EXPECTANCY-VALUE MODELS OF
HEALTH BEHAVIOUR: THE ROLE OF
SALIENCE AND ANTICIPATED AFFECT

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Expectancy-value models of health behaviour are based upon the assumption that this behaviour is determined by a subjective cost-benefit analysis. Generally, these models emphasize cognitive appraisal processes focusing on the likelihood and evaluation of the consequences of health-related behavioural practices. A first potential shortcoming of applications of these models concerns their neglect of the cognitive limitations of the human decision maker. This is reflected in the tendency to incorporate many possible costs and benefits when assessing individual attitudes. We propose that the concept “dimensional salience” could help to assess the individual’s frame of reference within which behavioural alternatives are judged, and help to provide a more realistic description of the individual decision making process that takes account of the limitations of our information processing capacity. A second shortcoming of expectancy-value approaches concerns the limited attention paid to the anticipation of post-behavioural affective consequences. We propose a model explicitly incorporating these anticipatory feelings. The model combines elements of one of the prevailing expectancy-value models (Ajzen’s theory of planned behaviour) with the notions of salience and anticipated affect. Both salience and anticipated affect could help to understand the structure of beliefs underlying attitudes and behaviour. Finally, we briefly summarize our approach and discuss some implications for research attempting to predict and explain health-related behaviours.

KEY WORDS: Expectancy-value models, belief salience, anticipated affect, health behaviour.

The prevailing models that aim to describe and explain health behaviour are all based on expectancy-value approaches of human judgment and choice. Basically, these models combine probability judgments (e.g. the likelihood of negative and positive consequences of one’s behaviour) and value judgments (the evaluation or the expected utility of these consequences). The Health Belief Model is probably the framework most widely used to explain preventive health behaviours (see for a recent overview Sheeran and Abrahm, 1996). This model distinguishes five factors that influence behaviour. These are (a) perceived susceptibility or vulnerability to developing a specific health problem, (b) perceived severity of that problem, (c) perceived benefits of preventive behavioural action(s), (d) perceived barriers and/or possible negative consequences of the action(s), and (e) specific cues to action. A person’s tendency to take preventive action is assumed to be strongest when perceived severity, susceptibility and perceived benefits are high, while the costs of behavioural change are low and a clear cue to action is present.

In the present article we focus on more general expectancy-value approaches that have also been used extensively in research on health behaviour: Fishbein and Ajzen’s (1975) theory of reasoned action and the more recent theory of planned behaviour (Ajzen, 1985; 1991). Both are based on subjective expected utility theory (SEU) introduced by

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Edwards (1954), and provide a framework that can also incorporate the factors included in the Health Belief Model.

According to the theory of reasoned action behavioural intentions are determined by attitudes and social norms. Attitudes are assumed to be based on the summed products of the likelihood of positive and negative consequences associated with behavioural actions and the evaluation of these consequences. Thus, the more positive consequences are associated with a specific behaviour and the more likely their occurrence, the more attractive the behaviour is. Social norms are conceived of as based on the summed products of beliefs about important others' opinion about behavioural actions and the tendency of the individual to be influenced by these important others. According to Fishbein and Ajzen social norms and attitudes are two independent predictors of behaviour that are not necessarily convergent. The theory has been applied to a wide variety of health-related behaviours ranging from smoking cigarettes, dieting, alcohol consumption, wearing seatbelts to the use of birth control measures. Overall the model provides adequate predictions of health behaviour, and it has received extensive empirical support (see Sheppard, Hartwick and Warshaw, 1988 for a meta-analysis).

Ajzen (1985; 1991) argued that support for the theory of reasoned action is strongest for behaviours that are under volitional control, and noted that many behaviours are not under (total) volitional control. In other words, people could have positive attitudes towards certain behaviours but simply lack the resources to actually carry out the behaviour. For instance, one could have a positive attitude towards dieting but fail to do so due to the limited ability to sustain this behaviour. Ajzen incorporated this factor in his revised model of the theory of reasoned action and termed it "perceived behavioural control"; which is closely related to Bandura's (1989) concept of "self-efficacy"; i.e. the subjective belief of the individual to be able to carry out a specific behaviour (e.g. stopping smoking, sticking to a diet etc.). Both Fishbein and Ajzen's theory of reasoned action and Ajzen's theory of planned behaviour have been applied to a wide variety of behaviours. Ajzen (1996) reports over 250 empirical investigations dealing with a wide range of behaviours. Ajzen's expanded model has been tested in more than fifty studies in a variety of applied fields of research. In many cases the theory of planned behaviour was found to improve the prediction of behaviour. Recently Conner and Sparks (1996) provided an overview of studies using the theory of planned behaviour to predict health behaviours. Behaviours that have been studied include smoking cigarettes, alcohol consumption, sexual behaviour, health screening attendance, exercise, food choice, weight reduction and preventive self-examination.

In the remainder of this article we will discuss two issues that could help to improve our understanding of health-related behaviours. These issues concern the role of salience and the role of anticipated affect. Both factors will be discussed in the context of the theory planned behaviour. The salience or importance of beliefs could help to improve the descriptive validity of expectancy-value models of behaviour; research on anticipated affect stresses the impact of an often neglected factor in these models.

DIMENSIONAL SALIENCE OR BELief IMPORTANCE

Both the theory of reasoned action and the theory of planned behaviour assume that attitudes are based on a rational and relatively complete cost-benefit analysis of the various (possible) consequences of behavioural alternatives. Fishbein and Ajzen (1975) argue that
people generally base their attitude on five to nine salient beliefs about possible behavioural consequences. As argued by Fischhoff, Slovic, and Lichtenstein (1982), and Van der Pligt and Eiser (1984), this assumption is not supported by results obtained in the area of cognitive psychology and decision making. Research in these fields points at the limited information processing capabilities of human decision makers. Multiplicative rules such as those presumed by SEU theory and other expectancy-value approaches such as the theory of planned behaviour are quite difficult, and it seems unrealistic to expect people to apply these rules, especially when there are many relevant outcomes or consequences and varying probabilities associated with each of these outcomes. Mostly, people will base their decisions on pragmatic decision making strategies, use simplifying heuristics and/or decision rules that take only very few consequences into account. Focusing on a limited number of important outcomes or consequences could be a functional and quite rational way of making decisions. Although it seems now generally accepted that the method of combining large sets of behavioural beliefs and outcome evaluations does not provide an adequate description of the processes by which people form attitudes or make decisions (see also Baron, 1994; Edwards, 1992; Fishbein, 1993), standard practice in attitude research suggests otherwise.

Research using the models of Ajzen and Fishbein frequently presents respondents with 20 or more beliefs about possible consequences. Van der Pligt and Eiser (1984) mentioned studies on health behaviour including as many as 50 consequences to be rated in terms of probability and value. It is difficult to know what it means if one can predict behaviour on the basis of large numbers of consequences associated with behavioural alternatives, especially if it is extremely unlikely that respondents used all these aspects in their decision making. Van der Pligt and Eiser (1984) argued that one should allow for individual or group differences and investigate consequences that are important or salient for specific individuals or groups. In their view, this could improve our insight into the structure of attitudes and reduce the analysis of the decision-making process to manageable and more realistic proportions. This was first tested in the context of attitudes towards an environmental hazard, i.e. nuclear power. In a series of studies, Eiser, van der Pligt and colleagues asked respondents not only to evaluate and rate the likelihood of a variety of consequences of nuclear energy, but also asked them to select the consequences most important to them. They found that a limited number (three to five) of salient beliefs about this technology were equally predictive of individual attitudes as a more extensive set of modal salient beliefs. Similarly, the predictive power of the remaining larger set of non-salient beliefs was generally inferior to that of the set of salient beliefs. More interestingly, different groups (in this case proponents and opponents of nuclear energy) focused on different consequences (see van der Pligt, 1992; Eiser, van der Pligt and Spears, 1995 for an overview).

Fishbein and Ajzen (1975, p. 218) acknowledge that for each individual only a relatively small number of beliefs serve as determinants of the attitude. Moreover, they argue that a person's attitude is primarily determined by no more than five to nine beliefs about the attitude object. They also argue that measures of belief strength (i.e. the probability ratings of the beliefs) cannot serve as indicators of salience. Non-salient beliefs may be assigned a high probability and salient beliefs may sometimes have a rather low probability.

In order to assess salient beliefs, individual beliefs could be elicited in a free-response format by simply asking to list the beliefs associated with the attitudinal object. Salient beliefs are expected to be elicited first. It is difficult however, to determine at which point
a person starts eliciting non-salient beliefs. One could also use response-latencies to assess the salience of beliefs (see e.g. Bargh, Bond, Lombardi and Tota, 1986). Fishbein and Ajzen, however, conclude that it is impossible to obtain a precise measure of the set of beliefs that determine an individual's attitude because the number of salient beliefs may differ between people. They recommend (as a rule of thumb) to rely on the first five to nine beliefs as the basic determinants of attitude and assess these for a representative sample of the population to obtain the so-called modal salient beliefs within that population. It needs to be added that providing a free versus closed response format could result in considerable differences between the salience of beliefs. This is illustrated by our own research on so-called "worry-budgets" (cf. Fisher, Morgan, Fischhoff, Nair and Lave, 1991). In a free response format personal worries (doing well at school, finding a job, relational problems) tended to be most salient for adolescents, while health related worries were mentioned less often (99 vs. 14 percent). However, in a closed response format in which a variety of issues were listed including health related issues, health was assigned considerable importance (van Schie, van Baaren, Jakobs and van der Pligt, 1994). In the latter case it is unclear whether the importance attached to health related issues is a function of demand characteristics or the result of the reminder provided by the response format. One could argue that if people need to be reminded of a specific issue it could well be less salient in their spontaneous judgement and decision making.

The concept of *dimensional salience* is related to Fishbein and Ajzen's usage of the term salience, which they operationalize as the ease with which a belief is mentioned in a free response elicitation procedure. Their usage can be related to Kreach and Crutchfield (1948) who described how a person's beliefs and attitudes vary in "salience", where salient beliefs are more prominent in the cognitive field and enter thought more readily. Bruner (1957) also argued that more "accessible" knowledge is more likely to be used in judgment. Fazio (1989) followed up on this by demonstrating that highly accessible attitudes are more predictive of behaviour. Higgins (1996) proposes to restrict the term salience to properties of the stimulus only, independent of any prior cognitive set for a particular kind of stimulus. Thus in his view salience is a source of selective attention that arises from properties of the stimulus event. The concept "dimensional salience" is used differently and is closer to what Higgins calls *judged usability* (the judged appropriateness or relevance of applying stored knowledge such as sets of beliefs to a stimulus (see Higgins, 1989)).

Dimensional salience is also related to what Fishbein and Ajzen (1975, pp. 220–222) call "importance of beliefs". They describe three different ways in which the term "importance" has been used in the research literature. These are (a) the perceived importance of a specific attribute for the person; (b) the perceived importance of an attribute as a defining characteristic of the object; and (c) the perceived importance of an attribute as a determinant of the person's attitude. Next, they argue that the first usage is likely to be highly related to the polarity of the attribute's evaluation, while the second usage is closely (but not perfectly) related to the subjective probability of an association between the object and attribute.

The concept *dimensional salience* is most closely related to the third usage of the term importance; i.e., the perceived importance of an attribute as a determinant of one's own attitude. Fishbein and Ajzen (1975, Chapter 5) argue that subjective estimates of perceived importance in this sense, or relative weights, bear little resemblance to empirically derived weights. Thus, subjective estimates of the relative importance of an attribute are not likely to show a high correspondence with the weights obtained in a multiple
regression analysis. This view is in accordance with Nisbett and Wilson’s (1977) view
that the quality of introspection about judgmental processes tends to be limited.

All in all, Fishbein and Ajzen conclude that none of the different interpretations of
belief importance can be used to derive measures that will identify salient versus non-
salient beliefs. They also reject the standard statistical method to derive importance, i.e.
correlate the belief × evaluation outcome of each attribute with the overall attitude. These
correlations (and hence regression weights) are objective indices of importance but pro-
vide no evidence about the causality. Thus, they state that it is “inappropriate to assume
that a high correlation indicates an important determinant of attitude or that a low corre-
lation is evidence that the belief is not an important determinant of attitude” (Fishbein
and Ajzen, 1975, p. 222, italics as in original).

It needs to be added that both the theory of reasoned action and the theory of planned
behaviour are presented as descriptive models and do not explicitly state that beliefs
cause attitudes; i.e. the models provide a description of the way in which different beliefs
are combined to arrive at an overall attitude or evaluation of the attitudinal object. Thus
the subjective probability and evaluation of a set of attributes can provide adequate esti-
mates of a person’s attitude, and should not be seen as reflecting the actual decision-
making process underlying the attitude. What to do, however, if for a given individual or
group a set of three to five attributes provides an equally good or better estimate of atti-
du e as a set of 15–20 attributes including both salient and less salient beliefs? In this case
it seems advisable to look more carefully at the smaller set of beliefs or attributes, espe-
cially if it is possible to identify subgroups with different sets of beliefs underlying their
attitude. Such an inspection could provide insight into the structure of attitudes and
improve our insight in the actual decision making process underlying attitudes. As argued
before, people quite often use simplified decision rules in order to keep the decision mak-
ing process manageable. One of these decision rules could be to focus on a limited num-
ber of outcomes. The prevailing tendency to include many outcomes or attributes does
not always tell us a lot. The most cynical interpretation would be that due to the inclusion
of large sets of relevant and irrelevant beliefs or attributes we finally stumbled upon an
adequate estimate of individual or group attitudes, without much insight in how and why
individuals or groups hold specific attitudes.

A number of studies attempted to assess belief salience or importance and relate it to
direct measures of attitudes and/or behavioural intentions. Some of these (e.g. Eiser and
van der Pligt, 1979; van der Pligt, Eiser and Spears, 1986; Budd, 1986) simply require
respondents to select the three to five beliefs they find most important. Jaccard, Brinsberg
and Ackerman (1986) compared six methods to assess the importance of beliefs underly-
ing attitudes. These included an open-ended elicitation approach, information-search
indices, direct ratings of importance, and a paired comparison approach. Their findings
show modest levels of convergence among measures, and they argue that the conceptual
foundations of measures of outcome or attribute importance require more attention. In
terms of cost-effectiveness of measures we think that a simple ranking task (e.g. rank the
first three or five most important attributes) or a direct rating task (indicate how important
each possible outcome is as a determinant of your attitude or preference) can provide
potentially interesting information about the salient beliefs underlying individual and
behavioural preferences.

As mentioned before, attitudinal expectancy-value models such as the theory of
planned behaviour are based on SEU-theory. This theory does not require a specification
of which outcomes or beliefs are most relevant to a given decision. Generally, respondents
are required to rate possible outcomes in terms of their utility and their probability regardless of their importance. Not surprisingly, this aspect also received limited attention in research on the theory of planned behavior. It needs to be added, however, that both the theory of reasoned action and the theory of planned behavior assume that salient beliefs may well differ from individual to individual, and from population to population. Unfortunately, most research pays only limited attention to this issue which seems a shortcoming of common research practice.

Multi-attribute utility theory (see e.g. Koene and Raiffa, 1993) pays more attention to personal differences in the importance or weight assigned to the various attributes that form the basis of a decision. One aim of this approach is to prevent a proliferation of attributes, some of which might be so insignificant relative to others that they could be excluded from the analysis without having a clear effect on the preferences of the individual decision-maker. In this research tradition one tends to rely on a direct assessment of decision weights by simply asking respondents to assign relative numerical weights to the various attributes that should reflect the relative importance of the attributes for the overall decision. One standard procedure to do this is to distribute 100 points over the attributes so that the points reflect the relative "share" of importance (see e.g. Edwards and Newman, 1982). Another method is to assign the importance value of 10 to a so-called referent attribute and ask respondents to assess weights to the remaining attributes; these weights are then standardized to allow for interpersonal comparison.

The implications of the above reasoning seem especially relevant in the context of health education. Paying attention to belief salience could help to prevent behavioural change programs to focus on consequences that are seen as less relevant by the target group. For instance, van der Pligt and Eiser (1984) report findings indicating that smoking and non-smoking adolescents emphasize very different consequences of smoking and non-smoking. This issue was studied in more detail by Eiser, van der Pligt and Friend (1983). They used open interviews, assuming that arguments generated spontaneously in the course of free discussions would reflect the attitude structures of the individuals concerned. Their main prediction was that individuals who have different positions on the issue of smoking see different aspects of that issue as "salient" or subjectively important. One of the striking aspects of their data was the tendency for non-smokers to be much more active in introducing new themes into the discussion than smokers, suggesting that smokers adopted an essentially defensive and reactive posture within the groups. A total of 20 coding categories were combined into eight basic categories as shown in Table 1. Differences between smokers and non-smokers were tested by $\chi^2$-tests. As can be seen, smokers are clearly distinguishable from non-smokers in the kinds of themes they introduced into the discussion.

The results of the content analysis show clear differences in the aspects which were most "salient" to the smokers and non-smokers respectively, in the sense of being most likely to be introduced by them into the discussion. Non-smokers, as would be expected, are more likely to mention the dangers of costs of smoking, and also parental attitudes. Smokers tend to emphasize the benefits and pleasure of smoking, are more inclined to challenge the assumption that smoking causes lung cancer, and are more likely to argue that smoking is no worse than a variety of other habits. Second, when making declarative statements, smokers were more inclined to talk in general, abstract terms than in concrete, personal terms. Interestingly, health education efforts in the same period tended to follow a different approach, and failed to focus on the most salient beliefs of smokers. Instead these efforts provided information about consequences that were seen as less relevant by
Table 1. Relative frequencies (%) of themes introduced by smokers and non-smokers

<table>
<thead>
<tr>
<th>Theme</th>
<th>Smokers</th>
<th>Non-smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Themes most salient to non-smokers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Health, cancer, fitness</td>
<td>8</td>
<td>29***</td>
</tr>
<tr>
<td>(b) Smell, dirt, annoyance</td>
<td>1</td>
<td>15**</td>
</tr>
<tr>
<td>(c) Money</td>
<td>0</td>
<td>10**</td>
</tr>
<tr>
<td>(d) Parental attitude</td>
<td>0</td>
<td>10**</td>
</tr>
<tr>
<td>II. Themes most salient to smokers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e) Relaxation, enjoyment</td>
<td>26</td>
<td>4***</td>
</tr>
<tr>
<td>(f) Attractiveness, sociability, friends,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>looking grown up</td>
<td>24</td>
<td>9**</td>
</tr>
<tr>
<td>(g) Comparison with alcohol and other</td>
<td>23</td>
<td>4***</td>
</tr>
<tr>
<td>habits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(h) Denial of cancer association</td>
<td>11</td>
<td>0***</td>
</tr>
</tbody>
</table>

***p < 0.001   **p < 0.01.

this group. Education efforts that focus on consequences that are seen as important and, at the same time, attempt to increase the importance or salience of the consequences seen as less relevant (e.g. long-term health consequences) could well be more successful in persuading people to change their behaviour. It needs to be added that attempts to increase the salience of a particular consequence need a different approach than convincing people about the likelihood of that consequence.

Budd (1986) assessed the salience of beliefs in a study on students’ attitudes towards cigarette smoking. In his study respondents were presented with a total of eighteen beliefs and were asked to select the five most salient beliefs to them personally. His results showed that belief-attitude correlations with the five most salient beliefs were considerably stronger than correlations with the 13 remaining less salient beliefs (r = 0.62 versus r = 0.07). Other studies allowed respondents to generate their own beliefs and used these beliefs to predict attitudes and behavioural intentions. For instance, Rutter and Bunce (1989) found that allowing respondents to generate their own beliefs led to a better prediction of intention and behaviour than providing them with a set of modal salient beliefs. Unfortunately, their findings were not very stable over time; a repeated measure some weeks later did not reveal the same pattern.

As argued before, it seems relatively inefficient for behavioural change programmes to focus on consequences that are not salient to the receiver of the message, especially if he or she not necessarily disagrees with the fact that the specific consequence could occur. Obviously, it is not only those who do and do not engage in a preventive health behaviour who differ in terms of the salience of the various possible beliefs or attributes. Groups that differ in terms of actual risk, knowledge, gender and various other sociodemographic variables might also adopt different frames of reference.

There are a few examples of other research paying explicit attention to belief salience or importance. For instance, a number of researchers argued that one need only assess the evaluative component of individually salient beliefs (see e.g. Conner and Sparks, 1996; Eagly and Chaiken, 1993; Bell, Esses and Maio, 1996; Eagly, Mladinic and Otto, 1994). Others also argued against the modal salient beliefs technique and suggested to elicit respondents’ self-generated beliefs about the attitude object. Cronen and Conville (1975) argued that when respondents’ own beliefs are elicited, the expectancy or probability
component of the model does not improve the predictive power, because scores on this component tend to be quite high. As argued before such a solution would be in line with multi-attribute-utility-theory (MAU). The crucial question is then whether the combined focus on evaluation and importance provides (a) better prediction of attitudes and/or (b) more insight in the decision making process underlying the attitudinal judgment. The answer to the latter is likely to be affirmative, assuming that people can adequately assess the importance of the various attributes underlying their decision. There is less systematic evidence, however, concerning the relative predictive power of an approach focusing on evaluation and importance only, although there are some suggestions that the proportion of explained variance in attitudes is not likely to be significantly reduced if one considers only salient beliefs as opposed to the whole set of beliefs. The fact that studies using individually salient beliefs have shown increases in explained variance as compared to using the remaining less salient beliefs (see e.g. Buid, 1986; van der Pligt, 1992) indicates that the predictive power of sets of individually salient beliefs can be quite adequate.

To summarize, we would like to recommend a mix of qualitative and quantitative research in the initial stages of research attempting to assess the relevant beliefs of the population. This research should rely on both open and closed response formats. For the later stages we would like to argue in favour of assessing the probability and evaluation of the consequences of specific behavioural alternatives and also ask respondents to indicate the subjective importance of the various consequences or attributes for their overall evaluation. In specific cases one could drop probability estimates or value judgments (e.g. if all outcomes are uncertain or if a simple dichotomy of good and bad consequences will suffice). It is difficult to decide beforehand when this is the case. Our preference therefore is to include both probability and evaluative ratings and also incorporate at least a simple measure of subjective importance. The most simple measure would be to ask respondents to select the three to five most important consequences, one could also ask respondents to rank these consequences in terms of importance. Finally, a more comprehensive measure would be to assess the weights of all listed consequences as is often done in research on MAU-theory. Earlier we briefly described one of the techniques used in this tradition; i.e. ask respondents to divide a total of 100 points over the various consequences. The higher the number allocated to a specific consequence the more important it is. Similarly one can ask respondents to give weights between 0 and 1 to each of the consequences; again these weights should sum up to 1.00. These techniques are more demanding and are best done in a computer-assisted set-up which allows respondents to see the effects of differential weights on their overall decision with the help of sensitivity analysis (see Edwards and Newman, 1982).

If statistical analysis reveals that the salient beliefs of individuals or subgroups indeed provide adequate predictions of their overall attitude, this additional measure could tell us something about the structure of individual and group attitudes and also allow us to be more realistic in our assumptions about the processes underlying individual attitudes. Thus our main argument in favour of an approach paying more attention to dimensional salience or belief importance is that such an approach could increase our insight in the decision-making process of specific individuals or groups and can also be used in the design of health education programmes.

All in all we would like to argue that the relative neglect of belief salience is not caused by the fact that the relevant theories did not pay attention to this factor. Both Fishbein and Ajzen's approach incorporate this aspect. Moreover, Ajzen and Fishbein present a detailed discussion of the pros and cons of incorporating a measure of salience
and importance in the theory of reasoned action. However, the simple fact that this factor was not explicitly incorporated in both theories at operational level has led to a situation in which this factor was less salient in research practice. A similar mechanism might have caused the relative neglect of another factor we think is important in the prediction of health behaviour: anticipated affect. As argued in this section, belief salience or importance could help to improve our understanding of the structure of beliefs underlying attitudes and behaviour. Some beliefs are simply more important than others. In the next section we will argue that anticipated affect can also be an important determinant of behaviour, but that this factor is often ignored in assessing the antecedents of health behaviour. Moreover we will show that increasing the salience of this factor can have an impact on behavioural intentions and behaviour.

ATTITUDES, AFFECT AND BEHAVIOURAL CHOICE

As argued before, both the theory of reasoned action and the theory of planned behaviour assume an informational foundation of human conduct. In the previous section we argued for a simplified model based on more realistic assumptions about human information processing capabilities. In the present section we will focus on a second potential shortcoming of research based on these expectancy-value models. This concerns the neglected role of anticipated affective consequences of behaviour. Approaches such as the theory of reasoned action and the theory of planned behaviour tend to focus on cognitive appraisal processes as determinants of health behaviour.

The issue of affective determinants of human decision making was introduced in the attitudes and decision making literature in the late 1970s and early 1980s. There is now considerable evidence that affective factors can influence attitudes and behavioural choice. For example in a study of political person perception Abelson, Kinder, Peters and Fiske (1982) found that the way politicians made the respondents feel in the past (e.g., happy, hopeful, angry, afraid) was a better predictor of their preferences and attitudes than the traits (e.g. honest, open-minded, immoral, weak) respondents ascribed to the politicians. Breckler and Wiggins (1989) found that both belief-based evaluation and affect engendered by the attitude object correlated independently with attitudes in a number of attitude domains. For instance, they found that affect was a more important determinant of blood donation than evaluative beliefs. Their study is one of the few that also investigated the influence of affect on behaviour. Generally, studies investigating affective processes in an attitudinal context focused on the impact of affect on overall attitudes towards persons, objects, or issues. In attitude-behaviour research, affect apparently is generally considered to be a constituent of attitude and not a separate determinant of intentions and behaviour. Mostly studied in this context are past or general affective reactions with respect to the attitude object. For instance, the study by Abelson and his colleagues (1982) we described earlier investigated whether the feelings respondents had in the past about presidential candidates predicted their attitudes towards these candidates. Triandis (1977; 1980) also included an affective determinant in his model of attitude-behaviour relations. In his view, affect can be seen as: "The particular configuration of emotions that becomes activated at the thought of the behaviour" (Triandis, 1977, p. 16). Triandis thus focused on affect related to the behaviour itself.

Research on behavioural decision making focused on the role of anticipated, post-behavioural affective reactions. Early examples can be found in Janis and Mann (1977)
and research on regret theory (Bell, 1982; Loomes and Sugden, 1982). The basic assumption of this research is that people are particularly motivated to avoid feelings of post-behavioural regret. Janis and Mann (1977) conceive anticipatory regret as a "hot" cognitive process and define *anticipatory regret* as a generic term to refer to the main psychological effects of the various worries that beset a decision maker before any losses actually materialize.

Anticipatory regret thus refers to negative feelings that may arise after a specific behavioural action. In the framework of Janis and Mann these feelings are not restricted to regret; they refer to a variety of related anticipated affective reactions. Recently, the effects of anticipated affective reactions on decision making have been studied in behavioural domains, such as gambling for money (Josephs, Larrick, Steele and Nisbett, 1992), purchase decisions (Simonson, 1992), and medical decisions (Hershey and Baron, 1987). In a series of studies Richard, van der Pligt and de Vries (1995; 1996a, b) investigated the role of anticipated, post-behavioural affective reactions in the context of preventive health behaviour.

As mentioned before, research on the role of affective processes in the context of attitude-behaviour correspondence only occasionally addressed affective reactions associated with specific behaviours. Richard, van der Pligt and de Vries (1995) argued that the prediction of behaviour could be improved if post-behavioural, affective reactions are included in expectancy-value models of behaviour. Since models such as the theory of planned behaviour deal with *future* behaviour they should not only focus on belief-based consequences of the behaviour but also address the impact of *anticipated* affective reactions.

Richard *et al.* (1995) argued that anticipated affective reactions may enhance the predictive ability of Ajzen’s theory of planned behaviour, especially when there is a discrepancy between the evaluative response towards a particular behaviour and the anticipated affective reaction after this behaviour. This discrepancy seems to apply to a variety of health behaviours. In many cases a person’s anticipated affective reactions after a given behaviour may be quite different from his/her evaluation of the behaviour itself. For example, people may like (i.e., have a positive evaluation of) the idea of going out with friends, drinking alcohol, and having a good time, but may also realize that they could regret their behaviour the next morning when having to get up for work. Similar examples concern diet behaviour, compliance behaviour and risky sexual practices.

The attitudinal component of the theory of planned behaviour differs from anticipated affective reactions in two respects. First, the former tends to stress belief about utilitarian, non-affective outcomes, while the latter focuses on affective consequences of behaviour. Second, the concepts also differ in their time perspective. Applications of expectancy value models to health behaviour tend to stress evaluative beliefs about the behavioural activity itself and longer term (negative) consequences. This is inherent to the nature of most health behaviours being studied; i.e. pleasurable habits with possible adverse long term consequences. Anticipated affect deals with relatively immediate, post-behavioural affective consequences.

Richard *et al.* (1995; 1996a) thus added anticipated affective reactions to the theory of planned behaviour. Initially they focused on negative affective reactions such as regret and worry and tested the role of these factors in the domain of sexual behaviour. The assumption being, especially in the case of unsafe sex, that there would be a discrepancy between attitudes towards the sexual activity itself and affective reactions after this activity. Results of their studies showed that anticipated regret and worry significantly added
to the prediction of behavioural intentions. The contribution of anticipated regret and worry was independent of other evaluative beliefs about the target behaviour. Moreover, their findings showed a superior fit of their model (separating affective and attitudinal components) as compared to a model treating the two components as a single construct.

In a related study Richard et al. (1996a) focused on more general anticipated affective reactions and extended the application of their model to health behaviours such as eating "junkfood", using soft drugs and alcohol consumption. Results confirmed the earlier findings with a clear independent role for anticipated affect as a predictor of behavioural intentions, although the effects were less pronounced as those obtained for sexual behaviour. Results of this study showed that anticipated post-behavioural affective reactions were more negative than attitudes and general affective reactions towards the target behaviours.

Findings of Richard et al. (1996a) indicated only moderate correlations between anticipated affective reactions and attitude. Moreover, in both studies anticipated affective reactions predicted a significant proportion of variance in behavioural expectations and self-reported behaviour, over and above the components of the theory of planned behaviour. Thus, the results of their research suggest that the predictive power of the theory of planned behaviour may improve if anticipated, post-behavioural affective reactions are incorporated in the model. Moreover, their findings revealed a better fit of the model if anticipated affective reactions were treated as a separate factor and not incorporated in the attitudinal component of the theory of planned behaviour.

One way to test the causal role of anticipated affect is to manipulate its salience. Richard, van der Pligt and de Vries (1996b) argued that when people think about their feelings about a behavioural action, different beliefs could be salient than when they think about the feelings they would experience after carrying out the action. Their reasoning is related to work by Wilson and Hodges (1992), who argued that people often have contradictory beliefs about an issue or a behavioural option and that the corresponding attitude depends on the subset of beliefs to which they attend at a specific moment in time. Wilson and Hodges also suggest that attitudes are easily changed if people are led to attend to a particular subset of beliefs.

Richard, van der Pligt and de Vries (1996b) applied these insights to preventive sexual behaviour (see also van der Pligt and Richard, 1994) and introduced a simple technique to increase the awareness that unsafe sex is likely to result in unpleasant post-behavioural feelings. Respondents (first year students) were presented with scenario's describing a realistic situation in which they met someone to whom they felt attracted and wanted to have sex with. In these studies respondents were either asked to imagine how they would feel about such an event or how they would feel after the event. With this simple procedure Richard et al. aimed to influence the time perspective of respondents and increase the salience of their post-behavioural feelings.

Results of this study can be summarized as follows: (a) Respondents listed significantly more negative feelings, such as regret, worries and anxiety, when asked to think about unsafe as opposed to safe sex, (b) this difference was significantly more pronounced when respondents were asked to describe the feelings they would have after having had sex, and (c) asking questions about feelings after having had unsafe sex also resulted in increased intentions to use condoms in future casual sex or sex with new partners. Thus this simple manipulation of time perspective when thinking about affective reactions resulted in the increased salience of negative affective reactions such as worry and regret and also influenced expectations about future risk behaviour.
A second study (Richard et al., 1996b) confirmed these findings. In this study time perspective was manipulated in a similar way. Results showed again that this manipulation affected respondents’ anticipated regret and worries, as well as their expectations to use condoms in the future. Those who were asked to imagine and describe their feelings after having had (unsafe) sex with a new partner, had higher expectations to engage in safe sex, i.e. use condoms. More importantly, these increased behavioural expectations elicited by a simple variation in questionnaires proved to have an effect on actual behaviour. Five months after the experiment, respondents were contacted again. Those who had been asked to imagine post-behavioural feelings after having had unsafe sex reported to have been more preventive (i.e. reported a higher frequency of condom use). These findings suggest that a simple straightforward intervention which consists of asking adolescents to think about how they would feel after unprotected sex can be effective in persuading them to take preventive action. This is supported by other research suggesting that anticipated affective reactions such as regret and worry can also influence behaviours such as committing driving violations (Parker, Manstead, Stradling, Reason and Baxter, 1992; Parker, Manstead and Stradling, 1995) and consumer behaviour (Simonsen, 1992).

In the domain of traffic behaviour, Parker, Stradling and Manstead (1996) report that an intervention based on increasing the salience of the anticipated affective reactions was more effective than interventions directed at influencing attitude, social norms or perceived behavioural control.

Stressing the affective consequences of specific behavioural practices could be an effective way to change health behaviour. The main reason is that people tend to discount long-term consequences. Although this tendency is more pronounced for positive outcomes it also applies to negative outcomes (see e.g. Thaler, 1981; Loewenstein, 1988). Thus, contracting a disease tomorrow is seen as worse than contracting a disease in ten years time. Reasons for discounting long term health consequences could be related to the belief that one can change one’s behaviour later, mitigate the risks by other compensating behaviour, or that advances in medical science will eventually make the risk disappear or provide a cure for disease. Reminding people of the affective consequences (worry, regret and anxiety) of risky practices introduces more immediate negative consequences of these practices. Our findings suggest that these anticipated feelings are taken into account when making decisions about health behaviour.

In our view health education campaigns that stress the rather immediate negative post-behavioural consequences could help to increase the willingness to engage in preventive behaviour. Reminding people of the possibility of these affective consequences seems a less extreme manipulation than fear appeals stressing (extremely) negative consequences for one’s health. Although fear aroused by a communication is often predictive of intentions to adopt the recommended preventive behaviour, excessive levels of fear can also trigger denial and hence reduce the effectiveness of interventions aiming to increase the likelihood of preventive behaviour (see for instance Liberman and Chaiken, 1992; Joseph, Montgomery, Kirsch and Kessler, 1987). It could be that stressing post-behavioural negative affective consequences results in lower anxiety levels than fear appeals and still stimulates people to take preventive action.

Of course, the generalizability of these results needs to be further investigated. Until now, research has focused on behaviours that are associated with positive affect, and also have more negative long-term consequences. In such cases more immediate negative affective consequences seem relevant and can enhance the predictive power of expectancy-value models. Moreover, increasing the salience of the immediate negative affective
consequences of behaviour seems to be effective in this domain and can lead to behavioural change. A shift in time perspective might well be less effective in domains where the balance of positive and negative consequences is different in the first place, or where there is not a discrepancy between affect associated with the behaviour itself and possible (long-term) outcomes.

It needs to be added that further research is needed to assess the necessity of including anticipated affect as a separate factor in the theory of planned behaviour. Some of the tests provided by Richard et al. (1995; 1996a) did not present respondents with belief statements about possible consequences but with semantic differentials focusing on either affective consequences or an evaluation of the target behaviour. One of the major advantages of the theory of planned behaviour is that it can incorporate a variety of beliefs related to the target behaviour including beliefs about immediate affective consequences. It could well be that incorporating these affective consequences in the set of belief statements used to assess attitudes improves the predictive power of the theory of planned behaviour without making it necessary to incorporate it as a separate predictor. Further research is needed to provide an answer to the question whether anticipated affective consequences need to be treated as a separate factor.

The reason why this factor received only limited attention in the theory of reasoned action and the theory of planned behaviour could well be related to the way in which beliefs are elicited in the context of these two theories. Generally, the two approaches require an initial stage determining the set of beliefs to be included in the assessment of attitudes. The typical elicitation technique requires respondents to list advantages and disadvantages of the target behaviour. This wording may induce respondents to focus more on utilitarian outcomes, and pay less attention to the possible affective outcomes of the behaviour (see also Manstead and Parker, 1995; van der Pligt, Zeelenberg, van Dijk, de Vries and Richard, in press). Present findings indicate that paying attention to anticipated affect could help to improve our insight in the antecedents of health behaviour and also help to improve the predictive power of expectancy-value models of health behaviour. Moreover, increasing the salience of such considerations could well be a fruitful avenue for designing interventions.

DISCUSSION

In this article we stressed the potential relevance of two factors that received limited attention in expectancy-value models of human behaviour and their applications in the field of health psychology. The first factor concerns the salience of beliefs underlying attitudes and behavioural decisions. We argued that it seems essential to take account of the frame of reference of the individual decision-maker and incorporate a measure of subjective importance of the various beliefs underlying attitudes towards (preventive) health behaviour. Second, we presented evidence indicating that paying explicit attention to anticipated, post-behavioural affect as a determinant of health behaviour could also help to improve our insight in the belief structure underlying attitudes and behavioural preferences. Moreover, incorporating anticipated affect could also help to improve the predictive power of expectancy-value-models of health behaviour.

Figure 1 summarizes our approach and explicitly incorporates anticipated affect and dimensional salience or belief importance. Our preference to incorporate a subjective measure of importance is related to the fact that people's decisions about behavioural
practices tend to be based on a limited number of considerations. The concept of dimensional salience could help to provide more insight in the structure of attitudes and tell us what aspects of a behaviour are seen as important or salient. If a simple procedure to assess the subjective importance of beliefs results in adequate predictions of behavioural intentions, this could help us to understand the underlying decision making processes of specific subgroups. Too often intervention programmes seem to be based upon the frame of reference of those who are already convinced of the recommended behaviour. Knowing the salient beliefs that underlie the attitude of the target groups of an intervention or health education effort should help to tailor interventions aiming to change health-related behaviour. In this way it should be possible to assess whether the primary aim of an intervention programme should be to change beliefs about the likelihood of specific consequences, the evaluation of these consequences or their salience.

We thus argue that both basic and applied research could benefit from incorporating this factor. Basic research could learn more about individual decision making processes by comparing individually selected attributes to the weights of these attributes derived by statistical analysis, and provide more information about the actual decision-rules used by respondents. Applied research and practice could benefit from the improved insight into the frame of reference of individuals or groups when judging behavioural alternatives with different implications for one’s health. The reason why belief salience does not receive much attention in research on health behaviour could well be related to the fact that the prevailing expectancy-value models do not pay explicit attention to this factor at operational level.

This also applies to the second factor we discussed in this article; anticipated affect. The basic assumption of our approach is that the anticipation of affective consequences of behavioural actions could have an impact on decisions about health behaviour. Moreover, our findings suggest that these anticipated affective reactions seem partly independent of other main predictors of health behaviour such as perceived behavioural control, subjective norms and attitudes. The evidence presented in this article is restricted to behaviours which are associated with positive affect but can result in (longer-term) negative
consequences. Immediate, post-behavioural affect (e.g. worry, regret) tends to be negative for these behaviours. These discrepancies between affect associated with the behaviour itself, the immediate behavioural affective consequences and the longer term consequences apply to a wide variety of health-related behaviours. The strongest evidence we found concerned behavioural practices that could lead to serious and irreversible consequences (unprotected sex with new or casual partners), and our findings suggest that the anticipation of negative affective reactions could be effective in persuading adolescents to adopt preventive sexual behaviour. Overall, the effects of anticipated affect seem to be more modest when dealing with behaviours that are not associated with such extreme consequences. It needs to be added that interventions based on increasing the salience of anticipated regret have also been shown to influence driving behaviour (Parker et al., 1996). Stressing post-behavioural regrets and worries could thus be quite useful due to the limited impact of other behavioural determinants such as beliefs about the long-term consequences of health-related behaviours.

References


