

Behavioural experiments: historical and conceptual underpinnings

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Behavioural experiments (BEs) are amongst the most powerful methods for bringing about change in cognitive therapy. They are a key component of treatment. They are widely used, and yet, to be successful, they require creativity and sophisticated understanding on the part of the therapist. It is therefore surprising that there is remarkably little written about BEs: about their place in cognitive therapy, their value, or about the practicalities of designing and carrying out BEs. It is this gap that the present book seeks to fill.

The purpose of this first chapter is to provide some underpinnings for conceptualizing the place and role of BEs in cognitive therapy. It is divided into two parts. The first part provides a review of cognitive therapy. It describes the development of the therapy; its standing as a treatment for psychological disorders; its historical roots in behaviour therapy; and its core ideas. The second part focuses on the BE as a key intervention within cognitive therapy. It provides a definition; looks at the historical roots of BEs in the scientific method and in behaviour therapy; examines evidence supporting their effectiveness; and reviews theories which provide some understanding of their impact.

Our aim is to provide a historical and conceptual understanding of the value of BEs, while acknowledging that, in the current state of knowledge, there are large gaps to be filled.

Part 1: an overview of cognitive therapy

Introduction

Cognitive therapy has grown, from the publication of Beck's early work (Beck 1963, 1964, 1967, 1976), to become one of the foremost psychotherapies in the western world (Hollon and Beck 2003). Cognitive models have been developed for a wide range of disorders, and outcome research has repeatedly demonstrated their effectiveness (DeRubeis and Crits-Christoph 1998; Hollon and Beck 2003).

Although it is now commonplace to talk about 'cognitive therapy', in reality there are not one, but many, cognitive therapies (Dobson *et al.* 2000). Leading theorists in the early days of the cognitive therapies included Ellis (1962), Mahoney (1974), Beck (1976), and Meichenbaum (1977). However, the most widely used and validated methods are based on those originally developed by Beck, and in this book, the term 'cognitive therapy' refers to this 'Beckian' version.

Cognitive therapy's emphasis on empirical research, its theoretical base, and its coherence as a therapeutic intervention have meant that, at this stage, it is better validated as an effective treatment for a range of disorders than any other psychological therapy (DeRubeis and Crits-Christoph 1998; Hollon and Beck 2003). For some disorders featured in this book (e.g. panic disorder, social phobia), it is very clearly the treatment of choice. For other disorders (e.g. depression), it appears to be at least as effective as any other treatment (Hollon *et al.* 2002), and has an enduring effect in preventing relapse (Fava *et al.* 1998; Hollon *et al.* 2002). For a number of other disorders in this book, cognitive models have only been developed in the last few years (e.g. bipolar disorder, post-traumatic stress disorder, psychosis), or are still being developed (e.g. brain injury). However, results from some initial outcome trials (e.g. bipolar disorder, post-traumatic stress disorder) appear promising (Gillespie *et al.* 2002; Lam *et al.* 2000). A recent development, reflected to some extent in the present volume, is that clinicians and researchers are now starting to apply cognitive theory transdiagnostically (Fennell 1997; Harvey *et al.* 2004).

A full overview of the theory and therapeutic interventions of cognitive therapy is beyond the scope of this chapter (see Beck *et al.* 1979; Beck 1995; Dobson *et al.* 2000; Hawton *et al.* 1989). However, key elements which provide the necessary context for understanding the role of BEs are described below. First, to provide a background for both the development of cognitive therapy and the role of BEs, cognitive therapy's roots in behaviour therapy are briefly described.

The development of cognitive therapy: its behavioural heritage

In the first half of the twentieth century, psychoanalysis and its offshoots dominated the field of therapy. However, in the 1950s researchers started to question the theoretical basis and efficacy of psychoanalysis (Eysenck 1952), while at the same time learning theory, and the behavioural approach derived from it, started to influence psychological treatment, practice, and research.

The behavioural approach was based on certain key principles, which fundamentally challenged the prevailing psychoanalytic orthodoxy. For instance, it was asserted that:

- ◆ ‘Mind’ was not a legitimate object for enquiry
- ◆ The problem was the patient’s behaviour, rather than invisible (and untestable) processes such as the unconscious
- ◆ The focus of assessment and therapy should be on what could be observed, operationalized, and measured
- ◆ In changing behaviour, what was important were the current factors maintaining problems, rather than their assumed origin
- ◆ Scientific method provided a legitimate framework for developing relevant theory and clinical practice; understanding and application would advance most fruitfully through systematic empirical research

Outcome studies of behaviour therapy in the 1960s and 1970s showed considerable promise, particularly in the treatment of phobias and obsessive-compulsive disorders. However, it also became increasingly apparent that behaviour therapy too was limited, both by its theoretical framework and in the range of problems for which it was effective (Rachman 1997). When Beck (1970, p. 184) declared that ‘although self-reports of private experiences are not verifiable by other observers, these introspective data provide a wealth of testable hypotheses’, he was articulating the concerns of an increasing number of clinicians frustrated by behaviourists’ disregard for a valuable source of data and understanding—cognition.

Although cognitive therapy extended beyond behaviour therapy, and drew on influences from other sources such as psychoanalysis, phenomenology, personal construct theory, and rational emotive therapy (Beck *et al.* 1979), Beck nevertheless recognized the value of behaviour therapy’s emphasis on scientific method, empirical research, and verifiable evidence. He also continued to assert the importance of current maintaining factors, rather than past assumed causes. He retained a number of treatment elements (e.g. session

structure, goal setting, short-term treatment, graded task assignment); and perhaps most importantly in the present context, he recognized that behaviour change is a particularly powerful means of achieving cognitive and affective change.

The cognitive model

The theoretical advance made by Beck, and other cognitive theorists, was to assert the centrality of cognition in the psychosocial and emotional functioning of human beings. Thus, the way in which individuals structure their experiences cognitively is held to be a prime influence on their affect, behaviour, and physical reactions. Cognitive theory suggests that psychological disorders do not arise from events *per se* (e.g. a traumatic incident or the loss of a job or relationship). Problems arise from the *meanings* individuals give to events, filtered through the framework of core beliefs and assumptions which they have already developed through life experience. This explains why, for one person, a promotion at work is a cause for celebration and excitement, while, for another person, it represents the potential for failure and may lead to anxiety. Hence, therapists are particularly interested in patients' appraisals of situations, which can be accessed through their thoughts, images, and memories, and may become a prime target for therapeutic change.

Within cognitive theory, cognition is held to exert its influence on emotion, behaviour, and physical reactions in at least two ways: first, through the *content* of cognition and second, through the *process* of cognition. The *content* of cognition affects emotion, behaviour, and physiology through our appraisals of ourselves, others, and the world, and our interpretations of events; for instance, if we think of ourselves as failing, we may feel depressed, and cease to take initiatives. The *process* of cognition influences our experience of the world through the degree of flexibility we have in switching between different *modes* of processing; for instance, the extent to which we are able to shift our attention away from a focus on threat or loss, or the extent to which we get stuck in ruminative styles of thought, or thinking in an all-or-nothing manner (Beck *et al.* 1979; Nolen-Hoeksema 1991).

Beck developed his first cognitive model in the context of depression. *Cognitive therapy of depression* (Beck *et al.* 1979) is a landmark treatment manual which remains as valuable a grounding today for any aspiring cognitive therapist as when it was first written. In the 1980s, cognitive models were developed for some anxiety disorders (Beck *et al.* 1985; Clark 1986; Hawton *et al.* 1989; Salkovskis 1985), and were elaborated and extended over the next decade

(Clark 1999). Since 1990, the range of disorders for which cognitive models have been developed has mushroomed. They include bipolar disorder (Basco 2000), psychosis (Fowler *et al.* 1995), post-traumatic stress disorder (Ehlers and Clark 2000), eating disorders (Cooper 2003; Fairburn *et al.* 1999), and personality disorders (Beck *et al.* 1990; Layden *et al.* 1993; Linehan 1993). The diversity of chapters in the present volume reflects this expansion of cognitive therapy.

Cognitive models typically specify the kinds of cognition implicated in the maintenance of disorders. For instance, catastrophic misinterpretation of physical symptoms (e.g. 'I'll have a heart attack') is central to panic disorder, while an exaggerated sense of personal responsibility (Salkovskis 1999) and catastrophic misinterpretation of intrusive thoughts (Rachman 2003) are held to be central to obsessive-compulsive disorder (e.g. 'If I don't stop thinking this thought, my husband will have a car crash'). The identification of key cognitions for each disorder is a core element of the chapters in this book. They provide the basis for BEs which test the validity of these beliefs.

Cognitive theory recognizes different types of cognition. Automatic thoughts represent the most immediately accessible level. These are the kinds of thoughts that typically run through people's minds automatically and involuntarily. When people are suffering from psychological disorders, automatic thoughts are predominantly negative (e.g. 'What an idiot!', 'I'm useless', 'You can't trust anyone', 'I'll faint!')

At the next level, underlying assumptions are operating principles or rules which generalize across situations ('If I take a challenge of any sort, I'll be bound to fail'), and which may affect both the conclusions individuals derive from situations ('That was lucky, they didn't find me out') and the way in which they behave ('Duck out of challenges if possible').

Underlying assumptions may be fuelled by core beliefs, which take the form of enduring, global beliefs about self, others, and the world. They may be functional (e.g. 'I can usually manage difficulties', 'People generally mean well even if sometimes they get it wrong', 'Most problems have solutions') or dysfunctional (e.g. 'I'm incompetent', 'Others can handle things, I can't', 'The world is an unsafe place'). Underlying assumptions and core beliefs form part of the *schema* system. Schemas are 'deeper' enduring cognitive structures (e.g. 'perfectionist' schema, 'world-as-dangerous-place' schema), with emotional, physiological, sensory, and behavioural components, which characteristically bias the kind of information individuals attend to, store, and retrieve from memory (e.g. focus on past successes, selectively attend only to mistakes, or recall a catalogue of assaults and robberies).

For present purposes, it should be noted that dysfunctional schemas are held to increase vulnerability to emotional disorder, and contribute to its maintenance. Dysfunctional schemas are often the product of troubled developmental histories, though this is not always the case (e.g. they may result from traumatic episodes in adulthood—see Chapter 9).

Another class of belief, whose importance in cognitive therapy has recently been highlighted, is metacognitive belief (Wells 2000). Metacognitive beliefs are beliefs and theories that individuals hold about their own cognitions (e.g. the belief that worrying is uncontrollable and potentially harmful). Wells (2000) has identified different components of the metacognitive system (e.g. metacognitive knowledge, experiences, plans, procedures) which he suggests are implicated in the maintenance of anxiety disorders (see the later section ‘Theoretical perspectives on the value of behavioural experiments’ in this chapter and Wells (2000) for further details).

In the present volume, in the context of behavioural experiments, the terms ‘thought’, ‘assumption’, ‘belief’, and ‘cognition’ have been used, rather than schema, since the purpose of BEs is to test *specific* beliefs and ideas. The concept of schema is so generalized that it may not provide the necessary specificity for most BEs.

Cognitive therapy

Cognitive therapy is an active, directive, time-limited, structured therapy, based on the theoretical principles outlined above. Central to the practice of cognitive therapy is the case formulation, which links theory and implementation, and provides the springboard for therapy. A formulation reflects the therapist’s hypothesis about the psychological mechanisms underlying the patient’s difficulties (Butler 1998; Persons 1993). It specifies the negative automatic thoughts, assumptions, and core beliefs for a given individual, and suggests hypotheses about the processes maintaining them. The formulation provides the rationale and framework for the selection of techniques for intervention; is shared and developed as part of the developing collaborative relationship between therapist and patient; and may assist patients in understanding and normalizing their problems.

The overall strategy in cognitive therapy is:

- 1 to assist the patient to identify and reality-test unhelpful cognitions which underlie repeated negative patterns of emotion and behaviour; and
- 2 to develop and test new, more adaptive cognitions that can give rise to a more positive experience of the self, others, and the world.

Cognitive therapists may focus on disrupting the vicious circles of cognition, behaviour, emotions, and physical reactions maintaining the problem, and on reducing vulnerability to the problem's recurrence. For instance, a frequently observed vicious circle in depression starts from the belief that 'Nothing I do will help', leading to social withdrawal and behavioural inactivity, which lowers mood further. The initial focus of therapy is often on increasing the level of activity and testing negative thoughts; later, relapse prevention strategies may focus on reducing vulnerability to future episodes.

As in other forms of therapy, the quality of the therapeutic relationship is central to effectiveness in cognitive therapy (Beck *et al.* 1979; Keijsers *et al.* 2000). From the outset, Beck recognized that warmth, empathy, genuineness, building trust and rapport, and a collaborative relationship were the foundations of effective therapy (Beck *et al.* 1979). The therapeutic relationship is particularly important when working with patients with complex interpersonal issues (Beck *et al.* 1990; Layden *et al.* 1993; Safran and Muran 2000). Sometimes, the therapist and patient may decide to use a therapy session as a 'schema laboratory', and set up BEs to enable the patient's interpersonal schemas (e.g. 'If I say anything critical, I'll be rejected') to be tested within the relative safety of the therapeutic relationship (see Chapter 19).

A variety of therapeutic strategies are used in cognitive therapy—some verbal, some imaginal, some interactive, some behavioural and experiential (see Beck 1995; Hawton *et al.* 1989; Safran and Muran 2000; Wells 1997 for a range of strategies). Guided discovery, a means of helping patients uncover important information which may lie outside of their current awareness, is central to all approaches (Beck *et al.* 1979; Padesky 1993*a*). Some therapeutic strategies have been specifically developed within the context of cognitive therapy, together with a variety of tools and record forms designed to help patients use these methods in their daily lives (e.g. automatic thought records to identify and test negative automatic thoughts, weekly activity schedules to monitor and plan activity, positive data logs to collect evidence which supports the development of new core beliefs; see Greenberger and Padesky 1995). Other methods (e.g. graded assignments, psychodrama techniques, mindfulness) have been borrowed and adapted from other traditions (e.g. behaviour therapy, gestalt therapy, Buddhist meditation)—see, for example, Edwards (1989) and Segal *et al.* (2002).

Amongst the interventions that have been borrowed and then adapted, perhaps the most widely used, and one of the most powerful, is one adapted from behaviour therapy—the behavioural experiment. It is to this that we now turn.

Part II: the behavioural experiment in cognitive therapy

Introduction

According to the *Oxford English Dictionary*, an experiment is: ‘(1) The action of trying anything, or putting it to proof: a test, trial. (2) A tentative procedure: a method, system of things or course of action adopted in uncertainty whether it will answer the purpose. (3) An action or operation undertaken in order to discover something unknown, to test a hypothesis, or establish or illustrate some known truth.’ In a similar vein, experiments in cognitive therapy seek to test hypotheses, try things out, and discover new things, without any guarantee of success.

To our knowledge, there is no generally agreed technical definition of BEs in the literature. In this book, we have operationalized BEs as follows:

Operational definition of behavioural experiments

Behavioural experiments are planned experiential activities, based on experimentation or observation, which are undertaken by patients in or between cognitive therapy sessions. Their design is derived directly from a cognitive formulation of the problem, and their primary purpose is to obtain new information which may help to:

- ◆ test the validity of the patients’ existing beliefs about themselves, others, and the world
- ◆ construct and/or test new, more adaptive beliefs
- ◆ contribute to the development and verification of the cognitive formulation

It is easy to lose sight of just how radical a concept the BE is in the context of the history of psychotherapy. First, Beck’s formulation of cognitions as hypotheses to be tested—and testing them via BEs—provided a new way for therapists and patients to think about cognition. It enabled the notion of experimentation, derived from scientific principles, to be applied to the patient’s experience of the therapeutic process. Second, the BE’s focus on behaviour followed behaviour therapy’s lead—albeit with a new focus on cognition—in recognizing that *doing things differently* is a powerful means to change both cognition and affect. Again, this represented a significant break from most previous forms of

psychotherapy, which mainly or exclusively used in-session dialogue as the method of change.

In the next sections, we examine how the idea of BEs in cognitive therapy has been informed by their relationship to scientific experimentation, and by the focus on behaviour in behaviour therapy.

Behavioural experiments: the scientific context

There is a clear parallel between the role of BEs in cognitive therapy and the role of experiments more generally in testing scientific theories. As in physics or chemistry, experiments in cognitive therapy are designed to help us to build and test a theory by obtaining empirical evidence. In cognitive therapy, the ‘theory’ to be tested is the patient’s belief, rather than a general scientific law, but the philosophical approach is similar.

The acid test of a scientific theory is whether it can predict what happens in the real world, and many BEs follow this logic. The basic procedure for an experiment in science is to derive one or more predictions which follow from the theory to be tested: something along the lines of ‘If this theory is true, then in defined circumstances we should find that X happens’. We then look at what actually happens. If the theory’s predicted outcome does indeed occur, then we regard that theory as somewhat more likely to be true, and alternative theories as somewhat less likely (the degree of confirmation depending on the rigour and relevance of the experiment). Many BEs adopt a similar approach. Just as in scientific experiments, the impact of the BE may depend on how well we are able to control contaminating variables, which may muddy the waters and make interpretation of the results ambiguous.

Also, as in the wider world of science, there are two broad approaches to gathering the required information. The first approach—and the one which some would consider the only true form of experiment—involves a deliberate manipulation of some aspect of the world: some method of intentionally changing things to produce a particular event or situation. A classic example in physics is Galileo’s famous experiment of simultaneously dropping a wooden ball and a cannon ball from the leaning Tower of Pisa to test the hypothesis that an object’s weight should affect its speed of descent.*

However, not all branches of science use this type of experiment. In the study of evolution or astronomy, for instance, it is usually not possible to manipulate many of the variables of interest. We cannot re-run evolution to see what happens to the dinosaurs if the Earth does *not* suffer an asteroid impact, or

*There is some controversy about whether in fact he ever did this and indeed what the result was: even ‘pure’ science has its ambiguities!

change the Sun's gravitational field to see what happens to planetary orbits under different conditions. Sciences such as these use an *observational* approach to data gathering, rather than experimental methods in the pure sense. In the social sciences also, researchers frequently rely on *observation* to gather data, as it may not be possible to use experimental methods (e.g. to study the behaviour of football crowds). Under these circumstances, although researchers can carefully choose what observations will be most useful, they do not generally have the power to *manipulate* what happens.

We can also distinguish these two types of experiment within cognitive therapy. The first type is more akin to the 'pure' experimental approach and involves patients deliberately setting out to manipulate the environment from their behaviour. Typically, this necessitates doing something which is different to what they would usually do in a particular situation. For example, the patient may try to answer the question: 'If I go to the supermarket alone and do not take my usual precautions, will I actually faint (as my existing belief would predict) or will I just feel anxious (the prediction of an alternative theory)?'

The second type is akin to observational experiments, in that it is either not possible or not necessary to manipulate key variables. Instead patients set out to observe and gather evidence which is relevant to their specific thoughts or beliefs. For example, a patient may try to answer the question: 'Will people think I'm 'stupid' or 'abnormal' if I sweat in social situations?' In this case, it may be useful to conduct a systematic survey, and enquire what the respondents think about people who sweat. Our use of the term *experiment* will encompass both the experimental manipulation and observational types of experiment.

Another distinction which is useful when thinking about BEs, is that between the hypothesis-testing approach of the traditional sciences (and much of psychological science) and the discovery-oriented approach utilized in some of the social sciences (including, on occasions, psychology). The traditional function of science is to test theories through experimentation or observation. However, sometimes in new fields of research there may be no existing theory to test; data may need to be gathered to build a theory (e.g. Piaget's powers of observation and experimentation provided the data which enabled him to build a new theory of child cognitive development). The development in the social sciences of qualitative methodologies such as grounded theory (Glaser and Strauss 1967) has been a response to the need for a systematic method for building theories from data.

The relevance of this distinction for BEs is that, while many BEs are of the hypothesis-testing type, testing either old or newly developed beliefs, this does not apply to all. Some patients, especially those with deeply held core beliefs (e.g. 'I am worthless'), cannot necessarily identify or find any evidence for a set of new, more adaptive beliefs for themselves. They may not have any 'positive' hypotheses to test. Basic data may need to be collected in order for them to build a new hypothesis. Accordingly, they may need (at least initially) to be guided towards

discovery-oriented experiments (e.g. ‘What would happen if I acted ‘as if’ I was valued by others?’) or encouraged to try out different ways of behaving in order to collect these data (‘How might a valued person act in these circumstances?’).

To summarize, the form of BEs in cognitive therapy is mainly derived from, and consistent with, the hypothesis-testing approach to experimentation and observation that has traditionally been utilized in the sciences. On occasions, this is supplemented by a more discovery-oriented approach when patients have little or no idea what will happen when they undertake a BE and need to collect data systematically in order to ‘build a theory’.

Behavioural experiments: evolution and revolution

Superficially, the BE in cognitive therapy appears to be strikingly similar to the technique of exposure in behaviour therapy—but there are important, indeed fundamental, differences. As Beck *et al.* (1979) have written: ‘For the behaviour therapist, the modification of behaviour is an end in itself; for the cognitive therapist it is a means to an end—namely cognitive change’ (p. 119).

In behaviour therapy, a typical strategy for change is graduated, repeated, and prolonged exposure to a feared stimulus (e.g. in anxiety) until such time as anxiety dies down; or, in depression, changing prevailing patterns of reinforcement to increase behavioural activation. In contrast, BEs in cognitive therapy are primarily a means of checking the validity of thoughts, perceptions, and beliefs, and/or constructing new operating principles and beliefs. For the behaviour therapist, emotional change is assumed to occur with the passage of time through the process of habituation, whereas for the cognitive therapist, the aim is to help the patient to conclude that the situation is not really dangerous.

To continue with the example of anxiety, cognitive therapy assumes that anxiety is maintained by thoughts of threat, risk, and danger, the nature of which will vary according to the focus of the anxiety. So, for example, a patient whose panics involved changes in heart rate might predict imminent heart attack, whereas a person with social phobia might predict rejection if their anxiety becomes obvious to others. Patients fail to update these predictions (and the beliefs and assumptions on which they are based) because they understandably take steps to prevent the catastrophes from coming true. The panic patient might avoid exercise because it leads to raised heart rate, while the social phobic might strive to appear perfectly confident in front of other people. These ‘safety-seeking behaviours’ (Salkovskis 1991) keep the system of beliefs in place, and may indeed make things worse. (More commonly, they are called ‘safety behaviours’, a term which we shall be using in the remainder of this book.) They may even appear to confirm the predictions, for instance when the patient with panic avoids exercise, becomes increasingly unfit, and then experiences raised heart rate after minimal exertion.

The task in therapy is to identify the particular predictions that patients are making and to discover exactly what precautions they are taking to prevent these from coming true. Only by facing what they fear, without taking unnecessary precautions, will they have an opportunity to discover whether their fears are justified. In the case of long-standing difficulties, substantial and lasting changes in perspective may take time, and BEs may have to be modified or repeated. In many cases, however, provided both predictions and precautions have been accurately captured, the change in perspective can occur with great speed—sometimes after a single key experiment.

This approach may be contrasted with the behaviour therapy approach, in which exposure is seen as the key strategy and prevention of avoidance responses and habituation of fear as the predominant mechanisms.

In summary, cognitive therapy has benefited from behaviour therapy's explicit focus on doing things differently (e.g. in the instance above, ceasing to use safety behaviours), and this has contributed directly to the development of BEs within cognitive therapy. However, the emphasis is different; the target of change in cognitive therapy is cognition, not simply behaviour; and the methods of change are specifically geared towards this end.

The value of behavioural experiments

Clinicians' perspectives

Many clinicians view BEs as a particularly powerful method for producing cognitive change. For instance, Clark (1989, p. 82) noted that BEs 'can be one of the most effective ways of changing beliefs'; and Wells (1997, p. 78) has written that 'behavioural strategies offer the most powerful means to cognitive change in cognitive therapy'. Similarly, in their patient manual, *Mind over mood*, Greenberger and Padesky (1995, p. 113) suggested:

Developing alternative and balanced thoughts for your Thought Records may be like writing in a new language for you. Like any new language, these new thoughts probably seem awkward and only partly believable . . . *the best way to increase the believability of your alternative or balanced thoughts is to try them out in your day-to-day life.*

Cognitive theory assumes that BEs 'work' because they provide hard evidence relevant to patients' beliefs. As Salkovskis (1991, p. 15) has written in relation to the anxiety disorders:

According to the cognitive hypothesis, the value of behavioural experiments transcends mere exposure; such experiments allow patient and therapist to collaborate in the gathering of new information assessing the validity of non-threatening explanation of anxiety and associated symptoms.

For example, in panic disorder, BEs may provide evidence about causes of symptoms, their consequences, and the effects of safety behaviours (e.g. see Chapter 3).

In cognitive therapy, evidence to test cognitions may be gathered in a variety of ways. Experiments provide one strategy; verbal strategies, such as the use of automatic thought records and guided discovery, represent another. Although identifying and testing automatic thought records may ‘offer a means of loosening belief and presenting a foundation for attitude change’, Wells (1997, p. 78) has argued that ‘the most significant change in cognitive therapy of anxiety is usually obtained when behavioural reattribution is used’. In the next section, evidence to support this assertion is reviewed.

Empirical evidence

Although BEs are integral to cognitive therapy, there is little research in the literature which focuses specifically on the value of these, or of any other specific therapeutic strategy in isolation. Most outcome research has evaluated cognitive therapy packages, rather than specific strategies.

It might be argued that there are strong *a priori* grounds from the history of the success of behaviour therapy and of cognitive therapy to suggest that BEs are valuable treatment strategies. Experiments are a central feature of many successful cognitive therapy treatments for anxiety disorders such as panic disorder and social phobia (Clark 1997), obsessive-compulsive disorder (Salkovskis *et al.* 1999*b*), and post-traumatic stress disorder (Ehlers and Clark 2000).

The effectiveness of BEs, formulated from a cognitive perspective, is also indicated in research comparing the utility of treatment based on cognitive theory and behavioural theory. As predicted by the cognitive model, BEs where safety behaviours are dropped are more effective in producing cognitive, affective, and behavioural change than exposure where safety behaviours continue to be utilized (Morgan and Raffle 1999; Salkovskis *et al.* 1999*a*; Sloan and Telch 2002).

The only research we know of directly comparing the impact of BEs with another therapeutic strategy—the use of automatic thought records—was conducted with cognitive therapy practitioners, who undertook a training course which involved practising cognitive therapy techniques on themselves (Bennett–Levy 2003*a*). They were asked to compare the utility of automatic thought records and BEs in raising their levels of awareness of internal processes (e.g. thoughts, feelings, physical reactions), and in achieving cognitive and behavioural change. While the two techniques promoted equivalent levels of self-awareness, BEs were rated as producing significantly greater cognitive and behavioural change (see Fig. 1.1).

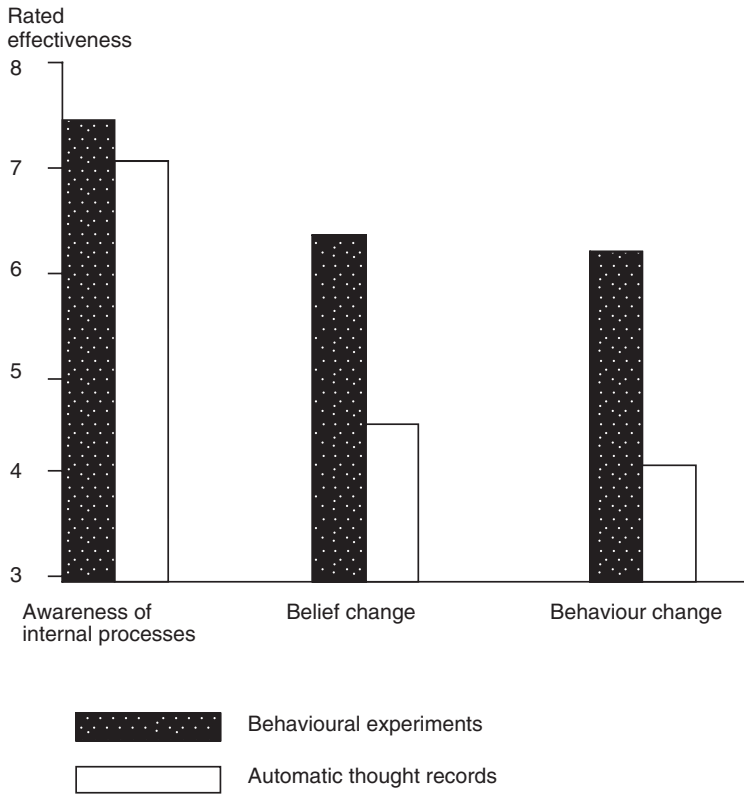


Fig. 1.1 Mean ratings of the effect of behavioural experiments and automatic thought records on awareness, belief change, and behaviour change (from Bennett–Levy 2003a).

Interestingly, qualitative feedback indicated that participants ascribed these differences to differences in the quality of evidential experience. New, alternative cognitions derived from automatic thought records tended to be believed ‘with the head’, but not always ‘with the heart’ (‘I know it rationally but . . .’), while new cognitions derived from experiments were more likely to be believed and accepted (‘I experienced it, therefore it must be true’). For instance, one trainee wrote:

Behavioural experiments give you virtually irrefutable evidence to discredit your maladaptive thoughts and beliefs. Although thought records involve producing evidence against the thought, the evidence provided by the behavioural experiment is much more convincing . . . Everything else was great in terms of understanding, but behavioural experiments were actually the way that I made a couple of changes.

In summary, empirical evidence for the specific effectiveness of BEs is sparse, but is consistent with the perspective of clinicians who have emphasized the

importance of BEs in cognitive therapy. Clearly, further research is needed to evaluate the quality of the experience of BEs, and their specific impact, in patient groups.

Theoretical perspectives on the value of behavioural experiments

The cognitive account of BEs specifies that their value lies in disconfirming existing maladaptive cognitions and/or providing evidence for new, more adaptive cognitions. However, our argument goes further. Clinical experience, and the limited empirical evidence available, suggest that BEs are amongst the most powerful therapeutic strategies available to cognitive therapists (Beck *et al.* 1979; Clark 1989; Greenberger and Padesky 1995; Wells 1997). It seems likely that they promote greater cognitive, affective, and behavioural change than purely verbal cognitive techniques lacking an experiential component (Bennett–Levy 2003a). This may manifest in greater synchrony (Rachman and Hodgson 1974) across these three systems—cognitive, affective, and behavioural—so that patients do not get into the position of saying ‘I can see the alternative, but I still don’t feel any different’.

Are there any theoretical grounds to support this assertion? What mechanisms may explain their impact? In this section, we draw on theories from cognitive science, and adult learning theory, in an attempt to provide much needed understanding of how and why change may occur as a consequence of BEs. While it is premature at this stage to attempt a theoretical synthesis, the themes that emerge indicate that the following characteristics of BEs may be particularly relevant:

- ◆ experiential learning
- ◆ emotional arousal
- ◆ the encoding of these experiences in memory in different ways at different levels
- ◆ the practice of new plans and behaviours
- ◆ learning through reflection

In the sections below, we highlight two classes of theory to explain the impact of BEs:

- 1 *Theories from cognitive science*, which suggest that the multi-sensory, experiential information derived from BEs is processed in a different and ‘deeper’ way by the information processing system than purely verbally-based information.

- 2 *Adult learning theories* from education, which assert the centrality of two processes—experiential learning and self-reflection—in creating the most effective learning experiences for humans.

Theories from cognitive science

A number of information processing theories are relevant to the clinical value of BEs. These include:

- ◆ The interacting cognitive subsystems (ICS) model of Teasdale (Teasdale 1997; Teasdale and Barnard 1993)
- ◆ Brewin's dual representation theory (Brewin 1996; Brewin 2001)
- ◆ Power and Dalgleish's SPAARS model (Power and Dalgleish 1997; Power and Dalgleish 1999)
- ◆ Epstein's cognitive-experiential self-theory (Epstein 1994; Epstein and Pacini 1999)
- ◆ Wells' metacognitive theory (Wells 2000; Wells and Matthews 1994)

The focus in this section is on two of these theories: the ICS model (Teasdale and Barnard 1993), which is broadly representative of a class of multi-level theories that includes Brewin's, Power and Dalgleish's, and Epstein's; and metacognitive theory (Wells 2000), which has a somewhat different emphasis.

While the multi-level theories of Teasdale, Brewin, Power and Dalgleish, and Epstein differ in focus and detail, what they all have in common is that they contrast at least two qualitatively different information processing systems: a more rational, verbal, logical, propositional, information processing system, without links to emotion; and a 'deeper', more holistic, non-linguistic, automatic, and rapid information processing system, with extensive links to emotion. These theories suggest that BEs may provide more powerful subjective evidence for cognitive, affective, and behavioural change than purely verbal strategies, because carrying out experiments means being involved in practical activities with clear emotional and psychological relevance, which are more likely to have an impact at the deeper, non-linguistic level of the 'felt sense'. In contrast, verbal techniques tend only to impact at the rational/logical level. For instance, there is a great difference in the 'felt sense' of safety between reading about the minimal risk of a parachuting accident and carrying out one or more successful parachute jumps.

Focusing here primarily on Teasdale's ICS theory, which has perhaps received the most attention from cognitive therapists, the theory suggests that these differences parallel the difference between what patients describe as 'intellectual' versus 'emotional' belief, or 'believing with the head' versus 'the heart'. Teasdale's argument is that 'intellectual' and 'emotional' belief are products of the

different levels of information processing that are accessed, and of the different kinds of experience needed to promote cognitive change in each case. Within the ICS model, for emotional change to occur, patients need to develop 'alternative schematic models' at the implicational (deeper) level, which encompass changes in behavioural, cognitive, emotional, and physical responses. The most direct pathway to create this change is to arrange for 'experiences in which new or modified models are created' (Teasdale 1997, p. 90). BEs are potentially a major source of such experiences, as their emotional qualities increase the likelihood that they will impact at the implicational level. In contrast, it is assumed that purely verbally-based techniques, such as automatic thought records will predominantly have an impact at the propositional (verbal/logical) level, unless completed when emotion is activated. In consequence, they may not be so effective in promoting change.

Although Teasdale contrasts implicational and propositional systems, and seems to imply that the value of BEs lies in their impact on the implicational system, this may be an oversimplification. As will be argued below (see adult learning theory section), BEs may be particularly powerful because they impact on *both* implicational and propositional systems.

Evidence supporting the value of the kind of emotional/experiential encoding which might be experienced during BEs can be derived from experimental research on memory. First, heightened emotion usually facilitates remembering, though accuracy can be compromised (Heuer and Riesberg 1992). Second, the 'enactment effect' indicates that 'memory for . . . actions that one has observed of other people, or that one has only heard about . . . is less good than memory for self-performed actions' (Engelkamp 1998, p. 139). Engelkamp (1998) has suggested that one of the most important reasons for the enactment effect is that information is encoded multi-modally using visual, auditory, kinaesthetic, and/or motor systems. Such results are consistent with multi-level theories suggesting that emotionally/experientially acquired information is likely to have a more widespread impact on cognition, emotion, and behaviour, than purely verbal information.

Another theory which may shed some light on the value of BEs is the metacognitive theory of Wells (2000). Wells draws on the distinction, from the experimental psychology literature, between declarative and procedural memory. Declarative memory contains knowledge and beliefs which are recalled as factual information (e.g. 'Brazil won the World Cup in 2002' or 'My thoughts are uncontrollable'). Procedural memory contains knowledge about plans or procedures which is often automatic and implicit (e.g. 'Aim for the corner of the net when taking a penalty' or 'Take a sleeping pill to get a night without worrying').

The important point made by Wells is that in order for metacognitive processing to change, it is necessary not only to develop a new *declarative* belief

(‘Worry can be controlled’), but also to develop a different *procedural* memory through the repeated enactment of a new plan or procedure (‘Postpone worry until 6.00–6.15 p.m. daily’). The point applies equally to other (non-metacognitive) declarative beliefs. For instance, a challenging situation may elicit, in a person with low self-esteem, declarative beliefs (e.g. ‘I am a failure’) and characteristic plans which are usually implicit (e.g. gaze aversion, slumped body, automatic thought ‘not me!’). Effective therapy will need to change both.

The implication of these ideas for BEs is that it is not enough to focus simply on changing declarative beliefs (‘I am a failure’, ‘Worry can be controlled’), as purely verbal strategies are liable to do. Procedural memory also needs to be changed, and this is best effected through implementation and evaluation. When the new behaviours are enacted (‘Volunteer for raffle, act ‘as if’ I can do it’, ‘Do worrying at 6.15 p.m.’), BEs will impact directly on procedural memory, and frequently on the declarative beliefs themselves (‘I’m quite good at organizing’, ‘Having dedicated worry time leaves so much more time for everything else!’), in a way that verbal techniques are much less able to do.

Much of the writing in the cognitive therapy literature has focused on identifying and testing *declarative* thoughts and beliefs. Wells’ theory reminds us that implicit plans, in the form of procedural memory, are just as much part of cognition as overt or covert declarative beliefs. Such plans may be rather less susceptible to change through verbal-only means. Like the multi-level theories, this theory suggests that the most direct way to change plans, and appraisals, is through interventions which impact *across* information processing systems. Wells argues that the most effective way to do this is through the BE.

Adult learning theory

A second set of theories, suggesting the particular value of BEs, is derived from the field of adult education. Since the time of John Dewey (1938), educationists have recognized the unique value of personal experience for learning. Later authors have also placed emphasis on the value of reflection (Kemmis and McTaggart 2000; Kolb 1984; Lewin 1946; Schön 1983).

The processes involved in experiential learning and reflection are embodied in the Lewin/Kolb four stage experiential learning model (Kolb 1984; Lewin 1946)—probably the most widely used model in adult education (see Fig. 1.2). Different terms to describe the four stages have been used by different authors; here we shall use the relatively straightforward terms, *Plan*, *Experience*, *Observe*, *Reflect*. According to the model, effective learning proceeds through a series of Plan–Experience–Observe–Reflect cycles.

With regard to BEs, experiential learning and reflection, as well as planning and accurate observation, are clearly key components. Based on the

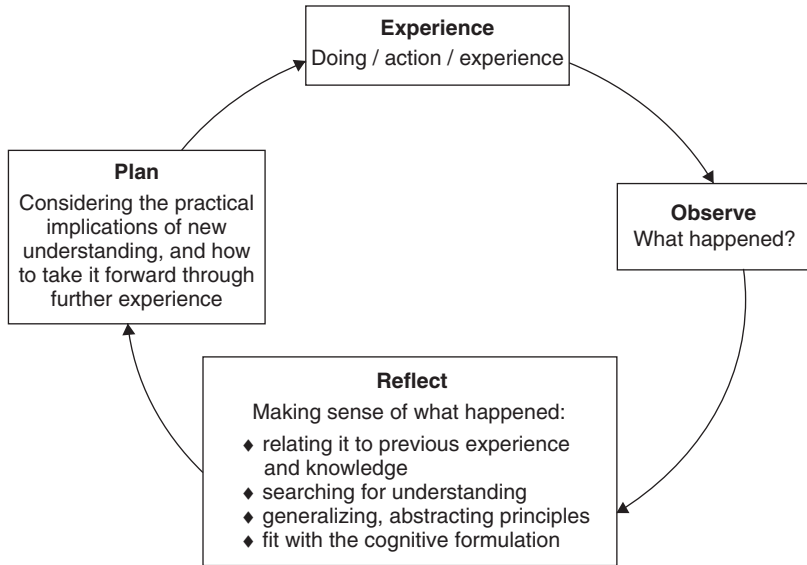


Fig. 1.2 The Lewin/Kolb experiential learning circle.

conceptualization of the problem (*Reflect*), the patient and therapist plan an appropriate experiment to test a declarative belief (*Plan*). The patient carries out the experiment (*Experience*), perhaps changing some aspect of normal performance, observes the results (*Observe*), and, with the therapist, reflects on the implications for the belief (*Reflect*). Further experiments are planned (*Plan*), and the cycle continues. Potentially, the cycle can start at any of these four points.

Essentially, the experiential learning model is a procedural theory, in contrast to the more structural theories outlined above. Although an empirical research base is lacking, the learning circle has high pragmatic value and face validity. Indeed, it provides such a useful structure for describing the steps involved in setting up, carrying out, and learning from BEs that we have adopted it as the organizing framework for Chapter 2.

Although adult learning theory comes from the educational context, while psychological theories of learning (e.g. classical conditioning, instrumental learning, social learning) derive from an experimental tradition, the two approaches can be seen as complementary. The particular contributions of adult learning theory, which make this theory especially useful in the context of personal change, are its emphasis on the uniquely human attribute of reflective learning (Bennett–Levy 2003*b*) and its clarity of procedural description. BEs are not simply about ‘carrying out the experiment’. Planning, observation, and

reflection are also central components, intrinsic to learning. As Bennett–Levy (2003a) has noted in relation to Teasdale’s ICS model, it is likely that BEs work so well because the cognitive (and experiential) components of planning, observing, and reflecting, combined with the experiential component of ‘experiencing’, mean that, in multi-level theory terms, BEs are more readily processed at *both* the ‘deeper’ implicational (experiential) level *and* the more conceptual/verbal prepositional level.

Conclusion

The aims of this chapter have been:

- 1 to site BEs historically and conceptually within the traditions of empirical science, psychotherapy, and cognitive therapy
- 2 to review clinical and empirical evidence for their effectiveness
- 3 to reflect on what it is about BEs that leads to change.

The experience of leading clinicians suggests that BEs occupy a particularly important role as a key therapeutic strategy within cognitive therapy. This apparent value may be contrasted with the current dearth of empirical evidence and relevant theory on the subject. There is an obvious need for more research, and more specific theory development.

In this chapter, we have indicated, without going into great detail, that BEs differ along various dimensions—for instance, they may incorporate different methodological approaches (hypothesis testing or discovery) and different types of experiment (experimental or observational). The next chapter, which focuses on the practical application of BEs, expands on these differences and utilizes the adult learning circle to provide a pragmatic framework for clinicians wishing to design effective BEs.