

Attention Training: Effects on Anxiety and Beliefs in Panic and Social Phobia

Adrian Wells*¹, Jim White² and Karin Carter³

¹*Department of Clinical Psychology, University of Manchester, UK*

²*Hairmyres Hospital, Glasgow, UK*

³*Mental Health Services of Salford, Manchester, UK*

This study tested the effectiveness of a new cognitive technique involving attention training. A single case systematic replication series (Sidman, 1960) was used to replicate and extend previous findings. In particular the effects of attention training on panic frequency, general anxiety, and beliefs was investigated across two panic disorder cases and one social phobia case, and across different therapists, and settings. A true reversal design was used in one of the cases. In this case attention training was followed by an attentional manipulation incompatible with the hypothesized effects of attention training so that the effects of attention training on target problems could be clearly evaluated on its re-introduction. The results are consistent with those of a previous study (Wells, 1990) and provide preliminary evidence that panic attacks, anxiety and beliefs can be effectively and lastingly reduced by cognitive techniques which do not directly target the content of negative appraisal. ©1997 John Wiley & Sons, Ltd.

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INTRODUCTION

Cognitive therapists argue that anxiety disorders are maintained by distorted danger-related appraisals (e.g. Beck *et al.*, 1985; Wells, 1997). Cognitive therapy has mainly focused on directly attempting to challenge the *content* of appraisals through verbal re-attribution and behavioural experiments. However, the modification of attentional *processes* may be beneficial in the treatment of emotional disorder (Wells, 1990; Wells and Matthews, 1994, 1996). In particular, it should be useful to increase the flexible use of attention, and elicit processing configurations that enhance disconfirmatory processing.

Attentional manipulations of different types have been used for some time in the treatment of anxiety and depression (see Wells and Matthews (1994) for review). Task-focusing instructions have been employed to enhance performance in test-anxious subjects (e.g. Wise and Haynes, 1983). Distraction has been used to interrupt depressive thinking (e.g. Fennell and Teasdale, 1984; Fennell *et al.*, 1987), and to investigate modulating influences on exposure in patients with phobias, and obsessions (e.g. Grayson *et al.*, 1982, 1986). Overall, the results across studies show equivocal effects of attention manipulations. Whilst task-focusing instructions tend to enhance performance in test-anxious subjects, distraction by neutral stimuli appears to increase the return of fear or retard long-term habituation in some anxiety disorders. Moreover, the interpretation of results is compounded by the fact that attention procedures have seldom been used in isolation but have been combined with other

*Correspondence to Dr Adrian Wells, University of Manchester, Department of Clinical Psychology, Rawnsley Building, Manchester Royal Infirmary, Manchester M13 9WL, UK.

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treatment techniques. Effects uniquely attributable to attention procedures are therefore unknown. Another difficulty arising from earlier studies is that attention has been treated in an oversimplified way. For example, studies have tended to use basic distraction from self-relevant information (thoughts/symptoms) and have not considered whether it is the shift from self to non-self processing or some other dimension of attention that underlies the effect observed.

In principle there are several types of attention manipulation that could facilitate cognitive-affective change in emotional disorder. First, attention may be diverted to neutral stimuli in order to interrupt negative thoughts or diminish the intensity of emotional symptoms. Second, attention may be explicitly task-focused in a way that enhances objective performance, as in cases of test-anxiety. However, there are at least two other possibilities. Drawing on a cognitive-attentional model of emotional disorder Wells and Matthews (1994, 1996) propose that attentional strategies will be effective in the long term to the extent that they modify dysfunctional appraisals, and restructure maladaptive processing configurations. First, attention may be directed towards information that disconfirms specific negative beliefs and appraisals. For example, social phobics may be instructed to 'interrogate' features of the external environment for disconfirmatory data rather than self-focus in feared situations. However, caution should be exercised when using some in-situation attentional strategies in states of anxiety. Specifically, the use of distraction by *neutral* stimuli may deplete attention needed for disconfirmatory processing, and the non-occurrence of catastrophe may be attributed to use of the attentional strategy rather than to the fact that the catastrophe is unlikely to happen. Thus, a danger is that some attentional strategies may contribute to coping strategies or 'safety behaviours' (Salkovskis, 1991; Wells *et al.*, 1995) that are normally employed by patients, and which inhibit unambiguous disconfirmation of beliefs. Second, attentional techniques may be used to modify executive functions, namely the plans that direct the cognitive system in its activities. Dysfunctional appraisals and beliefs may merely reflect the outputs of running particular processing routines. It is therefore necessary to modify such routines in order to promote and support long-term changes in appraisals and belief. According to the Wells and Matthews' (1994) model a marker for maladaptive processing routines is intensified and inflexible self-focused attention. It is conceivable that dysfunctional processing routines

may be deactivated and new plans for processing written by attentional control exercises that reduce self-focus and increase the flexible control of processing. In view of this, Wells (1990) developed an Attention Training Technique (ATT) to modify three conceptually distinct dimensions of attention: (a) intensity of self-focus; (b) attentional control; (c) attentional breadth (aimed at counteracting a narrow focus).

Attention training (ATT) consists of external auditory monitoring which requires progressively greater attentional capacity as the procedure unfolds. The technique is not intended to be used as a distraction strategy during states of anxiety. It is intended to modify stable cognitive factors involved in the regulation of cognition. The technique is practised when patients are not anxious. In an earlier single case study, this procedure proved to be effective in eliminating panic attacks in a patient with panic disorder and relaxation-induced anxiety (Wells, 1990).

The present study aimed to explore further the effects of attention training as a treatment of anxiety, by replicating effects previously found in panic and extending these to a case of social phobia. We measured for the first time the effect of the ATT on beliefs to determine if changes in processing, when not anxious, modified conviction. We did not combine the ATT with exposure because we wanted to examine the effects unique to the ATT without confounding this with exposure, safety behaviour, or emotional distraction influences.

METHOD

Patients

Three patients referred for treatment of anxiety problems were included in the case series. Patients selected were the first patients referred that met the desired diagnostic criteria. Two of the patients met DSM-III-R criteria (APA, 1987) for panic disorder with no or moderate agoraphobic avoidance, and one patient met criteria for social phobia. These diagnoses were confirmed by the structured clinical interview for DSM-III-R (Spitzer *et al.*, 1987). Patient 1 was a 42-year-old man with a 6-year history of panic attacks, and patient 2 was a 20-year-old woman with a 2-year history of panic. Patient 3 was a 47-year-old man who presented with social anxiety associated with eating in public which began at 19–20 years of age. A core feature of this patient's problem was the misinterpretation of

stomach sensations as a sign that he would vomit. He feared vomiting in public because this would be humiliating. The concern was only activated in situations where he could be subject to scrutiny. None of the patients had received previous psychological treatments for psychiatric problems and they were not taking psychotropic medication. All patients stated that panic/anxiety was their main problem.

Experimental Design

Replication helps to establish the generality of findings. In this series 'systematic replication' (Sidman, 1960) was used to determine the effectiveness of attention training across the disorders of panic and social phobia, and across different therapists, and settings. Systematic replications are a search for exceptions. 'If no exceptions are found as replications proceed, then wide generality of findings is established' (Barlow and Hersen, 1984, p. 364). The experimental case series presented here is a beginning in the search for exceptions.

In the present replication series, case 1 (panic disorder) was treated by the first author to demonstrate that attention training was effective as illustrated in an earlier study of a case of panic disorder (Wells, 1990). In case 2 (panic disorder) a different therapist delivered the treatment. For patients 1 and 2 baselines were extended until stable trends in most measures were evident. The two panic cases employed an A-B-A design with pretreatment baselines of 3 and 5 weeks. In patient 2 a second baseline period was introduced in which treatment was withdrawn but the patient continued to have a couple of meetings with the therapist so that any weekly fluctuations in outcome measures could be detected. In case 3, a third therapist implemented attention training in a case of social phobia. In this case the total available treatment time was limited by patient constraints and only a 2-week baseline could be established. In order to overcome this limitation and determine with greater confidence that attention training was the active causal agent of treatment effects a reversal design was used. Here we are following the terminology of Leitenberg (1973) who makes a distinction between withdrawal and reversal designs. A withdrawal design (used in cases 1 and 2) refers to a withdrawal of treatment, whilst reversal refers to introducing an alternative opposing or incompatible behaviour. In case 3 an opposing self-focused attention procedure was introduced followed by a return to ATT. For patient 3 an A-B-A-C-A-B design was

employed. Pre-treatment baseline was followed by 2 weeks of ATT. There was then a return to baseline of 2 weeks followed by a second intervention (self-focus instructions) designed to reverse the effects of attention training. The second intervention phase was followed by a further withdrawal of intervention and return to baseline before the re-introduction of ATT. The reversal design offers a powerful means of demonstrating that ATT mechanisms are the central causal agent of change. Each patient was followed-up at 3 and 6 months post ATT. No treatment was administered between post-tests and follow-ups.

In order to control for exposure to avoided situations or activities, which could contribute to treatment effectiveness, we asked patients not to change the extent of their exposure to anxiety-provoking situations but to behave in the way that they usually behaved. In addition, treatment sessions were restricted to the discussion and practice of attention training and discussion of the content of patients' fears was avoided.

Measures

A main belief was selected for each patient based on their worst fear, and was assessed on two rating scales. These beliefs served as cognitive dependent measures. The scales had the following anchor points: 0 = 'Do not believe the thought at all'; 100 = 'Completely convinced the thought is true'. One of the ratings assessed the level of belief in the current state, and the other was a rating of belief while anxious. For the purposes of this study relatively simple and unobtrusive measures of belief change were used because we wanted to minimize any demand effects associated with more extensive belief measurement. The two panic patients were asked to keep a daily diary of panic frequency as the main dependent anxiety measure. Panic attacks were defined in the diary in accordance with DSM-III-R criteria, as consisting of four or more symptoms (listed) which build up within 10 min. All patients also completed the Beck Anxiety Inventory (BAI; Beck *et al.*, 1988) at each session and at follow-up. The BAI and rating scales were completed by subjects at the beginning of each session.

Procedure

Treatment was carried out by all of the authors (one patient for each therapist) and each patient was treated at a different centre. The two therapists JW

and KC received training in the use of attention training from the first author. No other supervision or training was given during treatment. During assessment each patient's 'main fear' was elicited. The main fear was determined by asking patients about the worst catastrophe that could occur in anxious situations. In order to be selected the worst fear had to occur during most anxious episodes. Patients were asked to rate how much they believed each fear at the present time (belief in current state), and how much they would believe it when they had body sensations/anxiety (belief while anxious).

After the initial assessment, baseline periods were instituted. Patients met with their therapist once a week during this time for a brief period for collection of diary data and for making the appropriate ratings only. The first treatment session consisted of presentation of the rationale for attention training plus practice of the technique. The rationale emphasized the role of self-focus in maintaining anxiety problems as follows: self-focus intensifies emotional state and physical responses and can increase difficulties in thinking. Focusing on symptoms (a characteristic of anxiety) and being overly-aware of one's body can make sensations seem alarming. This was illustrated in terms of natural moderators of anxiety that the patient might have discovered such as the effect of engagement in absorbing activities and by highlighting bodily symptoms for which the patient had become hypervigilant. The basic message conveyed was that heightened self-focused attention is involved in the elicitation of anxiety and that such self-focusing tendencies can become habitual, and automatically produce anxiety. An effective strategy for overcoming anxiety is therefore the reduction of excessive self-focused attention, and this can be achieved by practising a technique called Attention Training. Because we wanted to reverse the treatment effects in patient 3 (social phobic), this patient was given the rationale that once external focus had been mastered the next step was to use body-focus exercises in order to increase the flexibility of attention and reduce anxiety further. This instruction was intended to reduce negative expectancy effects for the self-focus manipulation which could have been produced by the first part of the rationale.

The first treatment session was the longest, lasting up to 40 min, subsequent sessions were shorter (up to 30 min). In each session attention training was practised, and in the panic cases the therapist reviewed the panic diary with the patient to verify that the panics recorded met criteria for panic attacks. The Attention Training Procedure

(ATT) lasted approximately 10 min and consisted of the following sequence: first, patients were instructed in *selective attention* and required to focus on specific sounds in the consulting room and then focus on specific sounds outside of the room in the near then far distance. This was facilitated by therapist instructions, for example: 'Focus all of your attention on the sound of ... No other sound matters. Absorb only that sound. If your attention strays re-focus on that one sound. Do not allow yourself to be distracted. Focus all of your attention on that one sound'. At least three competing sounds were introduced and identified in the consulting room, and three natural sounds were identified outside.

After this selective attention phase the next phase; *attention switching* was introduced as follows: 'Now I would like you to switch your attention from one sound to another as quickly as you can. Focus on the sound of ... Focus only on that sound. No other sound matters. Give all of your attention to that sound. Now switch and focus on the sound of ...' etc. The exercise ended with a *divided attention* instruction: 'Now try and focus on as many different sounds as you can at the same time. Expand your attention and absorb all of the sounds. Focus on all of the sounds both within and outside of this room. Count the number of sounds you can hear simultaneously'. The precise phrasing of instructions varied slightly from session to session and between therapists but the basic elements and sequence of instructions was the same. In each case the patient was instructed to practise the procedure with their eyes open and vision fixed in order to increase general task difficulty. Patients were instructed to practice the technique at home for 10–15 min twice a day when not in a state of anxiety. The instructions for practising the procedure emphasized that it was intended to be used outside of anxiety episodes and *not* as a coping technique. Patient 3 practised body-focus for 10–15 min twice a day during the second intervention phase of his treatment. He was asked to focus on sensations in his stomach, which were the target of his pre-occupation. In particular to focus attention on pulsating feelings and any other associated sensations, and monitor them closely for the set time period.

RESULTS

The main fears selected and rated for each patient were as follows: patient 1: 'I'm losing control, going

crazy'; patient 2: 'I'm going to pass out'; patient 3: 'I'm going to vomit'.

Figure 1 shows patients' belief ratings while anxious, panic frequency and BAI scores. Ratings for belief in the current state were relatively low for all patients. For patients 1 and 2, non-anxious beliefs ranged from 0–20 across baseline but became 0 after 1 week of training and remained at this level apart from a single rating of 10 for patient 1 at session 3 of training. Patient 3 did not believe the thought at all when not anxious across baseline and treatment.

The impact of attention training on anxiety and belief (when anxious) levels can be assessed by comparing ratings at baseline with ratings at the last treatment session displayed in Figure 1. These data show that attention training resulted in a reduction in BAI, and belief in all patients, and also a marked reduction in panic frequency in the two panic disorder cases.

The return to baseline data on panic patients 1 and 2 demonstrated that following withdrawal of treatment the gains were maintained or improvement continued during this period. Both patients were panic free at 3- and 6-month follow-up and had not experienced panic since the cessation of treatment. Similarly the reduction in belief and BAI was maintained at 3- and 6-month follow-up points for these patients. These data confirm that attention training can produce clinically significant and relatively stable decrements in self-reported anxiety, and panic attack frequency, and can reduce belief in catastrophic misinterpretations of bodily sensations in panic disorder patients.

The data on patient 3 demonstrate that the technique was also effective in reducing anxiety and belief while anxious in a case of social phobia. Moreover, the effects of attention training were effectively reversed in this case by the introduction of body-focused attention practice, leading to a reinstatement of BAI and belief levels similar to those at pretreatment baseline. Following the withdrawal of the second intervention phase, attention training once again was demonstrably effective in reducing BAI and belief rating. Moreover, the patient continued to make gains across the follow-up period. A note should be made concerning BAI level at 3-month follow-up which was the highest recorded. It is unfortunate that this assessment session was held the day before the marriage of the patient's daughter, which accounts for the anxiety recorded. However, it is encouraging that belief level remained low despite this upsurge in BAI.

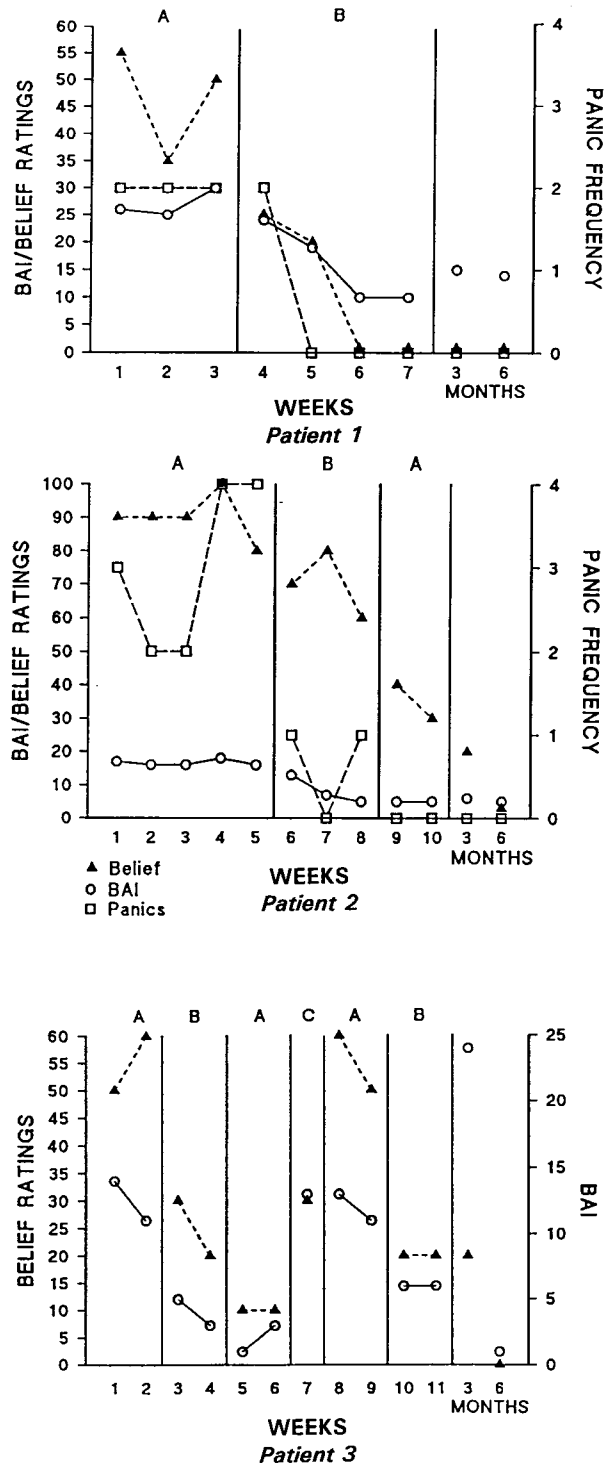


Figure 1. Panic attack frequency, BAI and belief ratings for relevant patients before, during and after attention training

Patterning of Anxiety and Belief Change

In all three cases belief in main negative appraisal decreased markedly. In case 1, a decrease in belief preceded decrements in panic and anxiety, whilst in case 2 a decrease in panic frequency preceded belief change. In case 3 belief and BAI score decreased simultaneously during ATT and increased simultaneously during self-focus exercises. This mixed pattern does not offer overwhelming support for belief change being the only mechanism of ATT effects. It is possible that both belief change and reduction in anxiety are both consequences of some other underlying variable. Alternatively, ATT may exert effects through a number of pathways.

DISCUSSION

The results of this study are consistent with earlier findings (Wells, 1990) and suggest that anxiety can be lastingly modified through a brief attention manipulation without the use of other cognitive behavioural techniques. All patients in this study showed a marked reduction in anxiety and beliefs following treatment. In two out of the three cases belief level reached 0 before or at the 6-month assessment session, and in the two panic cases panic attacks were eliminated. Although the use of panic frequency as an outcome measure can be problematic, since it is generally an unstable variable, the baseline data on the panic patients of this study shows that initial panic frequency was relatively stable, thus supporting a specific and stable effect of ATT on panic.

This study extends the data on the efficacy of ATT. The procedure was effective in reducing anxiety and belief in negative appraisals in cases of panic, and social phobia. The design of these studies presents a relatively good test of the effects of attention training. In particular, it has been demonstrated that although the effects of attention training appear lastingly effective, they can be reversed by self-focus exercises. This appears similar to the effect obtained in a case of panic disorder with relaxation induced anxiety (Wells, 1990) in which the ameliorative effect of ATT on panic was reversed with a body-focus relaxation procedure. The present findings extend ATT effects to two panic cases in the absence of associated relaxation-induced anxiety. However, there are limitations with the present study. We did not include a measure of self-focused attention which limits the conclusions that may be drawn about the effect of ATT on self-focus. We decided not to

measure self-focus since we were concerned that measuring the state could induce self-focus, and at this early stage of technique development our primary aim was to establish an effect for ATT rather than explore underlying mechanisms in detail. Future studies should attempt to include a manipulation measure of self-focus. Future studies should also use a wider range of symptom measures to assess the generality of ATT effects across affect, cognition, and behaviour.

A number of mechanisms could account for the effectiveness of attention training. First, the rationale may provide the patient with a convincing model for understanding their anxiety problem, which is an alternative to their model of catastrophe associated with anxiety. Second, ATT itself may modify characteristics of the processing system which are responsible for maintaining anxiety. More specifically, Wells and Matthews (1994) suggest that ATT may de-couple attention from negative beliefs. Thus, by attenuating self-focus and enhancing attentional control the patient may subsequently be able to prevent full activation of maladaptive processing routines and the elicitation of dysfunctional beliefs. Increased control over attention resulting from the procedure may facilitate the implementation of alternative strategies for appraisal and behaviour which allows the modification of dysfunctional beliefs. In particular, increased control of the cognitive-attentional system should allow the person to process threatening stimuli in a more objective way without triggering full-blown self-focused rumination or worry. This type of worry activity may normally maintain the processing of fear-congruent events in a way that interferes with re-attribution, and anxiety reduction.

In conclusion, attention training appears to cause more than transient improvement in anxiety by periodically altering the focus of attention, rather than by explicitly modifying appraisals and beliefs or by advocating use of distraction during anxiety episodes. We cannot entirely rule out the possibility that patients used the procedure when anxious. Although they were asked not to do so, one of the three patients (social phobic) reported using the procedure during one anxious episode. However, it is unlikely that the occasional use of distraction during anxiety could account for the effects of ATT. In-situation anxiety control procedures such as distraction can be counterproductive for long-term anxiety reduction because the patient can attribute the non-occurrence of feared catastrophes to use of their control strategy rather than to the fact that the belief in catastrophe is false (Wells *et al.*, 1995). In

such situations belief in future catastrophe and the anxiety associated with this belief will remain. Clearly, within this framework the use of ATT as a safety strategy could be counterproductive for belief change.

In view of the outcome of this case series, it seems worthwhile to explore the outcome of ATT over a longer time course. Apart from the type of ATT examined in this paper we have explored other forms of attention manipulation in our laboratory, and other researchers are investigating adaptations of the ATT with disorders such as hypochondriasis and social phobia (G. Vervaeke and T. Bouman and S. Bogels *et al.* personal communications). The results of the present series combined with our other empirical and theoretical analyses of the role of attention in emotional disorder (e.g. Wells and Matthews, 1994, 1996) suggest that a comprehensive treatment built on attentional modification is likely to be effective. Such a treatment should aim to eliminate behaviours that maintain self-focus (e.g. body checking, monitoring for cognitive and bodily events, use of certain self-control techniques), and manipulate attention in a way that interferes with dysfunctional processing strategies and facilitates the disconfirmation of negative beliefs. Further developments in effective treatment technology are likely to be gained from future theoretical and applied analyses of the role of attentional processes in the maintenance and treatment of emotional disorders.

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