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COMMENTARY

Toward a Critical Discourse on Affect and Risk Perception

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Introduction

Editorials and commentaries in academic journals can perform a useful function in the social sciences, by bringing different ideas and perspectives to the fore they may help to punctuate academic discourse and lead to a more focused debate about the development, validity and utility of a particular concept or theme of research. In this respect, Sjöberg's (2006) editorial of this issue, '*Will the real meaning of affect please stand up?*' is a timely critique of a burgeoning area of risk perception research. The negative appraisal of academic work on the role of affect in risk perception presented by Sjöberg might, however, make disconcerting reading for those finding promise in this line of inquiry. In his editorial Sjöberg (2006) makes a number of contentions about the basis, assumptions and implications of affect research, which if taken at face value point to the need to dissolve academic interest in the influence of affect on risk perception, or at the very least to redress any aberrations interest in this work has generated.

To briefly summarise, Sjöberg (2006) keenly observes that people now widely believe that affect plays an important role in risk perception and that risk perception is mainly governed by emotional responses. That this apparently mistaken belief should prevail is thought perhaps to be due to natural language and common academic usage of the word ''affect'' which can mean both emotion and liking. According to Sjöberg, empirical evidence for a liking-risk link may have been wrongly interpreted as implicating a role for emotion in risk perception, but as liking and risk perception obviously have different meanings it would be more appropriate if the term ''affect'' was used simply to denote emotion as then it would be clear that affect has

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only a minor role in risk perception. To illustrate this argument past empirical evidence is presented by Sjöberg which shows little support for the contention that emotions such as dread are involved in risk judgement processes; instead severity of consequences emerges as a major factor in perceptions of risk. In conclusion, Sjöberg intones that it is unfortunate that affect has been erroneously misconstrued as important because the belief that risk perception might be contaminated by emotion, though unjustified, can actually be used to dismiss public risk concerns as uninformed and emotional and thus to undermine due democratic process. Academics should therefore critically analyse and carefully reflect upon the received message of risk perception research.

Whilst I am sympathetic to some of the sobering sentiment expressed in Sjöberg's indictment of affect research, to my mind these objections are in part somewhat overstated and fail to give a fair representation of how far this field of inquiry has progressed. In so doing, I think an opportunity is missed to fully engage with some of the nuanced ideas and valuable insights that are offered by affect researchers into how people perceive risk. Therefore, in conjunction to Sjöberg's editorial I wish in this commentary to provide an alternative assessment of the importance of affective influences on risk perception by elaborating upon some of the questions raised through a consideration of the descriptive findings of this research and the possible implications for public policy that may be warranted. It is hoped that this will contribute to a critical discourse helping to address some of the stigma and misunderstanding as well as some of the worries that have seemingly built up around the application of a concept, which for many researchers has become a key factor in understanding how people perceive risk.

How is affect conceptualised in risk perception research?

Whilst it is true that many researchers have acknowledged an emotional aspect to risk perception for quite some time, indeed since the early psychometric studies by Fischhoff *et al.* (1978) revealed a "dread" component (now replicated in more than one hundred studies), the recent focus on the notion of affect has led to a notable resurgence of interest in this area of work. Although initially generally employed loosely to share common meaning with emotion and feeling, affect was at one point historically applied by Titchener specifically as a label for feeling pleasantness-unpleasantness (Reber, 1985). For the most part since then common use of affect in the general sense of the word has reverted again to being interchangeable with emotion and feeling with the notion of pleasantness-unpleasantness finding academic currency as one of six appraisal dimensions of emotion in cognitive appraisal theory (see Smith and Elseworthy, 1985 and Lerner and Keltner, 2000/2001). Furthermore, affective influences on judgement and choice have recently been distinguished in two general fashions: "integral affect" refers to the influence of subjective experiences that are directly relevant to present judgements, such

as emotion that is experienced from evaluating the situation at hand, or anticipated by contemplating the consequences of an action; and "incidental affect" refers to the influence of subjective emotional experiences which are unrelated to the situation at hand, but which may have direct or indirect impacts on present judgements (see Lerner and Keltner, 2000/2001 and Lowenstein and Lerner, 2003 for an overview).

However, in addition to these general distinctions a number of refinements to the notion of affect have been employed in academic writing on risk perception reflecting the relatively recent adoption of two newly emerging interrelated theoretical frameworks making explicit the role of affect and emotion in individual risk judgements. The first concerns the "risk as feelings" hypothesis proposed in the work of Lowenstein *et al.* (2001) in conjunction with and elaborated upon by work on the "affect-heuristic" by authors such as Finucane *et al.* (2000), Slovic *et al.* (2002) and Slovic *et al.* (2004). The second is the "appraisal tendency" framework which elaborates upon cognitive appraisal theory and has been developed and tested in work on risk perception by Lerner and Keltner (2000; 2001), Fischoff *et al.* (2004) and Lerner *et al.* (2003). These two strands of academic work have been especially informative for the risk perception field by adapting and building upon a well established theoretical and empirical body of research in psychology such as: Damasio (1994); Smith and Elseworthy (1985); Epstein (1994); Chaiken and Trope (1999); Zarjonc (1980); Forgas (1995); Clore *et al.* (1994); and many others (for good overviews see Lowenstein *et al.,* 2001; Lowenstein and Lerner, 2003; and Slovic *et al.*, 2004).

The intention here is not to provide an extensive review of this research both for reasons of limited space and that the reader would do better to consult the work of the authors listed, but instead to provide the briefest of overviews and to highlight certain points which I feel would do well to be elaborated upon. Key observations of "Risk as Feelings" by Lowenstein *et al.* (2001) and work on the affect-heuristic by Slovic *et al.* (2004) have illustrated that cognition and emotion operate as two distinct modes of reasoning to help guide risk judgements and decisions, and that not only does cognition influence emotion, but emotion in return may also influence cognition (see Slovic *et al.*, 2004 for a discussion). In fact it has been shown that emotional deficits can degrade the quality of a decision (Damasio 1994) and incorporating affect in models of decision making can greatly increase their explanatory power (e.g. Lopes, 1987).

These findings contrast sharply with previous 'consequentialist' research traditions which assert that emotion triggered by a situation is not integral to judgement and decision-making (see Lowenstein *et al.*, 2001). For much of the time it seems that cognition and emotion are complementary and typically work in concert, but in certain circumstances these modes of reasoning can diverge from one another. Lowenstien *et al.* (2001) have illustrated cases where it seems that emotional reactions can dominate deliberative analytical evaluations, and though showing support for this assertion, Slovic *et al.* (2004) have elaborated upon this work to include

circumstances whereby deliberative analytical evaluations may also dominate emotional reactions. The risk as feelings hypothesis is now receiving growing support from a number of new empirical studies. For example, in one recent piece of research, Fischhoff *et al.* (2004) found that even among people who have consistent and defensible beliefs, emotions may still affect choices. In their study, which investigated people's willingness to travel in light of the possible risk of terrorist acts, they showed that worry played a significant role in people's choice even after controlling for cognitive considerations. In a different risk domain, Townsend and Campbell (2004) reported comparable findings showing that integral affect – as measured using a dread scale – was a key predictor of willingness to purchase and taste genetically modified food.

But aside from this more general usage in which affect and emotion are seemingly equated, contemporary work has also regarded affect more specifically as a good-bad feeling state demarcating the positive-negative quality of a stimulus (e.g. Finucane *et al.,* 2000; Slovic *et al.*, 2004). Reference to an overall affective evaluation of a stimulus item can influence judgments of risk and benefit derived from that item (Finucane *et al.*, 2000). Reliance on this response – characterised as the affect-heuristic – is theorised to occur rapidly and automatically and is linked to images and associations which are representative of prior knowledge and past experiences. This mode of information processing provides an emotional cue or marker to an individual that enables them to contextualise and give meaning to new phenomena. A point of note here is that the work of Slovic *et al.* (2004) is one of the few studies to distinguish affect as a 'faint whisper of emotion' (p.312) as opposed to a more visceral feeling state such as fear or anger, which is emphasised in studies such as Peters *et al.* (2004).

As a key interest of this research is the way in which risk responses can occur rapidly and automatically as a heuristic, the extent to which a person expends mental capacity and energy evaluating a stimulus is a facet of whether experiential affect is the overriding mechanism for judging risk. Recent studies have thus sought to elaborate on the circumstances which induce affect-based responses or inhibit them and would seem to revolve around two interconnecting themes involving the properties of a stimulus and the disposition of the individual. According to this work individuals can differ in the strength of their affective reactions – termed "affective reactivity" (Peters *et al.*, 2004) – due either directly or indirectly via a person's general disposition unrelated to the present judgement (i.e. incidental affect), or due directly to the influence of subjective experiences that are relevant to present judgements (i.e. integral affect). Information can also differ in the extent to which it elicits an affective reaction according to the ease with which an attribute or characteristic can be mapped by an individual into an affective impression or against an existing affective frame of reference to give that information meaning – which might be termed "affective evaluability" (see Wilson and Arvai, 2006 in this issue for a discussion on evaluability).

If the attributes of a stimulus are ''affect rich'' or ''affect poor'' then this may in various ways respectively enhance or inhibit the use of affect-based responses (Wilson and Arvai, 2006). Typically, when people are faced with a difficult trade-off or there is ambiguity regarding the correct answer, people tend to focus on the cues that send the strongest affective signals (Hsee and Kunreuther, 2000). For example, technologies that carry high stigma such as nuclear objects and facilities as sources of radiation, or events such as terrorist acts can elicit strong negative responses and may be considered to be affect rich (Peters *et al.*, 2004). However, if a stimulus is demarcated with both positive and negative attributes then this may potentially cause further ambiguity, but if on the other hand the attributes of a stimulus are affect poor and a person cannot relate past experience to a new encounter this may fail to resolve any uncertainties and hinder automatic action. In either of these cases a person may need to engage in further information seeking activity if possible in order to make a satisfactory judgement, in which case, a greater depth of mental processing would be required that can no longer be said to constitute reliance on the affect-heuristic (see also Griffin *et al.*, 2004 for a recent study on the impact of worry on judgements of information sufficiency).

Departing somewhat from this line of inquiry, research by Lerner and Keltner (2000/2001) as previously indicated has elaborated on affect using appraisal tendency theory to move beyond valance-based approaches concerned with positive or negative feeling states to investigate emotion-specific influences of the same valance such as fear or anger on risk judgements. This work has illustrated that specific emotions are defined by a set of central appraisal dimensions that direct cognition to address specific problems or opportunities in certain ways until they are resolved. Emotions of the same valence such as fear and anger which have different central dimensions may therefore have different impacts on people's judgement of future events. For example, Lerner and Keltner (2000/2001) illustrated that fearful people may show a greater propensity to make pessimistic judgments whereas angry people may be more optimistic, which would conversely be more intuitively associated with a positively valenced emotion. In a study conducted after the September 11th attacks Lerner *et al.* (2003) replicated these findings showing that those who were exposed to an anger priming condition concerning the attacks gave lower risk estimates than those exposed to a fear priming condition, both for the specific risk of terrorism, and more generally over 25 different risks illustrating the potential for carryover effects of emotions on risk judgements. Those respondents in the anger priming condition were also less likely than those in the fear priming condition to advocate policy responses aimed to alleviate the potential future threat of terrorism.

The brief sketch of affect research outlined above illustrates a number of important findings which are relevant to academic understanding of risk perception. For instance, researchers have shown that events in people's lives not only elicit different levels of emotional response, but also different types

of emotional response, which may impact on individuals' perceptions of risk in both general and specific ways. However, progress in this field of research has highlighted the continuing need to contextualise notions of emotion and risk judgements, and in light of this consideration a number of questions are raised which I wish to address in the next section.

What further contextualisation of affect should be considered?

Following on from the work of Lerner and Keltner (2000/2001) above, one issue which is yet to be fully considered is what possible impact on risk judgements there might be when an event and the communication surrounding that event elicits a combination of different appraisal tendencies. For example, significant events in peoples lives such as the September 11th attacks (or other events ranging from the potential siting of a nuclear waste depository to a mobile phone mast antenna for example) could quite feasibly elicit a variety of appraisal tendencies consistent with fear, sadness and/or anger within an individual, if not simultaneously, then at least alternately over time as new information comes to light and as they become aware of different people's interpretations of events, such as those that are broadcast in the news media. After all, people typically live in a multi-channel information environment in which they are exposed to a variety of different messages and information sources which may be either unsolicited or sought intentionally. The information that people receive is sometimes framed so as to emphasis a specific point of interest or to reflect a particular point of view, but often a variety of different angles and perspectives are presented even within a short news bulletin, or over the more prolonged coverage of events. Therefore, given the inherent variety of appraisal tendencies that might possibly be elicited from a single event in everyday life or reports surrounding it, it seems that numerous emotional responses may also be primed within individuals, but at present it is not clear how people react in such circumstances.

As such, it is not known whether individuals would attend to one emotional cue more than another, for example if certain appraisals might exhibit stronger basic framing effects such as primacy or recency, or if certain appraisal tendencies are enhanced, inhibited or balanced out when triggered in conjunction with others. Speculations of this nature cannot be ruled out at present due to the inherent complexities and possibilities raised by considering the elicitation of emotion in everyday contexts, but which are yet to be fully tested. It would perhaps be paramount in a replication and modification of the Lerner *et al.* (2003) study to investigate the priming of fear, sadness and anger responses simultaneously or alternately, as well as individually, to test whether this would significantly influence the type of 'affective reading' taken of an event and the subsequent framing of individual's emotional responses. Further work of this nature would be complementary to emotion-specific approaches by providing an

understanding of the influence of multiple emotions on judgements of risk and the contexts in which these complex interactions may occur.

Another area that is also notably underdeveloped in theorising on the relationship between affect and risk perception is the potential impact of social factors in the causation and constitution of emotion. Parkinson (1996) has observed for example that in general researchers have traditionally to put a strong emphasis on the cognitive and physiological bases of emotion and have tended to overlook any social basis. According to Parkinson (1996), many causes of emotion are interpersonally, institutionally or culturally defined, and because emotions can be essentially communicative as well as internal and reactive they have consequences for other people and serve interpersonal as well as cultural functions in everyday life. This oversight also seems to have been repeated in work relating affect and emotion to risk perception, where to date, the connection to such social considerations would appear have been either ignored or largely taken for granted. For example, despite the fact that a model integrating the personal and interpersonal development of stigma (a distinctly social phenomenon) has been previously outlined (Fischhoff, 1998), research identifying a relationship between stigma, affect and risk has previously only been undertaken from an intrapersonal perspective (e.g. Peters *et al.*, 2004). Work modelling and testing the conceptual link between the social dimensions of stigma, emotion and risk perception would therefore seem to be an obvious avenue for future research.

To illustrate this point further, at present conceptualisation of the affect-heuristic has not accounted for the fact that judgements of risks that are ''experience-far'', and thus initially personally affect poor, may still become demarcated with affect through mechanisms such as social stigma and amplification of risk. For example, people may encounter risks for which they have no prior experience to gauge how they should respond. But any knowledge made available of another person's response to that same risk may act as a contextually rich proxy to personal experience by signifying that the qualities of a certain phenomenon or behaviour is positive or negative. The cognitive mechanisms via which individuals integrate such social information are well documented in accounts for example of social comparison processes (Festinger, 1954; Klein, 1997) and social learning theory (Bandura, 1977). This leads to the possibility that where the utilisation of socially imbued information is available to individuals, it may in fact serve as a heuristic to help guide an individual's risk judgements in the same sense that the affect-heuristic also negates the need to engage in a more deliberative analysis of events (see Wardman *in press* for a discussion). Personal reliance on this socially-based response may in fact be enhanced by appraising the emotions that people convey in their behavioural responses to a stimulus. For example, emotional responses that are a particularly salient aspect of another person's behaviour may enhance the evaluability of that behaviour by making it more affect rich.

One other possibility for exploring the impact of social influences on emotion and risk perception would be to pair the well established research on recreancy (Freudenburg 1993) and public trust (e.g. Slovic, 1993; Löfstedt, 2005) with appraisal tendency theory (e.g. Lerner and Keltner, 2000). It could be hypothesised for example that the type of actions that cause distrust (e.g. risk management scandals such as the UK Government handling of BSE) also elicit the same kind of appraisal tendencies which confer anger, sadness or fear, leading to carryover effects, which if not resolved could influence an individual's future judgements of risks managed by the same institutional actors. The affective cues provided by others could play a major role in the appraisal of these types of actions and consensus about their possible resolution and might potentially enhance the variance of risk perceptions presently accounted for by psychological models of trust. Further empirical work would of course be needed to investigate this intriguing possibility, but it seems that there is much scope yet for research to elaborate on the interplay of affect cues provided by social action and interaction and their impact on an individual's judgement of risk.

How ambiguous is affect relative to other concepts?

The previous points clearly highlight some interesting challenges facing descriptive research on affect, and in some respects I can see why Sjöberg (2006) feels justified in asserting that affect can be ambiguous. The term ''affect'' is certainly used interchangeably with other terms such as ''emotion'', ''feeling'' and ''liking'' across academic writing in general, and the studies depicted above have been noticeable in their cross-labelling of frameworks relating affect, feeling or emotion to risk perception (e.g. *risk as feelings* or the *affect-heuristic*). It is also unusual to find considered attempts by researchers to clarify what general distinctions there might possibly be between such concepts. As Sjöberg (2006) observes, with generally few exceptions textbook coverage has been informative only up to a point, and it seems authors have also in the past even been known to strategically employ emotion/affect terms as chapter headings in the hope that the material presented would substitute for a tight definition (see Reber, 1985). The fact is that the meaning of affect, emotion or feeling has proven difficult to isolate in an historic body of research where traditionally the primary theoretical focus has been more concerned with the factors which underlie subjective experiences of emotion (e.g. cognitive appraisal models). I would therefore not dispute the claim that in certain respects the meaning of affect or emotion has been largely taken for granted.

However, although Sjöberg's (2006) point that affect ought to be used simply to denote emotion in risk perception research may be a fair one, on current evidence it would not necessarily indicate that affect is only of minor importance and it should not be accepted unquestioningly. Despite the descriptive questions still posed by this work (for example in consideration of a third possible strand of more social research on affect above), the two

main theoretical frameworks relating affect to risk perception thus far, though distinguishable from one another, are inwardly coherent, quite straightforward and to my mind reflect a reasonably consistent evolution of the concept. To place this within a broader context it should be further noted that the interchanging of affect terminology is not exceptional to risk perception academics alone, nor is it exceptional in common academic usage of risk perception terminology more generally. By comparison I would argue that many social scientists are probably no more clear about what is meant by ''risk perception'' than by ''affect'' judging from the manner and variety of ways in which the former term is commonly used and applied in different ways in academic research and writing.

For example, a forthright appraisal of risk perception research for the Royal Society in 1992 quite naturally led one widely respected review to conclude that 'risk perception involves people's beliefs, attitudes, judgements and feelings, as well as the wider social or cultural values and dispositions that people adopt, towards hazards and their benefits' where hazards were regarded as 'threats to people and the things they value' (Pidgeon *et al.*, 1992 p.82). Leaving notions of feeling and cultural values momentarily to one side, a reading of the risk perception literature today confirms that each of the terms ''decision'', ''judgement'', ''belief'' and ''attitude'' are commonly equated with ''perception'' within and between many risk based studies despite each having different underlying conceptual meanings. Does it therefore necessarily follow that ''risk perception'' should be used more restrictively to denote the specific meaning of either one of those terms?

On current showing any consensus on this matter is unlikely to be achieved soon. Researchers should of course always be careful to provide appropriate definitions, be sufficiently specific and acknowledge inconsistencies wherever possible, and there is clearly a role here for journal editors and referees to act as a form of quality control during peer review. It is therefore not my intention to defend loose academic usage of affect terminology by in effect arguing that ''two wrongs make a right''. My point is that rather than falling into the proverbial trap so to speak of ''the pot calling the kettle black'', it should be acknowledged that the interchanging of terminology is not generally confined to work on affect and is more common throughout the risk perception literature than Sjöberg (2006) suggests in his editorial. This facet of academic writing on risk perception can of course apparently be tolerated to a degree. Where it would pose a real problem is if the meaning of a concept becomes so vague as to loose all coherence in interpretation and application between studies.

A certain amount of clarity and consistency is therefore important, but where boundaries are crossed it is paramount that researchers provide qualifiers for the terms they use and sufficiently elaborated explanations of how and why they have operationalised concepts in various ways in particular contexts. After all, even when a concept becomes part of the common academic lexicon new empirical findings or intellectual developments may lead to a renewed negotiation between different researchers

trying to establish a particular meaning. It would of course be helpful if researchers acknowledge and clarify any inconsistencies, but it might also be said of the readers of academic journals that they tend not to be passive recipients of single pieces of information and are often best served by critically formulating their own ideas on the useful boundaries of a concept from the evidence and argumentation which is provided. Arguably then, if these considerations are borne in mind it would appear on present reading of the literature that most research on affect generally does observe these conventions and that the concept has faired no particularly worse than those in any other areas of risk perception research. In these respects I would suggest that academic discussion on affect, at least within psychological studies of risk perception is not as hard to follow, or as confused or ambiguous as might be contended.

What are the warranted implications of affect research?

On the one hand concern about the real meaning of affect evidently reflects a much wider and longer running debate amongst risk perception academics about the real meaning of risk perception. Sjöberg has certainly conducted many rigorous studies over the past decade or two which offer evidence to refute the intentionally broad definition of risk perception advocated by the Royal Society review (Pidgeon *et al.*, 1992) referred to above. However, Sjöberg's extensive research (and work by other critics) has to be balanced against a wealth of other academic research evidence of which only a selection is presented in this commentary. Based on the weighing of this evidence I am not that compelled by the argument that emotion is not important in risk perception. On the other hand there probably is some legitimacy to concerns about how such work is interpreted and prescribed outside of the social scientific community, especially in applied settings such as policymaking and risk communication where there is potential for the profound misappropriation of research findings.

To paraphrase McDaniels (1998), the findings of psychological studies on risk perception can often be among the most insightful, widely cited and most controversial of the social science research efforts on risk. This observation was originally made with specific reference to psychometric studies, but I think it would arguably also apply to psychological work on risk perception more generally. According to McDaniels (1998) controversy arises largely because of a failure to distinguish between descriptive and prescriptive lessons to be drawn from risk perception studies with problems particularly relating to those interested parties who put prescriptive interpretations on research results. McDaniels (1998) argues that risk perception research is not intended to provide direct prescriptions for action, rather it provides descriptive insights about the views of average, or purposely selected persons and how they formulate those views which can, and should, only be employed indirectly. The ends to which risk perception research could conceivably be applied therefore include helping to clarify

public values and commonly held views, design better public process, select better public policy alternatives, or structure better risk communication, among others, but to achieve these ends one would have to use risk perception findings within a framework that involves judgements about what "better" implies for each context and compares alternatives that are best (McDaniels, 1998).

Elaborating on this view from the standpoint of decision theory, Fischhoff (2005a) suggests that effectively deciding what is "better" requires understanding the facts of the choice and the implications of one's own values for it well enough to identify the option in one's own best interests and to implement it faithfully. In a democratic society, for policy makers this decision problem extends beyond those choices that are personally relevant to the balancing of competing interpersonal preferences of what is in the best interests of people other than themselves. In both personal and interpersonal cases, determining the best or most effective decision would typically benefit from a normative analysis of choice options and actions, valued outcomes, relative values of those outcomes, uncertainties of those outcomes and decision rules which integrate these elements in order to make a choice (see Fischhoff, 2005a for an in-depth discussion). But as Fischhoff (2005a) cautions, describing choices in these terms does not mean assuming that individuals follow decision theory, so psychological work may therefore find an applied focus by identifying and explaining disparities between normative ideals and the descriptive reality and then designing prescriptive interventions helping people to make better (i.e. more normative) choices. Fischhoff (2005a) suggests that those interventions could encourage better choices by changing people, for example through education, or their environment such as through better disclosures, but may also entail discouraging or curtailing freedom of choice when effective decision making seems unlikely, such as banning products that seem likely to be misused. Ultimately, however, the decision to engage in these interventions is a matter more directly concerned with ethics, politics and public policy rather than psychology alone.

Given the descriptive findings on affective influences on risk perception outlined above, what prescriptions if any might then be indirectly employed from such work? Unfortunately, answers to this question are not as forthcoming as they should be. To date, few attempts have been made within the risk perception field to explicitly pose questions of the prescriptive application of affect research findings in the context of the strategic normative choices that would be advised by Fischhoff (2005a) and McDaniels (1998) above. That this could have occurred I think may in part be due to the lack of focussed debate by academics on the possible implications and prescriptive applications of affect research findings, which have tended to be preoccupied with the notion of "rationality". However, I think it would be a mistake to pose the notion of "emotionality" in opposite polarity to rationality. Though interconnected, cognition in the deliberative-analytical sense can be distinguished from cognition in the affective-emotional sense. Therefore, I think that debate on affect and risk should not

be construed with regard to the presence or absence of rationality in individuals' perceptions of risk, so much as with specific regard to the presence or absence of emotion in individuals' perceptions of risk to better reflect this distinction.

As indicated above, one primary concern of affect researchers has been to pinpoint the circumstances whereby emotional reactions diverge from deliberative analytical evaluations of risk and to explain how these responses interact to determine behaviour. The assumption is that optimal decisions (normatively defined) can at times be impaired by responses which focus too restrictively on the emotional aspects or indeed on the deliberative-analytical aspects of risk judgements. The descriptive implications outlined by Slovic *et al.'s,* (2004) ''risk as analysis and risk as feelings'' hypothesis indicate that where people's responses are overly emotionally driven they may benefit by an infusion of deliberative-analytical thinking, but equally in other circumstances where people's responses are overly reliant on a deliberative analysis an infusion of emotion may be what is called for. However, emotion and deliberative analysis are not set apart by notions of rationality; by way of clarification Slovic *et al.* (2004) attempt to demystify the generally negative preconceptions of emotion as an irrational component to risk perception by highlighting the positive intuitive rationality of emotional responses as a natural way of dealing with risk that has vitally contributed to human endeavour and survival.

One of the overriding conclusions that might be drawn from this work is that the most effective responses to risk may in fact occur when they are driven by both affective and deliberative-analytical considerations, and that it is the absence of one or the other that may cause problems, not that either one ought to be especially discounted in certain circumstances. Work on the role of affect in risk perception should therefore not be mistaken as tantamount to proposing that people are irrational, uninformed and overly emotional for most of the time when they are confronted with risk as is apparently supposed of such work in other research fields and in policy circles (see Sjöberg, 2006). Neither should this work be seen as advocating the need for a blanket prescription of rational discourse, or as ammunition for tirades against an invariably ''luddite'', ''panicked'', ''risk averse'', or increasingly ''precautionary'' public. Instead, it is suggested that decision makers – be they lay members of the public or in public administration – would perhaps do well in certain circumstances to recognise the biases and limitations of their decisions and compensate accordingly if they so wish. However, it is one thing to realise the virtues of this non-persuasive premise in principle and an altogether different matter to apply it effectively in practice.

Affect studies thus far have generally said little about what would be considered as a biased or limited decision as this requires the kind of normative analysis prescribed above, which though often implicit to research can often fall outside the realms of what is reported in psychological studies. In practice, health authorities seem to have found little trouble in taking a

leading role in attempting to challenge biases and limitations in others when they regard that individuals do not recognise them for themselves. Whether these authorities implement the kind of formal normative analysis prescribed by Fischoff (2005a) is not altogether clear, but one would perhaps hopefully assume that some sort of rough or informal normative analysis must take place even though realistically there might be obvious exceptions to the rule in some cases. The truth is that with few notable exceptions (e.g. Lerner *et al.*, 2003) fields such as marketing, media studies and health promotion have taken the lead on developing the utilisation of emotion by institutions through the use of fear or threat "appeals" in applied communications (see Devos-Comby and Salovey, 2002). It should also be acknowledged that risk communicators may have to compete with emotion appeals that have also been utilised to great effect by various campaign and vested interest groups.

Communication which utilises emotion appeals may be used to help individuals put certain risks into context, or to make risk information more memorable; after all if a person does not remember a message they are much less likely to rely on any of the information it provides to guide their subsequent behaviour. However, the general aim of using such appeals is to induce fear which may shock those people into action who may not realise or care that they are personally exposed to a risk. These types of campaigns have tried to promote behavioural change across a range of activities such as smoking, drink-driving, tanning, safe sex or crossing the road, but have arguably had mixed results. One of the primary reasons for failure being down to individual differences as what may produce a fear response in one person may not necessarily have the same effect across a heterogeneous population (Ruiter *et al.,* 2003; Witte and Allen, 2000). Researchers have also been keen to point out that to have the desired effect, fear appeals must be paired with messages which sufficiently enhance the perceived self-efficacy of the target population, and it may in fact be irresponsible to promote fear in individuals without contingent information to redress the possibility of maladaptive responses such as a sense of helplessness that may accompany fear (Witte and Allen, 2000). Other researchers have questioned whether an interaction between fear and self-efficacy truly exists and have indicated that utilising a fear appeal does not necessarily enhance the use of efficacy information in promoting behavioural change (Ruiter *et al.*, 2003).

The use of emotion or affect inducing communication is, for better or for worse, therefore metaphorically already "out of the bag". It is paramount that risk perception researchers recognise and try to understand its impact through concerted research efforts rather than to turn away from the many possibilities and/or problems it may entail and thus forsake the opportunity to take the initiative in formulating or supplementing appropriate normative protocols for its application or migration. Risk perception researchers must not forget that people live in a multi-channel information environment in which actors numerously compete for the limited attention that individuals have for every new piece of information they receive. The question of whether official risk communications should be used non-persuasively, for

example to facilitate greater understanding, or more instrumentally to persuade people to engage in certain types of thinking or feeling to promote normatively desired behaviour should be an integral and necessary part of academic discourse on affect.

Conclusion

In conclusion, this commentary hopefully shows that the concept of affect as used by academics is no more or less vague or ambiguous than the concept of risk perception, and is fairly consistent, at least by conventional academic standards, reflecting a natural evolution in academic thinking on this subject. Although Sjöberg, amongst other well respected researchers, has conducted many studies which question the importance of affect in risk perception, this has also to be balanced against a wealth of research that suggests it is important for judgement and decision making, and a number of studies that show that affect may be more important to risk perception in certain contexts than in others. Clearly, however, much work remains to explore in finer detail the risk contexts which elicit emotion cues and people's behavioural responses to those cues, but so far research has generally indicated that though emotion may serve a mobilising function it does not by and large inevitably lead to "irrationality", let alone "public panic" (Fischhoff, 2005b). There is, however, the concern that inducing emotion through communication can be problematic, and might potentially lead to maladaptive responses if not considered in conjunction with messages which for example enhance self-efficacy. These are logical propositions that I think are consistent at least in part with some of the sentiment expressed by Sjöberg's (2006) editorial, and are points on which I think many proponents of affect research would generally share the same view.

Postmodern discourses in the social sciences have, however, taught academics the valuable lesson that they do not necessarily control different interpretations of what they write, either by others within their profession, or by people outside of the research community. This is especially apparent in social arenas where evidence can be reported selectively to promote a particular perspective (political or otherwise) and prescribe a certain course of action, as much as for confirming the general validity of a particular argument or concept. There is of course a role for professional communities such as the Society for Risk Analysis and affiliates such as the Society for Risk Analysis Europe and the Society for Risk Analysis Japan, in promoting a particular view of the work of its members. Academics such as Sjöberg should be saluted for being watchful and raising concerns where different interpretations and prescriptions of such work in the public domain may need to be redressed if they have gone awry. In light of the current resurgence of research on affect and risk perception, which would it seems still have much potential to grow, there is clearly a pressing need for academics to engage in a critical discourse on the possible prescriptive application of such findings.

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