WORKING PAPER 453

UNDERSTANDING 'RISK PERCEPTION': CONCEPTUAL FOUNDATIONS FOR SURVEY-BASED RESEARCH

S.M. MACGILL AND F.G. BERKHOUT

School of Geography
University of Leeds
Leeds LS2 9JT

February 1986

Understanding 'risk perception': conceptual foundations for survey-based research

S M Macgill and F G Berkhout

School of Geography, University of Leeds

February 1986

Introduction

This paper was written in the process of seeking to understand the 'risk perceptions, attitudes and opinions' of people who live in the vicinity of a spent nuclear fuel reprocessing plant at Sellafield in West Cumbria, UK (otherwise known as Windscale). More specifically, the paper was written as part of a research project investigating the relevance of the Black Report (the product of a high level officially appointed inquiry into possible radiation induced health risks from Sellafield, and offering reassurance to concerned individuals, Black 1984) for the communities who live in the locality of Sellafield's disputed health risks. We would suggest that a set of incidents related to the nuclear industry in West Cumbria towards the end of 1983 and afterwards (notably a controversial and unusually well publicised television programme which prompted the commissioning of the Black Inquiry, and a significant beach contamination

incident) provide an eminently suitable subject for a local case study into the form and complexity of 'risk perceptions, attitudes and opinions' (*). A social survey was our primary means of empirical research. The aim of this paper is to reassess the theoretical foundations of the social survey in the understanding of 'risk perception'.

There are a number of helpful introductory guides to social survey methodology setting out what we might call 'good housekeeping rules' for questionnaire design (the wording and juxtaposition of questions) and choice of sampling frame (Fink and Kosecoff 1985, for example). There are also many examples of surveys undertaken in the risk field translating many of the rules into practice. But currently we have not found a satisfying set of theoretically based foundations for survey-based risk perception research within which these housekeeping rules (as well as more general evaluations of risk perception and acceptability, Council for Science and Society 1977) might be more profoundly disciplined. At the same time, there is a body of ideas in structuralist linguistic and social theory which has not been invoked in the main thrusts of research in this field. This provides foundations for new and valuable insights into the

(*) We will clarify our understanding of these terms in due course, and state a preference for the term 'positions'; the conventional interpretations meanwhile would be to take perception to refer to what people consider the risks to be, attitudes to refer to their social general disposition towards these risks (including the way they talk about the risks and how they may affect lifestyles), and opinion to refer to their related evaluation of them (whether they are acceptable and if not what ought to be done about them).

pattern and shape of risk attitudes, as well as a much fuller explanation of an analyst's preconceptions, interests, and position in relation to his or her object of study. Thus there is both a need, and the scope, for a new methodological contribution.

We have sought in this paper to identify a number of key elements which we believe to be useful in clarifying the real difficulties inherent in the process of interpretation in risk perception research. They are foundations to underpin what we take to be the craft of representing and understanding the views of particular populations through the use of a social survey questionnaire as the research tool. But they are not presented only as foundations to guide the action of those undertaking and analysing such a survey. They are also presented in order to suggest to the reader the terms in which the findings of such surveys (and in particular our own) can be understood.

Perception research: levels of understanding

The field of risk perception research has by now a large literature. It originates from hermeneutical work done from the late '60s onwards on

environmental perception, work in which geographers also took part (see, for example, Mitchell 1979 for a review). Through the 1970s the delicate siting problems of nuclear power stations primarily in rural coastal areas came to be seen as a useful application of this research. However, as public attitudes to nuclear power itself began to change, chiefly on grounds of safety, these surveys increasingly began to resemble public opinion polls on support for, or opposition to, nuclear power. Much of this work was sponsored by agencies with active interests in the survey results, and this was often reflected in the orientation of the work. The purpose was to find out whether people were pro- or anti-, whether people wanted a power station on their doorstep, whether people had locational preferences for such facilities, and what peoples stated preferences were on a number of related issues. In general, the findings have shown a progressive decrease in 'support' for (whatever that really means) nuclear power in Europe and America, and public acceptance is now one of the industry's major problems.

Developing out of such findings was the identification of factors that were believed to account for people's often inflated perceptions and adverse attitudes towards nuclear risk. These factors included its 'dread' aspect, its uncontrollability, its impact over long time horizons, and its unseen and unknown qualities. The identification and testing of a whole range of psychological dimensions of risk, often measured on numerical scales, came to dominate the research field (notably the work summarised

in the paper by Fischhoff, Slovic and Lichtenstein 1982). A number of such dimensions are summarised more fully in Table 1, drawing here on a good review of psychological work by Lee (see Royal Society 1983). It may seem reasonable to think that if such basic 'axiomatics' could be spelled out more completely, they might provide a basis for deriving laws through which they could be combined to understand risk perception and explain the apparent irrationality of responses to nuclear power by certain groups of people and the social patterns of such responses - generative schemes that might be simply and automaticaly applicable. Very little progress has been made to that end.

Suggested interventions against the low and apparently decreasing public acceptability of nuclear power, based on attempts to offset psychologically adverse dimensions have included recommendations to provide more information, having particular regard to its better presentation (if only people were better informed about the technically minute risks then their concern would lessen), and recommendations to compensate people perceiving themselves at risk (if communities stood to gain some obvious benefit, they may take a more positive attitude). Neither remedy seems to be fully adequate.

The net result from a large mass of psychologically-based empirical study seems to be a supply of ad hoc insights, partial generalisations, and some rather unsatisfying conclusions such as 'there are no general findings'

(Otway and Thomas 1982) or 'these results might be thought to be depressingly inconsistent' (Brown 1985) or 'there's more to it than risk' (van der Pligt and Eiser 1984). Part of the insufficiency of psychological perspectives seems to lie in an unsatisfactory reification of social reality into categories detached from the actors that individually and collectively produce the views that are being investigated. The different categories are of unknown relation to the fundamental terms in which the actors themselves interpret the 'risks'.

More recently there has been a growing interest (including interest from researchers previously favouring a psychological approach) in adopting frameworks of reference derived from cultural anthropology (Douglas and Wildavsky 1982, Thompson 1980, Wynne 1983) to provide new insights for perception research - notably through the concepts of cultural bias and cultural relativism. From such perspectives, different cultural norms are seen systematicallly to shape the way people view the world; peoples perceptions of risk, then, must be understood in terms of their wider cultural (and subcultural) biases and values, and part of the aim of the research process should be systematicaly to test these biases.

Wynne succinctly captures this perspective and points to a fair multitude of clues for others to follow up in remarking that:

"Social institutions, be they formal ones or informal ones like friendship networks, are the origins of meanings, problem definitions and

perceptions; 'risks' are part of a structure of meaning based in the security of those institutional settings in which people find themselves. Such settings interconnect the personal scale and the scale for example of organisations or political cultures. These cultural patterns are being constantly reproduced by people through routine social interaction, in their constant cultivation of a sense of security and autonomy." (Wynne 1983 pp6)

It is interesting to note that some of the psychologically significant dimensions can often be reinterpreted in socio-cultural terms, for example, uncontrollability as an indication of the 'social distance' between ordinary individuals and an apparently autonomous technology (Winner 1978).

The cultural perspective has also lent telling insight into the dichotomy between 'objective' and 'perceived' risk, and in particular to what a 'rational' view of risk might mean. As Thompson (1980) has argued, once we give credence to the idea of there being different cultural biases and different prejudices, and to there being related contradictory convictions about how the world is (and what the risks are), then to ask 'who is right?' is not just to ask a question that probably only history can answer, it is to encourage the arbitrary tyranny of one provincial rationality over all others. Analysts who fail to recognise this, but speak only of 'irrational' bias and 'misperception' will miss issues of real interest and mask them with an implicit absolute of rationality. Rationality is only definable with respect to the biases which constitute it, but these are not always fully apparent to the actors themselves. People are 'ensared' in their own provincial rationality which may have

very few linkages or similarities to other rationalities. The perception analyst, in turn, is released from the onerous (and now evidently impossible) task of searching out an unbiased view. Instead we are led to search for the characteristics of individual biases.

We can discern, in this brief summary of past aproaches, three broad 'levels' of understanding in existing thrusts of risk perception research. First, very generalised attitudinal barometers of pro/anti views towards nuclear power, second, the identification and testing of psychological dimensions which underlie risk perception and account for perceptional differences, and third, sociological and cultural perspectives which give first importance to social context and cultural norms in determining people's attitudes. Some of the recent literature is reviewed by O'Riordan (1983).

The foundations set out in this paper can be interpreted as an attempt to move to a fourth 'level' of understanding of people's positions towards nuclear (and other) risks. This approach also marks the retrieval of risk perception analysis from the positivism and ideologism of previous work. Instead we are concerned to understand attitudes to risks through an analysis of the language used in talking around and about risks, and to locate those readings of 'risk discourse' with respect to the social and institutional settings in which it is used. In outlining this departure from the mainstreams of research below we draw, in particular, on what

from our knowledge of the risk perception research field are hitherto neglected aspects of social and linguistic theory. In companion papers to this (Macgill and Berkhout 1985a,b; Berkhout and Macgill 1985) we present and interpret some of the empirical survey analysis, undertaken from the perspective of the present paper.

Mapping out the way ahead

We begin by taking stock of the truism that different people obviously have different opinions, perceptions and attitudes. It is suggested that the most powerful general foundation for the understanding of subjective differences is to be found in the notion of intersubjectivity: it is through intersubjectivity that subjectivity is produced and disciplined. Developing this notion in the present context entails the recognition that the influences on perceptions, attitudes and opinions are partly psychological (of minds), partly linguistic (of brains) and partly socio-cultural (of social experience). Where these three elements overlap we contend that the basic subjective activity is interpretation, so that a theory of meaning based on the concept of signification will be necessary before we can penetrate the world views of participants in risk perception surveys. In particular, we adopt the idea that an individual's 'risk attitude' is manifested and can be observed in terms of the particular way in which he or she invokes the available material of risk discourse.

We then recognise that any reading of this discourse must be made with regard to the institutional and ideological regime within which it is employed. All readings of risk discourse are therefore inherently problematic since each one depends on an a priori assessment of the context (often defined by local and temporal particularities) within which the reading will be made. This context may be difficult to define precisely. Finally we acknowledge in addition that the completing of a questionnaire is a particular kind of social activity, and suggest a number of terms in which this should be understood.

Conceptual foundations

1. Different realities: subjectivity and intersubjectivity

There are clearly widely different convictions within the same society as to what really <u>are</u> the risks that people face in their everyday lives. It is also apparent that different people worry about different things. The broad aim of perception research is to use methodologically sound and empirically based means through which such differences in conviction, belief and perception can be described, represented, differentiated, and understood.

That differences are apparent might in the first instance be taken to be an exemplification of the intrinsic feature of the human mind which philosophers and psychologists call subjectivity. Searle (1984 pp15) describes and elaborates this quite simply as follows:

"...subjectivity is marked by such facts as that ..... I can see the world from my point of view; you see it from your point of view. I am aware of myself and my internal mental states, as quite distinct from the selves and mental states of other people....

Being concerned about a tendency of certain 'scientists' to neglect the fact of subjectivity, he continues (pp15-16)

....it is a myth to conceive of reality as something that must be equally accessible to all competent observers - that is to think of it as objective....it seems to me a mistake to suppose that the definition of reality should exclude subjectivity. If a scientific account of the world attempts to describe how things are, then one of the features of the account will be the subjectivity of mental states since it is just a plain fact about biological evolution that it has produced certain sorts of biological system, namely human and certain animal brains, that have subjective features.....if the fact of subjectivity runs counter to a certain definition of the word 'science', then it's the definition and not the fact that we will have to abandon..."

Having recognised that different people experience reality in different ways it may in turn be more correct to speak of different realities. But where in the survey process we must give full weight to subjectivity and seek to engage it as completely as possible, we propose that in our analysis of data so derived, we should be interested in the frameworks of intersubjectivity which link them, because it is here that the social and political reality and significance of risk discourse will be revealed.

"In our everyday life we are continuously ordering, classifying and interpreting our ongoing experiences according to various interpretative schemes. But in our everyday life those interpretative schemes are themselves essentially social and intersubjective. Intersubjectivity lies at the very heart of human subjectivity" Bernstein 1983 pp145.

Thus, from trying to assist a personal expression of a subjective reality in the interview stage of the survey process we move, in the analysis of data, to a discrimination of the conceptual and linguistic structures which enable these realities to exist.

Central to the foundations set out in this paper, then, is the notion of intersubjectivity. By this we understand that humans are always in the midst of a pre-given context: there is no transcendental vantage point outside it from which they can view things. There is instead a

"participatory involvement in the dialectics of subject to subject (intersubjectivity) and subject to object [of interest]." Jay 1982 pp94.

Only by acknowledging each and everyone's place in an already given interpretive context (the hermeneutical cycle) can one correctly approach the 'truth' behind the many possible meanings available.

In the case of the Black Report and the communities in West Cumbria, for example, we should not only identify their locale as the spatial domain of primary relevance to the Black Inquiry (and a television programme broadcast nine months earlier), but, quite crucially, as a locale for which Sellafield is the primary local institution, dominating its social

and economic affairs, and which is, above all, an ordinary part of life. It follows that the roots of concern for possible malign effects or, of rejection of any basis for such concern run much deeper than the content of the two current events - tv programme and report. These events became embedded in the existing pre-givens for these communities: additions to pre-existing intersubjective worlds of communicative action, dialogue, social being, meaning and understanding which are, in important respects, centred on Sellafield. Its reprocessing plant is not only a source of local prosperity relative to the rest of Cumbria, but a binding force of community identity and thereby a major focus of virtually all life.

In summary, we specify subjectivity as our initial way into the understanding of risk 'perceptions' and 'attitudes', but then identify intersubjectivity as the way in which this subjectivity is possible and the way it can be investigated.

2. Minds, brains and social experience

[FIGURE 1 ABOUT HERE]

Figure 1 depicts in very broad terms, our conceptualisation of the origins of risk discourse, portraying on the one hand, individuals' own private

reflective understanding of things, conditioned in turn by past experience, and on the other, individuals wider communication and interaction as a member of a social milieu. This includes both informal (eg friendship, kinship) and formal (eg authoritarian) networks whereby communication and dialogue with others can serve to confirm and verify already held positions, or lead to revisions. The model presents people's perceptions, attitudes, and opinions (their positions) as products of both their own interpretations and of their material and cultural experiences. A more detailed sketch of what we take to be the constituents of the institutional context which frames these experiences in the case of populations local to Sellafield is given in Figure 2.

[FIGURE 2 ABOUT HERE]

The influences identified correspond with Wynne's (1983) more general description of risk as being one facet of conceptions about technology and industry which are set within an historically changing and transforming framework of social values, meanings and cultures.

3. Perception as an interpretative, not a cognitive process

It follows from section 2 not only that a 'risk' identified by an analyst (for example disputed health risks from Sellafield) will tend to produce different attitudes for different individuals but, more fundamentally, the risk itself should not be assumed to be the same thing for all individuals. In short, people have different attitudes to risks not only because they see things differently, but because they see different things. Risks, and our appreciation of them, are buried within social codes and social action. This is not to deny that there are such things as more or less objectively calculable physical risks - tolerances and margins of safety which are integrated into industrial systems. But if we want to study the social world as it is, we must conceive of its realities as being socially produced, not as an inert, exogenous purely physical entity.

In the light of these remarks we can introduce a more specific definition of what we take 'risk' to be. As opposed to the sort of technical definition that has been adopted as a basis of the mainstream of psychological research, we find a more fluid definition considerably more useful: that people perceive of risk not simply as something numerical but rather as something that has itself arisen from a set of circumstances or contingencies within the dynamics of technical, managerial and labour processes and structures. For us risk perception has become <u>people talking</u>

about an imperfect technology; it can only be understood as an interpretative activity actualized in discourse. From our understanding of 'institutional risk' there is nothing 'actual' about risk. It is not 'out there' and measurable in an obvious sense (it is not a fact in the normal sense, although it is often studied as if it is). Risk has to happen, a set of circumstances have to coincide within the dynamics of technical social processes and structures. Risk 'comes true' in the multiplicity of new contingencies which are imposed when a new phenomenon arises. Risk happens in the 'becoming' of, in this case, an industrial system; it is latent within its 'possibilities'. What is therefore 'actual' about risk is not its possibility but the institutional structures within which these possibilities occur. We understand that it is not a phenomenon called 'risk' which we conceive of when thinking about the risk of child leukaemia around Sellafield, for instance, but those patent manifestations of the strucutres within which hazard may be a possibility.

4. Signification and semiosis

The entire world, whether described as fact or value, can only be understood by relating one thing to another, or, more formally, by interpreting (reading) words, events and worlds as if they were signs

(symbols signifying further words, events, phenomena). Words have meaning because they can be related to other words; events have meaning because they can be related to other events and experiences, and so on. Formally, we can say that the world is experienced through systems of signs, and understanding what a symbol or word (sign) means is through the constant, infinite, activiation of the structure of other symbols (signs) within which it can attain meaning. The way in which signs relate to each other and the way in which they are revealed to the interpreter is described by Pierce as follows:

"A sign is anything which determines something else (its interpretant) to refer to an object to which itself refers (its object) in the same way, the interpretant becoming in turn a sign, and so on ad infinitum" Pierce in Eco (1973) pp57.

Therefore the interpretation (and understanding) of the coupling of signifier and signified can only come about by opposing it to or combining it with another sign. To interpret a signifier it is necessary to posit or substitute another signifier (and another, and another) and it will be the tension and relationship between the two (the differance) - which 'translates, makes clear and analyses' (Eco 1973) the sign - which produces meaning. Formally, semiosis is the process of transformation of anything which we seek to interpret and comprehend into a sign. Practically, semiosis is the means through which life (one's entire world) is experienced and attains meaning for an individual.

Significations then, provide a ".... means by which collective social

understandings are created..." (Hall 1982 pp70). They are therefore a real and positive social force which impose a particular range of privileged meanings, the legitimate currency of a discourse, through their classification and framing strategies. Significations associated with nuclear power are, for many individuals, of great depth and pathos; as, for example, indicated in children's drawings (Brown 1985), in anti-nuclear art, posters and other propoganda (and conversely extreme attempts to soften them in corresponding pro-nuclear material) and in the diverse interpretations given and connotations attached to particular nuclear messages and issues.

To understand public 'risk' perceptions and attitudes in the nuclear context is to understand significations as they exist in the public sphere; it is to interpret and deconstruct the pre-suppositions, arguments, propositions, evidences and images of public discourse on nuclear power. By adopting this perspective a much more solid and comprehensive programme of research into public attitudes to nuclear power and risk is revealed. By recognising risk 'attitudes' as products of the process of signification (processes which are developed and operated through systems of intersubjectivity) we develop further, and with a more critical analytical edge the conception of man as an intersubjective agent. Since, moreover, interpretation is a complex and dynamic activity whose raw material, signs, are continuously in a state of flux, continuously creating identities through their relationships, it should be

clear that meaning can be a very fragile thing. The notion of signification therefore radically problematizes the adoption of any static, technical concept of risk.

In summary we have already described risk as part of a structure of meaning (see figures 1 and 2); we can now further suggest that the way this structure of meaning was derived, and can be understood, is in terms of the process of signification.

5. The social organisation of signification

Promotion of the above perspectives may prompt the fear that the analyst may be faced with an infinite, possibly random array of possible interpretative interrelationships with no means of organisation, ordering or discrimination. It should be realised though, that all reason functions within tradition; tradition is neither random nor a 'dead weight' but is continuously embraced, affirmed and cultivated. The process of signification itself, then, is socially organised into a number of codes.

The location/fixation of tradition can be seen to be fundamental to culturally based approaches. We can quote further from Wynne to reinforce

the brief summary of such perspectives already outlined above:

"Cultural filters shape the perception of nature in a systematic way, blocking inconsistent data and higlighting confirmatory data. These filters are not merely encrusted habits learned by rote and mindlessly enacted from one generation to the next; they are the product of active scheming to maintain a given cultural style or bias in contention with competitors" Wynne (1983) pp4.

As Thompson (1980) remarks, this use of the term culture does not refer to those vague pseudo-entities such as 'American culture' or 'French culture' but instead, to the various cultural biases that are to be found in varying proportions within American society and French society. They are synonymous with different 'world views' - shared convictions about how the world is, that sustain and justify moral judgements. Moreover, Thompson argues that there are, in fact, relatively few 'stable' cultural biases, so it is possible that this view could be fully integrated within the frameworks of intersubjectivity.

To date the interface between such cultural perspectives, and linguistically based frameworks of intersubjectivity does not appear to have been elucidated, and therefore does not yield a sufficiently explicit basis for present purposes. As it stands, cultural relativism seems to make too decisive a distinction between culture and the minds of the individuals who produce it. It produces culturally orientated investigations which give insufficient consideration to the inner thoughts, feelings and perceptions of culture-producing actors; relations among cultural elements being examined without consideration of

(inter)subjective meanings. We do not find the formal separation of subjectivity and culture to be satisfactory because we understand that people's subjectivity is both shaped by and manifest in their culture. Their subjectivities both make up and are themselves created by their cultures. In order to adopt a more satisfactory conception of these interpenetrating factors (subjectivity, intersubjectivity, and culture) we prefer to appeal more generally to the concept of prejudice.

"[I]t is not so much our judgements as it is our prejudices that constitute our being. This is a provocative formulation, for I am using it to restore to its rightful place a positive concept of prejudice...It can be shown that the concept of prejudice did not originally have the meaning we have attached to it. Prejudices are not necessarily unjustified and erroneous, so that they inevitable distort the truth. In fact, the historicity of our existence entails that prejudices, in the literal sense of the word constitute the initial directedness of our whole ability to experience. Prejudices are biases of our openness to the world. They are simply conditions whereby we experience something - whereby what we encounter says something to us" Gadamer (1967) pp9.

and again

"...There is no knowledge without preconceptions and prejudices. The task is not to remove all such preconceptions [by bracketing or overcoming them] but to test them criticallly in the course of inquiry": op cit pp128.

It is through the identification of differentiations and fractionations in people's language, dialogue and discourse that prejudices and biases (peoples personal frames of reference or paradigms) can be discerned, and through which experiences can be opened for the analyst. We must acknowledge that participants in a survey will have <u>already developed</u> positions, through experience in engaging in previous discourse on related issues. They may maintain a unity of opinion by repeating arguments which

have been effective in past dialogues (effectiveness, in turn being conditioned and assessed in relation to particular social networks), and by adapting them to the needs of the moment. These arguments may have altered with practical and discoursal experience. This corresponds to the Gadamerian 'prejudice' which is the dialectic of performance and interpretation; a recognition of both a material, dynamic, socially constructed discourse and an active application, use and elaboration of that discourse by variously socialized and positioned individuals with interpretive competence. Adopting this perspective in the analysis of responses to questionnaire surveys, we believe, will take us beyond approaches adopted elsewhere to date in the risk perception research field. What is to be primary in the analysis is people's discourse. From the perspective of the discourse we can then investigate which social elements compose it, how they participate in it, and also perhaps indicate something of the relationship between discoursal features and wider cultural characteristics.

6. Language as the data for analysis

We earlier defined risk perception as 'people talking about imperfect technology'. In order to analyse this <u>activity</u> in terms of a concept of

discourse we will assume a risk attitude to be the particular way in which anybody chooses to invoke the available raw material of what we are calling 'nuclear discourse'. Analysing language, dialogue and discourse means confronting a broad, dynamic process of communicative action and interpretation. The term discourse itself needs explanation. In Edward Said's (1984) definition, discourse is "a language of truth, discipline, rationality utilitarian value, and knowledge [which clothes, disguises, rarifies and wraps up the will to exercise dominant control in society".] The sense in which we will use the term will be slightly less rigorous. In a discourse around a scientific dispute we have to allow for a wide possiblilty of resistance and disagreement. Therefore, although all the authoritarian connotations of Said's definition hold true, we see this authority as basically problematized and compromised. To put it another way, public risk perception research delineates a crisis of legitimation for the nuclear industry.

Any idea of discourse necessarily assumes the social organisation of communication and the networks of power which act in its production. An analysis of discourse must assume the contingency of speech situations (who speaks to who, when and what about, not only in the survey interviews - see 9 below - but in all interactions in the local area, past and present), the dominations within communicative interactions, and the evn more difficult to assess determinants of speech such as memory and speech competence. These are the objective conditions of the production of a

discourse.

"The sign is a construct between socially organized persons in the process of their interaction. Therefore the forms of a sign are conditioned by the social organisation of their participants (and their interests) and also by the immediate conditions of their interactions" Volosinov 1929, in Forster 1984 pp59.

To recognise language as a deserving focus for analytical attention is by no means original. As Jay (1982) argues, the intellectual history of twentieth century western thought has been dominated by a quickening interest in the question of language in virtually all disciplines. The premise of almost all this philosophical endeavour has been the recognition that language cannot be treated as a neutral, transparent medium of expression and representation. On the contrary, language is prior to humanity and speaks through it. In this view, man is constantly in the midst of a linguistic pre-given, trying to find meaning through it. It is a view that posits language as actually essential in the structuring of experience, as being intrinsic to social being. In the end human reality is determined by its linguisticality. Though there is continuing debate about the extent to which structuralist ideas can exhaust the conceptualisation of people's realities, we consider them very powerful (without necessarily being exhaustive) in opening up rich new perspectives for 'perception' research.

Following this line of thought, it is through language that people are ordering and articulating experience. Language is a very basic medium

through which symbolic structures achieve meaning. The roots of how people bring meaning to and adapt around threats in the environment, we suggest, can often be found in the way terms and propositions are used in talking about them. Language is of importance then, not only through being the medium of an analysts observation, but indeed in the very generation of 'perceptions' and formation of 'attitudes', through its key role in interpretative processes.

The real complexity of analysis within the linguistic perspective resides in the fact that the range, intricacies and politics of a discourse is variously known and utilized by different actors. As such a discourse is an available source of meaning before it is linguistically enacted.

It is Habermas's contention that

"Language is <u>also</u> a medium for domination and social power; it serves to legitimate relations of organized force. In so far as the legitimations do not articulate the power relations whose institutionalization they make possible, in so far as these relations manifest themselves in the legitimations, language is ideological" (Habermas 1977 pp380)

Humanity is therefore not only immersed in linguisticality, but this language (or linguistic context) has already been defined (again, more or less rigorously) by a whole range of contingent and complementary uses: as an instrument of authority, as an instrument in persuasion, or deception, or information (in pure science), and so on. In the end it is precisely these distortions (of organised force) which need to be 'unmasked' and explained.

7. The instrumental nature of survey processes

In appreciating that the empirical evidence (language, dialogue, discourse) arising from the use of a social survey questionnaire will observe and depict perceptions and attitudes in its own characteristic way, it must also be recognised that other means of observation will yield other types of evidence, and will in turn give their own (probably different) characteristic depiction of the attitudes etc of the population. In other words, what is observed will depend on the instrument of observation (including how it is employed), and not only on what is already 'there'. In the social sciences it can be recognised to be a case of the Giddensian (1979) theory of structuration. He presents the concept of a duality of structure in social systems by which

"....the structural properties of social systems are both the medium and the outcome of the practices that constitute those systems" pp69

The structural properties in our case are the characteristics of public opinion, and the medium by which they are, in part, constituted is public opinion research. Certainly we have surmised (in the previous principle) the influences on public opinions, but 'opinion' has to be articulated and recorded before the notion can be translated into something tangible (see figure 3). It might be intended merely to monitor public opinion in West

[FIGURE 3 ABOUT HERE]

Cumbria (or elsewhere) by means of a social survey in that locality, but there is no escape from the realisation that the opinion as reported by the survey is, at least in part, a creation of the survey process. The social survey is therefore a primary means by which public opinion of nuclear risk is reproduced and reconstituted. Other social practices - speeches, letters to newspapers, and an analyst's observation of them, entail different media which in turn have the means to produce different complexions of public opinion. Each in its own way and in its own place performs the function of maintaining an area of dispute which is 'public opinion'. This is not a trivial point since it is necessary to be able to say why there is <u>not</u> a 'public opinion' about, for example, chocolate bars.

Within the medium of the questionnaire there are delimitations (sometimes strict, other times relatively loose, but always somehow) for what can be said and on what issues opinions can be uttered. The instrumental characteristic of survey questionnaires is very readily apparent in the case of obviously 'leading' questions on the questionnaire. What must be appreciated is that all questions are, to some extent, leading: they put

certain topics or issues on an agenda for the respondent to address, and not others. It is these questions (to the exclusion of others) in terms of which opinion is monitored and created.

Analysis of survey responses (for methodology and findings, see Macgill and Berkhout 1985a, Berkhout and Macgill 1985) then in turn imposes a particular dissection, partitioning and aggregation of replies, and thereby structures what may previously have been a whole set of inchoate utterances and observations into something which is recognizable as a fragment of risk or nuclear discourse. The basis for the dissection, partitioning and aggregation may be partly intuitive, partly explicit, and will always impose its own further structuring of opinion.

8. Windows on realities

We have argued that to understand public opinion properly, public opinion research must engage with the frames of reference, arguments, problems and myths manifest in a public discourse. For an issue such as nuclear power, this is likely to embrace very different ways of defining and looking at problems, very different attitudes to authority, particular loyalties and desires to maintain them, different degrees of trust in institutions, particular types of justification and criticism. These are issues that many questionnaires on attitudes to nuclear risk have generally neglected,

through being dominated by a technical analysts, not a respondents, point of view. The argument of the present paper, for example, demands the use of free response questions, yet these have typically been given secondary importance (and their significance barely appreciated) or, more usually, omitted altogether in previous surveys.

In testing discourse it is important to acknowledge that the analyst's intended use of words may not match that of the people responding to the questionnaire. We cannot depend simply on the intentionality of the questionnaire designer for meaning. Spent fuel, for example, might be variously interpreted as nuclear waste, valuable resource, bomb material, subject of research, or whatever. It is just not possible to set questions whose meanings can be assumed to be common to all individuals who are involved. Respondents will, within bounds, set their own terms of reference in answering an interviewer's questions. Indeed, it is this very diversity which careful, sensitive interviewing will seek to elucidate, and discourse analysis to systematize.

A further point to recognise is that it is clearly impossible for an analyst, through social survey work, to get a complete picture of an individual's view on anything beyond the most straightforward matter, let alone that of a community of individuals. From what has already been said it should be apparent that even relatively specific questions about aspects of Sellafield may conjure a myriad of connotations - as already

mentioned, Sellafield appears in all sorts of ways in people's lives in West Cumbria - in reportage, in conversation, in work, in seeing others working, in the physical infrastructure on the landscape with its tall stacks and diffusing plumes, in monitoring activity, in its position as a social focus, in local humour and folklore. Nuclear reprocessing is not a stark technical fact. It is very much part of a rich local cultural experience and should be spoken about in those terms in any analysis. Of these many associations and connotations, only part may be communicated to the analyst, only part then undertstood, and only part then represented and recorded. A succession of 'windows on' and in turn 'clues to' the respondent's reality, only partially alligned, and each incompletely transparent. Any one conversation or survey interview, however full and however well aided by an appropriately designed questionnaire, cannot yield an exhaustive record of one type of view or attitude. An analyst can only seek to create partial (re)constructions of people's views through social survey work. Which parts are reconstructed and interpreted is going to depend upon which questions are asked, how informed are the coordinates of analysis, and how 'realistic' the analyst's guiding intuition. However, no matter how 'careful', 'unobtrusive' or 'informed' the analysts scalpel in separating and discriminating different patterns of language, what will be produced will inevitably be artefactual - an account of accounts.

"One is entitled to give an 'account of accounts', so long as one does not put forward one's contribution to the science of Pre-scientific

representation of the social world as if it were a science of the social world". (Bourdieu 1977 pp21, following Garfinkel 1967)

Bourdieu continues:

"Because the native is that much less inclined to slip into the language of familiarity to the extent that his questioner strikes him as unfamiliar with the universe of reference implied by his discourse (a fact apparent in the form of the questions asked, particular or general, ignorant or informed), it is understandable that anthropologists [or, in our case, the social surveyers and readers of their findings] should so often forget the distance between learned reconstruction of the native world and the native experience of that world, an experience which finds expression only in the silences, ellipses, and lacunae of the language of familiarity." Bourdieu p18.

"...the subtlest pitfall doubtless lies...in the fact that such descriptions [might] freely draw on the highly ambiguous vocabulary or rules, the language of grammar, morality, and law, to express a social practice that in fact obeys quite different principles [than the one attributed by the analyst]" Bourdieu, p19.

9. Response to a questionnaire as social interaction

Finally, we should try to make clear what participation in a social survey may mean to a respondent in terms of what is happening when someone agrees to participate in a survey interview. We can distinguish between assuming that respondents are either freely but passively laying bare their attitudes, views and opinions (or getting things off their chests), and conversely inviting and encouraging them actively to participate in a public discourse. A bit of each, perhaps, but what is important is to see that they are each different in kind, and thus clarify our understanding of the nature of a survey interview as a social activity.

Responding to a questionnaire on environmental risk/nuclear power and disputed health risks might be looked upon as a political activity. It would be naive to assume that respondents reply with no consideration for what the implications of giving certain answers might be. Respondents may anticipate the responses of other participants and measure their own responses against them, in tandem with purely private criteria. Populations remote from nuclear power stations may treat surveys with disdain or disinterest: they may have little desire to participate and may not believe that their voices can affect such a monumental technology as nuclear power. And as knowledgeable, intersubjective agents, they would probably be quite right. Similarly, for surveys undertaken in an area like West Cumbria there may be different considerations. Particularly apparent in some responses to our survey was a deep desire to <u>become involved</u> in the public debate about Sellafield which many local people felt excluded from.

The voluntariness of a response does not guarantee either a disinterestedness or disengagement from the role of <u>becoming</u> a member of public opinion, from being asked to take part in a social process on equal terms with everyone else who has been asked. As civilians they are being asked to express a view which might be constitutive, perhaps in the newspapers the following week, or simply in the minds of the nuclear establishment, of a representative mood. Consciousness of this role is

reflected, for example, in the different sorts of defensiveness towards their own locale found in West Cumbria, and peoples desire to know who is funding and organising the survey and what the findings are to be used for.

Willing participation in a survey requires the acceptance by the respondent that it is a legitimate social tool and that he or she is able to put his or her point across fairly. There is nothing ordinary about an interview. In many ways a survey in West Cumbria in 1984 would be a repeat of the invasions which journalists had made before. The difference in our case was that most of the interviewers in our survey were local and came under the aegis of a legitimacy of expertise and impartiality; a kind of arbitrating third party which could somehow stand outside the bitter in-fighting of the "controversy" and thereby still retain a concern for the best interests of local people. We had to accept that in undertaking the survey we would be both in real and perceived terms acting as an agent of the very legitimating force we were seeking to investigate. Our impartiality and autonomy would actually be a state-sponsored partiality. This might finally be the only basis on which it could be conducted.

What is expected of the interview by both participants in an interview? What can be said? What is not said, consciously or unconsciously? (There is a crucial difference between postal and interview survey which can be positively exploited, not tolerated as unwelcome interviewer bias.) The

interviewer has, if his or her credentials are right, immense power, as a complete stranger who is able to ask difficult, and sometimes intimate questions of a vulnerable interviewee. Some people may feel vulnerable; others may give untruthful or deliberately partial answers: the interviewer is not necessarily a person in which they would want to confide. Respondents may over- or under- state their 'views', repressing deeper thoughts and feelings too overwhelming to bring consciously to mind, let alone to express for an external observer. Others though, may respond fully and positively to the opportunity for reflection and dialogue (itself generative of thinking) arising from the survey interview. It cannot matter that lengthy responses lead to an 'over representation' of certain respondents veiws in the survey overall. The complexities in the generation of risk discourse and the impurities of any observation processes render the whole concept of 'representative' views deeply problematic anyway (though some surveys pretend that this is not the case). Besides, people who talk at length may often constitute the dominant, influencing voices in the social milieu. If the truly dynamic and fragile nature of 'perception is acknowledged, then the findings should be taken back to the community, not only to inform people of how they have been depicted, but for further response and reaction. The experience of being faced with a reflection of themselves may of itself generate further reaction.

In summary, following from a progression through seven interlocking

principles by which the nature of people's 'risk perceptions, attitudes and opinions' can be understood and revealed, we recognise in turn a number of inevitable impurities in the observation process (the survey), both as an instrument (section 8) and as an activity (setion 9).

Conclusion

In this paper we have argued for the adoption of new perspectives within the academic community (and elsewhere) in the pursuit of knowledge about what are ordinarily called risk perceptions and attitudes. Specifically, rather than the idea of a 'risk attitude' being either a psychologically generated expressivity (cf Royal Society 1983 ch.5) or a culturally determined position (cf Douglas and Wildavsky 1982, Thompson 1980), the idea of a 'risk attitude' being the way an individual chooses to invoke the available material of what we can call 'risk discourse' should be given primacy.

What seems to us to be imperative is to refute the simplistic idea of an irrationally fearful and misinformed public. Instead of being passive subjects of the nuclear debate they are very much part of it. The very fact that an organic, elaborate discourse exists is already a challenge to the authority of Sellafield in West Cumbria. That is why, in seeking more completely to discover it, we are making that same challenge to the three previous levels of understanding of 'risk perceptions and attitudes'

distinguished earlier in this paper. Not only are we underlying our belief that it is important to make the industry more accountable, but that risk discourse is an objective social phenomenon which constitutes a fundamental element of local and national culture. It will be the evolution of this large, complex, volatile sphere of intersubjectivity which will have to be reckoned with in social surveys, Black Reports, other 'expert' inquiries, the nuclear industry's own legitimation and public relations. Risk discourse is a well of experience, argument, reflection, agreement and resistance, which cannot easily be changed, shaped, or broken down by authoritarian pronouncements and assurances. There are deep emotional and material investments in it. As we observed earlier, it is a 'part of life'. Any policy towards the legitimation of nuclear power, whatever it may be, will have to come to terms with its complexity and subtlety, and engage with the often tacit demands which it makes of the industry.

Acknowledgements. We would like to thank Byung Doo Choi for his comments on an earlier draft of this paper. The work was partly supported by a grant from the Economic and Social Research Council.

References

F G Berkhout and S M Macgill (1985) Child leukaemia around Sellafield - local community attitudes to the television documentary 'Windscale: the nuclear laundry'; School of Geography, University of Leeds.

R J Bernstein (1983) Beyond objectivism and relativism; Oxford; Blackwell.

D Black (1984) Investigation of possible increased incidence of cancer in West Cumbria; Report of an advisory group; London; HMSO.

P Bourdieu (1977) Outline of a theory of practice; Cambridge; Cambridge University Press.

J Brown (1985) How the public think feel and act towards nuclear power; paper presented to the Institute of Energy; London; 26th March.

Council for Science and Society (1977) The acceptability of risk; Barry Rose Publishers.

M Douglas and A Wildavsky (1982) Risk and culture; California; University of California Press.

U Eco (1973) Social life as a sign system, in D Robey (ed) Structuralism: an introduction; Oxford; Clarendon Press.

A Fink and J Kosecoff (1985) How to conduct surveys: a step by step guide; London; Sage Publicatons.

B Fischhoff, P Slovic and S Lichtenstein (1982) Lay foibles and expert fables in judgements about risk; in T O'Riordan and R K Turner (eds) Progress in resource management and environmnental planning, vol 3, pp161 - 202; Chichester; John Wiley.

Foster (1985) New Left Review; vol 150.

H Gadamer (1967) Philosophical hermeneutics; trans. D E Linge; Buckley University of California Press.

H Garfinkel (1967) Studies in ethnomethodology; Englewood Cliffs, New Jersey; Prentice Hall.

A Giddens (1979) Central problems in social theory; London; Macmillan.

J Habermas (1977) A review of Gadamer's 'Truth and method', In F R Dallmayr and T A McCarthy (eds) Understanding and social inquiry; Notre Dame: University of Notre Dame Press, pp335 - 363.

S Hall (1982) The rediscovery of 'ideology' - return of the repressed in media studies; in M Gurevitch et al (eds) Culture, society and the media; London; Methuen.

M Jay (1982) Should intellectual history take a linguistic turn? Reflections on the Habermas - Gadamer debate; In D La Capra and S L Kaplan (eds) Modern European intellectual history; Ithaca and London; Cornell University Press, pp86 - 110.

S M Macgill and F G Berkhout (1985a) Child leukaemia around Sellafield - local community attitudes to the Black Report; School of Geography, University of Leeds; Working paper 450.

S M Macgill and F G Berkhout (1985b) Languages of risk in West Cumbria; School of Geography, University of Leeds.

B Mitchell (1979) Geography and resource analysis; London; Longman.

T O'Riordan (1983) The cognitive and political dimensions of risk analysis; Journal of Environmental Psychology; 3; 345 - 354.

H Otway and K Thomas (1982) Reflections on risk perception and policy; Risk Analysis; 2; 147 - 159.

Royal Society (1983) Risk assessment: a study group report; London.

E Said (1984) The world, the text and the critic; London; Faber.

J Searle (1984) A froth on reality; Reith Lecture, reprinted in The Listener; 8th November.

M Thompson (1980) Political culture: an introduction; Laxenburg, Austria; International Institute for Applied Systems Analysis; WP-80-175.

J van der Pligt and R J Eiser (1984) Public attitudes to nuclear energy; Energy Policy; 12; 302 - 305.

V N Volosinov (1929; trans. 1973) Marxism and the philosophy of language; Seminar Press, New York.

L Winner (1978) Autonomous technology; Cambridge, Mass: M I T Press.

B Wynne (1983) Public perception of risk - interpreting the "objective versus perceived risk" dichotomy; Laxenburg, Austria; International Institute for Applied Systems Analysis; WP-83-117.

Table 1 Possible determinants of attitude

1. Information. People have different amounts of information about what the physical risks are estimated to be - perceptions may be too conservative or too alarmist as a result. In the key report by the Council for Science and Society (1977) it is suggested that the most acceptable risk is perhaps the one about which people are most ignorant, and Douglas and Wildavsky echo this sentiment in suggesting that the very dangers people seek to avoid are those that may harm them least. It is the deemed importance of information (or the lack of it) as a basis for exaggerated risk concerns that underlies the promotion of better information campaigns as means of allaying fears.

2. Compensation or benefit. People stand to benefit in different ways from activities that might be deemed to be sources of risk; the same sources might generate jobs, indirect income, useful consumer products and security to a neighbourhood too. The idea that people engage (or can be persuaded to engage) in a risk-benefit 'trade-off' has been prominent in the psychological literature. Otway and Thomas (1982), in distancing themselves from conventional psychological approaches argue more fundamentally that since risk cannot be separated from the wider package of characteristics (impacts) from the risk source. and individual's perception of risk can likewise only be properly understood in the context of his or her relation to wider impacts.

3. Culpability. This heading is used to refer both to the degree of voluntariness in exposure to a possible risk, and the degree of controllability a person has over a perceived source of risk. Such factors can be fundamental both in acting as a catalyst for deeper seated risk concern, and in seeking apportionment of blame in the event of accident. Though not directly associated with the psychological school Wynne (1983) gives a telling account of this characteristic, arguing that mistrust in institutions should not be regarded simply as a symptom of, but rather as a catalyst for, risk concern, an argument which we consider more fundamentally in the text.

4.Familiarity. The Royal Society Report (1983) states that it has been amply demonstrated at the neurophysical level that living organism react less and less to all stimuli with repeated exposure (a familiarity effect). It is an adaptation effect thought to depend on the fact that repeated exposure contains no intrinsically new information. They suggest that this explains why anxiety towards nuclear plants may be found to increase at greater distance from such plants, though alongside this explanation, another factor is introduced - that rumours (products of low information and a cause of innaccuracy) may be more primitive at further distances.

5. Other risks. People's differing tendencies to compare a given risk source with others (and in each case with their wider packages) may also correlate with different perceptions (ie different people have different points of reference about what is acceptable in terms of comparisons with other risks, though the idea of 'comparing' risks is quite alien to many people).

6. Mental capability. Individuals' abilities mentally to visualise models of cause and effect, to visualise one or many aspects of a risk context, and to differentiate and synthesise them clearly differ. How it all impinges on their wider values, feelings and goals (self interests) in life will likewise vary enormously.

Figure 1

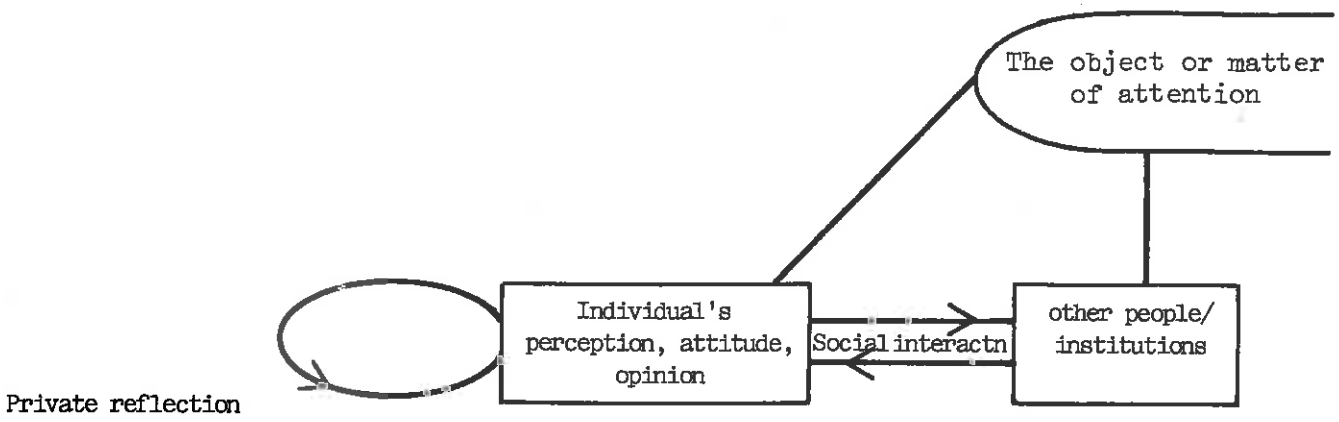


Figure 3

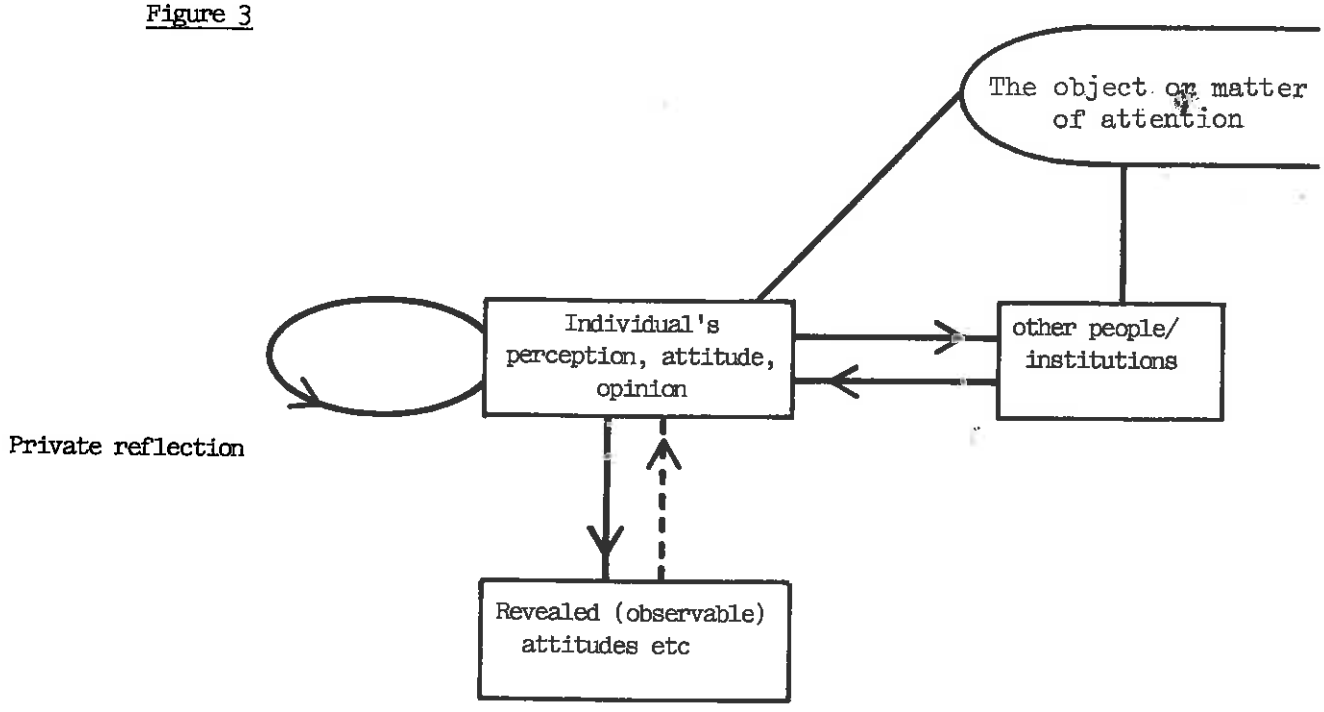
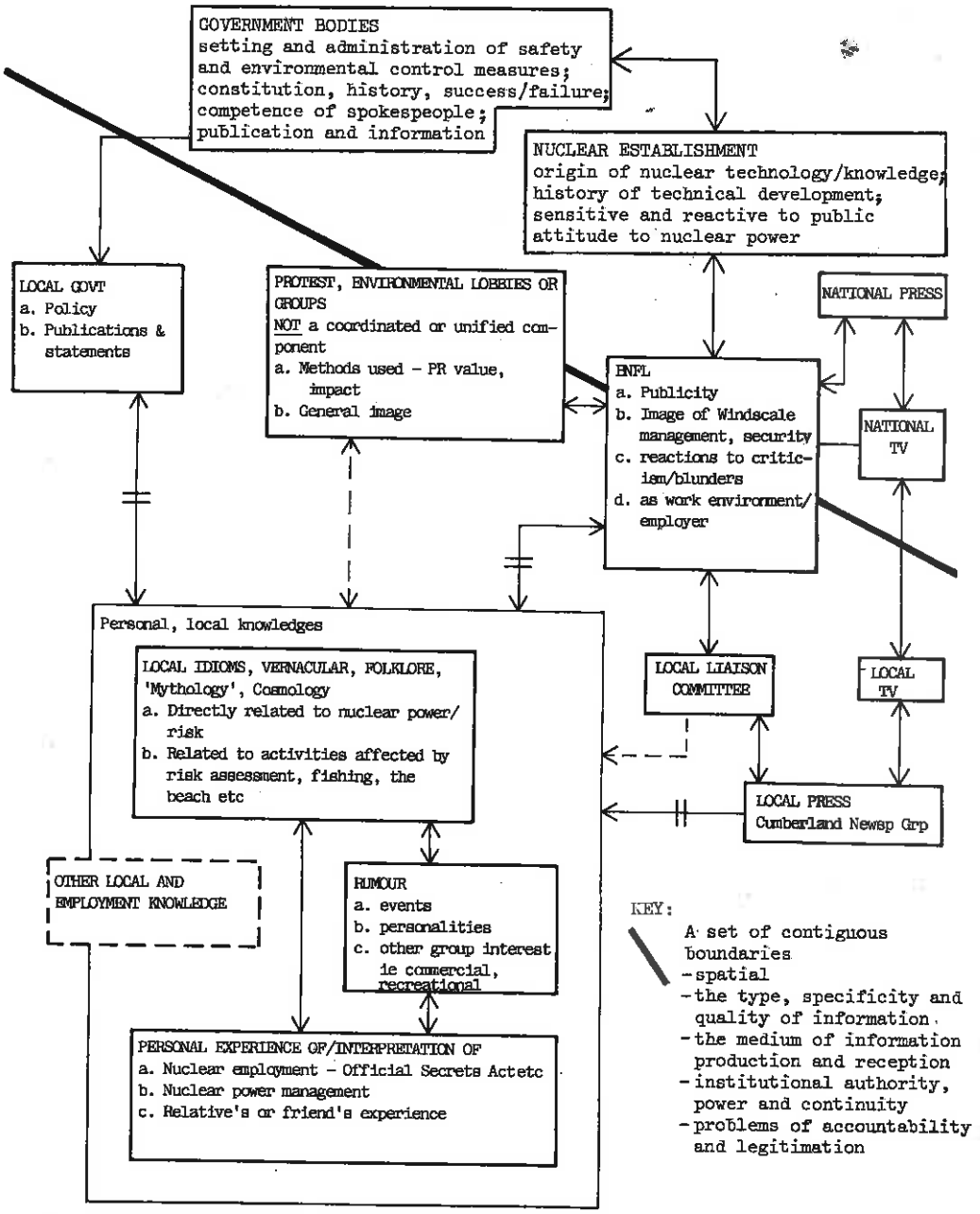


Figure 2


GOVERNMENT BODIES
setting and administration of safety and environmental control measures; constitution, history, success/failure; competence of spokespeople; publication and information
NUCLEAR ESTABLISHMENT
origin of nuclear technology/knowledge; history of technical development; sensitive and reactive to public attitude to nuclear power
LOCAL GOVT
a. Policy
b. Publications & statements
PROTEST, ENVIRONMENTAL LOBBIES OR GROUPS
NOT a coordinated or unified component
a. Methods used - PR value, impact
b. General image
NATIONAL PRESS
BNFL
a. Publicity
b. Image of Windscale management, security
c. reactions to criticism/blunders
d. as work environment/ employer
NATIONAL TV
Personal, local knowledges
LOCAL IDIOMS, VERNACULAR, FOLKLORE, 'Mythology', Cosmology
a. Directly related to nuclear power/ risk
b. Related to activities affected by risk assessment, fishing, the beach etc
LOCAL LIAISON COMMITTEE
LOCAL TV
LOCAL PRESS Cumberland Newsp Grp
OTHER LOCAL AND EMPLOYMENT KNOWLEDGE
RUMOUR
a. events
b. personalities
c. other group interest ie commercial, recreational
PERSONAL EXPERIENCE OF/INTERPRETATION OF
a. Nuclear employment - Official Secrets Actetc
b. Nuclear power management
c. Relative's or friend's experience
KEY:
A set of contiguous boundaries
- spatial
- the type, specificity and quality of information
- the medium of information production and reception
- institutional authority, power and continuity
- problems of accountability and legitimation