

Are Techniques Used in Cognitive Behaviour Therapy Applicable to Behaviour Change Interventions Based on the Theory of Planned Behaviour?

IMOGEN C. A. HOBBS & STEPHEN SUTTON

University of Cambridge, UK

IMOGEN C. A. HOBBS is a Clinical Psychologist and Post-doctoral Research Associate at the Institute of Public Health, University of Cambridge. She is interested in the application of clinical psychology within health behaviour change settings and interventions.

STEPHEN SUTTON is Professor of Behavioural Science at the Institute of Public Health, University of Cambridge. His research interests include the application of theories of behaviour change in the development and evaluation of interventions to change behaviours such as smoking and physical activity.

ACKNOWLEDGEMENTS. The authors are grateful to Dr Susan Michie, Professor Ann Louise Kinmonth and Wendy Hardeman for their helpful comments on an earlier draft of this manuscript.

COMPETING INTERESTS: None declared.

ADDRESS. Correspondence should be directed to:
I. C. A. HOBBS, DClinPsych Programme, MED-HPP, Elizabeth Fry Building, UEA, Norwich, NR7 4TJ, UK.
[email: ich26@medschl.cam.ac.uk]

Journal of Health Psychology
Copyright © 2005 SAGE Publications
London, Thousand Oaks and New Delhi,
www.sagepublications.com
Vol 10(1) 7–18
DOI: 10.1177/1359105305048549

Abstract

The Theory of Planned Behaviour (TPB) is increasingly being used to inform the development of interventions to promote health behaviour change. However, although the theory can be used to identify the determinants of particular health-related behaviours, it offers little guidance on how to change these determinants and hence how to promote behaviour change. There is evidence that Cognitive Behaviour Therapy (CBT) can be used to support health behaviour change. This article discusses the similarities and differences between the two approaches, and considers whether techniques used in CBT are applicable to interventions based on the TPB.

Keywords

behaviour change interventions, Cognitive Behaviour Therapy, Theory of Planned Behaviour

Introduction

THE THEORY of Planned Behaviour (TPB; Ajzen, 1991, 2002a) is widely used to inform studies to identify the predictors of behaviour, particularly health behaviour (Conner & Norman, 1996). More recently, it has also been used to inform health behaviour change interventions (Hardeman et al., 2002). However, although the TPB is consistently found to provide useful predictions of intentions and, to a lesser extent, behaviour (Armitage & Conner, 2001; Godin & Kok, 1996; Sutton, 1998), it does not provide guidance on how to promote behaviour change. Other social cognition models, for example Social Cognitive Theory (SCT), have been shown to be successful in promoting change, utilizing primarily behavioural techniques (Bandura, 1997). Such techniques have been used for many years in other contexts, predominantly mental health care settings with people who have psychological difficulties. One therapeutic approach that is currently attracting interest due to its reported empirical testability, efficacy and cost-effectiveness is Cognitive Behaviour Therapy (CBT; Department of Health, 2001; Nathan & Gorman, 2002; Roth & Fonagy, 1996), which incorporates both behavioural and cognitive techniques to support change. Given the apparent success of CBT in promoting changes in psychopathological behaviour (e.g. Clark et al., 1994; Whittal, Agras, & Gould, 1999), and the value of behavioural techniques in health promotion interventions using SCT, it is timely to consider whether such techniques, together with others utilized in CBT, may be used to promote behaviour change in interventions based on the TPB. Using a CBT framework in this context rather than other therapeutic models is supported as CBT can be used to inform brief interventions, applicable to either individuals or larger groups. This mirrors the application of the TPB to short-term, group-based interventions. Thus, to use CBT in this way seems feasible.

The TPB is just one of many theories that can be used to predict and explain health behaviours and to guide behaviour change interventions. We focus on the TPB for three main reasons. First, it is currently the most widely used social cognition model for predicting and explaining

health behaviours (Ogden, 2003). Second, the theory is clearly specified and there are clear published recommendations on how to measure the components of the theory (Ajzen, 2002b). And third, there is a substantial body of evidence supporting the theory as providing consistent prediction of intentions and, to a lesser extent, behaviour (Armitage & Conner, 2001). However, although we focus on the TPB, much of what we say in this article is applicable to other social cognition models, including stage theories such as the Transtheoretical Model (Prochaska & Velicer, 1997). Compared with theories like the TPB, stage theories have a more complex structure and different implications for intervention (Sutton, 2005; Weinstein, Rothman, & Sutton, 1998). In particular, they imply that interventions should be stage matched, that is, that different interventions should be used depending on which stage a person is in. Techniques from CBT could be used as part of a stage-matched intervention to promote movement to the next stage in the sequence. However, in this article we focus on the TPB.

In sum, this article will address whether certain therapeutic techniques used in CBT can offer useful additions to behaviour change interventions based on the TPB. Before addressing this question directly, we give a brief outline of each approach, and then discuss the similarities and differences between them. We devote more space to describing CBT and its underlying cognitive theory than to the TPB, because we assume that readers of this journal are likely to be less familiar with the details of this approach. The description of the TPB ignores some of the complexities of the theory (see Sutton, 2002a, 2004).

The Theory of Planned Behaviour

The TPB is an extension of the Theory of Reasoned Action (TRA; Ajzen & Fishbein, 1980). According to the theory, the strength of a person's *intention* to perform a given behaviour is the proximal determinant of that behaviour (for behaviours that are at least partially under the person's control). Intention, in turn, is influenced by *attitude* towards the behaviour (overall evaluation of the behaviour),

subjective norm (perceived social pressure to perform the behaviour) and *perceived behavioural control* (PBC, perceived control over performing the behaviour). PBC can also predict behaviour directly to the extent that perceived control accurately reflects actual control. Underlying attitude, subjective norm and PBC are considered to be specific *beliefs*, referred to as *behavioural beliefs*, *normative beliefs* and *control beliefs* respectively. Beliefs salient to the individual are held to determine their attitude, subjective norm and PBC. According to the theory, changing behaviour requires changing these underlying beliefs. (Another way of changing behaviour that is suggested by the theory is to increase actual control over the behaviour. However, we are not aware of any TPB-based interventions that have used this approach.)

Developing an intervention based on the TPB involves a number of steps (Fishbein & Middlestadt, 1989; Sutton, 2002b). The first step is to define the target behaviour and population. For example, in a physical activity intervention the target behaviour could be defined as walking for at least 30 minutes a day and the target population as sedentary adults aged 30–50. The second step is to identify the salient behavioural, normative and control beliefs with respect to performing the target behaviour in a sample from the target population. The salient beliefs are those that first come to mind in response to standard open-ended questions such as ‘What would be the advantages for you of walking for at least 30 minutes every day?’ The most frequently reported beliefs are designated the *modal salient beliefs*. The next step is to conduct a quantitative study using a structured questionnaire incorporating measures of the modal salient beliefs to determine which components of the theory (attitude, subjective, PBC) are the most important in influencing intentions and behaviour in the target population. The relevant set of beliefs is then examined to see which individual beliefs best discriminate between intenders and non-intenders. These are selected as the key beliefs to target in the intervention.

According to the TPB, anything that changes these key beliefs in the appropriate direction will increase the likelihood of behaviour change. In practice, as a recent systematic review has

shown (Hardeman et al., 2002), most TPB-based interventions attempt to change beliefs by providing information (e.g. leaflets).

The set of modal salient beliefs may not adequately represent the salient beliefs held by individuals in the target population (Sutton, 2002b; Sutton et al., 2003). Thus, in an intervention that targets modal salient beliefs, many individuals in the target group will be presented with information designed to change beliefs that are not salient to them. This may limit the efficacy of the intervention.

An alternative approach is to elicit and target *individually* salient beliefs. Each individual would receive a different version of the intervention, the exact content depending on his or her own idiosyncratic set of salient beliefs. Individually tailored interventions based on the TPB are rare but they are entirely consistent with the theory that explains behaviour at an individual level. This approach is being used in the ProActive trial, an intervention designed to increase physical activity among people at high risk of diabetes, in which trained facilitators are using the TPB to elicit and modify individuals’ beliefs about being more physically active (Hardeman et al., submitted).

Cognitive Behaviour Therapy

Cognitive Therapy¹ arose from Beck’s (1976) cognitive-behavioural hypothesis of emotion. This hypothesis states that emotions arise not *because* of events but from *how* they are appraised or interpreted, which is influenced by underlying cognitive structures that cause faulty or biased interpretations of events. Cognitive Therapy was first described in terms of the cognitive theory of depression (Beck, Rush, Shaw, & Emery, 1979), which sees early life experiences as influencing the development of *core beliefs* (‘schemas’ or ‘schemata’). Core beliefs are held to be at a level of unconsciousness such that an individual is not fully aware of their significance and influence on current cognitions, emotions and behaviours until their attention is drawn to this through therapy. Considered to be stable personality traits, core beliefs are global, rigid, absolute statements that organize information and allow individuals to interpret experiences and

information in personally meaningful ways. They are seen to relate to oneself ('I am worthless'), the world ('The world is a competitive place') and the future ('Things will never get better') (Beck, 1983). Core beliefs lead to the development of *dysfunctional assumptions*. These are conditional statements in the form 'If ... then ...', for example, 'If I do X, then Y will occur' (Beck, 1987). Dysfunctional assumptions can be conceptualized as 'rules for living' in that they guide how experiences are interpreted and acted upon. They are considered to be dysfunctional because they affect the interpretation of situations in a biased or exaggerated way. They, in turn, influence the content of the most conscious representation of these underlying cognitive structures, *automatic thoughts*. These thoughts are described as automatic as they appear to come 'out of the blue' and to be uncontrollable, characteristics that are particularly important in the treatment of mental health difficulties as they give the impression that the thoughts are facts and thus resistant to change. They are usually negative in content and are considered to play a role in the development and maintenance of mental health problems. Thus, cognitive theory is formulated in terms of cognitive structures at different levels of conscious awareness influencing observable behaviour.

Cognitive Behaviour Therapy was developed from cognitive theory. It works to modify biased and dysfunctional cognitive processing. Initially, CBT aims to educate patients about the reciprocal relationship between thoughts, feelings and behaviours, and to increase awareness of the automatic thoughts that occur in response to situations, events and interactions. The accuracy of these thoughts is then evaluated by assessing the available evidence supporting or refuting them, and considering their utility in allowing someone to function adaptively in everyday life. They are then modified accordingly. Patients are encouraged to test out and experience new ways of thinking and behaving through the application of out-of-session homework 'experiments' to see if their existing thoughts and beliefs are manifest in reality and whether the feared outcomes do occur. Changes in behaviour are promoted as different ways of interpreting situations and

events are encouraged, and alternative outcomes are experienced. Thus, working at the level of conscious mediating cognitions (automatic thoughts) is the first line of approach in CBT. For cases of more long-term and enduring difficulties, a greater emphasis is placed on the role of core beliefs. These are challenged and restructured using the same techniques as are applied to automatic thoughts, although it is considered that working at this level of cognitive structure takes much longer given their perceived rigid and inflexible nature.

General applicability of the cognitive framework

This framework of cognitive structures determining how incoming information is processed, consisting of underlying core beliefs and assumptions and more conscious automatic thoughts, is deemed to apply to everyone, not just those with psychological difficulties (Clark & Beck, 1999), though clearly in most cases, cognitions do not cause distress. Indeed, it is considered that the negative cognitions and biased forms of cognitive processing characteristic of psychological difficulties reflect an exaggerated and persistent form of those seen in normal emotional functioning (Beck, 1991). For example, core beliefs are seen as having positive/negative polarity so that those without psychological difficulties will possess positive core beliefs (Clark & Beck, 1999), for instance 'I am a worthwhile person'. So, in reaction to stimuli, appropriate functional and adaptive beliefs are applied to incoming data, which elicit an appropriate response in terms of behaviour, emotion or motivation (Clark & Beck, 1999). Thus, underlying beliefs about the outcomes of behaviours will be reflected in people's actions, including health-related ones. For example, someone may hold the core belief 'I am a health-conscious person' and the associated rule for living 'If I take care of my health now, then this will benefit me in the future'. It follows that their other thoughts and actions will then be in accordance with this belief. This suggests that techniques used in CBT to identify thoughts and beliefs are as applicable to those without mental health concerns as those with.

Cognitive Behaviour Therapy for health-related behaviours

CBT has, in addition, been demonstrated to be applicable to health and health-related behaviours, in those with chronic illness and physical health problems, and in broader-based health promotion initiatives. In the former interventions, CBT works with illness-specific beliefs and cognitions that may be distorted or unrealistic and aims to help the patient reconceptualize their beliefs in a more functional, adaptive or coping-orientated fashion. From this, it is assumed that more adaptive behaviours in relation to their health status will be adopted. Examples of the application of CBT in chronic illness include diabetes (Henry, Wilson, Bruce, Chisholm, & Rawling, 1997), obesity (Braet, Van-Winckel, & Van-Leeuwen, 1997; Liao, 2000) and myocardial infarction (Cowan, Pike, & Budzynski, 2001), all of which require alteration to current lifestyle to improve health outcomes. For example, cognitive behavioural strategies have been shown to be helpful in supporting increases in physical activity in angina patients (Lewin et al., 2002). While a number of patients with chronic health problems receiving CBT may have concurrent psychological difficulties as well, this may not always be so and does not preclude the application of CBT techniques to those without. The focus of a CBT approach on the development of a repertoire of self-management skills and the patient's active participation and involvement in change seems ideally suited to a broader health behaviour change context. That many health promotion approaches to behaviour change mirror a CBT approach has been previously described (Graham, 1985), and examples of the use of CBT in this context exist. For example, CBT has been applied in a mental health promotion context to support stress management (Brown, Cochrane, & Hancox, 2000; Kaluza, 2000), and 'cognitive-behaviour modification' has been used in interventions promoting physical activity (Marcus et al., 2000).

In applying CBT to health-related behaviours, it may not be necessary or desirable to elicit and modify core beliefs. Working at the level of automatic thoughts and underlying assumptions is considered more appropriate for psychological problems that are not long-term

or ingrained, as these cognitions are more easily tested and thus more open to change than core beliefs (Mooney & Padesky, 2000). Core belief work is usually considered appropriate for working with complex and enduring mental health problems. Thus, working at the level of core beliefs may not be necessary to promote change in health behaviour interventions. In addition, the appropriateness of working at the level of core beliefs with people who do not suffer from psychological difficulties outside of specialized mental health care settings may be questioned. Recently, concerns have been raised about the potentially damaging consequences of working at the level of core beliefs with individuals who have no prior history of psychiatric problems, particularly by those who are unskilled in the approach (James, 2001). While eliciting core beliefs, including those not related to psychopathological beliefs, may theoretically inform interventions, the exact nature of how this would be done, the particular beliefs considered important to the intervention and the potential consequences of eliciting certain forms of beliefs must be seriously considered, particularly as it is not clear how such information would or could be acted on within the constraints of many health behaviour interventions. These cautions may be even more significant for interventions conducted in ways other than face-to-face, and, indeed, group interventions based on CBT tend to work primarily at the level of automatic thoughts and rules for living (Morrison, 2001).

This brief description of the two models shows that similarities and differences in the approaches are apparent. These will now be explored further.

Comparison of the two approaches

Underlying theoretical framework

A significant similarity between CBT and the TPB is that both approaches focus on beliefs and see belief change as necessary for behaviour change. In the TPB, the beliefs of interest are a limited subset of a person's beliefs that concern the target behaviour and are of three kinds: behavioural, normative and control beliefs. Although a person may hold many beliefs about

performing the target behaviour, the theory assumes that their intentions are determined only by those that are salient or accessible. By contrast, the cognitive theory on which CBT is based postulates different kinds of beliefs at different levels of consciousness, from core beliefs at the deepest level to automatic thoughts at the most conscious level.

There is no equivalent in the TPB to core beliefs in cognitive theory, which are assumed to be unconscious and global in nature. However, there appears to be some similarity between salient beliefs in the TPB and automatic thoughts in cognitive theory, where these are behaviour-specific, insofar as both are easily accessible and may be automatically elicited by relevant cues. Although dysfunctional assumptions or 'rules for living' in cognitive theory have a conditional ('If-then') form like beliefs in the TPB, they may not be specific to the target behaviour. For example, someone who is thinking about stopping smoking may hold the salient normative belief 'If I stop smoking, my wife would approve'. From the standpoint of cognitive theory, this belief may reflect a more global rule for living, for example 'If I do things for other people then they will like me'.

Method of eliciting beliefs

In the TPB, salient beliefs are elicited by a small number of standard open-ended questions. CBT, on the other hand, elicits relevant beliefs in an unstructured manner. A style of questioning that is often used in CBT is that of 'Socratic questioning' or guided discovery (Padesky, 1993) whereby carefully worded exploratory questions are used to help the patient determine the personal and idiosyncratic meaning of beliefs that drive their behaviours. Examples of Socratic questions include: 'What difference would making changes to X make to you?', 'What makes you think that X would be difficult to do?', 'How might X change your day-to-day life?' Similarities can be observed here between the content of these questions and those used to elicit salient beliefs in TPB-based studies. Where differences do exist they are in the style and process of questioning, rather than the content. In CBT, questions are not pre-determined by a script, so the individual is free to bring to sessions the issues that are most pressing for them at that time.

The process of questioning is continued until the beliefs underlying the automatic thoughts are elicited. From the viewpoint of CBT, the elicitation techniques used in applications of the TPB yield very limited information. Socratic questioning, by contrast, has the potential to yield much more detailed information with a broader content.

In typical applications of the TPB, elicitation of beliefs is a separate stage that precedes the attempt to modify beliefs. In CBT as it is usually conducted, on the other hand, the processes of belief elicitation and belief modification continue throughout the course of therapy and there is no clear separation between them.

Setting and target group for intervention

Most interventions based on the TPB tend to focus on large groups within the general population and are targeted at everyone within this group. CBT, conversely, has primarily been used with individuals or small groups. As such, the idiosyncratic, individualized focus of the method is lessened in larger group settings. However, the theory underlying the cognitive approach and techniques for evaluating and modifying thoughts can be taught in group settings, thus retaining certain essential aspects of CBT (Morrison, 2001). For example, the utility of a CBT approach in larger groups has been demonstrated by the successful use of cognitive behavioural stress management techniques in a recent population-based large group study ($N = 40$) (Brown et al., 2000). While such interventions might not be considered as strict CBT, as they do not incorporate the idiosyncratic nature of the approach, these results suggest that individual settings, implementing the standard delivery of CBT are not needed for change to occur. Furthermore, limited contact TPB-informed interventions for use in one-to-one settings are currently being evaluated, for example in the ProActive trial (Hardeman et al., submitted); CBT techniques may be particularly applicable to interventions of this form. Thus, although in practice the two approaches are used in different settings, this is not an inherent difference between them.

In TPB-based interventions, decisions about the target behaviour and target population are likely to be influenced by the interests and

concerns of, for instance, researchers or policy makers, and may include behaviours such as increasing physical activity or altering diet. CBT, however, is primarily used with people who are actively seeking help to support behaviour change (or who have been referred for help through the instigation of another, for example, parent or partner). Thus, health behaviour change programmes based on the TPB are generally instigated by others who consider such programmes to be of benefit to populations they deem to be at risk, rather than by those seeking help.

Population-based interventions such as these raise concerns regarding the ethical implications of such initiatives. Health promotion programmes may ignore issues of personal choice and autonomy in behaviour change, for example, when others make decisions regarding health status on behalf of a population (Webb, 1997). These issues would need to be considered within any large-scale intervention regardless of the theoretical framework used. Approaches that acknowledge the importance of individualized care need to 'accept the possibilities of individual beliefs and attitudes to health' (Thomas & Wainwright, 1996). A CBT approach, with its focus on individual and idiosyncratic beliefs may, in part, be able to achieve these aims.

Behaviour change techniques

For both the TPB and CBT, the intervention aims to modify existing unhelpful beliefs, strengthen pre-existing adaptive beliefs or create new ones. However, the TPB does not specify how beliefs are changed. In practice, most TPB-based interventions attempt to change beliefs by presenting information (Hardeman et al., 2002). In contrast, CBT targets behaviour change through a combination of cognitive and behavioural techniques, for example thought challenging and behavioural experiments in which patients try out alternative ways of behaving based on new, more adaptive beliefs. The presentation of persuasive information alone is not considered sufficient to produce change within this paradigm; experience of both cognitive and behavioural change is required (Persons, 1989). For example, a CBT intervention aimed at increasing physical activity may encourage participants to conduct a behavioural experiment to test out

increasing physical activity (and the beliefs about their ability to do so) in an achievable way. This strategy of generating situations through which an individual can gain experience of making successful changes is akin to the *guided mastery experiences* of interventions based on SCT (Bandura, 1997), and suggests that such techniques can be used successfully and effectively within health promotion and lifestyle change interventions.

The similarities and differences between the two approaches are summarized in Table 1.

Having outlined the two approaches and highlighted the similarities and differences between them, we now turn to the main question posed by this article.

Are techniques used in CBT applicable to TPB-based interventions?

The conceptual frameworks underlying CBT and the TPB are fundamentally different. According to the TPB, intention to perform the target behaviour (and hence the likelihood of performing the behaviour) is influenced by salient beliefs about the behaviour. By contrast, according to the cognitive theory that underlies CBT, these behaviour-specific beliefs may not be the most important influences on intentions and behaviour. Instead, behaviour may be influenced by more global beliefs at a deeper level of consciousness. For example, according to the TPB, the intention to walk for at least 30 minutes a day will be determined by salient behavioural, normative and control beliefs with respect to this specific target behaviour (although these three sets of beliefs may not be equally important). It is these beliefs that should be targeted in an intervention. Cognitive theory, on the other hand, holds that this behaviour may be influenced by global beliefs such as 'I am a lazy person'. Such beliefs may influence not only the target behaviour but also other behaviours related to physical activity. They may also have wider implications, for instance contributing to a person's sense of self-worth. CBT would aim to elicit and modify these more global beliefs.

The two frameworks can be brought closer together by arguing that the effect of global beliefs held at a deeper level of consciousness on intentions to perform a given target

Table 1. Similarities and differences between the models and approaches of CBT and TPB

CBT	TPB
<i>Similarities:</i>	
	Primary focus on underlying beliefs
	Sees belief change as necessary for behaviour change
<i>Differences:</i>	
Sees behaviour as influenced by different kinds of beliefs at different levels of consciousness	Sees behaviour as influenced by salient (accessible) behaviour-specific beliefs
Beliefs elicited using unstructured methods, e.g. 'Socratic questioning'	Beliefs elicited using a small number of standard open-ended questions
Traditionally used with individuals or small groups (but can also be used with large groups)	Most interventions have been at a population level or with large groups (but individually-tailored interventions also possible)
Interventions usually instigated by intervention recipients	Interventions usually instigated by others e.g., researchers, policy makers
Sees beliefs at different levels of conscious awareness as potential targets of an intervention	Sees salient beliefs as sole focus of an intervention
Provides guidance and strategies on how to change behaviours	Focus is on what to change, no guidance included on how to instigate change

behaviour is mediated by salient behavioural, normative and control beliefs. This would be consistent with the TPB assumption that the effects of *all* variables that influence intentions are mediated by salient behaviour-specific beliefs. However, it would imply that TPB-based interventions should elicit and target such global beliefs rather than directly targeting salient behaviour-specific beliefs, which would represent a major shift of focus and would require evidence supporting the proposed causal links. Furthermore, proponents of cognitive theory would see this proposed constraint on possible causal pathways as unrealistically restrictive.

It follows from this analysis that it would not be appropriate to use CBT belief elicitation techniques such as Socratic questioning in interventions based on the TPB. From the perspective of the TPB, these techniques would yield superfluous and irrelevant information. However, the use of other CBT techniques designed to change beliefs and behaviours is not precluded. These fall broadly into cognitive and behavioural categories and will be discussed separately, though the division between purely 'behavioural' and 'cognitive' techniques is artificial as they clearly overlap (Bandura, 1997).

Behavioural strategies

Behavioural techniques to support behaviour change used in CBT include goal setting and

action planning, monitoring progress through diaries, self-reward and relapse prevention strategies, including identification of high-risk situations and rehearsal of management strategies. While these techniques are integral to the application of CBT, their use is not dependent on, or limited to, the use of CBT, and indeed, interventions based on social cognition models have utilized behavioural techniques. For example, studies based on SCT have proved efficacious in promoting dietary and physical activity change (Anderson, Winett, Wojcik, Winett, & Bowden, 2001; Marcus, Owen, Forsyth, Cavill, & Fridinger, 1998). Studies purporting to be TPB-based have also incorporated behavioural techniques. For example, Hardeman and colleagues' (2002) recent systematic review notes that after information giving and persuasion, skills learning, goal setting and action planning were the most commonly used intervention techniques.

The use of such behavioural techniques is broadly consistent with the TPB. For example, goal setting and action planning involve helping participants to form intentions, and self-reward in effect creates a new behavioural intention ('I will reward myself by going to the cinema if I achieve my goal') and a new behavioural belief ('If I achieve my goal, I will receive a reward').

Another useful strategy commonly used within CBT is the 'behavioural experiment' in which participants are encouraged to test

alternative beliefs by trying things out themselves. This provides personal experience of the outcomes of adopting an alternative behaviour, which is considered important in encouraging the adoption of new behaviours. As noted previously, this is akin to the use of guided mastery experiences in SCT. However, large-scale SCT interventions do not seem to have used this approach (e.g. Marcus et al., 1998) and, in general, TPB-based interventions do not work to increase personal experience of alternative behaviours in the same way, though this CBT-informed technique is currently being used in the ProActive trial. Again, this technique can be regarded as compatible with the TPB. Trying out a new behaviour may lead to the development of new salient beliefs and increase PBC.

Cognitive strategies

The application of cognitive techniques in therapeutic settings arose partially from observations that behaviour therapy was not always successful, and that cognitive factors were inherently involved in psychological difficulties. Thus, an approach incorporating aspects of both seemed more likely to engender successful and lasting change. Consideration of behaviour change interventions based on social cognition models that have not produced positive results supports this. For example, it has been proposed that the negative outcomes observed in some SCT-based studies may be the result of failure to address underlying beliefs regarding, for example, barriers to behaviour change (Hallam & Petosa, 1998). Therefore, if this were the case, using cognitive strategies to tackle these underlying beliefs may be helpful in challenging current ways of thinking. For example, CBT focuses on evaluating how currently held beliefs influence behaviour and responses to situations; whether these are helpful and constructive or destructive belief systems; and on the development of alternative, more adaptive and functional ways of understanding and interpreting events.

To suggest that techniques from CBT could be used in TPB-based interventions in a one-to-one, in-depth way may provoke questions about the cost-effectiveness and feasibility of doing so at the level of large-scale, population-based interventions. However, first, CBT may not need to be conducted on a one-to-one basis.

That CBT techniques can successfully be taught in group settings to some degree has already been discussed, and the cost-effectiveness of group CBT treatment has some support (Gould, Buckminster, Pollack, Otto, & Yap, 1997). Although the impact of the strategies may be diluted at a group level, this may be balanced by the potential to treat more participants more quickly and at a lower cost. In addition, the applicability of CBT delivered through distance media, for example via email or by telephone has been supported (Burgess & Chalder, 2001; Robinson & Serfaty, 2001) potentially eliminating the need for face-to-face meetings. Second, there are arguments for conducting health-behaviour change interventions on a one-to-one level, for example that large-scale interventions do not address individually salient beliefs. Using additional techniques such as those used in CBT may alleviate these concerns and help to improve outcomes.

Implications for future research

Theory-driven research is needed to investigate the links between behaviour-specific beliefs in the TPB and the more global beliefs postulated by the cognitive theory that underlie CBT. Intervention studies should compare the efficacy of a 'pure' TPB-based intervention, in which beliefs are targeted by providing information, with an enhanced intervention incorporating techniques from CBT. These could include both intensive, one-to-one interventions and distance approaches in which CBT is delivered remotely. Mediation analysis should be used to examine whether CBT techniques influence intentions and behaviour by changing the components of the TPB as the theory would predict.

Conclusion

This article has examined whether health behaviour change programmes informed by the TPB may be improved in their scope and effectiveness by inclusion of techniques used within CBT. It is acknowledged that there are conceptual differences between the TPB and the underlying theory informing CBT, which may preclude use of some techniques. However, it

appears that there are enough similarities, particularly the shared focus on underlying beliefs, for some ideas to be of benefit. Application of behavioural techniques and cognitive strategies, together with consideration of how CBT works to influence the translation of intentions into actions could contribute to improved outcomes in interventions informed by the TPB. Furthermore, TPB-based interventions to date have done little to encourage target populations to act to increase their personal experiences of altering their behaviour and, thus, experiencing the consequences of this. The limits potentially imposed by the setting and scope of future interventions should not outweigh the possible benefits of drawing on CBT. Further research is needed to illustrate where these gains may occur.

Note

1. The terms Cognitive Therapy and Cognitive Behaviour Therapy are used interchangeably as it is usual for 'Cognitive Therapy' to incorporate behavioural techniques as well.

References

- Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes*, 50, 179–211.
- Ajzen, I. (2002a). The theory of planned behaviour. Available at <http://www.people.umass.edu/ajzen>
- Ajzen, I. (2002b). Constructing a TPB questionnaire: Conceptual and methodological considerations. Available at <http://www.people.umass.edu/ajzen>
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour*. Englewood Cliffs, NJ: Prentice Hall.
- Anderson, E. S., Winett, R. A., Wojcik, J. R., Winett, S. G., & Bowden, T. (2001). A computerized social cognitive intervention for nutrition behaviour: Direct and mediated effects in fat, fibre, fruits and vegetables, self-efficacy, and outcome expectations among food shoppers. *Annals of Behavioural Medicine*, 23, 88–100.
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology*, 40, 471–499.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York: International Universities Press.
- Beck, A. T. (1983). Cognitive therapy of depression: New perspectives. In P. J. Clayton & J. E. Barrett (Eds.), *Treatment of depression: Old controversies and new approaches*, pp. 265–290. New York: Raven Press.
- Beck, A. T. (1987). Cognitive models of depression. *Journal of Cognitive Psychotherapy: An International Quarterly*, 1, 5–37.
- Beck, A. T. (1991). Cognitive therapy: A 30-year retrospective. *American Psychologist*, 46, 368–375.
- Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. New York: Guilford Press.
- Braet, C., Van-Winckel, M., & Van-Leeuwen, K. (1997). Follow-up results of different treatment programs for obese children. *Acta Paediatrica*, 86, 397–402.
- Brown, J. S. L., Cochrane, R., & Hancox, T. (2000). Large-scale health promotion stress workshops for the general public: A controlled evaluation. *Behavioural and Cognitive Psychotherapy*, 28, 139–151.
- Burgess, M., & Chalder, T. (2001). Telephone cognitive behaviour therapy for chronic fatigue syndrome in secondary care: A case series. *Behavioural and Cognitive Psychotherapy*, 29, 447–455.
- Clark, D. A., & Beck, A. T. (1999). *Scientific foundations of cognitive theory and depression*. New York: Wiley.
- Clark, D., Salkovskis, P. M., Hackman, A., Middleton, H., Anastasiades, P., & Gelder, M. (1994). A comparison of cognitive therapy, applied relaxation and imipramine in the treatment of panic disorder. *British Journal of Psychiatry*, 164, 759–769.
- Conner, M., & Norman, P. (1996). *Predicting health behaviour: Research and practice with social cognition models*. Buckingham: Open University Press.
- Cowan, M. J., Pike, K. C., & Budzynski, H. K. (2001). Psychosocial nursing therapy following sudden cardiac arrest: Impact on two-year survival. *Nursing Research*, 50, 68–76.
- Department of Health. (2001). *Treatment choice in psychological therapies and counselling*. London: HMSO.
- Fishbein, M., & Middlestadt, S. E. (1989). Using the theory of reasoned action as a framework for understanding and changing AIDS-related behaviors. In V. M. Mays, G. W. Albee, & S. F. Schneider (Eds.), *Primary prevention of AIDS: Psychological approaches* (pp. 93–110). Newbury Park, CA: Sage Publications.
- Godin, G., & Kok, G. (1996). The theory of planned behaviour: A review of its applications to health-related behaviours. *American Journal of Health Promotion*, 11, 87–98.
- Gould, R. A., Buckminster, S., Pollack, M. W., Otto, M. W., & Yap, L. (1997). Cognitive-behavioural and pharmacological treatment for social phobia: A

- meta-analysis. *Clinical Psychology: Science and Practice*, 4, 291–306.
- Graham, P. (1985). Psychology and the health of children. *Journal of Child Psychology and Psychiatry*, 26, 333–347.
- Hallam, J., & Petosa, R. (1998). A worksite intervention to enhance social cognitive theory constructs to promote exercise adherence. *American Journal of Health Promotion*, 13, 4–7.
- Hardeman, W., Johnston, M., Johnston, D. W., Bonetti, D., Wareham, N., & Kinmonth, A. L. (2002). Application of the theory of planned behaviour in behaviour change interventions: A systematic review. *Psychology and Health*, 17, 123–158.
- Hardeman, W., Sutton, S., Griffin, S., Johnston, M., White, A., Wareham, N. J., & Kinmonth, A. L. (submitted). Use of causal models in the development of theory-based behaviour change programmes for trial evaluation: Integrating psychology and epidemiology.
- Henry, J. L., Wilson, P. H., Bruce, D. G., Chisholm, D. J., & Rawling, P. J. (1997). Cognitive-behavioural stress management for patients with non-insulin dependent diabetes mellitus. *Psychology, Health and Medicine*, 2, 109–118.
- James, I. A. (2001). Schema therapy: The next generation, but should it carry a health warning? *Behaviour and Cognitive Psychotherapy*, 29, 401–407.
- Kaluza, G. (2000). Changing unbalanced coping profiles: A prospective controlled intervention trial in worksite health promotion. *Psychology and Health*, 12, 423–433.
- Lewin, R. J. P., Furze, G., Robinson, J., Griffith, K., Wiseman, S., Pye, M., & Boyle, R. (2002). A randomised controlled trial of a self-management plan for patients with newly diagnosed angina. *British Journal of General Practice*, 52, 194–196, 199–201.
- Liao, K. L. (2000). Cognitive-behavioural approaches and weight management: An overview. *Journal of the Royal Society of Health*, 120, 27–30.
- Marcus, B. H., Dubbert, P. M., Forsyth, L. H., McKenzie, T. L., Stone, E. J., Dunn, A. L., & Blair, S. N. (2000). Physical activity behaviour change: Issues in adoption and maintenance. *Health Psychology*, 19(Supp. 1): 32–41.
- Marcus, B. H., Owen, N., Forsyth, L. H., Cavill, N. A., & Fridinger, F. (1998). Physical activity interventions using mass media, print media and information technology. *American Journal of Preventative Medicine*, 15, 362–378.
- Mooney, K. A., & Padesky, C. A. (2000). Applying client creativity to recurrent problems: Constructing possibilities and tolerating doubt. *Journal of Cognitive Psychotherapy: An International Quarterly*, 14, 149–161.
- Morrison, N. (2001). Group cognitive therapy: Treatment of choice of sub-optimal option? *Behavioural and Cognitive Psychotherapy*, 29, 311–332.
- Nathan, P. E., & Gorman, J. M. (2002). *A guide to treatments that work*, 2nd edn. Oxford: Oxford University Press.
- Ogden, J. (2003). Some problems with social cognition models: A pragmatic and conceptual analysis. *Health Psychology*, 22, 424–428.
- Padesky, C. A. (1993). Socratic questioning: Changing minds or guiding discovery? Transcript of keynote address delivered at the European Congress of Behavioural and Cognitive Therapies, London, 24 September.
- Persons, J. B. (1989). *Cognitive therapy in practice: A case formulation approach*. New York: W. W. Norton & Company.
- Prochaska, J. O., & Velicer, W. F. (1997). The trans-theoretical model of health behavior change. *American Journal of Health Promotion*, 12, 38–48.
- Robinson, P. H., & Serfaty, M. A. (2001). The use of email in the identification of bulimia nervosa and its treatment. *European Eating Disorders Review*, 9, 182–193.
- Roth, A., & Fonagy, P. (1996). *What works for whom? A critical review of psychotherapy research*. London: Guilford Press.
- Sutton, S. (1998). Predicting and explaining intentions and behaviour: How well are we doing? *Journal of Applied Social Psychology*, 28, 1317–1338.
- Sutton, S. (2002a). Testing attitude-behaviour theories using non-experimental data: An examination of some hidden assumptions. *European Review of Social Psychology*, 13, 293–323.
- Sutton, S. (2002b). Using social cognition models to develop health behaviour interventions: Problems and assumptions. In D. Rutter & L. Quine (Eds.), *Changing health behaviour: Intervention and research with social cognition models* (pp. 193–208). Buckingham: Open University Press.
- Sutton, S. (2004). Determinants of health related behaviours: Theoretical and methodological issues. In S. Sutton, A. Baum, & M. Johnston (Eds.), *The Sage Handbook of Health Psychology*. London: Sage Publications.
- Sutton, S. (2005). Stage theories of health behaviour. In M. Conner & P. Norman (Eds.), *Predicting health behaviour: Research and practice with social cognition models* (2nd edn). Buckingham: Open University Press.
- Sutton, S., French, D. P., Hennings, S. J., Mitchell, J., Wareham, N. J., Griffin, S., Hardeman, W., & Kinmonth, A. L. (2003). Eliciting salient beliefs in research on the theory of planned behaviour: The effect of question wording. *Current Psychology*, 22, 234–251.
- Thomas, J., & Wainwright, P. (1996). Community

- nurses and health promotion: Ethical and political perspectives. *Nursing Ethics*, 3, 97–107.
- Webb, P. (1997). Some ethical issues in health and patient education. In P. Webb (Ed.), *Health promotion and education: A professional's guide* (pp. 38–56). Cheltenham: Stanley Thornes (Publishers) Ltd.
- Weinstein, N. D., Rothman, A. J., & Sutton, S. R. (1998). Stage theories of health behaviour: Conceptual and methodological issues. *Health Psychology*, 17, 290–299.
- Whittal, M. L., Agras, W. S., & Gould, R. A. (1999). Bulimia nervosa: A meta-analysis of psychosocial and pharmacological treatments. *Behaviour Therapy*, 30, 117–135.