

## Workshop on ‘Changing nutrition behaviour to improve maternal and fetal health’

### The application of psychological theory to nutrition behaviour change

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Changing individuals' health behaviour seems to be the key to solving many of the world's health problems. Although there is a multitude of potential influences, many interventions to improve health seek to change intrinsic psychological determinants of health behaviour. To date, most attention has been paid to cognitions, such as attitudes and beliefs, and a number of social cognition models (SCM) are in current use. SCM all describe cognitions as determinants of behaviour, thereby implying that changes in cognitions will lead to changes in behaviour. Although SCM are widely used to predict a range of health behaviours, they are associated with a number of important limitations, including poor levels of predictive power, particularly in relation to eating behaviour, and limited guidance about the operationalisation of theoretical constructs. These limitations may explain why very few interventions to change behaviour are explicitly theory-based, despite the widely-held view that having a clear theoretical underpinning will improve effectiveness. Ultimately, advances in understanding and changing health behaviour will come about only if psychological theory and practice are integrated. The recently-published taxonomy of behaviour-change techniques used in interventions is a good example of integrated research, but more work of this type is essential and will require respectful collaboration between researchers and practitioners working from a range of different disciplines such as health psychology, public health nutrition and health promotion.

#### Behaviour change: Food choice: Psychological theory: Nutrition behaviour

#### Changing behaviour to improve health

It is widely accepted that engaging in or abstaining from a wide range of behaviours can have a massive impact on health outcomes. The UK National Institute for Health and Clinical Excellence has recently concluded that there is overwhelming evidence for the impact of health-related behaviour on causes of mortality and morbidity<sup>(1)</sup>. Nowhere is this impact better illustrated than in relation to diet. The total worldwide mortality attributable to low consumption of fruit and vegetables, for example, was recently estimated to be  $2.635 \times 10^6$  deaths per year<sup>(2)</sup>. The same research suggests that increasing an individual's fruit and vegetable consumption to the recommended 600 g/d would reduce the burden of heart disease by 31% and the total worldwide burden of disease by 1.8%. The answer to many

of the developed world's health problems therefore seems to lie in changing individuals' health behaviour, and in particular their eating behaviour. However, attempts to change individuals' health behaviour have had mixed success. One suggestion is that this outcome may be explained by the failure of many interventions to take into account the theories and principles that underlie health behaviour<sup>(1)</sup>.

One of the difficulties in considering how to change individuals' health behaviour is that there is an enormous range of physiological, psychological, social and environmental factors that have the potential to influence human behaviour. This is as true of eating behaviour as of any other health behaviour, and leaves researchers and practitioners with the problem of deciding which of these diverse factors should be targeted by interventions. In the UK punitive measures such as legislation to change the

**Abbreviation:** TPB, theory of planned behaviour.

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environment and hence restrict the opportunity to engage in unhealthy behaviour, with the exception of the ban on smoking in public places, have been largely rejected in favour of approaches that encourage individuals to take responsibility for themselves and voluntarily make appropriate healthy choices<sup>(3)</sup>. As a result, many contemporary interventions to improve health seek to change intrinsic psychological determinants of health behaviour.

### Psychological determinants of health behaviour

While there is a variety of potential psychological determinants of health behaviour such as personality and emotion, most attention has been paid to cognitions<sup>(4)</sup>. Cognitions are defined as mediating internal mental processes such as knowledge, attitudes and beliefs that allow individuals to ‘... enact their self-conceptions, revise their behaviour, or alter the environment so as to bring about outcomes in it in line with their self-perceptions and personal goals’<sup>(5)</sup>. What is particularly appealing about focusing on cognitions is that they are considered to be relatively open to manipulation and therefore represent an important channel through which health behaviour can be modified<sup>(6)</sup>.

Research in this area has sought to define the different types of cognitions (also referred to as constructs) that act as behavioural determinants and has attempted to combine them into structured explanatory models (also referred to as social cognition models or social cognition theories). Popular examples of these models include the health belief model<sup>(7)</sup>, the theory of planned behaviour (TPB)<sup>(8)</sup> and the transtheoretical or stage of change model<sup>(9)</sup>. Social cognition models tend to focus on the cognitions that are thought to be important in decision making and motivation to adopt health behaviours. This process is conceptualised in the TPB, probably the most dominant model in current health behaviour research<sup>(4)</sup>.

The TPB suggests that the likelihood of an individual behaving in a certain way is best predicted from their intention to perform that behaviour. Intention is an indication of an individual’s readiness to perform a given behaviour and is considered to be the immediate antecedent of the behaviour. Intentions are a product of the individual’s:

1. attitude towards the behaviour, which is composed of behavioural beliefs about the consequences of engaging in the behaviour and outcome evaluations about the extent to which these consequences are positive or negative;
2. subjective norm, which is composed of normative beliefs about the way in which significant others would wish them to behave and motivation to comply with these social pressures;
3. perceived behavioural control, which is composed of control beliefs about the factors that would facilitate or impede performance of the behaviour and beliefs about the power of control factors to facilitate or impede performance.

It follows that the more positive an individual’s attitude and subjective norm towards a certain behaviour, and the

greater the extent of control they perceive they have over this behaviour, the stronger should be the individual’s intention and the greater the likelihood of them performing the behaviour. An application of the TPB to eating a low-fat diet therefore suggests that a strong intention to eat a low-fat diet (e.g. strongly agreeing with the statement ‘I intend to eat a low-fat diet over the next month’) would be predicted by a positive attitude to eating a low-fat diet (e.g. ‘My eating a low-fat diet in the next month is beneficial’), strong social pressure to eat a low-fat diet (e.g. strongly agreeing that ‘People who are important to me want me to eat a low-fat diet’), and the perception of having a great deal of control over eating a low-fat diet (e.g. strongly agreeing that ‘Whether or not I eat a low-fat diet in the next month is entirely up to me’)<sup>(10)</sup>. Furthermore, it is predicted that strength of intention to eat a low-fat diet would be positively correlated with actual behaviour (e.g. dietary intake assessed using an FFQ).

### Limitations of social cognition models

Although social cognition models such as the TPB are widely used to predict a range of health behaviours, they have received harsh criticism<sup>(4,11,12)</sup>. One of the main issues is that many of these theories are based on very similar theoretical constructs that they label differently, creating confusion. The claim is that this situation has led to fragmentation rather than synthesis of the body of knowledge about the determinants of human health behaviour. A prime example of such a construct is that of control, which has variously been labelled sense of control, locus of control, perceived behavioural control, perceived control or personal control<sup>(13)</sup>. The construct of control also overlaps with constructs not explicitly labelled as such but clearly related, such as self-efficacy and mastery<sup>(14)</sup>. As so many different constructs relating to issues of control are currently being used to explain and predict health behaviour, a great deal of investigative time and energy has been wasted in trying to define where differences between the constructs lie and in determining which is the most useful.

Another major criticism of social cognition models is that even the best of them have been found to account for a relatively small amount of variation in observed behaviour. It has been estimated that social cognition models explain at worst 1% of variation in behaviour and at best 65%<sup>(12)</sup>. A meta-analysis of results from 185 applications of the TPB has concluded that this model explains on average only 31% of self-reported behaviour and only 20% of objectively-measured behaviour<sup>(10)</sup>. In addition, social cognition models have had more success in accounting for some types of health behaviour than others<sup>(15)</sup>. For example, meta-analyses indicate that the TPB has accounted for an average of 39% of the variance in drug use, alcohol use and smoking, but only an average of 16% of the variance in dietary behaviours<sup>(16)</sup>.

One explanation for the relatively-poor predictive power seen by many applications of social cognition theory is the inadequate assessment of theoretical constructs<sup>(17)</sup>. In order to investigate individual differences in cognitions it is

necessary to quantify the constructs of interest. Cognitions are by their very nature unobservable and so measurement most often relies on self-report, whereby participants respond in a verbal or written manner to statements about the object in question, most often in the form of a self-completed questionnaire. There are a range of guidelines about the construction of questionnaires for many social cognition models<sup>(18)</sup> and, as with any quantitative measure, it is essential that the questionnaire is both reliable and valid<sup>(19)</sup>. The construction of psychometrically-sound, salient and user-friendly questionnaires, however, requires both expertise and adequate resources, not always available to practitioners trying to apply theory to the design of behaviour-change interventions.

Other explanations are less easily remedied. Social cognition theories predict deliberate behaviour (behaviour that is conscious and planned) and it is now known that much of eating behaviour is not deliberate in the way of other health behaviours. Recent research has shown how very susceptible human eating behaviour is to environmental cues; for example, although they are completely unconscious of these effects, individuals eat more at a meal eaten with other individuals<sup>(20)</sup> and they eat less if served in a smaller bowl or on a smaller plate<sup>(21)</sup>. According to the latter analysis, individuals make on average 200 daily food decisions of which they are unaware, in addition to those of which they are aware. The fact that individuals are largely unaware of much of their eating behaviour may explain why models based on the premise that the decisions are deliberate and conscious fail to predict what individuals choose to eat.

All social cognition theories focus on an individual's own beliefs in determining their behaviour. As such, they tend to down play the role of structural factors that shape and constrain individual choices. In the case of nutrition behaviour, factors such as socio-economic status, age, gender and place of residence all have marked effects on diet<sup>(22)</sup>. Social cognition theories assume that such factors have ultimately to play out through the beliefs and actions of the individual, which might mean that an individual's attitudes to healthy eating might be given more weight in these models than, for example, the relative cost or difficulty of accessing healthy food. These latter factors would be treated as incidental rather than central to social cognition theories.

Other researchers argue that contextual factors completely outweigh an individual's beliefs in determining their health behaviour. The emphasis in the TPB and other social cognition models on the amount of variance in behaviour that can be explained by particular cognitions in a given population has been rejected<sup>(4)</sup>. It is dismissed as fundamentally reductionist, and it is claimed that individual behaviours can only have meaning if they are considered in context. The implication is that cognitions relating to behaviour such as healthy eating in one situation will not generalise to healthy eating in another, and therefore trying to accurately predict behaviour from measurements of underlying attitudes and beliefs is futile.

Finally, social cognition models as a whole have been criticised for giving little consideration to how cognitions can be most effectively modified to create behaviour

change<sup>(23)</sup>. For example, it is suggested that 'The theory of planned behavior can provide general guidelines ... but it does not tell us what kind of intervention will be most effective. We could consider persuasive communications, perhaps in the form of newspaper ads, flyers'<sup>(24)</sup>. Indeed, a systematic review of health interventions based on the TPB has revealed that the majority of the reported studies have used some form of information provision or persuasive communication, although they have also employed a range of behavioural techniques<sup>(25)</sup>.

### Changing nutrition behaviour

So where does this position leave researchers and practitioners wishing to design and run interventions to change individuals' cognitions? Clearly, psychological theory is not only needed to explain individual propensity to engage in health behaviour but is essential for the design and evaluation of interventions<sup>(26)</sup>. Without theory it may be possible to determine the extent to which an intervention affects the target behaviour, but not how or why it has such an effect. Without an organising governing theory of health behaviour there would be no way of understanding why, for example, delivering nutrition information in person is so much more successful in changing eating behaviour than simply handing out a leaflet that describes the benefits of a healthy diet<sup>(27,28)</sup>. If an intervention of this type were to be based on a theory of human behaviour, it would help explain the relationship between the provision of information and the behavioural outcome. Answers to 'how?' and 'why?' can be provided by theory and tested by mediation analyses<sup>(18)</sup> and are essential if researchers and practitioners are to go on and create new and innovative interventions. The relationship between theory and practice is not only one-way. As has been pointed out 'Theory is not theology. Theory needs questioners more than loyal followers ... The advancement of ... theories ... will come from those who are willing to use the theories, test them, and subject them to rigorous evaluation'<sup>(29)</sup>.

Although theory-based interventions to change health behaviour are encouraged and recognised as likely to be more effective<sup>(1,30)</sup>, unfortunately very few are explicitly theory based<sup>(31)</sup>. This approach may seem woefully short-sighted, but it is perhaps unsurprising when the limitations of social cognition models, the most widely used psychological theory, are considered.

### Bridging the gap between theory and practice

There appears to be an unhelpful disconnection between academics working to develop psychological behaviour-change theory and practitioners working to develop interventions to change health behaviour. A novel approach to this issue has recently been proposed, which rather than focusing on one theoretical perspective and its application to changing health behaviours, is a reliable 'taxonomy' or directory of generally-applicable psychological behaviour-change techniques<sup>(32)</sup>. The analysis of 195 published interventions has resulted in the description and definition of twenty-six different behaviour-change techniques. In

addition, each of the twenty-six behaviour-change techniques have been mapped onto relevant psychological theory so that in the documentation each technique is accompanied by an explanation of the way in which it works towards helping the individual change their behaviour. This approach is important in that it gives the practitioner an understanding of the mechanism underlying each technique and an appreciation of the theoretical basis for the technique they want to employ. For example, technique 2 entitled 'Provide information on consequences' is defined as 'information about the benefits and costs of action or inaction, focusing on what will happen if the person does or does not perform the behaviour'<sup>(32)</sup>. This technique targets cognitions specified by the theory of reasoned action<sup>(33)</sup>, the TPB<sup>(8)</sup> and social cognitive theory<sup>(14)</sup> and attempts to increase motivation to change behaviour through informing the participant of the positive consequences of action and the negative consequences of inaction.

It is important to note that claims are not made for the effectiveness of the behaviour-change techniques included in the taxonomy. It is, however, suggested that adoption of such a taxonomy by practitioners would first provide some theoretical justification for the techniques selected and second allow a body of evidence to accumulate that could be used to examine the effectiveness of particular techniques and ultimately develop theory<sup>(32)</sup>. This development is relatively recent and it is acknowledged that further work is needed to develop and operationalise the taxonomy<sup>(32)</sup>. For example, practitioners using behaviour-change techniques are encouraged to contribute to the body of knowledge about what works in which context via a website<sup>(34)</sup>.

Ultimately, advances in understanding and changing health behaviour will only come about if psychological theory and practice are integrated. For nutrition, this approach places the onus on researchers and practitioners working in areas such as health psychology, public health nutrition and health promotion to respect and capitalise on the strengths of each discipline. These researchers and practitioners do, after all, have something fundamental in common that should transcend any differences, they all want to help individuals achieve optimal health by adopting a healthy diet.

### Conclusion

Clearly, behaviour has a huge impact on health and nowhere is this impact better illustrated than in relation to nutrition behaviour. Amongst those researchers and practitioners who work to change health behaviour, there is currently an emphasis on its psychological determinants, and in particular on underlying cognitions and cognitive processes. However, this approach has a number of limitations, especially in relation to translation of theory into interventions. It is widely acknowledged that behaviour-change interventions with a theoretical underpinning are more effective, but unfortunately the difficulties of translation mean that the majority of interventions are not based on theory. In addition, there is no conclusive evidence that

any one theory is better than another as a basis for effective interventions across all situations. One recent attempt to bridge the gap between theory and intervention has been offered, which provides an alternative technique-focused approach that allows for flexibility in selecting behaviour-change techniques to fit best the population under study, whilst emphasising rigour in their application and in understanding how techniques work<sup>(32)</sup>. It is hoped that such work will lead to more successful collaboration between researchers and practitioners working from a range of different disciplines such as health psychology, public health nutrition and health promotion. For many researchers this approach may require a change in their own behaviour!

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