



Anorexia nervosa: Valued and visible. A cognitive-interpersonal maintenance model and its implications for research and practice

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Anorexia nervosa (AN) is highly valued by people with the disorder. It is also a highly visible disorder, evoking intense emotional responses from others, particularly those closest to the person. A maintenance model of restricting anorexia nervosa, combining intra- and interpersonal factors is proposed. Four main maintaining factors (perfectionism/cognitive rigidity, experiential avoidance, pro-anorectic beliefs, response of close others) are suggested and the evidence supporting these is examined. These factors need to be integrated with what is known about starvation-related maintenance factors. This model departs from other models of AN in that it does not emphasize the role of weight and shape-related factors in the maintenance of AN; that is, it is culture-free. Implications for clinical practice and research are discussed.

Anorexia nervosa (AN) continues to be a poorly understood and rather 'mysterious' condition. This is particularly true of the restricting subtype of the disorder, where the main method of weight loss is through self-starvation and where the degree of weight loss and emaciation is often extreme. While recent discussions on classification and treatment of eating disorders have highlighted the overlap and similarities between diagnostic groups and a 'transdiagnostic approach' to classification and treatment has been suggested (Fairburn & Bohn, 2005; Fairburn, Cooper, & Shafran, 2003), there is solid evidence supporting the notion that restricting AN should be considered a distinct and separate phenotype (Clinton, Button, Norring, & Palmer, 2004; Keel *et al.*, 2004; for review see Collier & Treasure, 2004). What follows focuses particularly on restricting AN because, clinically, this group is perhaps the most frightening (because of the medical risks) and puzzling (see below) group of patients.

One of the most striking aspects in the clinical presentation of individuals with AN is the extreme degree to which they value and 'defend' their undernourished state

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(Vitousek, Watson, & Wilson, 1998). This goes beyond the lack of insight present in patients with psychosis or the 'denial' typically found in patients with addictions. People with AN, even in a state of severe emaciation, may insist on the benefits of their highly compromised physical state for their well-being, and are reluctant to contemplate change.

A second important factor which sets AN apart from almost any other psychiatric disorder is the highly visible nature of the disorder. It is perhaps the only psychiatric 'spot diagnosis'. While many people with AN are seemingly oblivious to the dangers they are facing, their often grotesquely frail physical appearance arouses strong emotions in others, ranging from fear, despair and pity to disapproval, horror and disgust. Thus, whether intentional or not intended, the anorectic symptomatology carries a hard-to-ignore message to others, in particular, those close to the person with the disorder. Family, friends and professionals desperately try to persuade the person with AN to change. Despite the discrepancy between the person's view of their difficulties and that of close others, in our clinical experience the vast majority of people with AN remain dependent on their family often living together even in adulthood.

Even in adults with AN we often find that it is the families who instigate referrals for treatment and the clinician typically finds himself as the 'piggy in the middle' having to perform a difficult balancing act between the expressed wishes of the person with AN and the wishes and needs of the family. Thus, treatment of AN presents a major challenge.

Psychological models and the treatment of anorexia nervosa

Analogous to the situation in other psychological disorders, Shafran and de Silva (2003) suggest that *specific* models of the *maintenance* of AN (rather than accounts of the development of the disorder) are likely to generate treatment advances. Several criteria have to be fulfilled in order to confirm that a given variable has a role in maintaining an illness. Stice (2002) in an excellent meta-analysis of risk and maintaining factors provided the following definition: 'a factor that predicts symptom persistence over time versus remission among initially symptomatic individuals is a maintenance factor. If an experimental increase or decrease in a factor among initially symptomatic individuals results in symptom expression or suppression, respectively, it may be referred to as a causal maintenance factor'.

Cognitive-behavioural, family systems, and psychodynamic models with different degrees of sophistication and specificity for AN are available (for review, see Dare & Crowther, 1995; Shafran & de Silva, 2003; Waller & Kennerley, 2003). Attempts to translate these models into effective interventions for adults with AN have been limited and the few small randomized controlled trials in this area have been relatively unsuccessful with poor outcomes and no clear frontrunners in terms of treatment efficacy. For example, only about a third of adult patients with AN are in remission after one year of different specialist treatments, and a large proportion develop chronic disabilities (Hay, Bacaltchuk, Claudino, Ben-Tovim, & Yong, 2003; Treasure & Schmidt, 2005).

Very few of the models summarized above are pure maintenance models, with the exception of Fairburn, Shafran, and Cooper, (1999) and Fairburn *et al.* (2003). There is some preliminary evidence supporting the first of these models (Shafran, Fairburn, Nelson, & Robinson, 2003) and the latter is currently being tested in a large clinical trial.

The lack of success in the psychological treatment of adults with established AN where traditionally there has been a focus on treating the individual, contrasts with the much better treatment outcomes achieved in children and adolescents using treatment approaches involving the family (Eisler, Le Grange, & Asen, 2003; Gowers *et al.*, 2005). Involving close others in treatment of adults produced outcomes equivalent to individual treatment in two recent randomized controlled trials (Dare, Eisler, Russell, Treasure, & Dodge, 2001; Eisler, 2003).

We propose here a maintenance model of AN which combines intra- and interpersonal maintenance factors. This model has evolved from a comprehensive cognitive-behavioural model of AN developed previously in our unit (Wolff & Serpell, 1998), giving an account of the development and maintenance of the disorder.

In addition, our maintenance model draws on Gilbert's (1997, 1998a, 1998b, 2001a, 2001b) evolutionary approach to psychopathology. This suggests that psychiatric '*symptoms are often related to the activation of defence mechanisms*', which have evolved in response to social threats to key biosocial goals of evolutionary relevance (Gilbert, 2001b), such as '*eliciting care from others*', or '*gaining and maintaining social rank*'. The purpose of what follows is not to come up with a fully fledged evolutionary account of AN, which would need to include an exploration of the specific nature of the types of social threat commonly precipitating AN. Instead we simply wish to point out that self-starvation in AN is a manoeuvre with complex defensive functions, which has the effect of reducing social threat. Thus, the symptoms of AN can be seen to have adaptive functions, a point that has previously been highlighted by Vitousek *et al.*, (1998) who was one of the first to focus on the valued nature of the disorder.

We propose here that anorectic symptoms are maintained *intrapersonally* by beliefs about the positive function of the illness for the person and *interpersonally* by both positive and negative responses elicited from close others by the physical presentation and behaviours associated with AN, in individuals who are vulnerable because of avoidant and/or obsessive-compulsive personality traits and unknown biological factors. Functionally, the avoidance centres mainly on a need to avoid the experience and expression of intense negative emotions and the need to avoid close relationships, which trigger these emotions. The obsessive-compulsive traits are manifested in perfectionism and rigidity which make these individuals prone to all-or-nothing/black-or-white type thinking, meticulous attention to details and a terror of making mistakes. These vulnerability traits are intensified by starvation, a process which patients seem to be aware of and value. Different factors come into play in different phases of the illness and those with a longer duration could reasonably be expected to have a higher loading of the maintaining factors.

The aim of the present paper is to describe the model, examine the evidence supporting the components of the model as putative maintenance or causal maintenance factors, and to discuss the implications of the model for clinical practice and research.

Some preliminary remarks

Some premises need to be explained before we describe the model.

Nomenclature

Much of the research evidence cited here is based on patients with anorexia nervosa. However, some of the studies quoted here are based on people with eating disorders not

in treatment (e.g. recruited via the Eating Disorders Association or from our own large volunteer register). Thus, for simplicity and uniformity's sake we have chosen to talk throughout of 'people with AN' rather than patients. However, it needs to be acknowledged that in theory factors that maintain the disorder in the community may differ from those that maintain the disorder in clinical samples.

Lack of emphasis on weight/shape concerns

In contrast to bulimia nervosa, AN is not a Western culture-bound syndrome (Keel & Klump, 2003). There are many descriptions of AN from non-Western cultures. Moreover, there are well-documented cases dating back to the middle ages. What these historical and non-Western cases have in common is that their psychopathology and justification for weight loss is not based on the current slim body ideal and concerns about weight or shape. Rather, these cases complain of 'inappetence' and 'inability to eat' or may justify their food restriction in terms of ascetic or religious ideals. Moreover, in a study of risk factors for AN, factors which increased the likelihood of dieting, such as weight-shape related criticism by family members, had no independent effect (Fairburn, Cooper, Doll, & Welch, 1999). While current diagnostic criteria of AN and a number of models of treatment focus on weight and shape concerns as *the* central psychopathology of the disorder we – along with others (Palmer, 2003; Russell, 1995) – would see the essence of the disorder as 'motivated eating restraint'. Weight/shape concerns then can be seen as *one* motivation for such restraint among many others that are possible (Palmer, 2003). Thus, our model does not emphasize weight and shape concerns, something that may be surprising to some readers.

The role of starvation-related maintenance factors

The focus of the present paper is on psychological maintenance factors of AN. We are aware that there are a number of central and peripheral starvation-related maintenance factors of AN. We only allude to some of these in what follows, and do not cover them in detail. This is not to detract from their importance, but a more comprehensive discussion is simply beyond the scope of the present article. The interested reader may wish to consult Robinson and McHugh (1995), Fichter and Pirke (1995), and Treasure and Szmukler (1995) for review of these starvation-related factors.

Female preponderance of AN

A related point is that AN is a disorder that almost exclusively affects women. It has been argued previously that any aetiological model of AN needs to explain this female preponderance (Treasure, Collier, & Campbell, 1997). The answer almost certainly lies in biological factors; that is, female humans and animals are much more sensitive to the effects of starvation, in terms of resulting alterations in affect and behaviour (Treasure *et al.*, 1997). Again, we have not dwelt on this here, as we are concerned with the maintenance of AN not its causation. Moreover, our model is not gender specific.

An overview of the model

We hypothesize that during the early stages of the illness, dietary restraint is maintained intra-personally by positive reinforcement from a temporary improvement in mood and well being. This may be moderated by a biological vulnerability (e.g. related to 5-HT

neurotransmission; Kaye *et al.* 2003; Kaye, Stober, Stein, & Gendall, 1999). This early stage has been summarized by Casper (1998) who noted that AN patients initially typically are cheerful, content, and euphoric, with high levels of energy despite a low caloric intake and continued weight loss, suggesting that they feel mentally alert and physically active. This accounts for the 'denial' that is said to be part of the psychopathology, epitomized by one of the patients of the French physician Charles Lasègue (1873) who said, 'I do not suffer therefore I am well'. Moreover, dieting provides these individuals with ample opportunity for developing and rigidly adhering to clear, but arbitrary, personal rules and paying meticulous attention to detail. With successful dieting, a sense of mastery and being in control over their body, and consequently their life, arises (cf. Fairburn, Shafran, & Cooper, 1999). Thus, positive beliefs about the utility of self-starvation form, for example, 'I see my anorexia as being dependable and consistent'. Patients rarely come to clinical attention during this early stage of the illness and (unless pushed by others) and have little motivation to enter treatment.

In the chronically starved state, eating increasingly arouses unpleasant physical sensations (such as feeling bloated, nauseous and overfull; Keys, Brozek, & Henschel, 1950). Both biological and cognitive factors may play a role in this. For example, falling insulin and neuropeptide Y levels lead to poor appetite. Delayed gastric emptying increases the sense of fullness and reduces appetite and delayed gut transit times lead to constipation, bloating and discomfort and reduce appetite further (Treasure & Szmulker, 1995). The prospect of having to eat becomes a threat associated with these aversive consequences. The learnt expectation that certain foods (e.g. foods high in fat) cause particular physical sensations may exacerbate such physical symptoms (Feinle-Bisset, Meier, & Fried, 2003).

Eating anything outside an idiosyncratic, self-imposed, limited range of low-calorie 'safe foods' or, in severe cases, eating anything at all is construed by the person to be a mistake and a failure, which causes extreme negative emotions in those with a strong drive for perfection and a terror of making mistakes. Eating therefore becomes a threat to emotional and physical equilibrium. However, in the starved state, the drive to eat supersedes all other drives. As Seneca said, 'A hungry person listens not to reason, nor cares for justice, nor is bent by any prayer' (www.llewelyn.net/docs/quotes/seneca.html). This is manifested in the person with AN experiencing constant food-related thoughts or images, dreaming about food, stealing food, hoarding food, and the well-documented preoccupation with cooking for others, while fiercely resisting eating. This intense preoccupation with food and eating (Keys *et al.*, 1950), while to some extent aversive, also signals to the individual the need to stay vigilant and not to give in to the drive to eat. The exclusive mental focus on food and eating is associated with emotions becoming less salient and clinically many patients report that they feel somewhat numb. This numbing is valued by patients with anorexia nervosa, many of whom have an avoidant disposition with difficulty tolerating any emotions. Thus powerful positive pro-anorectic beliefs develop, linking anorexia and being able to manage emotions (e.g. 'anorexia helps me to cope with my feelings'). One of our patients expressed this sentiment as follows: 'Anorexia nervosa is a way of dealing with my anger and frustration with the world and my feelings of hate and the emotions I couldn't deal with. I needed to find a way of dealing with my emotions without making it destructive for myself . . . using the anorexia to bury them all . . .'.

In addition to these intra personal mechanisms, the reactions in the interpersonal domain are highly relevant. Close others, especially peers, initially are often

complimentary about the person's weight loss, reinforcing efforts to restrain intake and leading to beliefs about being attractive, special or more confident as a result of the AN (Branch & Eurman, 1980).

Later on, close others often become concerned and worried and many families become organized around the needs of the person with AN. This powerful effect of being able to elicit care and attention, without needing to communicate this directly, underpins another important pro-anorexia belief, as expressed by one of our patients: 'I think in a way when I am showing that there's something wrong mum and dad pay a bit more attention to me, they understand that I am finding it hard and they try and talk to me and everything like that, I don't know whether they'd be so sensitive or whatever if I didn't have it'.

Alternatively, the illness typically arouses strong negative emotions in family members (Treasure *et al.*, 2001), because of the patients' reluctance to accept the need for change and the burden that the illness places upon carers. Parents' own feelings of helplessness and self-blame for 'failing to help their daughter' or believing that they have caused the illness translate into overt criticism of the person with anorexia. In some families, these negative emotions may be expressed directly and confrontationally as blame, criticism, or hostility, whereas in other families, overt conflict may be avoided and critical attitudes are expressed less directly (e.g. through changes in tone of voice). The person with anorexia distances herself from the exhortations of others because of her intolerance of negative emotions and sensitivity to criticism, which are part of the avoidant and perfectionist traits of the person with AN. Closeness to others is perceived as progressively dangerous and threatening, as it becomes increasingly associated with the risk of being exposed to conflict, criticism and negative emotions and the dependable safe nature of the AN becomes more valued.

Thus, the manifold and evolving responses of close others lead to the formation and elaboration of further pro-anorectic beliefs, which justify the need for further self-starvation as a vitally important defensive manoeuvre for self-preservation and striving to reduce threat in women with avoidant, perfectionist, and obsessional personalities. It is the nature of perfectionism that no degree of self-starvation is ever good enough and that 'one should always try harder'. Clinically, it is well known that the goal posts shift to forever lower weights.

Evidence supporting the model

Below, we outline the evidence supporting the components of the above model. As much of the evidence is based on patient populations with well-established AN, it relates to maintenance of the full syndrome rather than the early stage described above. For each of the putative maintenance factors, we will assess how well they fulfil Stice's (2002) two-stage criteria for qualifying as a maintenance factor; that is, does the presence of the factor in symptomatic individuals predict symptom persistence over time, and does experimental manipulation (e.g. in a treatment trial) of a factor result in symptom decrease or increase? Where longitudinal evidence is not available, we will provide cross-sectional or other suggestive evidence. In addition, we will suggest or describe specific studies that could be undertaken to provide the necessary evidence. We will start by discussing the role of (a) obsessive-compulsive traits and perfectionism and (b) the role of avoidance in the maintenance of AN. In describing the nature of these, we will separate the evidence on their role as risk/vulnerability factors from that

of their role in the maintenance of the disorder. We then go on to describe the role of the pro-AN beliefs and the response of close others.

The role of obsessive-compulsive personality traits and perfectionism in the maintenance of AN

The nature of obsessive-compulsive personality traits and perfectionism in AN

Approximately 50% of people with eating disorders suffer from obsessive-compulsive spectrum disorders (Woodside & Halmi, 2003). This includes high levels of obsessive-compulsive disorders (Kaye, Bulik, Thornton, Barbarich, & Masters, 2004) and/or obsessive-compulsive personality traits (Anderluh, Tchanturia, Rabe-Hesketh, & Treasure, 2003). Even those who do not fulfil criteria for a formal lifetime diagnosis of obsessive-compulsive spectrum disorders show elevated levels of these and other anxiety traits, usually dating back to childhood (Kaye *et al.*, 2004). While these traits are present across the whole spectrum of eating disorders, there is evidence that people with AN have higher levels of childhood rigidity and perfectionism than those with bulimia nervosa (Anderluh *et al.*, 2003). Starvation and weight loss appear to increase compulsive behaviours both in animals and humans. Perhaps the most well known example is the overactivity mouse model (for review see Johanson & Schalling, 2002). A variety of compulsive behaviours such as hoarding develop during experimental starvation in humans (Keys *et al.*, 1950). The onset of AN leads to a worsening of rigidity and perfectionism (Anderluh *et al.*, 2003) and many of the rituals and obsessional behaviours, which are recognized to be part of the clinical picture of AN, decrease with weight gain (Channon & De Silva, 1985).

Thus, perfectionism, cognitive rigidity, obsessive-compulsive disorder and obsessive-compulsive personality traits may be both a risk factor (Anderluh *et al.*, 2003; Fairburn *et al.*, 1999; Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004; Shafran, Cooper, & Fairburn, 2002; Shafran & Mansell, 2001) for AN and a factor maintaining these symptoms.

Individuals with these traits value perfection and fear making mistakes. They are excessively conscientious and cognitively rigid and have constricted affect (DSM-IV, American Psychiatric Association, 1994). The traits (being rigidly rule-bound, striving for perfection) can facilitate persistent dietary restriction and the control of appetite. A wish for simplicity and focus on details make this type of behaviour satisfying and may lead to the pro-AN belief 'anorexia nervosa makes me feel in control'.

The effect of perfectionism and obsessive-compulsive personality disorder on outcome

A consistent factor in the literature on AN is that either perfectionism or having an obsessive-compulsive personality disorder (OCPD) adversely affects outcomes (Bizeul, Sadowsky, & Rigaud, 2001; Diaz-Marsa, Carrasco, & Saiz, 2000; Gillberg, Råstam, & Gillberg, 1995; Milos, Spindler, Ruggiero, Klaghofer, & Schnyder, 2002; Santonastaso, Friederici, & Favaro, 1999; Sutandar-Pinnock, Blake, Carter, Olmsted, & Kaplan, 2003). At present, there is no evidence addressing the question whether interventions, which aim to reduce perfectionism or other obsessive-compulsive traits, improve outcome.

Additional considerations

Family members may share these traits; for example, OCPD is increased threefold in first degree family members of people with AN (Lilenfeld *et al.*, 1998). Affected parents may find it difficult to buffer the noxious effects of these traits in their daughter (for tentative

evidence supporting this point see discussion of the expressed emotion literature below).

The role of avoidance in the maintenance of AN

The nature of avoidance in AN

Avoidance is a broad term that has been conceptualized in a number of different ways.

Avoidance as a temperamental or personality characteristic. In an attempt to integrate a number of different personality conceptualizations, Elliot and Thrash (2002) suggested that there are two broad underlying personality dimensions: one that can be labelled *approach temperament*, the other *avoidant temperament*. The former is seen to be characterized by a general sensitivity to positive or desirable (reward) stimuli (present or imagined) and is accompanied by 'perceptual vigilance for, affective reactivity to and a behavioural predisposition towards such stimuli', while the latter is characterized by a general sensitivity to negative or undesirable (punishment) stimuli. This two-factor model was supported by a factor-analytic approach. There is converging evidence from different lines of research to suggest that people with AN are temperamentally avoidant. Several studies have used Cloninger's Temperament and Character Inventory (Cloninger, Svarakic, & Przybeck (1993) and have found patients with AN to show high levels of harm avoidance (Brewerton, Hand, & Bishop, 1993; Bulik, Sullivan, Weltzin, & Kaye, 1995; Fassino *et al.*, 2002; Klump *et al.*, 2000; Price Foundation 2001). Moreover, approximately a quarter of people with AN fulfil the criteria for avoidant personality disorder (Diaz-Marsa *et al.*, 2000; Grilo, Levy, Becker, Edell, & McGlashan, 1996; Skodol *et al.*, 1993). From early adulthood, people with avoidant personality disorder exhibit a pattern of pervasive behavioural, emotional and cognitive avoidance. In particular, they pull away from intimacy and close interpersonal relationships. These difficulties pre-date the onset of the disorder, which suggests that avoidant personality traits may be a risk factor as well as contributing to the maintenance of the disorder (Troop, Holbrey, & Treasure, 1998; Troop & Treasure, 1997). These avoidant traits also persist after recovery (Casper, 1990).

In a recent study (Holliday, personal communication), some of the pro-anorectic beliefs were found to be associated with particular personality traits characteristic of people with an avoidant personality disorder; namely, restricted emotional expression, intimacy and identity problems.

Avoidance as a functional diagnostic dimension. Using a functional analysis approach to diagnosis and treatment, Hayes, Wilson, Gifford, Follette, and Strosahl (1996) coined the term 'experiential avoidance' to describe a phenomenon that occurs when a person is 'unwilling to remain in contact with particular private experiences (e.g. bodily sensations, emotions, thoughts, memories, behavioural predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them'. The reasons for why such avoidance is ultimately detrimental to an individual are complex and are reviewed in detail Hayes *et al.* (1996).

In individuals with AN, there is converging evidence from different lines of research to suggest that the experiential avoidance focuses particularly on avoidance of emotions, emotional memories, and intimate relationships. Geller, Cockell, and Goldner (2000) showed that women with AN are prone to suppressing negative feelings in general and minimizing their own needs to preserve close relationships. Moreover, individuals

with AN showed avoidant coping when faced with stressful life events and difficulties (Troop & Treasure, 1997).

In addition to a deliberate suppression of negative emotions, there is evidence that people with AN have an impaired ability to detect emotional signals both from others (Kucharska-Pietura, Nikolaou, Masiak, & Treasure, 2004; Zonnevijlle-Bender, van Goozen, Cohen-Kettenis, van Elburg, & van Engeland, 2002) and themselves (i.e. have alexithymia; Råstam, Gillberg, & Johansson, 1997; Troop, Schmidt, & Treasure, 1995). Furthermore, they have difficulty retrieving specific emotional autobiographical memories (Dagleish *et al.*, 2003). There is also a difficulty expressing emotion, particularly pronounced in those with an associated avoidant personality disorder (Sexton, Sunday, Hurt, & Halmi, 1998).

Lastly, there is evidence to show that whilst people with AN are typically premorbidly shy, have few friends, and are psychosexually inhibited (Fairburn *et al.*, 1999; Murphy, Troop, & Treasure, 2000; Vaz-Leal & Salcedo-Salcedo, 1992; Wiederman, Pryor, & Morgan, 1996), this avoidance and dislike of intimate and sexual relationships persists and increases after onset (Schmidt, Evans, Tiller, & Treasure, 1995).

Avoidance as an evolved defence strategy. Gilbert (2001b) noted that the expression of 'defensive' emotions (i.e. those triggered by social threat such as threat to rank) is often avoided because it is recognized that the expression may generate further threat. There is preliminary evidence suggesting that people with eating disorders do perceive themselves as having low social rank (Troop, Allan, Treasure, & Katzman, 2003; Troop & Connan, 2003). Defensive emotions aroused by threat to rank include shame, guilt or jealousy (Gilbert, 2001b). These are highly relevant to AN, as these individuals have been found to be shame-prone (for review see Troop & Connan, 2003) and to experience more jealousy compared with their unaffected sisters (Karwautz *et al.*, 2001; Murphy *et al.*, 2000). Guilt is also common (Burney & Irwin, 2000).

Self-starvation/weight loss as an avoidance strategy

In his seminal work on starvation, Keys *et al.* (1950) noted personality changes in his subjects, consistent with those observed in avoidant personality disorder (e.g. social isolation, unwilling to be involved in interpersonal relationships) without evidence of these characteristics prior to starvation. In this study, the focus of the starved male subjects' attention turned to food with a decrease in libido, apathy and an attenuation of emotional reactions. Of course, it could be argued that the mere fact that starvation makes people more withdrawn and less interested or involved in emotional and relational matters is not in itself enough to show that people with AN use starvation as a strategy for avoiding emotions and intimacy. However, people with AN seem to be aware of, and welcome the fact that self-starvation facilitates their capacity for avoiding emotions and close relationships, as evidenced by their common endorsement of the pro-anorectic belief 'anorexia nervosa helps stifle emotions' (Serpell, Teasdale, Troop, & Treasure, 2004). Of course, it cannot be ruled out that this might simply be a *post factum* explanation.

The effect of avoidance on outcome

One study (Fassino *et al.*, 2001) has examined the effect of temperament on treatment outcome in a small sample of patients with AN and found low novelty seeking to be associated with a poor outcome. In an age cohort series of AN cases, anxiety disorders, avoidant-dependent and OCPDs were common and were associated with poor outcome

(Herpertz-Dahlmann *et al.*, 2001). It has been concluded that these problems may be constitutional rather than a result of AN, and that they may warrant a different treatment approach (Nilsson, Gillberg, & Råstam, 1999). In another study, high scores in the interpersonal distrust scale of the Eating Disorders Inventory predicted poor long-term outcome in AN (Bizeul *et al.*, 2001).

Additional considerations

The strong achievement motivation and striving for educational goals in AN has been noted (Dura & Bornstein, 1989) and may seem at odds with the idea of this group being temperamentally or experientially avoidant. In a study linking temperament with achievement, Eliot and Thrash (2002) found that individuals with avoidant temperament construe their achievement goals as helping them to avoid undesirable outcomes, rather than to achieve desirable outcomes. As yet, there is no information on whether the same holds true for achievement motivation in AN.

There is some evidence to suggest that avoidant traits and avoidant information-processing may be passed on transgenerationally in families with an anorectic family member. Genetic as well as social learning factors may be involved. For example, one study evaluated temperament and character traits of patients with AN and their mothers and fathers using Cloninger's Temperament and Character Inventory and compared their responses against those of non-eating disordered women and their families. Anorectic individuals were high in harm avoidance, low in novelty seeking and high in persistence. Their fathers, but not their mothers, were high in harm avoidance (Fassino *et al.*, 2002).

Moreover, in a study of attachment in AN we found that both daughters with AN and their mothers had insecure avoidant attachment and poor 'reflective functioning' (Ward *et al.* 2001). Poor reflective functioning is a concept akin to 'theory of mind'; that is, the ability to draw inferences about other people's mental states. It is possible that his information processing style contributed to the high levels of unresolved loss seen in mothers and daughters.

In summary, 'avoidance' has been conceptualized in a number of different ways with different strands of research supporting the utility of these different conceptualizations in AN. Thus, there is evidence supporting the notion that an avoidant temperament is a risk factor for AN, and that people with AN may particularly avoid intense emotions and intimate interpersonal relationships (which are likely to arouse these emotions). There is also evidence to suggest that starvation increases avoidant traits, and that people with AN are well aware of this, perceiving it as a benefit. Lastly, there is some evidence that avoidance has a negative effect on outcome in AN. What is missing so far is any direct evidence showing that a reduction of avoidance of, say, emotions or intimacy precedes recovery. Having said this, there is preliminary evidence to suggest that treatments that focus exclusively on food, eating habits, and weight recovery such as dietary interventions are less successful at effecting lasting change than psychological treatments that foster emotional processing (Serfaty *et al.*, 1999; Pike, Walsh, Vitousek, Wilson, & Bauer, 2003).

Pro-anorectic beliefs

The nature of positive beliefs about AN

The beliefs a patient may have about their illness, in particular, positive beliefs about the value or function of the illness or particular symptoms, play an important role in the

maintenance of different emotional disorders, such as generalized anxiety disorder (Wells & Butler, 1997), and have also been included in a model of the maintenance of AN (Wolff & Serpell, 1998) to account for the often major discrepancy between the person's severely compromised physical state and their reluctance to change. The recent appearance of pro-anorexia web sites where some individuals with this disorder present their anorexia as a positive life-style choice highlights the intensity and pervasiveness of such beliefs (for review, see the Academy of Eating Disorders' position statement on pro-anorexia websites on www.aedweb.org).

Both positive and negative beliefs about AN were firstly explored using a decisional balance measure derived from the transtheoretical model of change (Prochaska & Di Clemente, 1984). The measure was adapted from one that had been used in obesity (Blake, Turnbull, & Treasure, 1997). The findings on AN were in accord with those found in other conditions; namely, the balance of positive to negative beliefs about the illness varied with the stage of change. People in the pre-contemplation stage endorsed more positive aspects of the illness than negative aspects, and this situation was reversed in people in the stage of action. Cockell, Geller, and Linden (2003) extended this work and developed a decisional balance measure specifically for people with eating disorders using items obtained from expert consultation. Their scale includes 'avoidance' as a factor in addition to positive and negative beliefs.

In a qualitative study, based on an analysis of therapeutic letters written to 'anorexia nervosa, my friend', a variety of pro-AN themes emerged (Serpell, Treasure, Teasdale, & Sullivan, 1999). These were developed into a 'Pros and Cons of Anorexia Nervosa' Questionnaire (P-CAN) and administered to a large sample of people with AN (Serpell, *et al.*, 2004). The commonest positively endorsed items were beliefs that AN made the person with AN feel safe, communicated distress, and stifled emotions, thereby enabling emotional avoidance. This supports the hypothesis of the adaptive function of anorectic symptoms for the person with anorexia, both in intra-personal (increasing sense of safety, stifling emotions) and interpersonal terms (communicate distress). This scale has been adapted for children (Serpell, Neidermann, Haworth, Emmanuelli, & Lask, 2003), showing that younger patients with AN less commonly felt that AN made them special, stifled their emotions, or made them feel trapped, but otherwise were similar in their profile of positive and negative beliefs about the illness. In a further study, the P-CAN was administered together with a measure of personality functioning, the DAPP (dimensional approach to personality pathology; Livesley, Jackson, & Shroeder, 1991). Some of the positive beliefs about AN were found to be correlated with particular personality traits. For example, the 'stifle emotion' subscale was positively correlated with DAPP dimensions assessing restricted expression ($r = .399, p < .001$) and identity problems ($r = .339, p = .001$), and the function of AN in communicating distress was positively related to intimacy problems ($r = .317, p = .002$). However, contrary to the authors' hypothesis, the 'safe' subscale did not relate to the compulsivity factor on the DAPP (Holliday, personal communication). Thus, beliefs about the positive nature of AN appear to match reported domains of personality common in the at risk group; that is, AN seems to have a function that is specific to the needs of the individual with temperamental vulnerability traits.

The effect of pro-anorectic beliefs on outcome of AN

To date, no study has examined prospectively whether the nature, intensity, or persistence of pro-anorectic beliefs predict outcome. One cohort study found that a reduction of pro-anorectic beliefs was associated with a good outcome in patients with

AN attending a day patient programme (Cockell *et al.*, 2003). There have been no randomized controlled trials to examine whether models of treatment that directly aim to modify pro-anorectic beliefs (such as motivational enhancement therapy) improve outcome, although individual case studies (Treasure & Ward, 1997) and cohort studies (Feld, Woodside, Kaplan, Olmsted, & Carter, 2001) suggest that such approaches may be useful.

Additional considerations

Further research is needed to establish the role of pro-anorectic beliefs as a maintenance factor. Intervention research may need to focus specifically on addressing pro-anorectic safety beliefs and help people with AN identify alternative ways of communicating distress and learning to express emotions.

Responses of close others

The nature of close others' response

The outcome of many psychiatric conditions is influenced by the response of close others. One aspect of this response is captured in the construct of expressed emotions (EE), which reflects the amount of criticism, hostility, and emotional over-involvement expressed by relatives of psychiatric patients towards them. High EE is a well replicated predictor of relapse across many different psychiatric disorders (Butzlaff & Hooley, 1998). According to Hooley and Campbell (2002), 'rather than being a trait or state of relatives, EE in all probability reflects the dynamic interaction between patient and relative factors'. Greenley (1986) suggested that the major components of EE are primarily messages asserting dominance in an interpersonal struggle for control (see also Wuerker, 1994). Moreover, high EE relatives have been found to attribute more control over their behaviour or disorder to their ill relative and to behave in a more controlling fashion towards the ill family member than low EE relatives do (Hooley & Campbell, 2002).

Most clinicians would endorse the notion that in AN, the fight for control typically takes place at the dinner table, as meals become the central organizing and communicative focus within most families. Family members frequently engage in protracted arguments about food/weight in an attempt to make the person with AN eat. Such confrontations elicit the rigid, unshakable, pro-anorectic beliefs from the person with AN, which appears to defy logic and reason. The person quite literally digs in her heels. Family members who take on this battle are usually defeated in this fight for control (i.e. they lose emotional control or face). This 'victory' by the person with AN over logic and parental authority is perpetuated, and serves to reinforce anorectic beliefs and behaviours. It may also reinforce beliefs of personal self-potency and self-esteem. An understandable reaction of parents to these unproductive bouts of conflict is to attempt to assert themselves by becoming critical, hostile, and overcontrolling (i.e. expressing high levels of negative emotion). However, the person with AN merely entrenches herself further into AN as a means of avoiding these difficult interactions and defending her 'safety'.

An alternative type of high EE interaction are those where the patient's overt signs of distress and anxiety draw carers into giving comfort and reassurance without any attempts to challenge anorectic behaviours, in order to avoid conflict at all cost. The person with AN becomes special, dominating family routines, and is treated with kid gloves. Mothers may drive for miles to get special food and give inordinate amounts of

time to the preparation and consumption of a special anorectic meal. Thus, a mutually reinforcing cycle of care eliciting and overly supportive care giving arises. This usually means that the needs of other family members are neglected. For example, siblings are ignored and husbands become peripheral. This fuels resentment and hostile interactions from other family members.

Close others' response and effect on outcome

There is good evidence suggesting that outcome of AN is influenced by the emotional reactions of close others. Several studies have found that EE affects adherence to treatment and/or outcome in AN (Eisler *et al.*, 2000, 1997; Stice 2002; Szumukler, Eisler, Russell, & Dare, 1985; Uehara, Kawashima, Goto, Tasaki, & Someya, 2001; Van Furth *et al.*, 1996). Indeed, the effect size of the relationship between living with a relative with high EE and poor outcome is 0.51 (Butzlaff & Hooley, 1998), which is higher than the effect size found for schizophrenia or for mood disorders. This finding must be interpreted with caution as it is based on a single study in AN.

Furthermore, this variable is modifiable by family-based interventions (Eisler *et al.* 2000; Uehara *et al.*, 2001). Interestingly, there is an interaction between level of EE and type of family intervention; namely, families with high EE have a better outcome with separated family therapy (where the parents are seen together and the index patient is seen separately) rather than conjoint family therapy (Eisler *et al.*, 2000). Changes in some of the key attitudes associated with eating disorders; namely; interpersonal trust, maturity fears, and perfectionism (as measured by the Eating Disorders Inventory-2) in the short term have also been associated with a measure of EE (Moulds *et al.*, 2000).

In conclusion, there is preliminary evidence from a small but consistent body of work that suggests that the type of close interpersonal interaction captured in the construct of EE may be a causal maintaining factor in AN. This effect is probably most pronounced where there are high levels of contact between the person with AN and their relatives.

Additional considerations

High levels of EE in relatives of people with AN are related to distress in caregivers (parents/partners) and other family members (siblings/children). High scores on the General Health Questionnaire (Goldberg & Hillier, 1979) in family members are predicted by the burden of care (Treasure *et al.*, 2001), in particular, by uncertainty about how to help (Haigh & Treasure, 2003). As mentioned above, once AN starts to rule family life, families find it increasingly difficult to meet other needs arising within the family and fulfil other roles (Van Furth *et al.*, 1996).

High EE may also be linked to the temperament or personality characteristics of the relatives. For example, Hooley and Hiller (2000) showed that high EE relatives of people with schizophrenia were less flexible and tolerant than low EE relatives. Thus, it is possible that in AN, too, a parent with particular personality traits (e.g. obsessive-compulsive traits) may be drawn into protracted hostile confrontations, whereas a parent with an anxious disposition may be drawn into a cycle of emotional over involvement and care giving.

However, as mentioned above, this is not to say that EE is only the product of factors located in the relative. Certain patient characteristics hold the potential to elicit relatives' high EE and the accompanying controlling behavioural style. For example, in families of people with psychosis, the degree of family involvement in care was associated with emotional over-involvement, whereas number of previous episodes of

illness was associated with level of criticism (Van Os, Marcelis, Germeys, Graven, & Despaul, 2001). Thus, high EE may need to be seen as an expression of well-intentioned but ineffective attempts on behalf of the family to care for their ill relative (Hooley & Campbell, 2002).

Future research should focus on defining further and refining the determinants of high EE and other unhelpful interactive patterns, in terms of specifying patient, carer, and interactive factors, and their effect on persistence of symptoms/relapse and treatment outcome.

Discussion

We have presented a putative model of the maintenance of AN, which differs from other models in that it combines intra- and interpersonal factors. To date, the evidence supporting the role of the different factors mentioned as maintenance factors or even causal maintenance factors is limited. While for some aspects of this model, particularly family emotional interactions, there is reasonably good evidence to suggest this may be a causal maintenance factor; other aspects of the model clearly require further testing both in longitudinal cohort studies and experimental/intervention studies. These mechanisms need to be integrated with what is known about starvation-related mechanisms (see Introduction) to provide a complete account of the maintenance of anorexia nervosa.

How specific are these maintenance factors to AN? The answer to this question is presently unknown. To some extent, it depends on how 'specificity' is defined. For example, pro-disorder beliefs probably play a role in other disorders too (e.g. addictions and other eating disorders). However, the exact nature of pro-beliefs and the strength with which they are held is likely to differ between disorders. For example, Serpell and colleagues examined pro-themes in letters people had written about their AN or their bulimia nervosa in two qualitative studies (Serpell & Treasure, 2002; Serpell *et al.*, 1999). While there was some overlap in positive themes, distinct patterns also emerged. The other three postulated maintenance factors are unlikely to be entirely specific to AN. What is specific however is how they mesh with and become associated with the avoidance of food.

Comparison with other models of AN

In developing a maintenance model for a particular disorder such as AN, there is a balance to be struck between how specific or broad to be in trying to explain and account for certain phenomena. At one extreme, a highly specific model may be too narrow to have broad applicability and utility. At the other end of the spectrum, if a model is not specific enough, then it is unlikely to lead to specific targets for intervention. In our view, in order to be clinically useful, a model needs to be broad enough to account for the majority of cases with a particular disorder.

One prominent cognitive behavioural model of AN, developed originally by Garner and Bemis (1982, 1985) and developed further by Vitousek and colleagues (for review, see Vitousek, 1996) holds that 'anorexic and bulimic symptoms are maintained by a characteristic set of overvalued ideas about the personal implications of body shape and weight. These attitudes have their origins in the interaction of stable individual characteristics (such as perfectionism, asceticism, and difficulties in affect regulation) with sociocultural ideals for female appearance.' Thus, in essence, this is a culture-bound model, which is unlikely to be applicable to people with AN from non-Western cultures.

In contrast, our model accommodates other 'valued' aspects of AN that may be idiosyncratic and therefore not culture-specific.

Fairburn *et al.* (1999) have previously published a highly specific, but also to some extent culture-bound, model of AN as a 'disorder of control'. Although control over emotions and drives is one important aspect of AN, this model cannot explain those cases where the function of the anorexia is interpersonal (i.e. to elicit care from others or to be seen as special). In contrast, our model is specific in that it focuses centrally on the positive function that the AN has in the person's life and on the highly visible nature of the disorder, which invites responses from others, while acknowledging that there are a number of different functions that the AN fulfils for different people both intra- and interpersonally.

The AN as a 'disorder of control' model has now been somewhat superseded by a new transdiagnostic model of eating disorders by Fairburn *et al.* (2003). This model suggests that in addition to the maintenance mechanisms postulated in their earlier model, one or several other additional maintenance mechanisms often come into play in individuals with eating disorders. These are clinical perfectionism, low self-esteem, mood intolerance, and interpersonal difficulties. While alluding to interpersonal difficulties in the broadest sense as one putative maintenance factor, very little detail is given by the authors on just what aspects of interpersonal difficulties might be important here and how these might conspire to maintain AN.

Predictions from the model

Three broad predictions follow from the model: (a) Firstly, it will be difficult for people with AN to break free from the disorder once this is well-established. There is indeed some evidence that this is the case, as the average duration of the disorder has been found to be in the region of 6 years (Herzog, Schellberg & Deter, 1997). (b) Secondly, where people do manage to recover spontaneously, this is likely to involve empathic action from close others/parents. Although very little is known about *how* people recover from AN spontaneously, the one recent small study that focused on this topic found that 'recovery was initiated through the empathic, participatory efforts of parents and friends, or was self-initiated. Respondents with the shortest disorder duration and most complete recovery reported early parental intervention' (Woods, 2004). (c) Thirdly, treatment that does not focus specifically on weight and shape concerns may just as (if not more) effective than treatments that do. There is some recent evidence in support of this notion from a randomized controlled trial comparing Cognitive Behavioural Therapy (CBT) for AN (with a focus on weight and shape concerns) with interpersonal therapy and non-specific supportive clinical management. The latter treatment was the most effective treatment of the three (McIntosh *et al.* 2005).

A number of specific predictions can also be made based on our model: (1) Within the person with AN, we predict (a) a reduction in pro-anorectic beliefs, (b) a decrease in avoidance of emotions, emotionally salient memories and/or intimacy, and (c) a reduction in perfectionism and/or cognitive rigidity will result in symptom improvement.

(2) A reduction in close others' expressed emotion will result in symptom improvement in the person with AN by its effect on reducing pro-anorectic beliefs and reducing avoidance of emotions, emotionally salient memories and/or intimacy.

Treatment implications

Existing CBT models and interventions for AN have tried to build on the success of CBT for bulimia nervosa by adopting a similar treatment focus (i.e. weight and shape concerns) and structure (i.e. using self-monitoring of food intake and cognitions related to eating, weight, and shape as a key therapeutic tool, introduced early on in treatment). The implications from our model are that a somewhat different style, focus, and structure of treatment may be more appropriate.

Even seasoned therapists are often taken aback when they first have contact with someone with AN by these patients' seeming lack of willingness to discuss their difficulties. Thus, it is essential that the therapist works very hard to engage the patient. The empathic, reflective style of motivational interviewing (MI) where the person with AN is seen as the expert and the therapist adopts a curious, patient 'one-down' position, can be very helpful in engaging the person with AN. As Wilson and Schlam (2004) point out, there is considerable 'conceptual compatibility' and 'procedural overlap between CBT and MI. Nevertheless, the distinctive therapeutic style and well-defined clinical procedures of MI are not necessarily inherent in the routine practice of CBT'.

Importantly, an in-depth exploration of the valued function of the anorexia in the person's life together with the identification of relevant pro-anorexia beliefs is essential in establishing a common starting-point.

Pro-anorexia beliefs are *one* aspect of a broader set of illness beliefs (Williams, 1997). Williams points out that it is the interaction between beliefs about the illness and other non-illness related beliefs (i.e. beliefs about self, others, and the world) that gives an illness its own unique meaning for a particular person. Thus, exploration of the origins of the pro-anorectic beliefs early on in therapy usually leads to important pointers about underlying core beliefs, values and personal rules that the person has. For example, someone who believes that AN helps them to stifle emotions may also believe that 'If I show emotions others will see me as weak and despicable'.

As treatment progresses, the focus should be on altering the balance between positive and negative illness beliefs in favour of the latter to create an impetus for change. The techniques of motivational enhancement therapy (Miller & Rollnick, 2002) and externalizing (White, 1988/1989, 1991) can be used to achieve this. Two preliminary studies have used motivational interventions in the first stage of treatment of eating disorder patients in general (Feld *et al.*, 2001) and AN patients specifically (Gowers & Smyth, 2004) and have shown improvement in motivation after the intervention, associated with greater increase in weight gain in those with raised motivation in one of the studies (Gowers & Smyth, 2004).

Given the combination of being emotionally avoidant and cognitively rigid/perfectionist with accompanying attention to detail, patients with AN will often provide a bland superficial account of emotionally significant events or relationships while being extremely willing to discuss in great detail particular dietary rules they follow or the impact of particular foods on their physical state. Thus, the use of self-monitoring techniques, such as food diaries and thought records, widely used in the treatment of bulimia nervosa, will be diligently complied with, with all the minutiae of their meagre diet recorded, yet often without engaging the person in a meaningful way and without leading to any helpful learning points for the patient.

Techniques such as structured writing tasks focused on the role of AN in the person's life, or on key events or relationships may be helpful in reducing emotional avoidance by fostering the expression of and the processing of emotionally salient material while giving patients' greater control over what and how much they feel able to divulge.

Specifically constructed writing tasks can also be used profitably to aid perspective shifting and to help patients get away from an excessive focus on detail and instead to see the bigger picture, all of which reduces cognitive rigidity (for review, see Schmidt, Bone, Hems, Lessem, & Treasure, 2002).

Diagrammatic formulations, typically used in CBT, because of their 'shorthand nature' make it easy for the patient to stay somewhat distant from and avoid the emotional impact of this. Letters, more so than diagrams, speak to the person's emotions. The practice of writing formulation letters derived from cognitive analytical therapy (Ryle, 1995) where the patient is typically presented both with a diagrammatic formulation and a formulation letter may be helpful here. In our experience, patients value these letters highly, and many report feeling very validated by the therapist's effort on their behalf and feeling very understood (Lavender & Schmidt, 2005).

Interpersonal maintaining factors

It is important for the therapist to be mindful of the fact that their own responses may model those of parents or other significant others (i.e. they may become very anxious when faced with a patient who is losing weight rapidly and covering this up by wearing multiple layers of clothes). This may lead to unhelpful therapist cognitions (e.g. about their own helplessness or about the deceptive behaviour of the patient) or unhelpful therapist behaviours, such as 'nagging' the patient about her food intake. Training in the risks of AN, the ability to conduct regular risk assessments, good medical backup and regular supervision are essential prerequisites for the therapist.

A range of different models exist for involving the families in treatment including family therapy, separate family counselling, multi-family group treatment or family skills workshops (for review, see Asen & Schmidt, 2005). The nature, type, and intensity of family involvement needs to be tailored to the developmental stage of the patient and also depends on the degree of involvement patients have with their families.

Testing treatments for AN is a difficult task as evidenced by the low numbers of clinical trials in the field. The medical risks involved make it very hard to be purist and strict dismantling designs testing the importance of different treatment components are difficult to implement. For our model, perhaps the most easily testable hypothesis for intervention research is that an intervention that focuses on *both* individual and family maintaining factors should be more successful than current models of treatment, which typically address only individual or family factors. This is a challenge that we hope the field will take up.

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