

# Anxiety Case Formulation (*Boschen*) 1

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A Cognitive Behavioural Case Formulation Framework for Treatment Planning in  
Anxiety Disorders.

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Abstract

A Cognitive Behavioural Case Formulation Framework (CBCFF) for anxiety disorders is presented, in which the aetiological and maintaining factors for the anxiety disorders are outlined in a single, simple, visual framework. This CBCFF is then used to demonstrate the specific links of different cognitive and behavioural treatment components to aspects of the case formulation. An example is used to illustrate the use of the CBCFF, highlighting its utility with novel presentations for which no manualised treatments exist.

A Cognitive Behavioural Case Formulation Framework for Treatment Planning in  
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A Case Formulation (CF) is “a provisional map of a person’s presenting problems that describes the territory of the problems and explains the processes that caused and maintain the problems.” (Bieling & Kuyken, 2003, p53). The CF represents the summation of the assessing clinician’s ideas about how the client’s psychopathology developed and is perpetuated, and evolves over time as further information is discovered and incorporated. A client’s CF is used as the basis for planning interventions aimed at reducing the impact of causal and maintaining factors in their presentation, and reducing enduring vulnerability factors.

There exists a strong general consensus among practicing clinicians from all therapeutic schools that CF is an essential step to providing effective, purposive treatment, particularly for complex presentations (Eells et al., 1998; Sperry et al., 1992). A sound understanding of the client’s presentation is a prerequisite for treatment planning, with the alternative being an unstructured, ad hoc style of intervention.

Case formulations, regardless of the therapeutic paradigm from which they emerge, all share several common elements. Case formulations generally describe the client’s psychopathology using an easily operationalized vocabulary, providing clear guidance in treatment, and evolve over time as more information comes to hand (Bieling & Kuyken, 2003). Eells et al. (1998) assert that CFs from psychodynamic, cognitive, behavioural and interpersonal therapies have three features in common. Firstly, they make inferences about the client’s presenting problem that are supported by the client’s own interactions in treatment. Secondly, the inferences made in the CF

process are concluded on the basis of the treating clinician's own knowledge and judgement, rather than the self-report of the client. Thirdly, CFs are 'compartmentalized' (p145) with an overall formulation being produced as the sum of a collection of smaller components.

A distinction has also been made by previous authors between overall, comprehensive formulations of the entirety of a client's presenting problem, versus smaller, specific formulations of separate situations (e.g. Persons, 1989; Persons & Tompkins, 1997). Complex cases may involve multiple different presenting problems, with a tangle of interactions that may be difficult to elucidate. Clinicians are often required to choose or oscillate between specific and monolithic formulations as required to best explain the primary complaint.

Despite the importance placed on the development of a case formulation in sound clinical practice, many clinicians may feel under-trained in the area. The limited body of research available into clinicians' formulation skills suggests clinicians feel under-trained in formulation skills, and trainers see the importance of improving training in CF (Fleming & Patterson, 1993; Ben-Aron & McCormick, 1980). Despite the apparent desire of clinicians and clinical trainers to increase the quality of CF skills, there is little published research into the formulation skills of clinicians, particularly within a cognitive behaviour therapy context (Eells et al., 1998).

Case formulation is an approach to the development of treatment plans that fits well within the scientist-practitioner model that dominates clinical psychology training and practice (Baker & Benjamin, 2000). Scientist-practitioners draw on research evidence to inform clinical practice, and evaluate interventions using scientifically supported methodologies. The use of a CF approach incorporates not

only a descriptive account of the presenting problem, but also the therapist's inferences about the underlying processes that can be tested as hypotheses as an integral part of the intervention. Indeed, the ability to approach cases within a scientist-practitioner framework *requires* that a sufficiently detailed CF has been generated as a starting point for hypothesis generation.

Methods and systems for developing individual case formulations for use in clinical practice have been developed previously for many different psychotherapy schools. Cognitive behaviour therapists have developed several systematic methods of formulating clinical cases (e.g. Mumma, 2004; Persons & Tompkins, 1997; J.S. Beck, 1995). Despite the existence of these formulation systems, it has been suggested that clinicians in practice are more likely to use a less systematic method to conceptualise clients' presenting problems (Bieling & Kuyken, 2003). This is of concern when evidence that systematic methods of CF are known to improve inter-clinician reliability (Persons & Bertagnolli, 1999).

### *Why Use Case Formulation?*

Previous authors have keenly highlighted the purported advantages of using CF in psychotherapy. It has been suggested that the use of a systematic CF approach gives the clinician a theory-based framework from which to make inferences about the nature of a client's problems. Individual CFs allow the provision of individual treatment plans, rather than manualised treatment delivery. The collaborative process used for CF used in cognitive behaviour therapy may also enhance therapist and client understanding of the presenting problem. When presented collaboratively, such individualised CFs may also strengthen the therapeutic alliance. Furthermore, by suggesting more specific, precise interventions, therapeutic outcome can potentially

be enhanced (Bieling & Kuyken, 2003). Such an approach is also suggested to be more useful than a diagnosis-based treatment planning approach (e.g. Persons, 1986), and may address concerns about the limits to categorical diagnosis (e.g. Widiger & Coker, 2003).

The overall quality of case formulations has been assessed in several recent studies by Kuyken et al. (2005) and Eells et al. (2005). Both these studies found a large variance in case formulation quality. Eells et al. (2005) reported that case formulation quality varied as a function of therapist expertise, but not orientation. Heiner et al. (2006) also reported on the quality of case formulation in trainee and experienced therapists, again finding a wide range in the quality of formulations provided by trainees and practicing clinicians.

Despite the eagerness to advocate for a CF approach to treatment planning, there exists a paucity of research to support these suggested advantages of CF. There are remarkably few systematic studies of the advantages of CF, and those that have been conducted offer only very limited support (Bieling & Kuyken, 2003).

One proposed advantage of systematic CF methods is that they serve to enhance agreement among clinicians as to the causal and maintaining factors relevant to the client's presenting problem. This inter-rater reliability of individual CFs is an essential pre-requisite to demonstrating their validity. In cognitive behaviour therapy, there is preliminary evidence for inter-rater reliability of CFs (Persons et al., 1995; Persons & Bertagnolli, 1991). Moreover, the reliability of cognitive behavioural formulations can be further enhanced through a systematic approach, whereby a set of specific domains is specified (Persons & Bertagnolli, 1999). Despite this, there is also evidence that the emphasis in cognitive behavioural CFs may be stronger for the descriptive component of the formulations than the inferential component, and that

inter-rater reliability may also be higher in description than inference (Eells et al., 1998). More recently, Kuyken et al. (2005) examined reported on the reliability and quality of case formulation, replicating the finding that there is greater inter-rater reliability for descriptive than inferential formulation elements.

The ability of CF to improve clinical outcomes is highlighted as the key factor in its utility. Some authors have opined that the ability of CF to improve clinical outcomes is the foremost in determining its value (e.g. Hayes et al., 1987). Despite the apparent face-validity of such assertions, there remains surprisingly little evidence supporting the assertion that CF enhances outcome in treatment (Bieling & Kuyken, 2003). Using cognitive analytic therapy, Evans & Parry (1996) attempted to evaluate the impact of a collaborative CF, delivered in the fourth session, on treatment outcome in a small sample of four patients. In this study, the authors found that the collaborative CF had little impact on client or therapist perception of treatment efficacy. The failure of CF to improve cognitive behaviour therapy outcome was also more recently supported in a group of psychotic patients (Chadwick et al., 2003). It should be noted the in both of these studies, particularly difficult patient groups had been used, and as such may not accurately represent the impact of CF on all clinical cases. Psychodynamic researchers have reported that outcome may be enhanced by *adherence* to a formulation-based treatment plan (Crits-Cristoph et al., 1988), however this is somewhat different to the impact of *the CF itself* on outcome. It would seem self-evident that a formulation can only be effective if it is actually utilised in treatment planning and delivery. We would suggest that adherence to formulation may mediate the impact of the formulation itself on treatment outcome.

There has been limited research comparing clinical outcomes from manualised versus formulation-based treatment approaches. Earlier research appeared to suggest

that manualised treatment approaches may offer superior outcomes, however more recent work has called these early findings into question. Eells et al. (2006) compared formulation-based treatment of anxious/depressed outpatients, and reported effect sizes of their treatments that were similar to that published previously. Similarly, Ghaderi (2006) reported on a comparison between manualized and individualized treatment for bulimia nervosa. Despite similar overall effect-sizes in the two groups, when treatment non-responders were examined, it was found that the overwhelming majority (80 percent) of these were from the manualized treatment group. The author used these findings to suggest preliminary evidence for the advantage of individualized, formulation-based treatment approaches.

In addition to clinical outcome, the impact of CF on other variables has been examined, again in a small number of studies. Chadwick et al. (2003) reported that even though CF did not improve clinical outcomes or patient perceptions of the strength of the therapeutic alliance, it did improve therapist perception of alliance strength. Other potential advantages to the use of CF have not been systematically studied. These include ratings of therapist confidence, extent of collaboration in treatment planning, awareness and consideration of the wide range of causal and maintaining factors in psychopathology, and extent of strategic forward-planned interventions.

### *Case Formulation in Anxiety Disorders*

Cognitive behaviour therapy has gained prominence as the psychological treatment of choice for the anxiety disorders (e.g. Andrews et al., 2004; RANZCP Clinical Practice Guidelines Team for Panic Disorder and Agoraphobia, 2003; Barlow et al., 2002; Franklin & Foa, 2002). Current cognitive behavioural treatments for



anxiety disorders draw on empirically based theoretical models to support use of specific treatment techniques and processes.

There exists some controversy within the anxiety disorder literature as to the taxonomy of anxiety problems. One body of literature has advocated for a categorical taxonomy in which the anxiety disorders are considered qualitatively different in presentation (e.g. Krueger, 1999; APA, 2000). Despite the empirically demonstrated ability of diagnostic interviews to discriminate between different anxiety disorder, it is also recognised that commonality is readily observed (e.g. Krueger, 1999), leading other researchers to assert that the anxiety disorders are more alike than different. Common underlying personality dimensions have also been isolated which provide some level of unification among the anxiety disorders (e.g. Andrews et al., 1990).

Despite some obvious surface differences, all of the anxiety disorders share a core set of common symptoms. All anxiety disorders show varying manifestations of the subjective, physiological and behavioural symptoms of anxiety (Barlow, 1988). In addition, all anxiety disorders are thought to share distortions in cognitive content (A.T. Beck, 1976; A.T. Beck & Emery, 1985) and processes (e.g. Mogg & Bradley, 1998). Although these basic anxiety symptoms are present in all disorders, they may manifest differently in each (Beidel et al., 2003). For example, although both panic disorder and social phobia may exhibit physiological arousal symptoms, patients with panic are more likely to exhibit paresthesias, lightheadedness and breathing difficulty (Page, 1994). It is suggested here that the common elements to the anxiety disorders allow a single unified framework to be used in CF development and treatment planning.

The Cognitive Behavioural Case Formulation Framework (CBCFF) for anxiety disorders presented herein aims to enhance clinical practice in a number of ways. Similarly to other CF methods proposed previously, it aims to improve inter-clinician reliability in conceptualisation by providing a clear structural framework. When used collaboratively in psychoeducation and treatment negotiation with the client, it is suggested that the anxiety disorder CBCFF may serve to enhance the strength of the therapeutic alliance through its emphasis on developing a shared understanding of the client's presentation. At a more fundamental level, the CBCFF for anxiety disorders aims to assist the clinician in understanding the interplay of different cognitive and behavioural mechanisms in anxiety aetiology and maintenance. A 'monolithic' model incorporating a wide range of these mechanisms also encourages clinicians to consider aetiological and maintaining factors from an extensive smorgasbord of possible mechanisms. Furthermore, through encouraging a logical, structured approach to formulation, it encourages clinicians to operate similarly in their treatment planning, constructing a series of intervention components that are supported by aspects of the CF.

The anxiety disorder CBCFF is presented in a flowchart in Figure 1. The use of a flowchart rather than other methods to describe the CBCFF has been a deliberate decision, aimed at enhancing its utility. Flowcharts are comparatively easy to read, providing clear indications of progression from one step to another (Kammann, 1975), especially when presented in a format that mirrors normal reading (i.e. left-to-right flow; Krohn, 1984). Flowcharts have been suggested previously as an effective aid to training in behaviour therapy (Craighead et al., 1979), and have been incorporated into behavioural treatment procedures (e.g. Danforth, 1998).

The use of the CBCFF for anxiety disorders in treatment planning is consistent with the principles of the scientist-practitioner model. It guides the clinician towards consideration of formulation components that are supported by the cognitive behavioural treatment literature. By presenting a large array of etiological and maintaining factors, it encourages the clinician to look broadly, rather than considering only the immediately apparent mechanisms. The CBCFF also presents obvious hypotheses for testing in the treatment process. Inferences such as the likely effect of specific treatment components on specific formulation factors (and psychopathology) are readily apparent when treatment plans are constructed using the model.

The CBCFF for anxiety disorders is also consistent with the three common features of CFs specified by Eells et al. (1998). Firstly, the CBCFF for anxiety disorders suggests formulation components that can be elucidated from the information gathered from the client during therapy sessions (and other cognitive/behavioural assessment methods). Secondly, the components of the anxiety disorder CBCFF are generally inferred by the clinician, rather than devised exclusively from client self-report. It is important to acknowledge here, however, that inferences made by the client as to the causal and maintaining factors in their presenting problem may yield important information for the CF. Thirdly, the CBCFF is constructed of components that are built together to construct an overall comprehensive CF.

It is apparent that the CBCFF for anxiety disorders does not incorporate a holistic view of the patient, but is instead focuses on the problems for which they are seeking treatment. This is consistent with the ideas of previous researchers who have

emphasised that the CF is a description of the presenting problem, rather than of the whole person (Bieling & Kuyken 2003).

### *Description of the CBCFF for Anxiety Disorders*

The CBCFF for anxiety disorders is presented as a flowchart in Figure 1. In general terms, the CBCFF describes a chain of events, behaviours and cognitions, as well as the interplay and enduring effects of these (e.g. reinforcement of certain behaviours). Broadly, the left-to-right chain in the CBCFF (shown with a bold arrow running through the centre of the flowchart) describes a situation where an anxious individual comes into contact with a stimulus that is perceived as dangerous, and then acts in such a way to reduce the ensuing anxiety. Other cognitive variables such as attentional biases and self-efficacy beliefs are also shown to impact on this basic chain. The chain is a recognisable expansion on the basic SORC model long-used in behaviour therapy formulation (e.g. Kanfer & Saslow, 1969).

Three different symbols are used within the CBCFF flowchart to denote different component types. Thought bubbles and six-sided shapes are used to represent cognition and behaviour respectively. Rectangular symbols are used to represent other components such as consequences of behaviour, interoceptive cues, and some stimuli. Arrows are used to show the flow from one component to another.

### Components of the CBCFF for Anxiety Disorders

Each of the components of the CBCFF for anxiety disorders is reviewed below. The review is brief and does not attempt to encompass all that is known about each specific component, instead presenting a basic description of the component,

how it impacts on aetiology and maintenance of anxiety disorder, and the interventions that can be directed at each component.

#### *Approach Behaviours*

Contact with anxiety eliciting stimuli often occurs as the result of the behaviour of the individual. For example, a client with agoraphobia becomes anxious after the approach behaviour of entering a shopping centre. The client's approach behaviour forms the first element in the CBCFF chain, leading the individual to the anxiety-provoking stimulus. Exposure-based interventions call specifically for an increase in the frequency of approach behaviour (see Figure 1 and Table 2).

#### *Stimulus*

The exact nature of the feared stimuli differs among individuals, and is focused on different areas in different anxiety disorders. Feared stimuli can be drawn from numerous sources, including external objects or situations, interoceptive stimuli, and cognitions. Table 1 includes a list of the specific stimuli that are the foci of different anxiety disorders. Social phobia, for example, has as its anxiety-provoking stimulus the perception that one is under scrutiny (the perceived 'audience', Rapee & Heimberg, 1997, p744). In panic disorder, alternatively, the primary feared stimuli are interoceptive cues (Clark, 1986; Barlow, 1988). Figure 1 shows that the stimuli themselves are not directly targeted by any particular cognitive behavioural intervention.

For the purposes of case formulation and treatment planning, the identification of the correct stimulus is essential. The anxiety-provoking stimulus is presented during exposure treatments, with the aim of reducing the anxiety it elicits, as well as the urge to reduce this anxiety. Obviously, exposure using an incorrect stimulus is likely to be ineffective, at best.

*Hypervigilance to Stimulus*

Individuals with anxiety disorder often show measurable tendencies to attend to threatening stimuli. Clients with obsessive-compulsive disorder, for instance, attend to normal intrusive thoughts (Salkovskis, 1999; Rachman & de Silva, 1978; Salkovskis & Harrison, 1984). In contrast, patients with panic disorder may show heightened attention to interoceptive cues (e.g. Lang & Sarimento, 2004), while those with social phobia are more likely to orient to socially threatening stimuli such as critical faces (e.g. Bögels & Mansell, 2004).

Interventions such as distraction and attentional training are aimed at addressing hypervigilance to threat stimuli in anxiety. There is evidence that correction of these biases is associated with successful treatment outcomes (e.g. Lundh & Öst, 2001; Hofmann, 2000).

*Perception of Danger*

In line with cognitive views of anxiety psychopathology (e.g. A.T. Beck & Clark, 1997), the CBCFF adheres to the view that the perception of threat or danger, rather than the feared stimulus itself, elicits anxiety. Different anxiety disorders are thought to perceive threat from different quarters, as shown in Table 1. Patients with specific phobias may have anxious thoughts regarding the risk associated with the feared stimuli (e.g. risk of being bitten by a dog), or about the aversiveness of the anxiety symptoms that the stimulus may elicit (Thorpe & Salkovskis, 1995).

Alternatively, those with obsessive-compulsive disorder, panic disorder and social phobia may have anxiotypic cognitions related to responsibility (Salkovskis, 1999), the catastrophic nature of physical symptoms (Clark, 1986), or the likelihood and severity of negative 'audience' evaluation (Rapee & Heimberg, 1997) respectively.

Cognitive restructuring is the broad name given to a host of interventions designed to assist the patient in rational evaluation of their cognitions, and modification of these cognitions with the aim of reducing emotional distress (J.S. Beck, 1995). In the anxiety disorders CBCFF, cognitive restructuring is seen as the primary vehicle by which perceptions of danger are addressed. Danger cognitions are, of course, addressed also through the acquisition of new information and experiential learning (see below).

### *Neuroticism*

There is mounting evidence for the existence of a set of personality characteristics that may predispose individuals to excessive levels of anxiety (Bienvenu & Stein, 2003). Neuroticism is recognised as a stable, pervasive personality dimension (e.g. Eysenck & Eysenck, 1985; McCrae & Costa, 1996), reflecting an individual's predisposition to experiencing negative affective states (Costa & McCrae, 1980). Studies which have examined the role of neuroticism have ascribed approximately half of the variance in emotional distress symptoms to this personality dimension (e.g. Andrews, 1991; Andrews et al., 1993; Duncan-Jones, 1987). In the anxiety disorders CBCFF, neuroticism is shown to influence both cognition and anxiety symptoms (see Figure 1). Previous research has demonstrated that negative affectivity (NA; a state measure of neuroticism) and cognitions have independent effects on psychopathology symptoms (Jolly et al., 1994).

Figure 1 shows that no cognitive or behavioural interventions act to directly target neuroticism. Although scores on measures of the neuroticism trait may change with successful treatment, these changes occur indirectly and slowly, rather than from the direct, specific action of any intervention component.

### *Information or Experience*

Inadequacies in simple associative models of phobia acquisition have long been recognised, leading to proposals that there may be several methods by which stimuli come to be appraised as threatening (e.g. Rachman, 1977). Included in these, is the development of fear through direct experience (e.g. being bitten by a dog), observation (e.g. seeing someone bitten by a dog), and verbal acquisition (e.g. hearing about someone bitten by a dog).

The process of exposure, although historically conceptualised as occurring through conditioning mechanisms, also provides the client with direct experience (and corrective information) regarding the threat posed by their feared stimulus. Through their own experience, the patient learns that the threat posed by the feared stimulus may be less, and their ability to cope with the threat may be greater, than previously supposed.

In addition to direct experience, Rachman (1977) discusses observational learning as another method of fear aetiology. In treatment, this is recognised with the use of modelling procedures before and during exposure. Where the therapist demonstrates approach towards, and tolerance of, a feared stimulus, this modelling may serve to assist the patient in making their own approach.

Cognitive behavioural treatments for anxiety disorder generally commence with a period of 'psychoeducation', in which information is provided regarding the nature of anxiety and the patient's psychopathology. Depending on the nature of the presenting problem, other corrective information may be given regarding the dangerousness of the feared stimuli (e.g. the normalcy of interoceptive sensations, the risk of acquiring a serious illness through touching 'contaminated' surfaces, the frequency of intrusive thoughts in the general population, etc.). Such information



may be provided directly to the patient, or research in the area may be negotiated as a homework task external to the therapy session.

Verbal information is also provided and ‘discovered’ through cognitive restructuring. During such restructuring, the therapist and patient work collaboratively to identify, evaluate, and adjust problematic ideas and assumptions that may exacerbate anxiety. Verbal information provided during therapy sessions is usually further consolidated experientially through the use of homework tasks such as behavioural experiments.

### *Increased Anxiety*

A common feature of the anxiety disorders is excessive, unreasonable levels of anxiety symptoms. Such anxiety is experienced through a constellation of emotional, physiological, cognitive, and behavioural symptoms (APA, 2000; Barlow, 2000). It is assumed that these anxiety symptoms are generally aversive when they reach excessive levels, and serve to motivate the individual to withdraw from that which is perceived as threatening.

A certain level of anxiety symptoms is generally seen as functional, while excessive or inadequate arousal levels impair performance (Andrews et al., 2004). Although a goal of eliminating anxiety is therefore unrealistic and undesirable, methods of managing anxiety levels are incorporated into most successful anxiety disorder treatments. Such methods may include relaxation training (Jacobsen, 1938; Öst, 1987) and breathing control training. These arousal management skills aim to improve the individual’s ability (and perceived ability) to manage anxious arousal.

### *Reduced Self-Efficacy*

An important component of anxiety disorders is the client’s perceptions of their ability to cope with anxiety provoking stimuli and the symptoms that follow.

These “beliefs and attitudes that people hold about their ability to cope, or perform ... a given behaviour” together comprise an individual’s self-efficacy (Johnstone & Page, 2004, p252). Self-efficacy beliefs have been implicated in panic disorder (e.g. Casey et al., 2004), agoraphobia (e.g. Hoffart, 1995a, 1995b), shyness and social phobia (e.g. Caprara et al., 2003), specific phobia (e.g. Jones & Menzies, 2000), and posttraumatic stress disorder (e.g. Benight & Bandura, 2004), as well as the general concept of anxiety (Bandura, 1983).

Within the anxiety disorder CBCFF presented in Figure 1, reduced self-efficacy is shown to have influence on two other components. Firstly, self-efficacy influences the individual’s perception of danger when the feared stimulus or situation is present. Bandura (1983) has suggested that people’s “perceived inefficacy in coping” (p465) is primary in determining whether a stimulus or situation elicits anxiety. Patients brought into contact with threatening stimuli show a greater perception of danger (and therefore greater anxiety) when they perceive that they are unable to cope with the situation and/or the anxiety it generates. Secondly, self-efficacy is shown in Figure 1 to influence the ability of anxiety to lead to anxiety-reducing behaviour. Where an anxious individual perceives that they are able to tolerate (or manage) their anxiety symptoms, their perceived need to reduce these symptoms through avoidance, checking, or other anxiolytic behaviour is reduced.

Figure 1 shows that an individual’s self-efficacy perceptions are a direct target of several interventions often used in the treatment of anxiety disorders. Having the person refrain from the use of their typical anxiety-reducing behaviour, as well as surrendering any safety signals (see below), is suggested to strengthen beliefs in their ability to tolerate the associated anxiety. Specific self-efficacy beliefs can also be viewed as a direct target for cognitive restructuring, usually with follow-up

behavioural experiments designed to consolidate any cognitive change. Furthermore, the teaching of arousal management skills like relaxation and breathing control may enhance some peoples' beliefs in their ability to cope in the face of anxiety.

### *Anxiety Reducing Behaviour*

It is considered adaptive and functional for an organism to seek to reduce its overall anxiety level. A wide variety of behaviours are used by people with and without clinical anxiety problems to reduce or manage anxiety levels. In anxiety disorders, such behaviours are used either too frequently, or without sufficient flexibility, thereby impairing functioning. The choice of anxiety-reducing behaviour used by individuals is influenced largely by the nature of the anxiety-provoking stimuli. Where the feared stimulus is a specific object (as in specific phobia), the simplest behaviour to reduce anxiety is to withdraw from (and subsequently avoid) the object. Where the feared situation is a certain place (as in agoraphobia), avoidance/escape may also be the primary anxiety-reducing behaviour. In disorders such as panic, individuals may behave in such a way as to minimise the severity of interoceptive cues by avoiding exercise or other similar activity. Where the feared stimulus is an intrusive thought (as in some cases of OCD and PTSD), the mechanism to reduce anxiety is often one of 'cognitive avoidance' whereby the individual attempts to avoid or suppress anxiogenic thoughts or imagery.

In the anxiety disorders CBCFF, anxiety-reducing behaviour is directly elicited by the experience of increased anxiety. Elevated anxiety serves as a discriminative stimulus to indicate to the individual that certain behaviours will be followed by anxiety reduction. Figure 1 also shows a link between the use of anxiety reducing behaviour, and perceptions of low self-efficacy. It is suggested that failure

to manage anxiety in a given situation, and the behaviour used to reduce this anxiety, strengthen beliefs about the individual's poor ability to cope.

As part of treatment of anxiety disorders, an individual needs to refrain from the behaviours they usually use to relieve anxiety. When these anxiety-reducing responses are inhibited, the usual pattern of negative reinforcement is circumvented. Furthermore, the individual's perception of their coping ability is strengthened. Such inhibition is labelled as 'safety response inhibition' in Figure 1. This concept incorporates the 'response prevention' treatment component used in OCD but it should be recognised that this principle to all anxiety conditions. Any exposure where patients are asked to refrain from their usual safety behaviours (e.g. escape) is conceptualised in the CBCFF as a form of 'safety response inhibition.'

### *Safety Signals*

Many anxiety-reducing behaviours are aimed at attaining a sense of safety through the generation of safety signals (Gray, 1975; Rachman, 1984). A distinction is made in the CBCFF for anxiety disorders between anxiety-reducing behaviours and safety signals. While anxiety reducing behaviours are *operants* which are open to reinforcement, safety signals are *stimuli* which indicate that an aversive outcome is less likely. For example, taking a diazepam tablet may be a behaviour which is reinforced through its ability to reduce anxiety. On the other hand, carrying the same tablet in a purse is a behaviour aimed at perpetuating the safety signal of the tablet's presence – a stimulus which has become associated with reduced anxiety. Other examples of safety signals may be the presence of a relative (or the therapist), knowledge of the location of the nearest toilet, or familiar, comfortable surroundings.

In the CBCFF for anxiety disorders (Figure 1), safety signals relate to three other components. Firstly, they show a reciprocal relationship with reduced self-

efficacy. It is suggested that the use of safety signals occurs, at least in part, due to a person's perceived inability to cope with anxiety in the absence of the safety signal. Conversely the ongoing use of such signals further erodes the person's perception of their inherent coping skill. Over time, safety signals may also become associated with reduced anxiety, through classical conditioning mechanisms.

Safety signals may play a role in successful treatment of anxiety (e.g. Sartory et al., 1989). A significant component of treatment during exposure is the surrendering of previously used safety signals. As the individual learns through experience that their anxiety can be managed without the use of their previous safety signals, their self-efficacy is enhanced. Through exposure and increasing self-efficacy, the perceived need to use safety signals further decreases.

#### *Reduced Anxiety and Reinforcement of Anxiety Reducing Behaviours*

Anxiety reducing behaviour, and the presence of safety signals, lead to a drop in overall anxious arousal symptoms. The reduction in anxiety symptoms that occurs following anxiety-reducing behaviour serves to reinforce the use of such operants, making their future use more likely. In anxiety disorders, commonly observed patterns of avoidance are explained through this cycle. The CBCFF for anxiety disorders clearly shows, in a visual format, the negative reinforcement contingency operating on the anxiety-reducing behaviour.

During anxiety disorder treatment, the individual inhibits their normal anxiety-reducing behaviour, thus preventing it being further reinforced. Over time, as the behaviour is not reinforced, it is subject to extinction.

#### *Punishment of Approach Behaviours*

The increase in arousal symptoms that accompanies the perception of danger is generally an aversive, punishing experience. When such anxiety occurs following

an individual's approach behaviours, this condition acts as a positive punisher on these operants, reducing their likelihood in future.

Exposure is shown in the CBCFF as the cognitive behavioural treatment component directed at the punishment of approach behaviours. It is hypothesised that habituation occurs over repeated exposure to the feared stimulus, and that the punishing effects of anxiety are diminished.

#### Formulation-Based Treatment Matching

An example is provided to illustrate the potential uses for the CBCFF for anxiety disorders. The example uses the CBCFF to formulate a single individual clinical case, and then to derive a novel formulation-based treatment plan.

#### *Clinical Case Example*

Figure 2 presents the use of the CBCFF in the case formulation of an individual with emetophobia (fear of vomiting) who presented for treatment with the first author. LJ, a 30 year old married woman, presented to a university psychology clinic complaining of persistent, debilitating concerns that she would become nauseous or vomit. LJ reported avoidance of numerous 'risky' foods such as seafood and poultry. At various times, when either exposed to risky stimuli, or when LJ experienced normal gastrointestinal (GI) cues (such as those experienced with hunger and normal digestive processes) she would begin to focus on automatic thoughts that she would imminently become severely nauseous and vomit. Through ongoing concern, LJ had also become hypervigilant to such GI cues. When she perceived that nausea/vomiting was likely, this led to an understandable increase in anxiety, and an accompanying withdrawal from activity. Furthermore, LJ would repeatedly seek reassurance from her husband that she was not looking pale or sickly. Such reassurance was negatively reinforcing, providing temporary anxiolysis. LJ's

husband had been enlisted into the role of a safety signal also, with his presence helping to reduce anxiety. LJ's repeated need for reassurance, and recurrent attacks of nausea had also, by the time of presentation, led to a severe reduction in LJ's self-efficacy perceptions about her ability to manage illness or nausea.

Figure 3 illustrates how each of the formulation components suggests items for a treatment plan. The components of a treatment plan, along with the formulation factors from which they are derived, are presented in Table 3. It is worth noting that the treatment plan derived here is similar to that suggested previously for treatment of emetophobia (*Boschen, in press*).

## Discussion

The CBCFF for anxiety disorders has been generated with the aim of presenting a single, visual model of anxiety disorders, from which formulation-based treatment plans can be derived. The model presented here achieves this goal, although further empirical testing of the impact of the CBCFF for anxiety disorders is required.

### *Limitations of the CBCFF for Anxiety Disorders*

It could be argued that the CBCFF presented here is also limited in that it does not clearly recognise the differences of formulation and treatment between different anxiety disorders. We believe, however, that the flexibility inherent in the CBCFF allows for formulation of different anxiety disorders within the same overarching conceptual framework. While such an approach may simplify our current understanding, it is argued here that such simplification may make clinical formulation and treatment planning an easier undertaking, without sacrificing treatment outcome.

The CBCFF for anxiety disorders artificially excludes the impact of other comorbid personality variables and psychopathological processes on anxiety disorders. For example, the complex interaction between anxiety disorders and commonly comorbid mood problems is not considered. This is seen as a reflection of the scope of the model, rather than a failing of the CBCFF concept. Competent clinicians using the CBCFF for anxiety disorders should remain mindful of comorbid diagnoses, as well as other factors not specified within the model which may also have bearing on the client's presenting problem.

The 'perception of danger' component of the CBCFF for anxiety disorders is acknowledged as a simplistic representation of the role of cognition in the aetiology and maintenance of anxiety disorder. It does not differentiate between different levels of cognition such as automatic thoughts, intermediate beliefs and schemas (J.S. Beck, 1995). Nor does it adequately address the difference between cognitive content and cognitive processes that operate in anxiety disorders. Like many aspects of the CBCFF for anxiety disorders, it is presented as a simplification to assist in conceptualising and planning treatment, rather than a comprehensive explanation. Other important components known to be relevant to anxiety disorders such as the impact of social and systemic factors (e.g. Tarrier & Callum, 2002) are also not fully incorporated, and should be considered by clinicians using the CBCFF.

The last few years have seen the expansion of models of anxiety disorder to incorporate new concepts such as mindfulness and metacognition (e.g. Miller et al., 1995; Wells, 2000; Wells & Carter, 2001). The current CBCFF does not incorporate these components, although their integration into the overall model is unlikely to be difficult. As further evidence clarifies the exact nature of these and other constructs,



it is recommended that they be incorporated into formulation systems such as the CBCFF.

*Conclusions*

The Cognitive Behavioural Case Formulation Framework (CBCFF) for anxiety disorders is a single cognitive-behavioural framework for understanding and treating anxiety disorders using formulation-based treatment plans. It encourages clear understanding of the cognitive and behavioural factors which cause and maintain anxiety disorder symptoms, as clear and specific links between these factors and treatment components. There is a clear need to evaluate the purported advantages of such a system empirically.

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Table 1

*Fearful Stimuli and Anxiety Reducing Behaviour in Different Anxiety Disorders*

Disorder	Stimulus	Perception of Danger	Anxiety Reducing Behaviour
Panic Disorder	Interoceptive cues	Catastrophic cognitions	Safety seeking; Avoidance
Agoraphobia	Fearful location	Occurrence of Panic Symptoms	Safety seeking; Avoidance
Specific Phobia	Phobic stimulus	Occurrence of Anxiety Symptoms; Occurrence of Negative Outcome from Stimulus	Safety seeking; Avoidance
Social Phobia	Perceived audience	Fear of negative evaluation	Safety seeking; Avoidance
Obsessive-Compulsive Disorder	Obsession	Doubt; Responsibility	Compulsion
Posttraumatic Stress Disorder	Trauma related objects, cognitions, or situations	Re-experiencing or recurrence of trauma	Avoidance
Generalized Anxiety Disorder	Worry	Validity, Utility, and Uncontrollability of worry	Attempts to avoid worry or threat.

Table 2

*Formulation-Based Treatment Matching*

Treatment Component	CF Component Addressed	Description
1. Exposure	Approach Behaviour	Exposure treatments encourage the client to engage in approach behaviour.
	Punishment of Approach Behaviour	When the anxiety caused by the stimulus reduces through treatment, punishment of approach behaviour reduces.
	Information or Experience	Exposure allows the client to acquire corrective information through experiential learning.
	Increased Anxiety	Through repeated exposure, habituation occurs.
	Reduced Self-Efficacy	Successful coping during exposure enhances self-efficacy.
2. Safety Response Inhibition	Anxiety Reducing Behaviour	Safety Response Inhibition requires that the client inhibit their usual anxiety reducing behaviours.
	Reinforcement of Anxiety Reducing Behaviour	By inhibiting anxiety reducing behaviours, they are no longer reinforced.
	Reduced Self-Efficacy	Coping with anxiety without performing anxiety reducing behaviour enhances self-efficacy.
3. Cognitive Restructuring	Perception of Danger	Cognitive restructuring can be targeted at anxiotypic cognitions such as danger expectancies.
	Information or Experience	Cognitive Restructuring and psychoeducation provide corrective information regarding the level of threat.
	Reduced Self-Efficacy	Cognitive restructuring can be directed towards self-efficacy beliefs.
4. Arousal Management	Increased Anxiety	Arousal Management skills such as relaxation and breathing control can give some control over increased anxiety levels.
5. Attention Management	Hypervigilance to Stimulus	Distraction and attention training procedures can be taught to help manage hypervigilance to threat cues.
6. Surrender of Safety Signals	Reduced Self-Efficacy	By surrendering safety signals, patients learn adaptive self-efficacy beliefs.
	Safety Signals	Relinquishing safety signals forms a core treatment component.

Table 3

*Case Example Formulation-Based Treatment Matching*

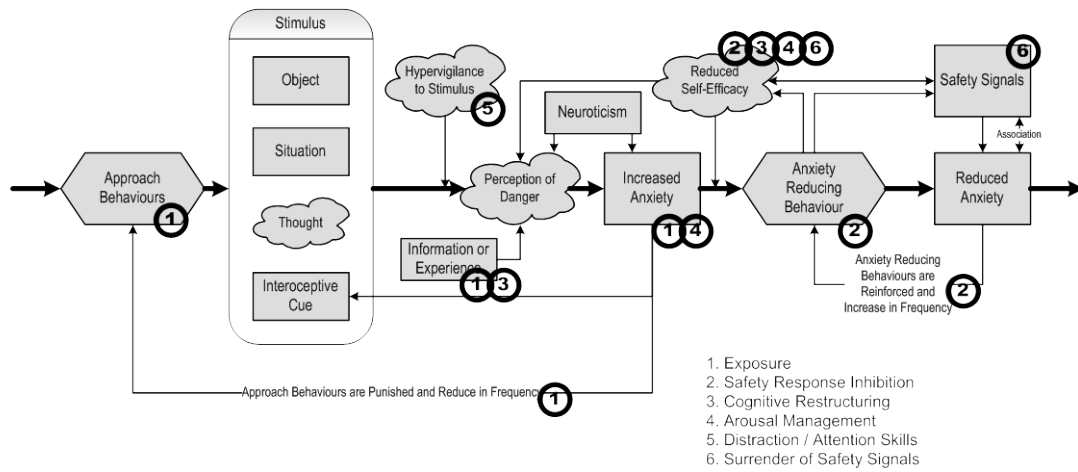
Treatment Component	CF Component Addressed	Description
1. Exposure	Avoidance of risky foods, etc.	Exposure treatments encourage the client to expose themselves to stimuli perceived as risky.
	Punishment for contact with risky stimuli	When the anxiety caused by risky foods, people, and situations reduces through treatment, punishment of approach behaviour reduces.
	Increased anxiety	Through repeated exposure to risky stimuli, habituation occurs.
	Perceived inability to inhibit reassurance seeking	Successfully exposing to risky stimuli, without withdrawal or reassurance enhances self-efficacy.
2. Safety Response Inhibition	Reassurance seeking behaviour	Safety Response Inhibition requires that the client refrain from seeking reassurance from her husband
	Reinforcement of reassurance-seeking	By inhibiting the reassurance-seeking, it is no longer reinforced.
	Perceived inability to cope without husband	Coping with anxiety/nausea without husband enhances self-efficacy.
3. Cognitive Restructuring	Catastrophic belief that nausea or vomiting is imminent	Cognitive restructuring can be targeted at cognitions about the likelihood and implications of nausea or vomiting.
	Perceived inability to inhibit reassurance seeking	Cognitive restructuring can be directed towards beliefs about the client's ability to resist the urge to seek reassurance.
4. Arousal Management	Increased anxiety	Arousal Management skills such as relaxation and breathing control may help control arousal and associated nausea levels.
5. Distraction / Attention Skills	Hypervigilance to gastrointestinal cues	Through learning that the occurrence of GI cues is not dangerous and does not lead to vomiting, the need to remain hypervigilant to them is reduced.
6. Surrender of Safety Signals	Reduced Self-Efficacy	By increasing activities without the husband, LJ learns adaptive self-efficacy beliefs.
	Safety Signals	Relinquishing safety signals forms a core treatment component.

Figure Captions

*Figure 1.* A Cognitive Behavioural Case Formulation Framework (CBCFF) of Anxiety Disorders and Associated Treatment Components.

*Figure 2.* Individual Case Formulation Example.

*Figure 3.* Individual Formulation-Based Treatment Planning Example.



1. Exposure
2. Safety Response Inhibition
3. Cognitive Restructuring
4. Arousal Management
5. Distraction / Attention Skills
6. Surrender of Safety Signals

