Triggering Behavioural response

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Is my intention to discuss the potential contribution of environmental and social psychology to many of the issues raised directly or indirectly today, and comment on David Pearce and Kerry Turner's discussion papers.

THE SOCIAL CONTEXT OF PSYCHOLOGICAL PROCESSES

We know from research that the structure of the public's beliefs about the environment, science and technology is complex, and multidimensional. For example, typing the public as pro or anti the new technologies in a unidimensional fashion does not reflect the differentiated cost-benefit analysis in which the public engage when reflecting on and coming to decisions about such technologies (Breakwell, 1989). We are in a position to predict the public's behaviour, but in the context of other beliefs and behaviours. We have found that it is inappropriate to attempt to elicit unidimensional, context-free statements about the beliefs. Any study which seeks to elicit beliefs about the environment and environmental change must investigate those beliefs within a larger context, in particular a constellation of beliefs and ideologies about the nature of change in society, its purpose and efficacy, and the role of different groups in society in bringing about change. Understandings and beliefs about environmental change have to be seen as intermeshing within a wider set of understandings and beliefs, and it is this inter-relationship which enables the prediction of orientation and behaviour. When attempting to trigger a behavioural response, it has to be recognised that we are not dealing with a single target of change as is typically assumed in much communications research. Insight into beliefs are likely to emerge not from whether an individual is pro or anti new technology but how far those pro/anti views are integral to the perspective and world view of particular groups in society. This, in turn, may have an important consequence for subsequent behaviour.

If we take this perspective then questions which need to be addressed include: to what degree are different elements within these networks of beliefs resistant or susceptible to change, and what is the effect of change in one element on other elements and the network of beliefs as a whole? Are people motivated to change behaviour as a consequence in changes in belief systems? We need to understand more about the dynamics of changing behaviour. We need to draw on various psychological models in order to understand the costs and benefits of our actions.

Do people take into account the broader costs and the broader benefits of environmental actions? To what degree do the public evaluate economic

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and non-economic consequences of environmental action? To what degree can the public generalise environmental problems and strategies in one domain to another? To what degree do the public see inter-relationships between environmental issues? How do people relate to change, especially environmental change and to other changes which are making place. How do they model the links between these different changes? One may find a propensity for attitude change in one area but such a change may be resisted if it is tied into another set of beliefs about the environment which are resistant to change.

While it is the nature of our disciplinary perspective to examine and understand cognitive and behavioural processes, as environmental and social psychologists we recognise that such processes have to be seen in their social context and that there is an important gearing between mental and social action. A good example of this can be taken from a study undertaken by one of my research students, Linda Blud (1988) who examined effective strategies for children's learning and understanding of scientific and technological concepts in museums. The study drew on Doise's theory of socio-cognitive conflict as a learning mechanisme. In this theory, the Piagetian concept of cognitive conflict (which is essentially an intrapersonal cognitive process) is augmented with social interaction (which is essentially an interpersonal social process). Our research found that initiating socio-cognitive conflict was a more effective device for enabling learning, knowledge gain and attitude change than simply using strategies which led to cognitive conflict alone.

A second study, using a co-orientation model, investigated the role of group membership on perceptions and attitudes to environmental issues and intergroup perceptions of the salience of environmental problems for other groups. We found that not only was the perception of one group influenced by their perception of «significant others» views and attitudes, but also their perceptions were highly influential in determining behaviour. Therefore, although we are dealing with psychological processes of perception, attitude and behaviour, such processes have to be seen within their social or group context. Again, a social psychological perspective was taken that is truly social and psychological.

Psychologists in the past have tended to focus on change at an individual level rather than addressing change strategies in respect of particular categories of people which would lead to corporate action. As attitudes should be seen within systems of belief structures related to and held by particular groups of people, so too should behaviour change be seen correspondingly.

IMAGES OF SCIENCE

It is clear that how people evaluate the environment does matter in terms of their perception and understanding of the environment. The sources of information to which the public pay attention are vitally important in terms of how they perceive and evaluate the environment. There is an important relationship between the public's perception, their attitudes and subsequent behaviour, and how these are influenced by sources of information.

Research by Glynis Breakwell on the public understanding of science has demonstrated that credibility and trustworthiness of sources of information about science and technology such as riskiness of technological developments is a vital element in attitude change. For the young, teachers are highly influential and scientists are seen as especially independent and trustworthy. This cannot be said of their view of politicians. The latest AIDS campaign has drawn directly on Breakwell's research and used senior scientists to convey risk messages.

Breakwell has found that there are three components to young people's image of scientists: dedication, productivity and anti-social life styles. This image is tied most closely to the individual's attitude towards scientific change and the scientific establishment. Seeing scientists as anti-social is associated strongly with being cynical about the extent to which the public can control science and benefit from it. Having said that, there is a belief that the speed and substance of scientific change is good. This is a good example of one of a number of issues about which we need to acquire more information if policies towards GEC and especially the feasibility of «willingness to pay» (WTP) approaches are to be meaningful.

There appears to be an increasing awareness nationally and internationally as to the threats which

the environment faces — the destruction of the tropical rain forests, the depletion of the ozone layer, widespread industrial pollution and soil erosion in both the Third World and the West. But are people able to relate global environmental problems to their own homes and neighbourhood and their own attitudes and behaviour? The recent publicity given to CFC's, the availability of lead--free petrol and bottle banks has probably helped. Yet it is suspected that translating global ecological problems into meaningful, everyday language and actions is not very far advanced. Indeed, how much real support is there for the «green» movement. Indicators which are typically cited such as the purchase of lead-free petrol, votes for the Green Party at the last European elections — are extremely unreliable and biased. Is support of environmental issues limited to the affluent sections of society who can afford to be «green».

GREEN ATTITUDES

Comparatively little is known about how the inhabitants of heavy industrial and economically declining areas perceive the environment. Do they have a positive attitude towards it, or do they not care what sort of condition it is in, given their dependence on industry for employment and the adage «where there's muck, there's brass»? Have they long since ceased to notice its condition? Can they relate global ecological issues to what is happening in their neighbourhood. Would they like it to be «greener»? Do they want to be involved in environmental change and are they aware of the opportunities for such involvement.

A project has been initiated recently between the East Durham Groundwork Trust (Graeme McLearie, Executive Director) and our Department (David Uzzell and Jenny Dickerson) which is attempting to address many of these issues. The project is focusing on the depressed and industrially derelict landscape of this part of Co. Durham. The project is regarded as important for many reasons.

Degradation of the environment generated locally as well as global environmental changes not only does and will have a physical effect on the East Durham landscape, but a social and psychological effect on the inhabitants and the community at large. The intention of the project is instil a sense of place and improve the villagers own self esteem and perception of themselves as being able to effect and contribute not only to the current visual appearance and future development of East Durham, but also global environmental solutions.

While this project will have a direct benefit for East Durham, it will also suggest possible actions for other Groundwork projects and other community-based initiatives throughout the country. The study has been largely conceived as an action research project. In addition, social surveys are being used, along with in-depth interviews and the development of psychometric measures.

ENERGY CONSERVATION

It is easy to see that indoor climate control is the largest sector of energy use and that studies so far have largely concentrated on attitude change. The study that Ian Griffiths of our Department undertook for SEGAS showed that while attitudes favourable to energy conservation were common, they did not really relate to energy conservation behaviour. At the same time, domestic energy seemed to use such a small proportion of the budgets of our sample that price indicators had no effect. There were other strong indicators that warmth in winter was almost inelastic. Positive attitudes to energy conservation are unlikely to reduce domestic energy conservation and we need to explore further the sort of modelling of attitude/behaviour change which Fishbein and later authors have elaborated.

The good news on the indoor climate front is that both the SEGAS study and the study of thermal comfort in passive solar buildings showed that temperatures desired for comfort are not anything like as high as international standards suggest; furthermore, they are not invariant either. Different building types (offices, homes, etc.) seem to require different temperatures and this is irrespective of activity level and clothing. If we could understand the processes underlying such differences — and we have some strong clues already — it could well be possible to have people comfortable in buildings running at 17-18° C in winter with consequent reductions in energy needs and the resultant emissions. It is worth adding at this point that the «energy crisis» a few years ago fuelled substantial work into energy conservation behaviour, in which

the cost/benefits of energy use was assessed. Such issues ought now to be addressed from a much wider perspective than energy conservation alone. Any calculation of cost/benefits of energy reduction should take into account the reduction of waste emissions into the atmosphere, and not simply calculate the depletion of non-renewable resources.

THE TECHNOLOGICAL FIX

It is clear that technological interventions will be necessary to tackle many of the GEC problems. But in times of crisis or disaster there are typically two responses: more legislation or more technology. In the former case, legislation by crisis leads to the accretion of laws and controls in a piecemeal fashion without the possibility of examining the system of legislation as a whole, or developing more radical solutions which deal with the basic problem. In the latter case, the question becomes increasingly one of how can we use technology to solve a technological problem rather than question why we needed the technology in the first place and is there some other way of operating without it? This «technological fix» approach whereby the solution to a problem is seen in technical terms and thereafter the problem is defined in such a way that only technical solutions are possible, permeates the «environmental crisis» debate in some quarters and is partly reflected in Pearce's *Priority 5*. This is not to say that scientific or technological solutions are unimportant. It is to say that they should be developed in the context of what we know about human behaviour, rather than what we think we know or what we would wish it really to be.

This has been the focus of David Canter's work on safety in the workplace (the steel industry), transport systems (Kings Cross Fire) and sports stadia (Bradford City Fire). All individuals develop an understanding of the situation in which they find themselves. They develop repertoires for dealing with situations which largely serve them well. Now and again those situation may change, but the individual may be unwilling to change their response or not recognise the need to change. Donald and Canter's (1988) study of the Kings Cross fire demonstrated how conventional behaviour patterns probably contributed to a higher loss of life than would have been the case. People waiting on the Piccadilly and Victoria line platforms were unaware of the fire developing on the Piccadilly line escalator until they approached it or were informed by police that the station had to be cleared. Many of the injured and fatalities would have got on the next train had it not been for the police officers instructing them to leave the station; they left by means of the escalator as the fire flashed over into the booking hall.

This illustrates well how what people see as appropriate actions are shaped by what they expect of the circumstances and what authority figures do and say to define those circumstances. Although London Underground staff gave evacuation instructions, few passengers took any notice of them as they were not seen as authority figures (confirmed by subsequent surveys of the public's attitude to Underground staff).

Furthermore, the position of the bodies of those who died in the Booking Hall related to their customary journey and familiar route out of the station. This illustrates that people follow well rehearsed rules of behaviour even under unusual circumstances and will abandon them only under extreme pressure of circumstances. These socially understood rules are an integral part of the particular places in which they are found. These findings have important implications for environmental hazard and global environmental change research.

GENDER, SCIENCE AND THE ENVIRONMENT

One of the principal findings of Breakwell's study into young people's understanding of science is that there are highly significant gender diferences in attitudes and beliefs about scientific and technological change. Attitudes to science and involvement in scientific activities are significantly correlated with parental encouragement, parental attitudes to science, attitudes of friends towards school, youth culture and achievement.

Gender also differentiates between males and females in terms of wanting to become scientists. Women who do not want to work in science are more likely to be cynical about the scientific establishment and perceive sexual discrimination to operate in science. Problems of the environment seem to be of much greater concern to girls who

are concerned about technological disasters. Boys, on the other hand, tend to focus on the technological fix philosophy. That is, technological programmes should not be tackled by changing our attitude or approach to technology but devising further technological solutions. Looking at public attitudes and beliefs about GEC in a social context must take into account the highly significant gender differences.

A RESPONSE TO THE PAPERS BY PEARCE AND TURNER

Anticipating the Future

I would like now to make a few comments and react more specifically to the papers by David Pearce and Kerry Turner. In so doing, a number of research priorities will be identified. These research questions do not necessarily represent precedence on the environmental psychological research agenda: they emerge from the priorities as derived by Pearce and Turner. There is a strong case for establishing a GEC research agenda however, from a environmental and social psychological perspective.

Turner suggests that «Environmental Scenario Analysis» offers a fruitful line of research. There has been a considerable interest in social psychology in what are called social representations. A social representation is the equivalent in everyday life of a scientific theory (Moscovici, 1984). It is a body of knowledge, ideas, images and emotional reactions which develop in society about everyday phenomena and which are communicated over time to particular audiences. Typically they move down the social hierarchy from the domain of elite language and thought to gaining a currency amongst the population as a whole.

The social representations approach has generally been used to investigate how people explain and interpret their social worlds. Moscovici's (1976) early study of how the specialised and technical language of psychoanalysis has become part of everyday discourse, and Herzlich's (1973) study of the cultural-environmental dimensions of perceptions of health and illness are examples. Social representations have a further relevance to the exploration of human relationships with science and the environment, if one takes the view that science and the environment are also social constructs. This is not to deny the importance of the physical environment, but an assertion that the environment is as much a social as a physical phenomenon.

Social representations have tended by their nature to the past-oriented, looking to the socio-cultural origins of phenomena, but Doise (1976) has argued the case for «anticipatory representations». Doise suggests that representations serve the function of justifying particular forms of development, while enabling groups to retain their particular nature and identity. He goes on to suggest that if this is the case then representations should also be seen as future-oriented, determining the development of intergroup relations by actively anticipating them. More anticipation of future scenarios and interactions is sufficient to create an image of the future and future intergroup behaviour. This is something of a self-fulfilling prophecy. Comparatively little research has been undertaken on anticipatory representations, yet clearly this could be a very useful and interesting line of research in respect of GEC. Images of the future environment, anticipated social, economic and political relations, anticipated crises and their consequences would contribute to the modelling of future political and environmental management systems.

GLOBAL ENVIRONMENTAL CHANGE: A TEMPORAL PERSPECTIVE

This raises the issue of the need for a temporal perspective. Research should be undertaken to better understand the publics perception of the relationship between past, present and future environmental change (Wallace, 1987). This will enable an assessment of the degree to which the public and particular groups in society see current events and actions as moments in larger processes — processes which are still in operation, and part of a wider spatial and global processes.

The relationship between past, present and future has a number of further implications. It is quite clear that what is considered a valued environmental asset changes from one generation to another. Natural capital for one generation can be

very different to that of another generation. The time perspective may play an important part in the reliability and validity of the contingent valuation method (CYM). For example, it is hypothesised that asking people to make bids in monetary terms which reflect the worth or value to themselves of a particular environmental asset would generate a very different response when compared to asking questions on «willingness to pay» on behalf of their children or their children's children.

A second line of investigation that «Environmental Scenario Analysis» suggests could build on the research currently being undertaken by Professor Tim O'Riordan (University of East Anglia) in the Yorkshire Dales. This project seeks to combine the relatively new approach of environmental interpretation with longer and well established methods/approaches in public participation in planning. Environmental interpretation draws on informal educational techniques to make the public more aware about the environment. Such techniques are typically used in countryside sites, especially visitor centres and exhibitions, but also in museums, castles and stately homes. The intention of environmental interpretation, as outlined by Tilden (1957), is to make the public more aware of the environment and the threats it faces, in order that they might change their attitudes and behaviour in a pro-conservation direction. The techniques and objectives have been extended considerably and are now used widely for broader intentions than simply conservation and focus also on subjects such as science and technology.

Interestingly, it has been used by O'Riordan has a device for conveying to residents and visitors to the Yorkshire Dales alternative scenarios for the future landscape of the area. These alternative scenarios include landscapes for high intensity agriculture use, recreation and wildlife conservation. Painting pictures in a meaningful and imageable way of what such landscapes would look like and the consequences of the creation of such landscapes for the population and the local economy enables the public to state more realistically their preferences for the future. As a set of techniques to use within a planning framework, it is an extremely exciting project and it circumvents a number of problems that have been found in public participation exercises in respect of the communication of information and the ability of people to conceptualise change in the environment and alternative futures.

It should be added here that the comment by Pearce in *Priority 6* that little work has been undertaken on the value of forest functions or on the means to induce conservation is not totally accurate. In the case of forest functions, a study is currently being undertaken by Terence Lee and David Uzzell for the Forestry Commission, the Countryside Commission and the Countryside Commission for Scotland, which is assessing the public's perceived value of forest landscapes beyond their purely visual aesthetic qualities. This, along with an extensive review of related landscape studies, is described in detail elsewhere (Uzzell, 1990). In respect of inducing conservation behaviour, the kind of interpretive techniques used by O'Riordan are widespread throughout the world. An up-to-date assessment of these approaches, their function and effectiveness has recently been published (Uzzell, 1989a; Uzzell, 1989b).

CROSS-CULTURAL HAZARD PERCEPTION

«Analogue Analysis» is not dissimilar from one of the approaches we are proposing to adopt in a recent research submission to the EEC on flood hazard perception. This is part of an international programme of research headed up by Professor Penning-Rowsell (Middlesex Polytechnic). It is proposed that our contribution will be undertaken in conjunction with Professor Luis Soczka (Laboratório Nacional de Engenharia Civil, Lisbon). We have been working on a model of natural hazard perception which involves: 1) the structure of beliefs about natural hazards (informed by cultural, historical, educational and experiential information) which effects 2) the perception of the hazard and the assessment of associated risk, which in turn leads to 3) a variety of decision-making options, and ultimately to 4) pre and post-event action/behaviour (such as strategies for coping in emergency situations and hazardous areas).

The aim of the study will be to explore the concept of flood hazard from an environmental psychological perspective, paying particular regard

to its multidimensional attributes and an assessment of perceived benefits as well as costs. People establish a particular level of perceived risk for every hazard, but this is embedded in a complex attitude to the hazard that includes cognitive, affective and behavioural components. Given that perceived risks are dependent upon other costs and benefits, they are unlikely to be changed in isolation, particularly in view of the tendency to risk compensation in which improved safety standards or hazard reduction is compensated for in order to maintain previous levels of riskiness. Research evidence, some historical, has shown that flood limitation procedures may be met by the public locating in what were previously high risk areas.

It is intended to develop a number of instruments which will measure the structure of beliefs about flooding among *at risk* inhabitants of flood--effected areas, engineers and environmental planners and policy and decision-makers, their perception of the risks, anticipated consequences and actions to minimise property damage and maximise personal safety. It is critical that the multidimensional structure of the variables contributing to the flood hazard perception are investigated and tested for their intercultural validity and reliability. Improved information systems invariably lay at the centre of hazard reduction programmes, whether between experts and decision-makers or decision--makers/experts and the public. It is important to understand not only how each of these groups perceive the flood hazard, but how they perceive each others understanding of the flood hazard. Previous research, such as that using the co-orientational model mentioned earlier, suggests that this will have a critical influence on information dissemination, attitude formation and subsequent behaviour.

CONTINGENT VALUATION METHOD AND THE QUESTION OF COMPENSATION

Turner argues that significant progress has been made in the last decade in the development and testing of techniques designed to assign monetary values to environmental effects, but progress is needed in some areas. Harris, Driver and McLaughlin (1989) spell out in detail the problems associated with CVM, including measurement biases and respondent biases, and the need for more direct, conventional psychometric tests of the validity and reliability of CVM results. For example, we know a considerable amount about the effect of social and emotional influences on decision-making, and that people assign judgmental weight to social and physical data in proportion to the familiarity with and vividness of the data. This is an especially salient finding in the context of environmental issues.

There is thus a need to test CVM values with derived values from other related variables such as preferences, income constraints and actual behaviour. Psychologists are well placed to undertake this work, and if CVM is to be the favoured way forward, then it is vital that the CVM model is refined to reflect sub-optimal environmental choices in a context of conflicts, doubts, social pressures to comply, moral and ethical considerations and situational constraints.

This leads one to question whether the contingent valuation process is ecologically valid (in a research sense) and provides an adequate decision structure compared with realworld situations. Market situations provide consumers wich a well rehearsed decision framework for choice making (variable price, ability to shop around, talk to friends, postpone decision). This is not the case with environmental issues. Does CVM enable people to use accustomed, familiar and rehearsed methods for making evaluative decisions? Indeed, our research (Canter, Comber and Uzzell, 1989) suggests that in times of stress or in unfamiliar situations people use familiar strategies until there is a such a dissonance that it is no longer possible to rely on past practices in order to solve problems. We need to test whether well rehearsed, marked--based strategies are appropriate for CVM. For example, if people typically make market decisions by comparing product prices and the attributes of alternative goods and services, what if an alternative does not exist or where many alternatives exist but are not considered in the evaluation exercise? The problem with providing monetary values for non-market goods is that this may lead to a situation which is so novel and over-stressful that subjects are likely to be over-influenced by whatever cues are available. People in this situation will respond by either not responding or regis-

tering «protest zero bids» especially in terms of willingness to accept compensation. Does the use of CVM in respect of the environment result in decision-making processes which are essentially different from what may be found in the market place? Or are the decision-making processes precisely the ones found in the market place even though the environment is a very different, if not inappropriate, subject for CVM analysis. That is, the environment and issues of GEC are not strictly comparable to conventional market scenarios, and therefore appropriate for CVM analysis.

The «willingness to pay» approach focuses on the willingness of people to accept monetary compensation for loss or damage to the environment; willingness to pay to prevent future loss; willingness to pay for environmental benefits. These are necessarily interrelated and might be seen in some cases as different sides of same coin. Clearly compensation is an important aspect of these trade--offs. One important area of research would be to focus on the nature of compensation. What does compensation mean? Instead of looking at willingness to pay in terms of monetary units, would it be more appropriate to frame such questions in terms of compensatory trade-offs. This might enable a much broader conceptualisation of environmental issues and exploration of compensatory strategies. What non-monetary forms of compensation are people willing to accept in return for damage to the environment. Or what other environmental losses are people prepared to accept in order to avoid a different kind or degree of environmental damage. For example, it has been argued that the Severn barrage would generate as much electricity as the current contribution of the British nuclear power programme. However, there have been objections on ecological grounds to the damage to wildlife habitats that this would entail. This suggests that trade-offs need to be considered not only between environmental agencies and public interest groups, but also between different categories or groups of the public. In this case research needs to be undertaken on the nature and level of what might be called «acceptable trade-off» between environmental groups in terms of, say, ecological damage and destruction to wildlife habitats as against the environmental consequences of further generation of electricity from nuclear power stations.

CONCLUSION

We have a long tradition of undertaking practical, applied policy-oriented research. However, we have always been concerned to ensure that such research is theory-driven and that the research itself feeds back into the discipline to assist in the development of psychology and psychological theories. This is vital as we believe that future policy-oriented and «relevant» research findings will need to be derived from sound theoretical premises.

We believe that psychology has an important part to play in most if not all the *Priority Areas identified* by Turner and Pearce. Many of the constructs identified and seen as essential in bringing about an effective human response to climatic and other environmental changes are essentially psychological: behaviour under uncertainty, attitudes, enhanced understanding, decision--making, risk — the list goes on. As we have seen today while economics offers a valuable perspective and contribution to our understanding of these issues, it is but one perspective conditioned by a particular — typically normative — model of man. I have tried to outline the way in which various environmental and social psychological research questions and perspectives might complement these.

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