

MECHANISMS OF CHANGE IN COGNITIVE THERAPY: THE CASE OF AUTOMATIC THOUGHT RECORDS AND BEHAVIOURAL EXPERIMENTS

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Abstract. The study tested the hypothesis, derived from Teasdale and Barnard's (1993) Interacting Cognitive Subsystems (ICS) model, that two commonly used techniques in cognitive therapy, automatic thought records (ATRs) and behavioural experiments (BEs), would have their primary impact on different cognitive subsystems. Teasdale (1997a, b) has suggested that while ATRs tend to impact on a logic-based propositional information processing system, BEs impact on a more holistic implicational system, which has extensive links with emotion. Quantitative and qualitative data derived from three groups of participants undertaking cognitive therapy training courses, who practised ATRs and BEs on themselves, supported Teasdale's theory. Differences were found in participants' ratings of behaviour and belief change, with BEs being perceived as more powerful and compelling than ATRs, as predicted by the theory. There were also qualitative differences in participants' experiences of the two techniques, suggestive of different modes of processing. The data indicated the particular importance of the therapist's role in BEs. In order to provide a more comprehensive account of ATRs and BEs, it was suggested that Teasdale's theory could profitably be extended to include the role of the therapist in promoting adaptive oscillation between the implicational and propositional modes.

Keywords: Automatic thought records, behavioural experiments, cognitive therapy, change processes.

Introduction

Despite intensive research on process and outcome in cognitive therapy over the past quarter century, we are still a long way from understanding the mechanisms of therapeutic change (Rachman, 1997; Segal, Lau, & Rokke, 1999). A large number of client and therapist factors appear to contribute to therapeutic outcome – for example, acceptance of therapy rationale (Fennell & Teasdale, 1987), stage of change (Beitman et al., 1994), undertaking homework assignments (Neimeyer & Feixas, 1990), therapist competence (Shaw et al., 1999), and quality of the therapeutic relationship (Keijsers, Schaap, & Hoggduin, 2000) – but the mechanisms of change remain unclear.

Most CT outcome research evaluates whole CT packages. There is surprisingly little

research on the value of specific CT techniques. Automatic Thought Records (ATRs) and Behavioural Experiments (BEs) are two of the most commonly used techniques in CT, yet there is little research on their value, efficacy, or mode of action. Since clinical experience and cognitive theory (Teasdale, 1996, 1999) suggest that their mode of action is rather different, comparing participants' experiences of ATRs and BEs may shed some light on mechanisms of change in cognitive therapy. This is the purpose of the present paper.

Automatic Thought Records (also known as the Daily Record of Dysfunctional Thoughts (Beck, Rush, Shaw, & Emery, 1979)) are designed to enable clients to record, monitor, evaluate and respond to negative automatic thoughts in written form. For instance, a client might have an automatic thought "no-one cares about me". The therapist will help him/her to look at the evidence for and against that thought, and to arrive at an alternative or more balanced thought. Beck et al. (1979) described the Daily Record of Dysfunctional Thoughts as "an integral part of cognitive therapy" (p. 287).

Behavioural experiments are "experiments", designed collaboratively between therapist and client, which aim to help the client test out thoughts and beliefs in order to discover their relative validity or truth (Beck et al., 1979). Typically, clients are asked first to predict the outcome of an experiment; then they undertake it; then they evaluate the result. Sometimes BEs are undertaken during therapy sessions (e.g. overbreathing in clients with panic disorder to monitor and evaluate their physiological response); more frequently, BEs are designed as homework assignments (e.g. ask my son to help with the washing up to test out new belief that "if I express what I feel and need, my son may actually respect me more").

Some authors see the role of ATRs and BEs as complementary, serving different functions. Beck et al. (1979, p. 6) have written: "Although behavioral assignments may be more dramatic in disconfirming faulty beliefs, cognitive techniques may be the optimal kind of intervention to correct the patient's tendency to make incorrect inferences regarding specific events". Fennell (1989, p. 200) saw their impact as additive, with ATRs acting as the precursor for BEs, creating the conditions under which BEs can take place:

Verbal challenging of automatic thoughts is routinely followed by behavioural assignments through which new ideas are put to the test . . . Questioning negative thoughts encourages patients to evaluate realistically the costs and advantages of acting differently, and to prepare for a range of possible outcomes. So it opens the way to changes in behaviour. These in turn produce consequences that contradict the original thoughts and thus further erode their credibility.

Other authors (Greenberger & Padesky, 1995; Wells, 1997), while recognizing the value of ATRs, have argued that BEs represent the most effective strategy for promoting change in CT. Wells (1997) has written that "behavioural strategies offer the most powerful means to cognitive change in cognitive therapy" (Wells, 1997, p. 78), and, in their client 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 . . . You probably believe the new thoughts "in your head" but they don't feel as if they fit your life experience as well as the old automatic thoughts . . . *the best way to increase the believability of your alternative or balanced thoughts is to try them out in your day-to-day life.* (italics added)

Certainly, BEs have been a central feature in the development of successful CT treatments

for the anxiety disorders e.g. panic disorder and social phobia (Clark, 1997), obsessive-compulsive disorder (Salkovskis, Forrester, Richards, & Morrison, 1999), post-traumatic stress disorder (Ehlers & Clark, 2000); and in CT treatment for other kinds of disorder (Bennett-Levy et al., in preparation). An important category of behaviours in this respect are safety seeking behaviours (Salkovskis, 1996), which are actions taken by individuals to prevent or minimize anticipated further catastrophes. Safety seeking behaviours prevent disconfirmation of prevailing beliefs (e.g. 'I'll faint if I go into the supermarket'), since individuals attribute the absence of further catastrophe to their apparently preventative actions (e.g. squeezing shopping trolley handle tightly to 'prevent fainting'). The importance of BEs in testing such beliefs can be gauged from research showing that BEs specifically targeted at safety seeking behaviours result in significantly greater changes than exposure alone (Salkovskis, Clark, Hackmann, Wells, & Gelder, 1999; Sloan & Telch, 2002).

The implication of the above arguments is that, although identifying and testing ATRs may also 'offer a means of loosening belief and presenting a foundation for attitude change' (Wells, 1997, p. 78), clinical experience suggests that BEs are likely to be more effective in actually giving alternative thoughts believability, and promoting therapeutic change.

Developments in cognitive science over the past decade suggest that clinical experience is now being mirrored by cognitive theory. Teasdale (Teasdale, 1996, 1997a, b, 1999; Teasdale & Barnard, 1993) has developed a comprehensive model, termed the Interacting Cognitive Subsystems (ICS) model, one part of which may provide a theoretical basis for clinicians' observations about the relative impact of ATRs and BEs in promoting therapeutic change. It is a complex theory, and here the focus will be only on the most salient elements as they pertain to ATRs and BEs. In this regard, the central point proposed by Teasdale is that ATRs and BEs impact on the human information processing system at different levels.

ICS recognizes two levels of meaning, a specific level and a more generic level, represented respectively by a propositional code and an implicational code. Concepts at the specific propositional level are usually easy to put into words. For instance, negative automatic thoughts ('Oh what a silly fool I am, I've mucked it up again') may have something like a one-to-one correspondence with the representation of information at this level, which tends to be linguistically-based. Importantly, propositional meanings have a truth value that can be assessed and verified by reference to evidence. ATRs, which ask the client to examine the evidence in favour of and against negative automatic thoughts, are a classic example of propositionally-based evidence collection.

The second level of meaning is represented by implicational code at a more generic, holistic level. Meaning at this level does not map directly on to language. Content is marked by pervasive themes and high level recurring regularities in the world, body and the mind (e.g. schemas, such as Young's (1994) abandonment or deprivation schemas, which are not always directly accessible, and may have to be inferred). These are experienced subjectively as 'felt senses' or 'feelings' with implicit meaning content: 'something wrong', 'confidence', 'on the right track', 'hopelessness' (Teasdale, 1997b). Sensory information from the body is held to play a particularly important role in maintaining or changing the patterns of implicational code.

Propositional and implicational codes can be contrasted in various ways outlined in Table 1. Teasdale contrasts 'heart-level' emotional belief with 'head level' intellectual belief (Teasdale, 1996, 1997b), and ascribes the differences to the different ways in which

Table 1. Features of the propositional and implicational codes in Teasdale and Barnard's (1993) ICS model

Propositional code	Implicational code
Meaning – represented linguistically	“Holistic” meaning represented schematically: traditionally via parables, stories, poems
Convey specific information about world	Convey themes and regularities across different contexts (e.g. schemas)
Explicit knowledge	Implicit knowledge
Truth value, verifiable by evidence, can be rationally evaluated	Holistic “felt sense” of rightness; cannot evaluate as true or false
Representation of self-as-object	Representation of self-as-subject
“Head-level” intellectual belief	“Heart-level” emotional belief
No emotional content	Emotion bound up within representation
No input from sensory experience	Input from sensory features of physical world (e.g. tone of voice) and especially from own body state
Change occurs via creation of alternative schematic models that do not produce dysfunctional emotional reactions. ATRs may operate to create change indirectly via:	Change occurs via creation of alternative schematic models that do not produce dysfunctional emotional reactions. Change may occur directly by, for example:
1. Changes at propositional, specific level of meaning may, on occasions, lead to creation of new higher level meanings at implicational level (e.g. finding out that 95% of others failed exam as well).	<ul style="list-style-type: none"> ● Arranging for actual experiences in which new or modified models are created (e.g. behavioural experiments) ● Homework assignments that create modified models in a wide range of contexts ● Having a different “mind set” towards symptoms of depression (e.g. “problems to be considered, approached and investigated”) ● Modifying physical elements of experience (e.g. “upright” body posture in association with a failure experience) ● Guided imagery after trauma, seeing self as in control and powerful (new schematic model) ● Relating to self more gently and kindly after failure, creating a new alternative schematic model related to failure
2. Thought answering exercise may led to creation of a modified mind-set (e.g. “thoughts and feelings as mental events to be considered and examined” vs. “thoughts as facts”)	

information is represented by the two codes. The implicational code is extensively linked with emotion and proprioceptive cues; the propositional code has no links with emotion or body. Hence “intellectual” and “emotional” belief are actually a function of the different levels of information processing that are accessed, and require different kinds of experience to promote belief change.

To date, Teasdale's model has largely focused on depression. He has proposed that depressed mood states are held in place by “depressogenic schematic models” (e.g. self-as-a-worthless-person), fed by bodily sensory data (e.g. experience of fatigue) and nega-

tive automatic thoughts, which are both a product and contributor to the maintenance of the depressogenic schematic model. Depressogenic schematic models are a product of the implicational code. In order for change to occur, clients need to develop alternative schematic models. The most direct pathway to create this change is “arranging for experiences in which new or modified models are created” (Teasdale, 1997a, p. 90). A prime example of such experiences is the behavioural experiment.

The implication of Teasdale’s work is that BEs impact primarily on implicational knowledge, whereas ATRs impact primarily on propositional knowledge. ATRs mostly do not result in the creation of new schematic models at the implicational level, the prerequisite for therapeutic change in Teasdale’s theory. Indeed, “a reliance on disputational forms of cognitive restructuring runs the risk of maintaining a propositionally buffered model of central engine function that may preclude effective emotional processing” (Teasdale, 1999, p. S70).

However, Teasdale does allow at least two circumstances under which ATRs may result in the creation of new schematic models. First, a change in propositional meanings through ATRs may, on occasion, lead to the creation of a new schematic model when new information changes the underlying meaning of the event – for instance, discovering that 95% of other candidates have failed the same exam that you have failed may lead to a re-evaluation of a “me-as-a-stupid-hopeless-person” schema. Second, ATRs may lead to the creation of new mental models through the thought-answering exercise, which implicitly creates a different relationship to depressive experience in general. This represents a meta-level change in the relationship of the person to their thoughts and feelings. The relationship may now become “thoughts and feelings as mental events to be considered and examined”, rather than “thoughts as self-evident facts”.

In summary, the following hypotheses may be derived from Teasdale’s theory:

1. BEs should be rated by participants as more powerful in promoting therapeutic change than ATRs, since they are more likely to result in the creation of new schematic models.
2. BEs and ATRs are linked to different modes of processing (implicational/propositional) with different qualities (logical/rational vs. holistic/felt sense). These differences may find verbal expression in contrasts such as “head” versus “heart”, and “emotional belief” versus “intellectual belief”, or “change at a different level”. BEs are also more likely to be associated with increased emotion than ATRs, since the implicational level has extensive links with emotion, while the propositional level has no such links.

In this study, these hypotheses are examined using quantitative and qualitative data derived from three cognitive therapy training groups, whose courses included an experiential component, known as self-practice/self-reflection (SP/SR) (Bennett-Levy et al., 2001). In SP/SR, participants practise cognitive therapy techniques on themselves. The study reports experiences of ATRs and BEs.

The research strategy is adapted from the work of adult learning theorist, Donald Schön, whose books on the “reflective practitioner” (Schön, 1983, 1987) have made a seminal contribution to the understanding of professional skill development and expertise. Schön advocated reflection as a key process in the development of professional artistry, and suggested that practitioner-researcher self-study would yield valuable insights about professional practice. In previous studies of SP/SR (Bennett-Levy, Lee, Travers, Pohlman, &

Hamernik, 2003; Bennett-Levy et al., 2001), practitioner-researchers have reflected on the value of SP/SR for therapist learning and development. The present study extends the methodology to encompass practitioner-researcher reflection on the experience of change in the therapeutic process.

Method

Participants

Participants were members of three SP/SR cognitive therapy training groups, details of which are reported elsewhere (Bennett-Levy et al., 2001, 2003). In brief, two of the groups (Group 1, $n = 7$, 6 females (F), 1 male (M), mean age = 26.0; Group 2, $n = 12$, 10F, 2M, mean age = 32.8) were postgraduate students undertaking cognitive therapy courses within their clinical psychology training program at James Cook University of North Queensland (Bennett-Levy et al., 2001). The third (Group 3, $n = 8$, 6F, 2M, mean age = 40.6) was a group of cognitive therapy practitioners working in various health services in Brisbane, who attended an SP/SR-based “cognitive therapy experiential training group” (Bennett-Levy et al., 2003).

Course requirements

Full details of course requirements are reported elsewhere (Bennett-Levy et al., 2001, 2003). SP/SR was either undertaken on their own (Groups 1 and 2), or in “co-therapy” pairs (Group 3). All participants undertook written reflections on their SP/SR experiences. Some general questions were provided to guide reflections (e.g. What was my experience? What did I learn from my BEs/ATRs? What are the implications for clients?). Length and depth of reflections were left to each individual, and varied considerably from a few lines to 6–10 paragraphs spread over several weeks.

Each group was specifically instructed to undertake ATRs and BEs (e.g. for Group 2, the SP/SR Workbook included practice and reflection on ATRs in Weeks 3 and 4; reflections on the design of a BE in Week 5, and on implementation and outcome in weeks 7 and 11). A small number of participants did not complete these activities – because of difficulties (e.g. excessive anxiety) either designing an experiment or implementing it. However, these participants still reflected on the experience, whether or not it was completed successfully.

Measures

Towards the end of the Group 1 course, which, as well as being an academic course, also had an action research focus (Bennett-Levy et al., 2001; Kemmis & McTaggart, 2000), it became clear that participants were starting to make a distinction between increased awareness of their thought processes and the achievement of actual therapeutic change. Accordingly, a simple questionnaire was designed by the author to determine if this distinction was measurable quantitatively, and whether different CT techniques were impacting differentially on “awareness” and “change”. It should be noted that the questionnaire was not designed with the idea of testing Teasdale’s theory.

The questionnaire asked participants to rate the impact of four cognitive therapy techniques (Thought Records, Behavioural Experiments, Goal Setting, Schema-focused

Approaches), plus “Reflections on Life Experiences, Workshops etc”, on three outcome measures: (1) Increased Awareness of Internal Processes (beliefs, moods, behaviours); (2) Belief Change; and (3) Behaviour Change. The instructions were: “Based on your experiences of self-practice, which of the following techniques were effective on which dimensions? Rate 1–10, where 1 = no effect and 10 = very strong effect. If you didn’t do that particular technique, just leave blank.”

Data analysis

Ratings of the impact of ATRs were obtained from 21 participants, and of BEs from 20, at the end of the cognitive therapy course. Four participants did not complete the questionnaire due to absence at the time the questionnaire was administered; other missing quantitative data are thought to be a result of not completing these tasks. Ratings obtained from the seven members of Group 1 were not independent in the sense that the idea and design of the questionnaire was already driven by their own experience. However, for the purposes of the present analysis, data from the three groups were combined, since there were no significant differences, or differences in the pattern, between the responses of Group 1 and the other two groups. Data from the other three techniques (goal setting, schema focused work, reflections) are not reported here, since they are not relevant to the present paper, and there were considerably more missing data on these other techniques (only 11 people had no missing data on any technique).

Extensive qualitative data were also collected, drawn from written reflections, interviews, and group reflections. Qualitative data may provide a perspective not easily identified using purely quantitative approaches (Bennett-Levy & Taylor, 2000; Patton, 1990), and, increasingly, writers are recognizing that quantitative and qualitative methodologies can be complementary (Brannen, 1992; Hammersley, 1996; Miles & Huberman, 1994; Patton, 1990). In the present study, the qualitative data were first of all subjected to a grounded theory analysis (Glaser & Strauss, 1967) to derive main categories for ATRs and BEs. Grounded theory is perhaps the best articulated of the qualitative methodologies (Bennett-Levy et al., 2001; Glaser & Strauss, 1967; Pidgeon & Henwood, 1996; Strauss & Corbin, 1990), and most suited for the present purpose (Bennett-Levy et al., 2001). The NUD*IST program for qualitative analysis (Richards & Richards, 1991) was used to store data, and provide a framework for analysis. Once the categories had been derived, the data were used to test the second hypothesis, that ATRs and BEs are linked to different modes of processing, and that these differences might be reflected in participants’ verbal expression e.g. “head vs. heart”.

As a test of validity, all the examples belonging to each of the 15 categories (8 ATR, 7 BE categories) were listed. A second psychologist was provided with the category names, and asked (i) to assign a category name to the group of examples it seemed to fit, and (ii) to determine if all of the examples fitted the category. Initial concordance for category names (93%) and individual items (88%) was high, and at a meeting between the analysts to eliminate ambiguous items, 100% concordance was achieved for both.

In the Results section, the reported categories are derived from the data of between four and 12 participants per category (15–44% of total group). Since reflections varied widely in content and length, due to the open-endedness of the reflective questions and variations in participant experience, it is considered that the reflections of 15–44% of the group illustrat-

ing a similar point are likely to be broadly representative of the group as a whole, or significant subgroups. Examples of participant responses, chosen for their typicality and clarity, are provided in the text to illustrate key themes. Names have been changed.

Results

The Results are divided into two sections, addressing the study hypotheses. Section 1 examines whether BEs or ATRs are more likely to be perceived by participants as leading to therapeutic change. This question is addressed using the quantitative data. Section 2 examines whether the verbal content of participant reports of ATRs and BEs are consistent with the hypothesized mode of processing differences (propositional/implicational).

Section 1: ATRs, BEs and therapeutic change

The ATR and BE data were analysed using a two factor (outcome, technique) repeated measures analysis of variance. Both the main effects and the interaction were fitted. All effects satisfied the compound symmetry assumptions of the univariate approach to repeated measures. The ANOVA showed a main effect of outcome (Awareness, Belief Change, Behaviour Change), $F[2, 38] = 13.70, p < .0001$; techniques (ATRs and BEs), $F[1, 19] = 2.35, p < .002$; and a significant outcome \times technique interaction, $F[2, 38] = 4.33, p < .015$. In view of the significant interaction effect, ATRs and BEs were compared for each outcome.

The mean scores by technique and outcome are represented in Figure 1. Statistical comparisons indicate that there were no significant differences between ATRs and BEs in their effect on self-awareness of internal processes (ATRs: $M = 7.05$ ($SD = 2.1$); BEs: $M = 7.48$ ($SD = 1.6$), $t = -1.00, df = 20, p = .329$). In contrast, there were marked differences in their effects on belief change (ATRs = 4.60 (2.0); BEs = 6.35 (2.6); $t = -3.26, df = 19, p = .004$) and behaviour change (ATRs = 4.00 (2.2); BEs = 6.20 (2.9); $t = -3.77, df = 19, p = .001$), with BEs rated as being significantly more effective in changing beliefs and behaviour than ATRs.

Section 2: Processing differences in ATRs and BEs

Grounded theory analysis of the verbal data from written reflections, interviews, and group reflections indicated seven main themes for BEs, and eight for ATRs. The principal themes for BEs were:

- BE1. Anxiety: Anticipation and implementation of BEs are associated with significant levels of anxiety (44%);
- BE2. Personal qualities: BEs require bravery and persistence (19%);
- BE3. Avoidance: BEs are sometimes avoided usually due to heightened anxiety (22%);
- BE4. Preparation: It is important to anticipate problems, including worst possible outcomes, and develop strategies to deal with them (22%);
- BE5. Value of therapist: BEs are hard to design and conduct on one's own – therapist role is most important (33%);
- BE6. Evaluation: Post-experiment evaluation is important e.g. attribution of success – don't discount or minimize own role (19%);

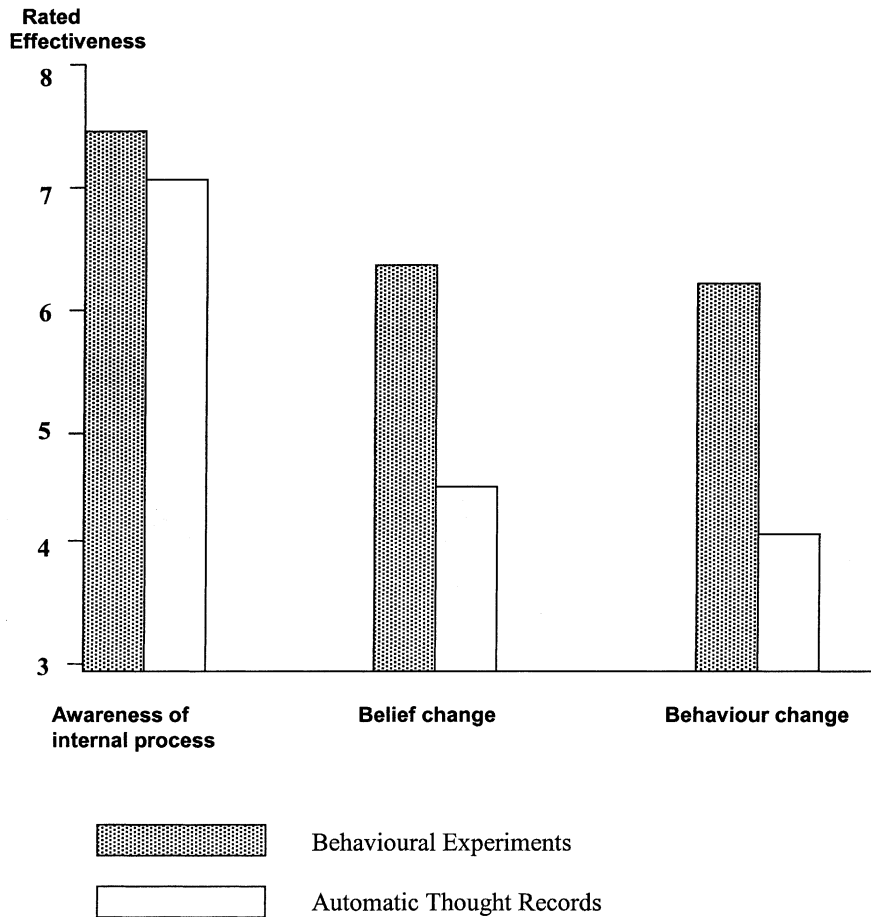


Figure 1. Mean ratings of the effect of BEs and ATRs on awareness, belief change and behaviour change

BE7. Quality of evidence: BEs provide compelling evidence for re-evaluating beliefs (e.g. when compared with ATRs) (19%).

The principal themes for ATRs were:

- ATR1. Avoidance: ATRs brought participants face-to-face with their thoughts/emotions; some noticed their avoidance (19%);
- ATR2. Mediating effect of emotion: It is more difficult to come up with alternative thoughts at times of high emotion (15%);
- ATR3. Being equipped: Diary, pen, paper needed at the time in order to record negative thoughts (19%);
- ATR4. Forgetting: Likely to forget occurrence and details of negative thoughts if recording is delayed (30%);
- ATR5. Impact 1: ATRs create clarity, notice links between thought, emotion, mood (30%);

- ATR6. Impact 2: ATRs can provide a different perspective of problems (33%);
 ATR7. Impact 3: Practice produces automaticity; writing becomes less necessary as skill at responding to negative thoughts improves (15%);
 ATR8. Quality of evidence: ATRs provide intellectual, rather than emotional, understanding (26%).

The remainder of this section draws on the relevant categories above (referenced in the text) to test some of the mode of processing predictions from Teasdale's theory. Specifically, the following hypotheses are evaluated:

1. BEs and ATRs provide a different quality of evidential experience, associated with "intellectual belief" (head) and "emotional belief" (heart).
2. Processing during ATRs tends to be rational/analytic; self is represented as object, and there is low emotional representation (except at the time of the "hot thought" when it may be difficult to find evidence against the belief). Processing during BEs is frequently associated with high emotion, representations of self-as-subject, and input from body state.

Different quality of evidence: 'head' versus 'heart'. There was a consistent theme in participants' reflections that BEs yielded a more compelling quality of evidence of change than ATRs (categories BE7 and ATR8 above). This was described in various ways as being felt on a different level (see Table 2): a "heart", "body" or emotional level, rather than just a "head" or intellectual one.

Different modes of processing. Participants identified "achieving clarity" (ATR5) and "gaining new perspectives" (ATR6) as two of the main outcomes of doing ATRs. They could see links between thought, action, and emotion, and were able to identify errors in thinking and distortions. Typically, they used words like "objective" and "rational" to describe the process, and noted its slow, sequential nature. For example, Christine wrote that it could seem like a "tedious but logical process"; Ken noted that "my thought record has helped me slow down and put things in perspective"; and Paul remarked that ATRs gave him "time to 'breathe' and actually removed some of the pressure of the situation itself". The self-as-object perspective was graphically demonstrated by Anne:

I think that even though my opinion didn't change it was really healthy for me to be able to come up with a balanced thought. Seeing it in writing helped, I felt like someone else thought I was okay when I read it. It felt good.

In the main, emotion seemed to play little part in ATR processing. However, this was less true when participants thought about doing ATRs immediately following a hot thought. Some noted that they engaged in avoidance strategies (ATR1), or that it was difficult to find evidence against the thought at that stage (ATR2); two participants found that the hot thoughts prompted a ruminative cycle, which Helen described as "the snowball effect". The implication was that the rational mode of processing, characteristic of ATRs, is less accessible during times of high emotion.

High emotion was a predominant characteristic of BEs, particularly during the preparation and implementation stages. Anxiety was noted by many participants (BE1); bravery and persistence were seen as important personal characteristics for undertaking BEs (BE2).

Table 2. Examples of “intellectual” and “emotional” belief in ATRs and BEs

Andy: I have noticed that I can come up with very rational challenges, which “intellectually” do make more logical sense to me. However, I have noticed that I do not “emotionally” click with them as I do with the negative automatic thoughts. I realise that is because they are not well practised like the negative automatic thoughts and that I need to actually put the new thoughts into practice – which is where the behavioural experiments come in.

John: 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.

Martina: I actually did a behavioural experiment to test one of my fears – it actually wasn’t planned by myself, kind of thrust upon me as these things sometimes are. What others had been telling me about myself and I had been saying “Yes I understand”, I still felt I had no evidence to disprove my irrational negativity (“They don’t really know me – I’m sure if they really knew they would agree with the way I see myself in this situation”). For me to disprove my own negative beliefs was really powerful and contributed probably more to my change process than anything else. I am actually starting to modify my negative belief on a different level and feeling good about it.

Richard, commenting on an ATR: I was able to come up with evidence for and against, and to think of an alternative, but my body still felt that the NAT had some credibility. I can say to myself “don’t be silly, of course it isn’t true” and agree with this rationally, but it doesn’t shift my physical and emotional experience of doubt.

Helen: This assessment pointed out to me how difficult it is to implement behavioural experiments, and thus how much of a challenge this would present to clients. However, at the same time it proved to be very useful in providing evidence that did not support my core beliefs. It’s fair enough thinking about evidence for and against a thought or belief, but actually setting out to test this seems to provide more substantial evidence – although this does not always work in your favour.

A feature of SP/SR was that Group 1 and 2 participants undertook SP/SR on their own. For BEs, in particular, the absence of the therapist was felt acutely (BE5), not only in providing emotional support, but also, importantly, in helping the client to think through the experiment: skills, resources, anticipated problems, strategies to overcome them etc (BE4). It was as if rational/logical faculties were partially disabled by the emotion associated with BEs, and participants had difficulty moving from self-as-subject experiencer mode to self-as-object planning consultant mode. Some participants did not proceed with experiments (BE3). Table 3 provides examples of the problems experienced by participants without “co-therapists” (BE5). In contrast, those who had “co-therapists” noted their particular value for planning and implementation of BEs.

Discussion

The comparison between participants’ experiences of ATRs and BEs indicated that, while both are perceived as similarly useful in becoming aware of internal processes (thoughts, emotions), BEs are seen as more effective in promoting behaviour and belief change. The evidence gained from testing beliefs in the real world through actual experience is perceived

Table 3. Mode of processing effects in BEs undertaken without the support of a therapist

Penny: Had several attempts at formulating a thought to be tested but couldn't work out why this was so difficult to do on my own as the process seemed quite straightforward when practising this with clients . . . This is much easier to do with clients than to do by myself, as I found I was initially unable to get started without much "thinking".

Bill: I think it would be easier to do it with a therapist. I found it really difficult to develop strategies to overcome problems.

Sandra: There were a number of things that I learnt from doing a behavioural experiment. First, try not to do it when you are feeling very angry and intense about a situation. This further signifies the need to do it with another person.

Anne: I think there is one essential ingredient missing when self-practising CBT, that is someone to hold your hand. To help you make sense of things and prod you in the right direction. It is hard to take big steps on your own and it is hard to focus on small reasonable steps when you are enmeshed in the problem . . . I look back and realize that for me this was too big a first step. A second voice might have been able to point this out, and save me some of the emotional baggage.

Jenny: In "trying" to set up a behavioural experiment I encountered a number of problems, which resulted in me not completing the exercise. The greatest difficulty was that I couldn't think of a way to test the alternative/balanced thought. I chose a number of similar NATs and alternative/balanced thoughts, but I couldn't find any specific way to test them.

Neil: My behavioural experiment has waned a little over the past few weeks. I have found that the behavioural experiment and organization and cognitive capacity that it involves has gone out the window in the last few weeks since my physiological arousal levels have increased somewhat.

as much more compelling than the evidence gained from testing or challenging thoughts using automatic thought records. Furthermore, there appear to be differences in mode of processing, with ATR processing tending to be slow and rational from a self-as-object perspective, while BEs are associated with high levels of emotion, particularly in the preparation and implementation stages, and processing from a self-as-agent perspective, in which participants have difficulty engaging in logical-rational processing.

The study therefore provides considerable support for the hypotheses derived from Teasdale's (1997a, b) ICS model that BEs should be rated as being more powerful in promoting therapeutic change than ATRs, and that these techniques are linked to different modes of processing. Participants' reports of a different experiential quality of evidence also appear to reflect quite closely Teasdale's distinctions between the propositional code's reliance on the truth value of evidence, and the implicational code's sense of "rightness", and between "head level" intellectual belief, and "heart level" emotional belief. This analysis suggests that BEs are important in promoting therapeutic change not only because of the reasons usually given – countering avoidance, exposure to experiences that provide new corrective information, habituation of fear etc – but also because BEs tend to impact on the human information processing system at a different level than ATRs.

The lack of differences between ATRs and BEs in awareness of internal processes, and the high ratings obtained, suggests that both techniques are quite effective in this regard. Participants noted that confronting avoidance was a key feature of the use of both ATRs and BEs. They became more aware both of their avoidance strategies, and the cognitions

and emotions that they were avoiding. ATRs were helpful in providing conceptual clarity and understanding of internal processes, and in providing new perspective, suggesting, as Fennell (1989) and Wells (1997) have argued, that they may open the way to changes in behaviour (Fennell, 1989), and be useful precursors to BEs, even though they were not as impactful as BEs in promoting actual belief and behaviour change.

An interesting feature of the results was the difficulty that participants who were practising SP/SR on their own experienced in setting up and undertaking behavioural experiments. This had not been anticipated, partly because self-practice is not a usual part of cognitive therapy, and there are no similar reports, as far as can be ascertained, in the literature. Participants reported problems in anticipating difficulties, marshalling their resources, thinking through the implications, judging the appropriate size of "first steps", and feeling confident enough to undertake the experiments. One interpretation of these data is that under conditions of high emotion, in which, by definition, participants are in implicational mode, it is difficult to access propositional mode. The interpretation is also supported by participants' reports that, on those occasions when they used ATRs at the time when negative automatic thoughts were "hot", they had much greater difficulty finding counter-evidence.

A related aspect of participants' experience was the importance that they ascribed to the role of the therapist in BEs. Some who were in co-therapy pairs reported that they were enabled to undertake BEs, which would otherwise have been outside of their comfort zone; both interpersonal and technical aspects of the therapeutic relationship appeared to be important. They noted the importance of their therapist's support and encouragement in feeling safe enough to explore feelings and underlying assumptions/schema, and undertake experiments. The data also suggested that one of the principal roles of the therapist, in preparing a client for a BE, was to "fill in" for the rational-logical propositional mode of processing, which may be largely unavailable while the client is contemplating the experiment in an anxiety-driven implicational-mode state. Thus, it seems that even relatively sophisticated "clients" (psychologists) appear to have great difficulty devising adequate BEs for themselves, in contrast to doing ATRs, which presented many fewer problems. They tend to have rational-logical "blind spots" (e.g. in anticipating problems).

If this argument is correct, then one further implication might be that clients undertaking therapy tasks are, at any given time, either predominantly or wholly in one mode or the other. This would provide a powerful explanation for the difficulty in setting up BEs for oneself. As soon as an SP/SR participant thinks about potential BE situations, emotion (anxiety) is triggered, and he/she may be automatically thrown into self-as-agent implicational mode, in which self-as-object propositional modes of rational-analytic thinking are relatively inaccessible. Hence, judgements about appropriateness of the task, creating first steps, and problem-solving strategies for worst outcomes cannot be made in the same way that they can from the therapist's chair. Similarly, one of the principal reasons participants may have such difficulty "being structured and rational" during an episode of "hot" negative automatic thoughts (e.g. getting out a diary and writing them down, or challenging thoughts at the time) is that they are in the high emotion implicational mode at that time, and the propositional code is difficult to access. On this argument, one of the main roles of the therapist in cognitive therapy may be to help the client oscillate between modes, and fill-in and prompt them, when they are operating within the less efficacious code.

Teadale's theory has not been designed to provide a comprehensive account of BEs and ATRs. However, the present analysis suggests that it could profitably be extended to do so,

by (i) incorporating the role of the therapist, and (ii) specifying more precisely the role of high emotion in facilitating or obstructing oscillation between propositional and implicational modes. A further implication is that different modes of processing are particularly salient at different stages of the BE process. For instance, in the midst of an experiment, the implicational mode may predominate; whilst before and after experiments, good therapists will facilitate use of the logical-analytical propositional mode for planning and reflection. Thus, although implicational mode may play a more significant role in BEs than ATRs, it is likely that those BEs, which produce the best outcomes, impact significantly on both implicational *and* propositional modes.

The present study has utilized a novel research strategy for investigating process in therapy: practitioner-researcher self-study. Obtaining detailed reflections on the therapy process can often be problematic, as there are limits to the demands that can reasonably be made on clients, and only occasional studies have done so (Elliott et al., 1994; Rennie, 1994; Watson & Rennie, 1994). However, for practitioner-researchers, reflection on process is a valuable source of learning (Bennett-Levy et al., 2001, 2003), and due to their pre-existing knowledge, practitioner-researchers are in a unique position to reflect on process in a sophisticated way. Hence the methodology has the potential to provide data about process that may be difficult to obtain by other means.

In their relationship to real world clinical phenomena, there are parallels between practitioner-researcher self-study and experimental analogue studies of clinical phenomena. Like analogue studies, practitioner-researcher self-study may offer advantages, such as those identified above. On the other hand, what is uncertain is the extent to which the results are generalizable; it is possible that some of the differences between ATRs and BEs may have been partially due to the “non-clinical” nature of the population, since the objectives of clients and trainees are rather different. Furthermore, it is not known if behaviours and beliefs actually changed, since the data were based on self-report, not direct evidence. Future studies should address these issues, and determine the extent to which the present findings are extendable to clinical populations, preferably using objective measures of therapeutic change.

Another problem with the present study was the absence of any quantitative measure of emotional change (to go with behavioural and belief measures), which would be predicted by Teasdale’s theory. Certainly, the study could have been strengthened by measures designed specifically to test Teasdale’s theory, which would have included measures of emotional change, and other dimensions (e.g. mode of processing attributes). On the other hand, it was, in some ways, a strength of the study that neither the participants nor the author knew at the time that the ratings and reflections would be used to test Teasdale’s theory. Thus, the ratings were uncontaminated for this purpose.

In summary, the study assessed participant experiences of the impact of ATRs and BEs to test predictions derived from Teasdale’s ICS model that there should be differences in perceived value and mode of processing between the two techniques. The predictions were supported by quantitative data, indicating that BEs were perceived as a more powerful and compelling technique than ATRs, and qualitative data suggesting that BEs and ATRs were associated with different modes of processing. An interesting by-product of SP/SR was that some of the participants indicated that their own approach to therapy had been influenced by the experience, with a renewed regard for the value of BEs (see Bennett-Levy et al., 2003). Qualitative analysis suggested that, to provide a more comprehensive account of

process in cognitive therapy, Teasdale's theory should be extended to encompass the role of the therapist in promoting adaptive oscillation between implicational and propositional modes of processing in clients.

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