
   O Periodical
   O Any other (please specify) _____

8. Please specify your maritime topics of recent interest, if any.
   _____
   _____
   _____

9. Are you aware of any exclusively maritime information resources such as Lloyds List Fairplay, etc.? O Yes O No (*Tick (✔) one*)

   If yes, please name the resources.
   _____
   _____
   _____
   _____
   _____

B CURRENT AFFAIRS DOMAIN

Your perception of recent maritime and other issues of global interest

10. Have you come across news of any shipping disaster lately? O Yes O No (*Tick (✓) one*)

If yes, what was the disaster? (*please describe in not more than 2 lines*)

_____

_____

Where did you learn about the disaster? (*Tick (✓) alternatives as appropriate*)

O Television
O Internet
O Periodicals
O Other Sources (*please specify*) _____

What, in your opinion, is this disaster attributed to? (*Tick (✓) alternatives as appropriate*)

O Inefficiency of the Government
O Deficiency of technology
O Negligence of owner/ operator
O Deficiency of legislation
O Other causes (*please specify*) _____
O Can't say

Comment in support of answer (if any)_____

_____

11. Was an invasion of Iraq necessary? (*Tick (✓) one*)

O Yes O No O Can't say O No response

Comment in support of answer (if any)_____

_____

12. Is any country's nuclear programme under consideration of UN Security Council? (*Tick (✓) one*)

O Yes (please specify the country if known) _____
O No
O Can't say
O No response

13. Does that country deserve sanctions for pursuing its indigenous nuclear programme to generate power for peaceful purposes? (*Tick (✓) one*)

O Yes O No O Can't say O No response

Comment in support of answer (if any)_____

_____

14. What poses a bigger threat to humankind today? (*Tick (✓) one*)

O Bird Flu
O AIDS
O Any other (please specify) _____
O Can't say

C NON-GOVERNMENTAL ORGANISATION DOMAIN

Your perception of Non-governmental Organisations associated with the marine environment

15. Do you know of any Non-Governmental Organisations (NGOs) that is involved in promoting the preservation of the marine environment? O Yes O No (*Tick (✔) one*)

    If yes, please name the NGOs.
    i. _____
    ii. _____
    iii. _____

16. Do you associate any NGO with a marine disaster where it played a significant role in raising awareness of the incident as also campaigning for the mitigation of its effects? (*Tick (✔) one*)
    O Yes
    O No
    O Can't say

    If yes, please specify.
    Incident _____
    Year_____ Place _____
    NGO that played a key role _____

    How did you get to know the work of this NGO? (*Tick (✔) alternatives as appropriate*)
    O Television
    O Newspapers
    O Internet
    O Periodicals
    O Pamphlets
    O NGO volunteer members
    O Public campaign
    O Other (please specify) _____

D ENVIRONMENTAL DOMAIN

Your perception of the risks to the marine environment and their resolution

17. Name three of the biggest environmental disasters you know of.
    i._____
    ii. _____
    iii. _____
    iv. No response

18. What is the best way to prevent environmental disasters? (*Tick (✔) one*)
    O Administrative vigilance
    O Enhanced technology
    O Responsible owner/ operator
    O Stringent legislation
    O Other means (*please specify*) _____
    O Can't say
    O No response

19. Are human activities causing harm to the environment? O Yes O No (*Tick (✓) one*)

If yes, what is the relative order of risk to environment?
(*Please specify rank 1 to 6 in order of maximum to least risk*)
O Global warming
O Air pollution
O Ground pollution
O Water pollution
O Marine pollution
O Loss of bio-diversity

20. Why is marine pollution due accidents of concern? (*Tick (✓) one*)
O Economic impact
O Ecological impact
O Any other reason (Please specify) _____
_____
O Can't say
O No response

21. What, in your opinion, is the safest way to transport oil? (*Tick (✓) one*)
O Pipeline
O Rail
O Road
O Shipping
O Other means (*please specify*) _____
O Can't say
O No response

22. Do you know of any special ship construction designs that minimise the harm to the environment in the event of an accident? O Yes O No (*Tick (✓) one*)

If yes, please specify the best available design option in your opinion?
O _____ O Can't say

23. List any ten words you would associate with prevention of marine oil spills.

i.……
ii.……
iii.……...
iv.……..…
v.……
vi.……..
vii.……..……
viii.……
ix.……
x.……

E	PERSONAL INFORMATION DOMAIN

24. O Yes, I agree to render my personal information for academic research only.
    O Sorry. I wish to remain anonymous.

25. Academic qualification? (*Tick (✓) one*)
    O Graduate
    O Post Graduate
    O Doctorate
    O Other (please specify) _____

26. Legal education? (*Tick (✓) one*)
    O Graduate
    O Post Graduate/ Doctorate
    O Other (please specify) _____
    O None

27. Environmental Studies? (*Tick (✓) one*)
    O Graduate
    O Post Graduate/ Doctorate
    O Other (please specify) _____
    O None

28. Is your occupation related to shipping? (O Yes O No (*Tick (✓) one*)

    If yes, please specify. (*Tick (✓) one*)
    O Employed
    - Organisation_____
    - Appointment_____

    O Self employed
    - Type of business _____

29. Nationality:_____

30. Gender O Male O Female (*Tick (✓) one*)

31. Age:_____ years

32. Your kind participation is solicited in a follow-up survey intended after a period of time. If you agree to participate, please provide your contact details.
    - E-mail:_____
    - Name and Address:_____
      _____
      _____
      _____

DATE:_____May 2006	**PLACE:**	**SIGNATURE:**

Keyword Choice

Below is a list of keywords associated with marine oil spills. Kindly select ten and re-write them in the order of ranking according to your opinion.

Suggested List of Keywords	**Your Selected List of Ten Keywords**
birds and fishes	
cleanup plan	1. ……
cleanup resources	
compensation fund	2. ……
co-operation	
double hull	3. ……
environmental damage	
fisheries	4. ……
fishermen	
government responsibility	5. ……
health risk	
industry responsibility	6. ……
livelihood	
marine pollution	7. ……
media coverage	
monetary compensation	8. ……
pollution of beaches	
regulation	9. ……
safety legislation	
seafarer training	10. ……
ship construction	
tanker ships	
technology	
tourism	

APPENDIX 2

The Underlying Strategy

The questionnaire is divided into five domains labelled 'A' to 'E' followed by a keyword choice. A discussion on the underlying strategy of each domain and the questions therein ensues.

A. Media Domain

The questions in this domain are primarily aimed at determining the reading habits of the sample population and their source of news. The three specific maritime related questions at the end of the domain merely seek to revalidate the preceding answers reflecting their interest in maritime topics and the media type that fuels the interest. The domain facilitates gauging how and to what extent the sample population is interested in environmental news. Nevertheless, a subtle description '*your interaction with the media'* is chosen to go along with the domain title.

B. Current Affairs Domain

Determining the sample's awareness of maritime disasters is an important constituent of the survey. Of the six questions in this domain, only the first two are maritime specific. The rest are chosen for their current wide coverage in two principal international news networks viz., the CNN and the BBC. While the questions appear to be innocuous and representative of *current issues of global interest*, their answers are expected to signal any existing positive influence of media on the surveyed. The questions on current affairs serve simultaneously as a buffer after the series of five specific maritime questions.

C. NGO Domain

The questions in this domain seek to determine the awareness of the NGOs and consequent impact on risk perception of the sample population. The most effective medium of influence is also sought to be ascertained.

D. Environmental Domain

This domain seeks to determine the sample population's perceived risk of shipping, the basis of this perception and its notional justification. The double hull has been consistently promoted as the chosen design alternative to mitigate any risk of marine oil spills from tankers. The impact of this promotion will be estimated as also its basis. The ten keywords at the conclusion of the domain serve as a cross reference or rather revalidate the choice of keywords and thus the themes for the content analysis of the chosen data.

E. Personal Information Domain

It is recognised that a legal or environmental education has a significant impact on the thinking process. Accordingly, this input is sought from the participants. Occupation and appointment influence an individual to a large measure and need determination. Nationality, age and gender are sought to determine their correlation with the media influence. The correspondence particulars will facilitate a follow-up survey of the population.

Keyword Choice

The survey participant is administered a keyword choice on completion of response to the main questionnaire. The suggested list contains 25 keywords. The participant is requested to select any ten keywords and rewrite them in the order of ranking. The suggested list contains words from fields associated with causes, effects and remedies of oil spills, key players, affected parties, and distinct focus areas of law, people, environment, technology and economy. The administration of keyword choice on conclusion of the main questionnaire is a conscious and considered decision to avoid any influence on the response, particularly the participants own list of keywords sought at question 23 under Environmental Domain.

Questionnaire: IMO Delegates and UK MCA

Personal Declaration

Sir/Madam,

I am a master's degree student at the World Maritime University in Malmö, Sweden and writing a dissertation entitled, "*Risk Communication and Maritime Safety Legislation*".

It is known that much of our thinking is influenced by the media. Conversely, it is also acknowledged that the media mirror's social perceptions. The survey aims at studying the dynamics of risk communication between the media and the society it caters and the legislative spin-off consequent to maritime disasters.

I will be much obliged should you complete the questionnaire below to the best of your belief and knowledge. The filled-in questionnaire will be treated with the strictest confidentiality and used purely for academic purposes.

Thank you.

Yours sincerely,

AA Hebbar

e-mail: s06073@wmu.se

Questionnaire

1. How many times have you been a delegate?
O >5 **O** 4 **O** 3 **O** 2 **O** This is my first meeting

2. How would you rate public interest in maritime safety issues?
O Very high **O** High **O** Moderate **O** Poor **O** Nil **O** No opinion
Additional comments, if any. (Please specify)_____

3. How would you describe the trend in public interest in maritime safety issues?
O Increasing **O** Steady **O** Decreasing **O** No opinion
Additional comments, if any. (Please specify)_____

4. How would you rate public awareness of maritime safety issues?
O Very high **O** High **O** Moderate **O** Poor **O** Nil **O** No opinion
Additional comments, if any. (Please specify)_____

5. How would you describe the trend in media coverage of maritime safety issues?
O Increasing **O** Steady **O** Decreasing **O** No opinion
Additional comments, if any. (Please specify)_____

6. How would you rate the content of media reports on maritime safety issues?
O Very high **O** High **O** Moderate **O** Poor **O** Nil **O** No opinion
Additional comments, if any. (Please specify)_____

7. How would you rate the faithfulness of representation of media reports on maritime safety issues?
O Very high **O** High **O** Moderate **O** Poor **O** Nil **O** No opinion
Additional comments, if any. (Please specify)_____

8. How would you describe the impact of media reports on maritime safety issues?
O Positive influence **O** No influence **O** Counter-productive **O** No opinion
Additional comments, if any. (Please specify)_____
_____
_____

9. How would you rate the influence of pressure groups on your administration?
O Very high **O** High **O** Moderate **O** Poor **O** Nil **O** No opinion
Additional comments, if any. (Please specify)_____
_____
_____

10. How would you describe the trend in the influence of pressure groups on your administration?
O Increasing **O** Steady **O** Decreasing **O** No opinion
Additional comments, if any. (Please specify)_____
_____
_____

11. How would you describe your administration's approach to the media?
O Proactive **O** Active **O** Passive **O** Elusive **O** No opinion
Additional comments, if any. (Please specify)_____
_____
_____

12. How would you rate the influence of media reports on decision making in your administration?
O Very high **O** High **O** Moderate **O** Poor **O** Nil **O** No opinion
Additional comments, if any. (Please specify)_____
_____
_____

13. Any other comment on risk communication and the media not covered in this questionnaire.
_____
_____
_____

Personal Information

14. O Yes, I agree to render my personal information for academic research only.
O Sorry. I wish to remain anonymous.

Academic qualification(s) _____

Employment Organisation_____
Appointment_____

Gender O Male O Female | Age_____ years | Nationality_____

15. Your kind participation is solicited in a follow-up survey intended after a period of time. If you agree to participate, please provide your contact details.

- E-mail:_____
- Name and Address:_____
_____
_____

Date:_____May 2006 **Signature:**

APPENDIX 4

List of Nationalities: IMO Delegates

1. China
2. Ecuador
3. Estonia
4. Finland
5. India
6. Indonesia
7. Iran
8. Jamaica
9. Korea
10. Nigeria
11. Philippines
12. Saudi Arabia
13. Sweden
14. Tanzania
15. United Kingdom
16. Uruguay