Anxiety disorders: why they persist and how to treat them

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Abstract

Anxiety disorders are characterised by distorted beliefs about the dangerousness of certain situations and/or internal stimuli. Why do such beliefs persist? Six processes (safety-seeking behaviours, attentional deployment, spontaneous imagery, emotional reasoning, memory processes and the nature of the threat representation) that could maintain anxiety-related negative beliefs are outlined and their empirical status is reviewed. Ways in which knowledge about maintenance processes has been used to develop focussed cognitive therapy programmes are described and evaluations of the effectiveness of such programmes are summarized. Finally, ways of identifying the effective ingredients in cognitive therapy programmes are discussed. © 1999 Elsevier Science Ltd. All rights reserved.

1. Introduction

Cognitive theorists propose that anxiety disorders result from distorted beliefs about the dangerousness of certain situations, sensations and/or mental events. Consistent with this proposal, numerous studies have shown that patients with anxiety disorders over-estimate the dangerousness of various stimuli. Several studies have also shown that such over-estimates are disorder specific, with each anxiety disorder being associated with a particular type of negative belief (e.g. Harvey, Richards, Dziadosz, & Swindell, 1993; Clark et al., 1997; Amir, Foa, & Coles, 1998; Breitholz, Westling, & Öst, 1998; Salkovskis et al., in press; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999; Stopa & Clark, in press). The present paper addresses a problem that arises from these findings. If anxious patients' beliefs are mistaken, why do the beliefs persist? Put another way, if the world is not as dangerous as patients assume, why do they not notice this and correct their thinking? Answers to this question are likely to be particularly helpful in understanding the maintenance of anxiety disorders and developing efficient treatments.

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However, before discussing possible answers, it is perhaps worth mentioning some observations that highlight why the question is interesting.

First, if one looks at the natural history of anxiety disorders it is clear that there are many people in the community who develop an anxiety disorder and then recover without any treatment. For these people, their negative thinking seems to be self-correcting. Something appears to prevent such self-correction from occurring in patients who present for treatment. Second, for many patients with chronic anxiety disorders, the persistence of their fears seems strangely irrational. Consider, for example, chronic panic disorder patients, who think during their attacks that they are having a heart attack. Before they come for treatment, they may have had several thousand panic attacks, in each one of which they think they are dying, but they are not dead. Despite what might appear to an outsider to be stunning disconfirmation of their fears, their thinking has not changed. In particular, they do not seem to have spotted that their repeated failure to die does not fit with the idea that the sensations they experience in a panic attack are a sign of a heart attack. After all, cardiologists do not report seeing patients who have had thousands of non-fatal heart attacks.

A similar problem arises in social phobia. Patients with social phobia are afraid of negative evaluation from other people. As children, they have often been bullied and teased at school. However, as adults they rarely receive explicit negative evaluation from other people, despite often going into difficult social situations. Why, therefore, do they not notice that they come across better than they think?

Below I describe Oxford research which has attempted to identify factors that prevent patients from changing their negative thinking normally. The research is very much a collaborative effort, involving many colleagues[1]. Six different maintaining processes: safety-seeking behaviour, attentional deployment, spontaneous imagery, emotional reasoning, certain types of memory processes and the nature of threat representations are discussed. An illustration of the way in which each can maintain anxiety disorders is provided, along with a summary of experimental evidence for the process. The treatment implications of the maintenance processes are then described and illustrated, again with a summary of their empirical status.

2. Jack Rachman

It is fitting that work focussing on why negative beliefs fail to self-correct should be outlined in a special issue honouring the outstanding achievements of Jack Rachman. In his classic critique of the conditioning theory of phobia, Rachman (1976) drew the field's attention to many of the puzzles about the persistence of anxiety. In subsequent articles (for example, Rachman & de Silva, 1978; Rachman, 1980, 1984, 1997; Rachman, Craske, Tallman, &

Solyom, 1986; Radomsky, Rachman, Teachman, & Freeman, 1998) he provided perceptive answers to some of these puzzles. As a mentor, he encouraged my colleagues and I to closely observe patients and spot phenomena that did *not* fit with current theories and to worry about these phenomena. As an inspired journal editor, he has consistently spotted and supported unusual contributions from behavioural scientists that ultimately became influential. As a clinical supervisor, he taught me the value of 'goonery' in therapy, though I cannot claim to have achieved his exceptional mastery of the art. Finally, he was a pioneer, and expert teacher, of the type of clinical experiment that has become a central feature of the Oxford Group's work. For all of these gifts, for his impeccable taste in wine and for his friendship, I am extremely grateful.

3. Safety-seeking behaviour

Salkovskis (1988, 1991) defined a safety-seeking behaviour as "a behaviour which is performed in order to prevent or minimise a feared catastrophe" and suggested that such behaviours often explain why the non-occurrence of a feared event fails to change patients' negative beliefs. For example, in the case of cardiac concerned panic patients, he suggested that they continue to think that they might die in a panic attack because every time they have panic attacks, they sit down, rest, slow down their breathing or engage in some other safety-seeking behaviour and believe, erroneously, that performing the behaviour is the only reason they did not die.

Consistent with the safety-seeking behaviour hypothesis, Salkovskis, Clark, and Gelder (1996) showed that panic patients engage in safety behaviours of the sort which *could* maintain their negative beliefs. Panic disorder patients completed the Agoraphobic Cognitions Questionnaire (Chambless, Caputo, Bright, & Gallagher, 1984), which assesses thoughts experienced during a panic attack and a Behaviours Questionnaire which assessed their behaviour during a panic attack. Correlational analyses revealed a series of meaningful links between cognitions and behaviour. For example, patients who thought they might be about to faint in a panic attack leaned against solid objects and patients who thought they might be going insane made strenuous efforts to control their thinking.

To determine whether safety behaviours actually prevent disconfirmation of panic patients' negative beliefs about body sensations, Salkovskis, Clark, Hackmann, Wells, and Gelder (in press) experimentally manipulated safety behaviours. Panic disorder with agoraphobia patients had equivalent periods of exposure to a feared situation while either maintaining their usual safety behaviours or dropping them. As predicted, the dropping-safety behaviours condition led to a significantly larger decrease in negative beliefs and produced a significantly greater improvement in anxiety in a subsequent behaviour test.

The Clark and Wells (1995) cognitive model of social phobia was strongly influenced by Salkovskis' safety behaviours analysis and highlights several additional interesting features of safety behaviours. First, although they are termed 'behaviours', many are internal mental processes (see also Salkovskis, 1996). For example, patients with social phobia who are worried that what they say may not make sense and will sound stupid, often report memorising what they have said and comparing it with what they are about to say, whilst speaking. If everything

Table 1
Safety behaviours associated with a patient's fear of blushing

Feared outcome	Safety behaviour intended to prevent feared outcome
"My face (and neck) will go red."	Keep cool (open windows, drink cold water, avoid coffee, wear thin clothes). Avoid eye contact. If in a meeting, pretend to be writing notes. Keep topic of conversation away from 'difficult' issues. Tell myself the man isn't really attractive; "He's no more than a 2 (out of 10) for attractiveness".
"If I do blush, people will notice."	Wear clothes (scarf, high collar) that would hide part of blush. Wear make-up to hide the blush. Put hands over face; hide face with long hair. Stand in a dark part of the room.
"If people notice, they will think badly of me."	Provide an alternative explanation for the red face; viz. "its hot in here", "I'm in a terrible rush today", "I'm recovering from flu", etc.

goes well, patients are likely to think "it only went well because I did all the memorising and checking, if I had just been myself people would have realised how stupid I was". In this way their basic fear persists. Second, because there are often many levels to social phobics' fears, it is common for patients to engage in a large number of different safety behaviours while in a feared situation. Table 1 illustrates this point by summarizing the safety behaviours used by a patient who had a fear of blushing, especially while talking to men whom she thought other people would think were attractive. Third, safety behaviours can create some of the symptoms that social phobics fear. For example, trying to hide underarm sweating by wearing a jacket or keeping one's arms close to one's sides, generates more sweating. Fourth, some safety behaviours can draw other people's attention to the patient. For example, a secretary who covered her face with her arms whenever she felt she was blushing discovered that colleagues in her office were much more likely to look at her when she did this than when she simply blushed. Finally, some safety behaviours influence other people in a way which partially confirms social phobics' fears. For example, social phobics' tendency to continually monitor what they have said, and how they think they come across, often makes them appear distant and preoccupied. Other people can interpret this as a sign that the phobic does not like them and, as a consequence, they respond to the phobic in a less warm and friendly fashion.

4. Attentional deployment

Several authors (Beck, Emery, & Greenberg, 1985; Eysenck, 1992, 1997; Williams, Watts, MacLeod, & Mathews, 1988, 1997) have suggested that selective attention *towards* threat cues

may play a role in the maintenance of anxiety disorders by enhancing the perception of threat. Studies comparing attention to threatening and non-threatening words have provided results consistent with this hypothesis. However, responses to words representing one's concerns may not be identical to responses to real-life threat cues. For this reason, researchers have recently started to study attentional bias to stimuli that are more directly related to stimuli that are likely to be encountered in a real-life feared situation. The results of such studies are complex and suggest attention *towards* threat cues and attention *away* from threat cues may both play a role in the maintenance of anxiety disorders.

4.1. Attention towards threat cues

Lavy and van den Hout (1993) provided one of the first demonstrations of attention *towards* real-life threat cues. Subjects were presented with pictures of spiders and other, non-phobic objects. Compared to non-patient controls, patients with spider phobia showed an attentional bias towards the spider pictures.

Panic disorder and hypochondriasis are particularly obvious candidates for a possible attentional bias towards threat cues. Patients with both disorders are afraid of certain bodily sensations and symptoms, fearing that they indicate the presence of a serious physical disorder (heart attack, cardiac disease, cancer, etc.).

Such patients have often had a large number of medical investigations which have indicated that they do not have the physical illness they are afraid of, but they are not convinced. One reason that they are not convinced could be that their fears lead them to focus attention on their bodies and, as a consequence of this attentional deployment, they become aware of benign bodily sensations that other people do not notice. The presence of such sensations could then be taken by the patient as evidence that a serious physical illness has been missed.

Ehlers and colleagues have reported a series of studies that support the hypothesis that enhanced awareness of body cues contributes to the maintenance of panic disorder and hypochondriasis. In an early study, using a heart beat detection paradigm, Ehlers and Breuer (1992, experiment 2) found that panic disorder patients were more accurate at counting their heart beats than infrequent panickers, simple phobics and non-patient controls. In a more recent study (Ehlers, Mayou, & Bryant, 1997), patients with panic disorder or hypochondriasis performed both the heart beat detection task and a new task designed to measure sensitivity to restriction of the airways. Both groups of patients were more accurate than non-patient controls at detecting their heart beats and small changes in airway resistance. The hypochondriacal patients were divided into those who were predominantly concerned that they might have cardiac disease and those whose disease concerns were unconnected with the cardiac system (mainly cancer concern). Consistent with the notion that enhanced awareness is a function of specific negative beliefs, only the cardiac concerned hypochondriacal patients showed enhanced detection of heart beats and changes in airway resistance. Simple exercise, such as running up the stairs, can produce changes in airways resistance. The likely consequence of these findings is therefore that cardiac concerned patients with panic disorder and hypochondriasis will notice cardiac changes and slight increases in breathlessness that other people would not notice.

Ehlers (1995) used a longitudinal design to determine whether or not such enhanced awareness contributes to the persistence of panic disorder. Patients who had a history of panic disorder, but were in remission when tested in the laboratory, were followed-up one year later and asked whether they had experienced any panic attacks during the follow-up period. As predicted, patients who reported a re-occurrence of their panic attacks had demonstrated significantly better heart rate perception during the initial laboratory test than patients who did not experience a re-occurrence.

Taken together, the studies of Ehlers and colleagues strongly suggest that attention *towards* threat cues plays an important role in panic disorder and hypochondriasis.

4.2. Attention away from threat cues

In social phobia, recent studies from the Oxford group suggest that attention *away* from threat cues may play an important role in the maintenance of this disorder.

Patients with social phobia are afraid of what other people think of them. Facial expressions are a potential source of information about the way others react to one. If patients with social phobia have an attentional bias towards potential threat cues in a social situation, one might, therefore, expect them to show enhanced attention to others' faces. On the other hand, long established clinical observation (for example, Darwin, 1872, p. 347) suggests that socially anxious individuals tend to avoid looking at other people when in a feared social situation. To clarify matters, we have recently completed two experiments which used a modified version of MacLeod, Mathews and Tata's (1986) dot probe task to assess attention for faces. Subjects were simultaneously presented with two pictures, a face and a household object (lamp, book, etc.), that were intended to represent stimuli that could be present in a room during a social interaction. After the pictures had been presented for 500 ms, they disappeared to be replaced by a probe in the spatial location of one of the pictures. Subjects had to identify the probe location as quickly as possible. Enhanced attention to faces would be indicated by speeded reaction times for the spatial location of the face and vice versa for attention to the object.

The results of the two studies are consistent. Mansell, Clark, Ehlers, and Chen (in press) compared students scoring high and low on fear of negative evaluation (FNE: Watson & Friend, 1969) and found that the high socially anxious students showed an attentional bias *away* from faces and towards objects. Chen, Ehlers, Clark, and Mansell (1999) tested patients with social phobia and found that, compared to non-patient controls, patients with social phobia also showed an attentional bias *away* from faces.

The finding of an attentional bias away from processing faces fits well with the Clark and Wells (1995) model of social phobia in which it is suggested that the condition is associated with reduced attention to external social cues. Reduced processing of other people would mean that social phobics would have less chance to observe other people's responses in detail and, therefore, would be unlikely to collect from other people's reactions information that would help them see that they generally come across more positively than they think (e.g. Rapee &

Lim, 1992; Stopa & Clark, 1993). In this way, attentional avoidance would maintain their fears[2].

Why should patients with spider phobia, panic disorder and hypochondriasis show an attentional bias *towards* threat cues that are relevant to their concerns, whereas patients with social phobia show some evidence of an attentional bias *away* from others' facial expressions? Consideration of the functional consequences of attentional avoidance and vigilance suggests one possible explanation. If a spider phobic is presented with a spider, looking away does not remove the threat. The spider is still there. Indeed, looking away from the spider may increase some aspects of threat as the phobic will not know whether the spider has moved closer. Rather similar considerations apply to panic disorder/hypochondriasis patients and perceived body sensations. On the other hand, looking away from others' faces and avoiding eye contact is likely to reduce some aspects of threat for a social phobic. If eye contact is broken, it is more difficult for other people to ask social phobics questions or engage them in conversation. In this way, attentional avoidance reduces certain aspects of a social situation without the individual having to leave. It provides a psychological escape. The idea that attention can be related to escape as well as threat also appears in a recent experiment by Thorpe and Salkovskis (1998), which independently varied the location of a spider and an exit door. When spider and exit coincided, attention to the spider was greater than when the exit was at the opposite location to the spider. Avoidance of other people's faces may also have an evolutionary origin as an appeasement gesture triggered by unwanted attention from a conspecific who is perceived as more dominant (see Darwin, 1872; Trower & Gilbert, 1989; Leary & Kowalski, 1995, p. 154).

5. Spontaneously occurring images

Beck (1976) suggested that spontaneously occurring mental images in which patients 'see' their fears realised are common in anxiety disorders and play an important role in enhancing the perception of threat. Consistent with this suggestion, Ottaviani and Beck (1987) found that images of physical and mental catastrophes (e.g. heart attack, losing control) were common in panic disorder patients. Similarly, Wells and Hackmann (1993) found that patients with health anxiety frequently report images involving illness, death and the interpersonal consequences of illness and death.

Social phobia provides a particularly stunning demonstration of the importance of spontaneous imagery. If social phobics attend less to external social cues, what makes them

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[2] Veljaca and Rapee (1998) recently found that, compared low socially anxious individuals, high socially anxious individuals were better at detecting negative audience behaviours while they were giving a speech. The experimenters explicitly required participants to intentionally monitor and detect audience reactions. Taken together with the Mansell, Clark, Ehlers and Chen (in press) and Chen, Ehlers, Clark and Mansell (1999) results, this study would appear to support the Clark and Wells (1995) and the Rapee and Heimberg (1997) recent models, both of which suggest that social phobia is associated with increased self-focused attention and reduced processing of external social cues, but that there is also a bias towards detection of negative external cues when attention is focussed on other's reactions.

think they are coming across badly? Clark and Wells (1995) suggested one particularly potent source of information is self-imagery. In particular, it was suggested that, when in a social situation, social phobics are prone to experience spontaneously occurring images in which they see themselves as if viewed from outside (observer-perspective). Unfortunately, in their image they do not see what a true observer would see, but rather they see their fears visualised. For example, one of our patients who is a teacher was very anxious about asking questions of her colleagues in a coffee break. When she started to think about asking a question, she thought other people would think she was stupid and she started to feel tense round her lips. The tension then became converted into an observer-perspective, mental image in which she saw herself with a twisted and contorted face. When asked ''what does that look like?'' she replied ''the village idiot'' and at that moment she was absolutely convinced that her colleagues thought she was stupid.

To determine how common such images are, Hackmann, Surawy, and Clark (1998) gave patients with social phobia and non-patient controls a semi-structured interview which focussed on spontaneous imagery in social anxiety-provoking situations. Fig. 1 shows the results. As predicted, the majority (77%) of patients with social phobia reported spontaneously occurring, negative, observer-perspective images, which they thought were at least partly distorted when they subsequently reflected on them. In contrast, only 10% of non-patient controls reported such images and their images were in general less negative.

A further intriguing aspect of the images that are associated with social phobia is their apparent lack of updating. Hackmann and Clark (1998) reported that many of the images reported by patients with social phobia are recurrent images. That is to say, they occur in similar form in many different social situations. In addition, they often seem to date back to around the onset of the social phobia and are linked to memories of criticism, humiliation, bullying and other adverse social events. It seems as though a mental model of the patient's observable, social self was laid down after an early traumatic social experience and this model
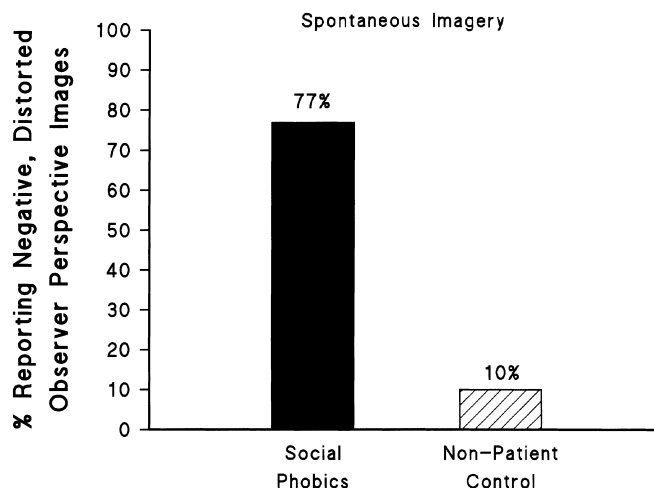

Fig. 1. Spontaneously occurring images in social situations.

is reactivated in subsequent social encounters. Reduced attention to the social situation then prevents the model from being updated.

6. Emotional reasoning

The results of the imagery interview studies reported above are consistent with the Clark and Wells (1995) suggestion that patients with social phobia use self-images and other anxiety-related interoceptive information, to make erroneous inferences about how they appear to others. Mansell and Clark (1999) recently reported a more direct test of the hypothesis that interoceptive, anxiety-related information is used to make inferences about how one appears to others.

High and low socially anxious individuals were asked to give a speech on a surprise topic. This task made both groups anxious. After giving the speech, participants rated the extent to which they had noticed bodily sensations during the speech and how anxious they thought they had appeared. An independent observer also rated how anxious they actually looked. Within the high social anxiety group, perceived body sensations were significantly correlated with self-ratings, but not observer-ratings, of anxious appearance. Furthermore, the more body sensations high socially anxious individuals noticed, the more they overestimated (self-ratings minus observer-ratings) how anxious they looked and the more they tended to underestimate global positive behaviours (looking confident, self-assured etc.). None of these correlations were significant in the low social anxiety group. This overall pattern of results suggests that social anxiety may be partly maintained by patients using perceived body sensations to make erroneous inferences about how anxious they appear and how poorly they come across. This is a specific instance of a process that has variously been called "emotional reasoning" (Burns, 1980) and "ex-consequentia reasoning" (Arntz, Rauner, & van den Hout, 1995).

7. Memory processes

At least two types of memory process may contribute to the maintenance of anxiety disorders. The first is a tendency for anxious individuals to selectively retrieve information which appears to confirm their worst fears. An experiment by Mansell and Clark (1999) illustrates this phenomenon and the rather precise circumstances under which it occurs. High and low socially anxious individuals encoded positive and negative words in one of three conditions: public self-referent ("describes what someone who knows you, or who had just met you, would think of you"), private self-referent (describes how you think about yourself) and other-referent (describes your next door neighbour). After encoding the words, subjects were either threatened with giving a speech or not threatened. They were then asked to recall the words. A very precise memory bias was observed. Compared to low socially anxious individuals, high socially anxious individuals recalled fewer positive words and tended to recall more negative words, but this effect only occurred when they were anticipating giving a speech and was restricted to words encoded in terms of how they thought they would appear to other people (public self-referent). This result suggests that a key aspect of the anticipatory anxiety

that is so common in social phobia may be selective retrieval of negative memories and impressions of the observable self. This would greatly enhance social phobics' doubts about their ability to achieve their desired impression in the social situation and would promote avoidance.

The second memory process is an apparent dissociation between explicit and implicit memory or, more precisely, between recall and priming. This phenomenon is perhaps at its most marked in post-traumatic stress disorder (PTSD).

Memory in PTSD is rather puzzling. On the one hand, patients with persistent PTSD often have difficulty in intentionally retrieving a complete memory of the traumatic event. Their intentional recollection is fragmented, details may be missing and they have difficulty recollecting the temporal order of events (Foa & Riggs, 1993; van der Kolk & Fisler, 1995; Koss, Figueredo, Bell, Tharan, & Tromp, 1996; Amir, Stafford, Freshman, & Foa, 1998). On the other hand, there is evidence that in some respects they appear to have a strong memory for the trauma. In particular, often they *involuntarily* re-experience aspects of the trauma in a very vivid and emotional way. In addition, many patients with persistent PTSD show a phenomenon which we have called 'affect without recollection'. This refers to the triggering of intense affect by the presence of stimuli that were associated with the trauma, without simultaneous recollection of the traumatic event. For example, some rape victims say that if they are walking along a street they can suddenly become very anxious but not be able to put their finger on what triggered the anxiety. Only afterwards may they realise that there was a man on the other side of the street who was about the same height and build as their rapist. At the time they became anxious, they were not aware of this link and did not recall the rape. How can one explain these rather puzzling phenomena? Ehlers and Clark (in press) have suggested that part of the problem in persistent PTSD may be a dissociation in memory with poor initial elaboration leading to weak intentional recall and retrieval being dominated by the basic memory mechanisms that operate through cue-driven retrieval. This could explain (see Ehlers and Clark for details), (1) the nature of intrusions (strong sensory impressions with the original emotions and a 'here and now' quality), (2) easy cuing of intrusions by stimuli that may have been temporarily associated with the trauma, even if they do not have a strong meaning link and (3) the fragmented nature of recall.

In a preliminary test of the Ehlers and Clark (in press) model, Ehlers, Michael, and Chen (in preparation) presented students with a sequence of three pictures which made up a story. The initial pictures were neutral and the last picture determined whether the story ended traumatically or neutrally. In a trauma sequence, the first pictures might show a woman standing by a table with a drinking glass and a table lamp. The next picture shows a man holding a bathrobe cord and the final picture shows a woman strangled. In a neutral sequence, the first pictures might be rather similar but the final picture shows a woman looking happy. Following presentation of the 'picture stories', memory for objects shown in the initial pictures was assessed in two different ways. First, in order to assess perceptual priming (implicit memory), participants were presented with extremely blurred objects and asked to identify them. Some of the objects had been presented in the 'stories' and others had not. Perceptual priming would be evidenced by better identification of the objects that had been presented. Second, explicit memory was assessed by asking participants to recognise non-blurred objects from the story pictures within a set of similar distractor objects. There were no differences in

explicit memory between objects from the traumatic and non-traumatic stories. However, as predicted, perceptual priming was better for the objects shown in the trauma stories. To assess whether enhanced perceptual priming (implicit memory) might be plausibly linked to PTSD-like symptomatology, participants in the experiment were followed up after four months and asked whether they had any unwanted intrusive recollections of the material that had been presented within the experiment. As predicted, there was a significant positive association between perceptual priming and the presence of subsequent intrusions.

The promising preliminary results obtained in the Ehlers et al. (in preparation) analogue experiment study have recently been extended in a larger scale, naturalistic, prospective study of road traffic accident victims (Murray, 1997). This study focussed on fragmentation of intentional recall and found that degree of memory fragmentation predicted PTSD at both one month and six months post accident. Other experiments are underway to more rigorously test the suggestion that PTSD symptomatology is partly a result of a dissociation between explicit and implicit memory processes.

8. Nature of the perceived threat

In the example above of 'affect without recollection', it is suggested that an aspect of PTSD, 'out of the blue' intense affect, may be maintained because the threat cue that triggers the problem is out of awareness and, as a consequence, patients have difficulty recognising the inappropriateness of their reaction at the time it occurs.

PTSD presents a further example of threat arising from a less than completely obvious source. For understandable reasons, clinicians and patients place a great deal of emphasis on the traumatic event itself and much of therapy focusses on helping people to process the event. However, it turns out there is another abnormality which is often neglected, but for some patients may be equally important. This is patients' interpretation of the symptoms they experience in the first days and weeks after the traumatic event. For many people, some initial PTSD-like symptoms may be a normal response. For example, in a longitudinal study of female rape victims, Rothbaum, Foa, Riggs, Murdock, and Walsh (1992) found that 94% of the women met symptomatic criteria for PTSD one week after the rape, this fell to 65% after four weeks and to 47% after three months. Such data raise the question "Why are the symptoms of PTSD persistent in some people and not in others?" Ehlers and colleagues (Ehlers & Steil, 1995; Ehlers & Clark, in press) have suggested one factor may be the way you interpret your initial normal intrusive recollections and other symptoms. If you interpret them negatively thinking they indicate you are going mad, losing control or becoming a neurotic person, you may engage in thought suppression and other dysfunctional strategies that could prolong the intrusions and other symptoms. Consistent with this suggestion, studies from our group have observed significant positive correlations between initial interpretations of PTSD symptoms and the subsequent severity and persistence of PTSD after both road traffic accidents (Ehlers & Steil, 1995; Ehlers et al., 1998; McManus, Clark, & Ehlers, 1998) and sexual or physical assault (Dunmore, Clark, & Ehlers, 1997, 1998). These findings suggest it may be important for therapy to focus on post-trauma interpretations, as well as the event itself, if optimal results are to be obtained.

9. Empirically derived treatment

One of the main reasons for studying the processes that prevent anxiety-related negative beliefs from self-correcting is to develop ideas about how to improve therapy. In particular, it is hoped that precisely targeting maintenance processes will make therapy more efficient and effective. During the last fifteen years our group has used research on maintenance processes to develop a particular approach to the cognitive treatment of anxiety disorders. This section provides a brief overview of the Oxford approach and highlights some of its main features. There is, of course, considerable overlap between the approach and other well-known, independently derived, CBT programmes (e.g. Heimberg, 1991; Barlow & Craske, 1994; Foa & Rothbaum, 1998) but the approach also has some distinctive features.

9.1. Developing an idiosyncratic model

Treatment starts by developing with patients an idiosyncratic version of the cognitive model of their particular anxiety disorder. In particular, the therapist aims to show patients how the specific triggers for their anxiety produce negative automatic thoughts relating to feared outcomes and how these are maintained by safety behaviours and other maintenance processes. The model is usually drawn up on a white board, so patient and therapist can look at it and discuss it together. Fig. 2 shows an example for a panic disorder patient. His panic attack started with a twinge of the muscles in his chest, he then had the thought "there is something wrong with my chest area, maybe I am having a heart attack". This interpretation made him
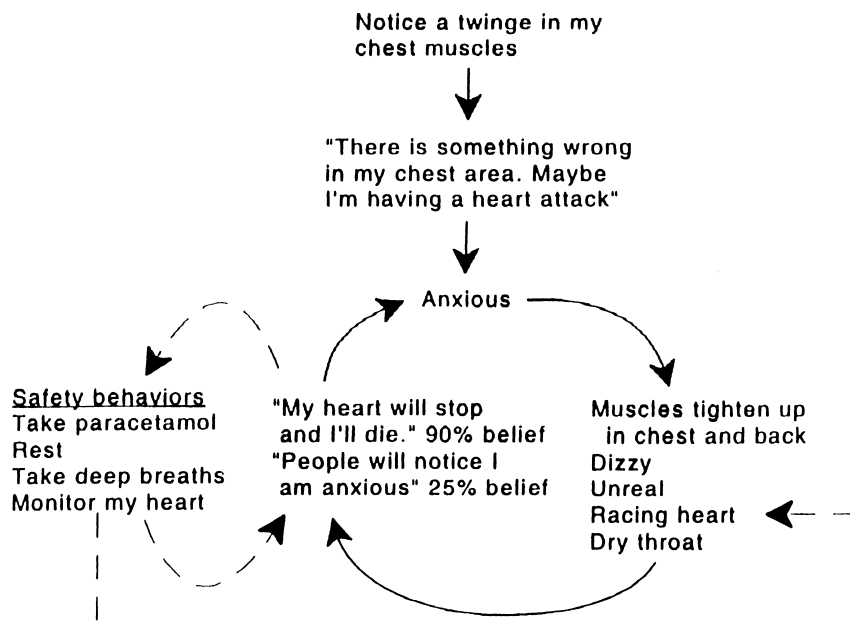

Fig. 2. An idiosyncratic model of a panic attack.

start to feel anxious, his chest muscles tightened up more, he started to feel dizzy, his heart raced more and he had the thought "Now, I think I'm dying, I'm having a heart attack" and also, interestingly, "If I don't die, people will notice I am anxious and think its odd". He then engaged in a series of safety behaviours to try to prevent himself from dying. He thought he had read somewhere that paracetamol is good for people with heart problems and so he took a paracetamol. This is incorrect information, but the key point is that he believed it. He also sat down and rested, took the strain off his heart and took deep breaths, trying to slow down his heart beat. He believed that a major reason why he had not died was because he had engaged in these safety behaviours. The reader will also notice that some of the safety behaviours (taking deep breaths and monitoring the heart) will have also augmented his feared symptoms.

Normally an idiosyncratic model such as Fig. 2 would be developed at the end of the first session of therapy and certainly not later than the second session. Currently, there is a movement in some cognitive therapy circles, particularly with personality disorders, to evolve the model and conceptualisation over many sessions of therapy. While this is valuable in some cases, we consider it negligent not to develop an idiosyncratic model of maintenance with anxiety disorder patients at the start of therapy because the model is the blue print that therapist and patient need to organise and develop the rest of the therapy procedures.

9.2. Examining and modifying negative beliefs and linked maintenance processes

A complex mixture of procedures is used to modify patients' negative beliefs and linked maintenance processes. Within a session, the procedures are closely integrated. For clarity they will be described somewhat separately.

Often, the first step is to identify patients' evidence for their negative beliefs. Anxiety disorder patients always have reasons for believing that the things they fear are dangerous, however strange the fears may seem. The therapist, therefore, tries to 'get inside the patient's head' and see what the evidence is. As anxiety disorder patients' beliefs about the dangerousness of feared stimuli are generally mistaken, patients have often experienced a number of events that contradict their beliefs before they come into therapy. Therapists can make considerable progress, even in an assessment interview, by spotting these events and helping patients understand their significance. For example, panic disorder patients who are worried that their symptoms mean they are about to have a heart attack may report that in some attacks something unexpected happened to distract them (for example, the telephone rang) and then their symptoms went away. The therapist could then pause and help the patient understand what this means, perhaps asking "would a cardiologist prescribe lots of telephone calls for someone with a cardiac condition?". The patient would probably answer "no". To which the therapist may reply, "if telephone calls would not stop a heart attack, how might they work? If the problem is your negative thoughts, could they help?".

Education about the symptoms of anxiety is a substantial component of therapy (see Clark, 1989, p. 76 for an example).

Images play an important role in many anxiety disorders and we often find it is necessary to work directly with images and to explicitly restructure them. A good illustration is provided by the treatment of social phobia where one of the most potent interventions appears to be video feedback. Patients engage in a difficult social task while being videoed. Afterwards they are

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Table 2
Record sheet for noting behavioural experiments

Date	Situation	Prediction (What exactly did you think would happen? How would you know?) (rate belief 0–100%)	Experiment (What did you do to test the prediction?)	Outcome (What actually happened? Was the prediction correct?)	What I learned. (1) Balanced view (rate belief 0–100%)? (2) How likely is what you predicted to happen in future (rate 0–100%)?
Mon 7/8	coffee break; sitting with other teachers; trying to join in the conversation	if I just say things as they come into my mind, they'll think I'm stupid; 50%	say whatever comes into my mind *and* watch them like a hawk; don't focus on myself; this only gives me misleading information (such as images of myself as the "village idiot"), and means I can't see them	I did it and I watched the others; one of them showed interest and we talked; she seemed to quite enjoy it	I am probably more acceptable than I think; 70%

asked to describe in detail their image of how they appeared. Once this is clear, therapist and patient view the video. If this viewing is carefully set-up (see later), patients usually see the video image as more positive than their own self-image.

Image modification also plays an important role in panic disorder. A common observation is that patients' spontaneous images generally stop at the worst moment. For example, patients who fear fainting in a supermarket might see themselves collapsed on the floor but not see themselves getting up, recovering and going home. A useful technique in such an instance is to 'finish out' the image by asking patients to recreate their negative image, hold it in mind until they start to feel anxious and then run it on until they see the positive resolution. It is important that this technique is not done as a cold, intellectual, exercise but instead includes eliciting the affect normally associated with the image. When done in this way, it can be an effective way of dealing with the intrusive image. Of course, for some images, asking "what would happen next?" would not produce a positive resolution. In these cases, other types of alternative image can be used for the restructuring (see Hackmann, 1997 for further details).

It is important to remember that anxiety results from overestimating the cost of feared events as well as their probability. Interventions aimed at modifying perceived cost are often helpful. This can be true even in cases where it might seem obvious that the feared event is objectively costly. For example, in hypochondriacal patients who are worried about dying, therapists may be tempted to focus exclusively on whether or not the patients are likely to die from the symptoms they are concerned about. Accepting that dying is a bad thing, the

therapist may not be inclined to ask, "what would be so bad about dying?". However, Wells and Hackmann (1993) found that many hypochondriacal patients have distorted beliefs and images about death and the process of dying. For example, they think that when they die they will remain conscious and will continue to experience all the pain they had up to that point. Such people can benefit greatly from discussion of their beliefs about the cost of dying.

Exposure to feared situations and sensations is a key component of cognitive therapy for anxiety disorders. However, the way exposure is conducted is rather different from the way it is conducted in at least some traditional behavioural approaches. In particular, cognitive therapists do not generally consider simple repetition of an exposure assignment to be helpful in itself[3]. The model that guides treatment is not a habituation model, but rather a cognitive change model in which exposure is explicitly used to test predictions the patient has about how dangerous a situation is. Such predictions can rarely be fully tested unless patients are instructed to drop their safety behaviours when in the feared situation. Otherwise, they will be able to think afterwards "Well nothing bad happened, but that is just because I did my safety behaviours".

Table 2 shows the way an exposure assignment was set up and afterwards processed in cognitive therapy with a social phobic patient. The patient, who was mentioned earlier in the section on spontaneous imagery, was a teacher who had difficulty joining in conversations with other teachers during coffee breaks. Questioning helped her articulate the prediction: "If I just say the things that come into my mind, they will think I'm stupid". Normally she would think very carefully (safety behaviour) about all the clever things she could say and then choose one for the conversation. The exposure assignment helped her to discover that, contrary to her prediction, she was acceptable even without her frantic attempts at self-presentation.

Exposure is only one of many behavioural experiments that are utilised in cognitive therapy. All the experiments have the aim of providing an explicit test of a problematic belief. A further common experiment focusses on the effects of thought suppression and can be particularly helpful in PTSD. Patients with PTSD often think their intrusive recollections mean they are going mad or are losing control in some way, and as a consequence, they try to push the intrusions out of their mind. If this problem is identified during the first session of therapy, therapists often conduct an experiment to illustrate the undesirable consequences of thought suppression. For example, the therapist might say to the patient "It doesn't matter what you think for the next few minutes as long as you don't think about one particular thing. It is extremely important you don't think about that thing.... The thing is a florescent green bunny rabbit eating my hair!". Most patients find they immediately get an image of the rabbit and have difficulty getting rid of it. Discussion then helps them see that an increase in the frequency of target thoughts is a normal consequence of thought suppression. This result can then be used to set up a homework assignment in which the patient is asked to collect data to test the idea that thought suppression may be enhancing intrusions. The experiment involves not trying to push the intrusions out of the mind, but instead just letting them come and go, watching them as though they were a train passing through a station. Often patients report

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[3] A possible exception is during the early stages of imaginal reliving of a traumatic event as part of the treatment of PTSD.

that this simple experiment produces a marked decline in both the frequency of intrusions and the belief that intrusions are a sign of impending insanity or loss of control.

10. Empirical status of cognitive therapy

Having provided a very brief overview of cognitive therapy procedures, I will now discuss the evidence for the effectiveness of the various Oxford cognitive therapy programmes.

10.1. Panic disorder

The treatment that was developed first, and therefore has been most extensively evaluated, is cognitive therapy for panic disorder. Seven controlled trials in six countries have evaluated the treatment, or close variants of it, using therapists who received at least some training from the Oxford team. Table 3 summarises the results. At the end of treatment, an average of 84% of the intention-to-treat sample are panic free (range 74–94%). Immediate post-treatment response is superior to no treatment, supportive psychotherapy, applied relaxation (2 out of 3 studies) and imipramine. Drop-outs are rare (3%) and treatment gains are well-maintained at one to two year follow-up.

The full cognitive therapy package involves 12–15 weekly sessions. In an attempt to make the treatment more cost effective, a brief (7 session) version, which utilises patient self-study modules to enhance cognitive change and reduce therapist time, was recently developed. In a controlled trial (Clark et al., in press), brief cognitive therapy was as effective as full cognitive therapy, both immediately and at one year follow-up (Table 3).

10.2. Hypochondriasis

Hypochondriasis is generally considered difficult to manage. Until recently there was no empirically validated treatment. In a preliminary study, Warwick, Clark, Cobb, and Salkovskis (1996) showed that cognitive therapy was superior to no treatment. The study was limited by the use of only one therapist and a follow-up of only three months. A subsequent study (Clark et al., 1998) addressed these limitations, using eight therapists and following up patients for one year after the end of treatment. At post-treatment patients who received cognitive therapy showed significantly greater improvements in hypochondriasis than patients who received either an equally credible, alternative psychological treatment (behavioural stress management) or no treatment. At one year follow-up, cognitive therapy patients remained substantially better than at pre-treatment but the difference between CT and the alternative treatment had substantially reduced. As in panic disorder, cognitive therapy had a low drop-out rate (6%).

10.3. Social phobia and PTSD

Our treatment programmes for social phobia and PTSD have only recently been developed. Both are currently being examined in controlled trials and a full evaluation of their effectiveness must await the results of those trials. However, preliminary data from consecutive

Table 3
Controlled trials of cognitive therapy for panic disorder (intention-to-treat analyses). Intention-to-treat analysis includes dropouts as well as completers. Dropouts are coded as still panicking. CT, cognitive therapy; brief CT, brief cognitive therapy; ST, supportive therapy; AR, applied relaxation; IMIP, imipramine; Exp, interoceptive and situational exposure; GM, guided mastery; WL, waiting list

Study	Treatments	Percentage (number) of panic-free patients	
		posttreatment	follow-up
Beck, Sokol, Clark, Berchick, and Wright (1992)	(1) CT	94 (16/17)	77 (13/17)[b]
	(2) ST	25 (4/16)[a]	–
Clark et al. (1994)	(1) CT	86 (18/21)	76 (16/21)[c]
	(2) AR	48 (10/21)	43 (9/21)[c]
	(3) IMP	52 (11/21)	48 (10/21)[c]
	(4) WL	7 (1/16)	
Öst & Westling (1995)[d]	(1) CT	74 (14/19)	89 (17/19)[c]
	(2) AR	58 (11/19)	74 (14/19)[c]
Arntz and van den Hout (1996)	(1) CT	78 (14/18)	78 (14/18)
	(2) AR	47 (9/19)	47 (9/19)
	(3) WL	28 (5/18)	–
Margraf and Schneider (1991)	(1) combined (CT)	91 (20/22)[e]	–
	(2) pure CT	73 (16/22)[e]	–
	(3) pure Exp	52 (11/21)[e]	–
	(4) WL	5 (1/20)	–
Hoffart (1995, 1998)	(1) CT	–	77 (20/26)[b]
	(2) GM	–	39 (10/26)[b]
Clark et al. (in press)	(1) CT	79 (11/14)	71 (10/14)[b]
	(2) brief CT	71 (10/14)	79 (11/14)[b]
	(3) WL	7 (1/14)	–
Total across all studies for CT		84 (93/111)	78 (90/115)

[a] At 8 weeks, which is the end of supportive therapy. At this time 71% of CT patients were panic free.

[b] One-year follow-up.

[c] Percentage of patients panic free at follow-up and who received no additional treatment during the follow-up period.

[d] The figures for CT are conservative as they *include* the therapists' four training cases. When these cases are excluded the panic free rate rises to 87% (13/15).

[e] Four-week follow-up.

case series in both disorders is most encouraging. In social phobia, fifteen consecutive cases were treated (Clark, 1998) and the overall improvement was substantial. For example, on the Fear of Negative Evaluation Scale (Watson & Friend, 1969), there was a mean improvement of 11 points at post-treatment and 15 points at follow-up, with pre-post effect sizes being 2.7 and 3.7, respectively. In PTSD, twenty consecutive cases received a mean of eight sessions plus two booster sessions (Ehlers, 1998). One patient dropped out. At the end of treatment eighteen (90%) no longer met diagnostic criteria for PTSD. As in other CBT programmes, imaginal reliving formed an integral part of treatment. However, it was used in an average of only three sessions per patient. This is encouraging as imaginal reliving is a highly stressful procedure and it may be that the broader focus of cognitive therapy helps reduce the amount of reliving that is required. Additional procedures included in the CT programme included modification of dysfunctional beliefs about the trauma and initial symptoms, restructuring of images and thought suppression experiments.

11. Active ingredients in cognitive therapy

Cognitive therapy for anxiety disorders is a complex mixture of education, verbal discussion techniques, imagery modification, attentional manipulations, exposure to feared stimuli, manipulation of safety behaviours and numerous other behavioural experiments. There is a strong emphasis on within-session experimental work and on working with high affect. Although all of these procedures are explicitly used to tackle distorted beliefs, some may be more effective than others.

A traditional way of trying to identify the most effective ingredients in treatment is to compare a full course of a treatment with a full course of a modified version, created by the removal of a particular ingredient. Marks, Lovell, Noshirvani, Livanou, and Trasher (1998) recently attempted to identify the relative contributions of exposure (imaginal and in vivo), verbal cognitive restructuring, and their combination, in the treatment of PTSD using this type of strategy. Exposure and verbal cognitive restructuring were both shown to be specific treatments, as each was superior to an alternative treatment (relaxation) which was included as a control for non-specific therapy factors, such as; the amount of therapist attention, structured homework and repeated assessments. However, there was no evidence that the combination of exposure and verbal cognitive restructuring was superior to either treatment alone.

Marks et al. (1998) nicely illustrate both the strengths and weaknesses of the traditional component analysis treatment trial. By comparing a full course of 'active' treatment with a full course of 'non-specific' treatment, control for non-specific factors is convincingly achieved. However, there are a number of weaknesses with the design that make it less sensitive as a way of identifying more subtle synergisms between supposedly active ingredients.

First, in order to create a combined treatment that is not presented and implemented in a different way to each of its components, it is often necessary to impose artificial constraints on the combination which may underestimate its power. For example, in the Marks et al. study cognitive restructuring was always given at the end of a session, after all exposure assignments had been completed, rather than intermingled with exposure as would be usual in most CT

programmes. In addition, quite different rationales were given for exposure (habituation rationale) and for cognitive restructuring, again a deviation from normal practice.

Second, 'dose response' effects are often not taken into account. If a single intervention is effective, it is reasonable to assume that more of it *could* be more effective. In the Marks et al. (1998) study, total treatment time was equated across conditions, so the amount of time devoted to exposure and cognitive restructuring was less in the combined treatment than in the separate treatments. The equally good outcome for combined treatment may, therefore, have arisen because the more modest effects of a reduced dose of each separate treatment were offset by the presence of the other treatment.

Is there any alternative to large-scale, component analysis trials in which treatment extends over many weeks? We suggest that, for some purposes, single session experiments may be more sensitive instruments, as they allow more rigorous control of extraneous variance such as homework and dose effects and can focus on very specific questions about how procedures should be delivered to maximise cognitive change. A recent experiment from our group (Harvey, Clark, Ehlers, & Rapee, 1998) illustrates this approach.

As mentioned above, video feedback has proved a powerful technique for correcting the distorted self-images of patients with social phobia. However, in our early explorations of the technique, we noticed it could sometimes backfire as some patients continued to see the video image more negatively than an impartial observer. Questioning suggested this was because patients re-experienced feelings they had during the social interaction while viewing the video. These feelings influenced their perception in a negative direction. To get round this problem, and to maximise perceived discrepancies between patients' self-image and the video, we asked patients to (1) visualize how they think they will appear before they see the video, (2) to operationalize what their negative behaviours will look like ("how much will you shake? Please show me". "How red is the blush? Please pick out a colour from the colour chart", etc.) and 3) to watch themselves as though they were watching a stranger, only drawing inferences from the visual and auditory information that would be available to any viewer, explicitly ignoring their feelings (see also Wells, 1997, pp. 186–187). Harvey et al. (1998) investigated whether this specific type of cognitive preparation enhanced the effects of video feedback by asking participants to give a speech and afterwards allowing them to watch the video, with or without prior cognitive preparation. For both groups, viewing the video tended to lead to an improvement in their impression of how well they came across, but this effect was significantly greater in the cognitive preparation condition. Many of the subtleties of cognitive therapy could, in principle, be analysed in similar, single-session experiments.

12. Conclusions

Why negative beliefs self-correct in some people but not others is still not entirely clear. However, six factors that seem likely to contribute to the maintenance of negative beliefs and anxiety disorders have been identified. Cognitive therapy programmes that specifically target these factors have proved highly effective in panic disorder and hypochondriasis. Preliminary data suggests they may be similarly valuable in social phobia and PTSD.

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