



Cognitive theory in anorexia nervosa and bulimia nervosa: Progress, development and future directions

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Abstract

Important developments have taken place in cognitive theory of eating disorders (EDs) (and also in other disorders) since the review paper published by M.J. Cooper in 1997. The relevant empirical database has also expanded. Nevertheless, cognitive therapy for anorexia nervosa and bulimia nervosa, although helpful to many patients, leaves much to be desired. The current paper reviews the relevant empirical evidence collected, and the theoretical revisions that have been made to cognitive models of eating disorders, since 1997. The status and limitations of these developments are considered, including whether or not they meet the criteria for “good” theory. New theoretical developments relevant to cognitive explanations of eating disorders (second generation theories) are then presented, and the preliminary evidence that supports these is briefly reviewed. The lack of integration between cognitive theories of EDs and risk (vulnerability) factor research is noted, and a potential model that unites the two is noted. The implications of the review for future research and the development of cognitive theory in eating disorders are then discussed. These include the need for study of cognitive constructs not yet fully integrated (or indeed not yet applied clinically) into current theories and the need for cognitive theories of eating disorders to continue to evolve (as they have indeed done since 1997) in order to fully integrate such constructs. Treatment studies incorporating these new developments also urgently need to be undertaken.

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1. Introduction

A paper has previously reviewed cognitive theories of eating disorders (EDs), their status, and limitations (Cooper, 1997). Developments in theory that might improve and extend our understanding of cognition and its role in eating disorders were suggested and the implications of these for clinical (specifically cognitive therapy) practice with eating disorder patients were outlined.

Important developments have taken place in cognitive theory of eating disorders, particularly anorexia nervosa (AN) and bulimia nervosa (BN) (and also in other disorders) since the 1997 paper was published. The relevant empirical database has also expanded. The aim of the current paper is to review the theoretical developments that have taken place in our cognitive understanding of eating disorders since 1997 and consider the relevant empirical evidence. The status and limitations of these developments will be assessed, including whether or not they meet the criteria for “good” theory. The relationship between (EDs) and risk (vulnerability) factor research is briefly considered, and a unifying model is noted. Implications for the future, including clinical practice and research, will then be discussed. This will include suggestions for the study of cognitive constructs not yet fully integrated into current theories.

As in the 1997 paper the current review will focus on primarily on AN and BN, and not binge eating disorder (BED) or Eating Disorder Not Otherwise Specified (ED-NOS). Although researchers are becoming increasingly interested in BED, a cognitive theory of BED is still lacking. Moreover, there is some evidence to suggest that BED differs in important demographic, symptom and psychological characteristics from AN and BN, even though it would appear at first glance to have much in common with the latter (for a brief discussion of the differences between BN and BED see Cooper, 2003). Eating Disorder Not Otherwise Specified (ED-NOS), although it appears to be very common in clinical practice (Turner & Bryant-Waugh, 2004), is also currently poorly understood in cognitive terms, and the relevant evidence has not yet been collected or presented in the published literature.

Nine hypotheses derived from four theoretical contributions were considered in the 1997 paper. These are reproduced in Table 1. As in the 1997 paper, and as has been indicated for the reasons outlined above, the discussion will be limited to the two classical eating disorders, i.e. anorexia nervosa (AN) and bulimia nervosa (BN).

The nine hypotheses identified in the 1997 paper were based on four theoretical contributions (Fairburn, Cooper, & Cooper, 1986; Garner & Bemis, 1982; Guidano & Liotti, 1983; Vitousek &

Table 1
Hypotheses derived from early cognitive theories

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1. Treatment based on the models, i.e. cognitive therapy, will be effective;
 2. self statements or automatic thoughts will reflect concern with food and eating, weight and shape;
 3. underlying assumptions reflecting concern with food and eating, weight and shape will be strongly endorsed;
 4. core beliefs will reflect global negative evaluations of the self;
 5. dysfunctional styles of reasoning or information processing errors and biases will be found in food and eating and in weight and shape concerns;
 6. there will be a causal relationship between underlying assumptions and self-statements and eating behaviour, particularly dietary restraint;
 7. dietary restraint, mediated by dichotomous thinking, will result in episodes of binge-eating;
 8. schema driven processes will be evident in areas of core belief concerns;
 9. early experience will be important in the formation of core beliefs.
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Table 2

Themes in eating disorders, 1997–2004

Theme 1

Collection of evidence that tests and further supports the 1997 hypotheses.

Theme 2

Development of revised and new theories.

Theme 3

Development of new, “second generation” theories.

Theme 4

Collection of evidence consistent with second generation theories.

Hollon, 1990). Evidence that supports each of these has continued to be collected, or in the case of some hypotheses, collected for the first time. Simultaneously, cognitive theory has been further developed in eating disorders. Two strands may be identified here—the extension of existing theory (notably that originally proposed by Fairburn and colleagues) and the development of “second generation” theories—those that have taken up some of the new ideas and proposals outlined toward the end of the 1997 paper (notably those developed by M.J. Cooper and colleagues and by Waller and colleagues).

Four themes can usefully be identified in the development of cognitive theory and research in eating disorders since 1997. These will be considered in turn below, and are summarised in Table 2.

2. Theme 1: collection of evidence that tests and further supports the 1997 hypotheses

One theme since the publication of the 1997 paper has been the continued collection of evidence that provides further support for the hypotheses as stated in the 1997 paper. This evidence will be briefly summarised and considered below. Each of the hypotheses identified in 1997 will be discussed in turn.

Hypothesis 1. Treatment based on the models, i.e. cognitive therapy, will be effective.

2.1. *Bulimia nervosa*

Treatment studies of bulimia nervosa patients based on cognitive models have continued to be conducted. As before, most studies have been based on Fairburn and colleague’s model of BN (Fairburn et al., 1986), and have been conducted with BN patients. The field has advanced a great deal methodologically. Most studies now use sophisticated, well controlled designs with careful inclusion and exclusion criteria, and psychometrically sound assessment measures. However, the primary purpose of most studies has been to replicate existing findings with improved methods and designs. Most significantly, a large multi-centre study (Agras, Walsh, Fairburn, Wilson, & Kraemer, 2002) has confirmed the usefulness of cognitive therapy in patients with BN. This is an important finding which extends the validity of the treatment beyond its’ original home (Oxford) and those who were initially involved in developing it (Fairburn’s group). However, it is also important to note that interpersonal psychotherapy (IPT) (which has no focus on food and eating, or weight and shape) was

equally effective in reducing the core eating disorder symptoms at follow-up in this study. A detailed and comprehensive systematic review confirms the suggestion that while cognitive therapy is clearly effective in the treatment of BN it is by no means the only effective treatment, particularly in the longer term, where IPT can be just as efficacious (Hay & Bacaltchuk, 2000). Differences between the two treatments have not as yet been much investigated. However, in Agras and colleagues' study, cognitive therapy was more effective at the end of treatment than IPT, thus it appears to act more quickly. This could be important pragmatically when making decisions about type of treatment to offer. The National Institute of Clinical Excellence (NICE) recommends cognitive behaviour therapy (CBT) be offered as a first line treatment for BN, noting that IPT may be a useful alternative, but that it takes longer to work than CBT (NICE, 2004). To date, however, what works for whom has not yet begun to be studied in detail; it may be that rapid gains are more important for some patients than for others. For example, patients low in morale and motivation may be particularly encouraged by rapid improvements, and thus might benefit most from CBT. Others may prefer and benefit most from a less structured approach or one that does not focus directly on eating. Personality, as well as illness relevant variables, individual experience and personal history may be related to this. Given that many people do not benefit a great deal from either of these two treatments (for example, 37% of those treated with CBT had a DSM-IV eating diagnosis at long term follow-up, Fairburn, Norman, Welch, O'Connor, Doll, & Peveler, 1995), this is an important area for further investigation. In particular, it might help to avoid low motivation and low rates of patient engagement resulting from receipt of unsuitable treatments, not to mention the investment of considerable service resources for minimal return.

2.2. Studies using treatment data to look at mechanisms

More convincing as a test of underlying theory is the evidence that cognitive therapy may have a specific effect on key symptoms and, importantly, on the key cognitive features of BN. Some preliminary evidence for this was reported in 1997, and has subsequently been confirmed in the multi-centre study conducted by Agras and colleagues (Agras et al., 2002). Not only does CBT have a particular impact on weight and shape concerns—the heart of Fairburn's BN model, but it also has a particular effect on other elements highlighted in the model (and in its later revisions, see below), including dietary restraint and negative affect, as well as self efficacy related to eating behaviour (Wilson, Fairburn, Agras, Walsh, & Kraemer, 2002). This provides some support for the underlying model—if these elements were unimportant in the success of treatment then they would not necessarily change. However, the evidence remains relatively weak. It is possible for example, that changing non-cognitive constructs results in secondary or fortuitous change in cognitive aspects of the disorder. Most studies, for example, also make use of non-cognitive change strategies, e.g. self-monitoring of daily intake conducted within a learning theory framework. There is an additional problem in assessing cognitive change—many studies do not use relevant measures to tap into these constructs (Anderson & Maloney, 2001). In particular, it might be argued, for example, that the Eating Disorder Examination (EDE), the measure most often used in these studies is not, strictly speaking, a measure of cognition, but contains many items that measure constructs such as satisfaction and affect. Perhaps, more importantly, existing treatment studies have not generally measured any of the specific cognitive constructs identified as important in the 1997 paper, such as core or negative self beliefs, or disorder specific automatic thoughts.

2.3. *Anorexia nervosa*

As in 1997, there is still no evidence that cognitive therapy, or indeed any psychological treatment, is effective in the treatment of AN. One study has reported on the use of cognitive therapy over a year in the post hospitalisation treatment of AN. Compared to nutritional counselling, cognitive therapy (based on [Garner, Vitousek, & Pike, 1997](#)) was more effective in reducing relapse and drop out, and more patients in the cognitive therapy condition had a good outcome, based on modified Morgan–Russell criteria (cognitive therapy=44%; nutritional counselling=7%) ([Pike, Walsh, Vitousek, Wilson, & Bauer, 2003](#)). This is a very encouraging finding, but it is important to note that patients' BMI had to be at least 17.5 to enter and remain in the study—thus the study was not, as is implicitly acknowledged in the title of the paper, treating patients who met current DSM criteria for AN. In addition, when outcome was assessed using key symptomatology from the Eating Disorder Examination ([Cooper & Fairburn, 1987](#)), including eating, weight and shape concerns, only three patients (17%) could be considered fully recovered. All three were in the cognitive therapy group. A systematic review of treatment for the disorder has concluded “no specific approach can be recommended” (p. 2) and “empirical research is urgently needed to help guide the practising clinician”, p. 19 ([Hay, Bacaltchuk, Claudino, Ben-Tovim, & Yong, 2003](#)). The lack of relevant outcome studies for AN is very disappointing, but perhaps unsurprising given the many difficulties in conducting treatment with this group of patients. AN patients are, for example, notoriously difficult to engage in treatment, and high levels of drop out are common. Even when determined efforts to engage and keep them in treatment are made (e.g. using Motivational Enhancement Therapy as a prelude to cognitive therapy), clinical experience suggests that many do not complete treatment. NICE guidelines ([NICE, 2004](#)) recommend psychological treatment that has a focus on eating behaviour and attitudes to weight and shape, as well as wider psychosocial issues but, in keeping with the sparse evidence base, do not recommend a particular type of therapy. However, it is important to remember that the recommendation for psychotherapy, while clearly a natural (and morally and ethically necessary) response to those with a severe and disabling psychological condition, is not based on empirical evidence that any such treatment is effective.

2.4. *Conclusion*

On the basis of existing treatment research it would appear that both a cognitive model and an interpersonal model may be useful as a framework for treating BN. The efficacy of CBT however, has been much more extensively replicated than that of IPT, giving this conclusion greater validity for CBT. The absence of relevant studies of cognitive therapy in the treatment of AN means that no conclusions about the usefulness of the underlying theory, e.g. as outlined by [Garner and Bemis \(1982\)](#) can be drawn at present from treatment studies. Overall, however, it is important to note (as in the 1997 paper) that treatment studies can provide only relatively weak evidence for the validity of the theory underlying treatment.

Although many CBT studies have now been conducted in BN, very few have assessed the full spectrum of the theoretical constructs as outlined in the 1997 paper. Most studies only assess concern with shape and weight and not the more specific or detailed cognitions that might be important ([Anderson & Maloney, 2001](#)). This might include, for example, disorder specific automatic thoughts in a vicious cycle maintaining bingeing, or cognitions that relate to underlying assumptions or to core or negative self beliefs—constructs highlighted as important in the 1997 paper. This means that our

knowledge of whether and how constructs, now hypothesised to be important in “second generation” theories (see below), change or not with treatment remains very limited. Future studies would benefit the validation and development of theory by including specific measures of such cognitions. While appropriate measures were largely unavailable when early treatment studies were conducted, several well validated measures now exist that could be employed (but have not been), including the Anorectic Cognitions Scale of Mizes (and now revised, see [Mizes, Christiano, Madison, Post, Seime, & Varnado, 2000](#)) to assess attitudes and beliefs specific to eating disorders. Other relevant measures now also exist and while also unavailable to early research studies, could usefully be incorporated into future investigations of treatment efficacy and the mechanisms involved in change. These measures will also be discussed further below.

2.5. *A cautionary note*

A study by Fairburn and colleagues ([Fairburn et al., 1995](#)), reported in the 1997 paper, remains the only longer term follow-up of cognitive therapy with BN patients. Worryingly, at follow-up (mean 5.8 years, 90% ascertainment rate) nearly half the patients, including several of those who had received CBT, met DSM-IV criteria ([American Psychiatric Association, 1994](#)) for an eating disorder. This is not a satisfactory state of affairs; it suggests that while some people clearly benefit from CBT for BN, many do not and remain with significant symptoms and distress both at the end of treatment and at follow-up. Importantly in the present context, one possibility is that the underlying model may not be valid for a significant number of patients. Another possibility is that, while the model is generally valid, the CBT received in research studies has not been adequately delivered. This seems unlikely given the experience and extensive training and supervision that therapists in trials typically receive. The other possibility, which seems more credible, is that we need to do further work on improving and refining the models that we have been using. Others share this view—it has been suggested by a National Institute of Health working party composed of experts in the field, for example, that models need to be more sophisticated in BN ([Grilo, Devlin, Cachelin, & Yanovski, 1997](#)) than they are currently. The same is likely to be true of AN—although it is important to remember that existing models in AN have not yet been adequately tested in treatment studies.

Hypothesis 2. Self statements or automatic thoughts will reflect concern with food and eating, weight and shape.

Research on self statements, popular in the 1980s in several fields where cognitive models were being developed, seems to have declined considerably. No studies focussing on this area in patients with eating disorders were found that had been conducted since 1997. This was true both of the development of self report questionnaires and techniques from experimental psychology, such as thinking aloud or thought listing. This may be regrettable, since such detailed studies of the phenomenology of cognitions have an important role to play in areas where relatively little is known about relevant cognitions, including in eating disorders ([Cooper & Fairburn, 1992](#)).

Hypothesis 3. Underlying assumptions reflecting concern with food and eating, weight and shape will be strongly endorsed.

Interest in attitudes, assumptions and rules relevant to eating disorders has continued. Two types of study have been conducted. One focuses on the detailed and specific assessment of cognitions, the other

focuses on the general assessment of the importance of weight and shape in determining self worth. Much of this research has employed self-report questionnaires.

Research using Mizes' Anorectic Cognitions (MAC) scale has added to the existing body of evidence obtained using this measure. A study has now demonstrated that patients with eating disorders are characterised by dysfunctional beliefs about weight, shape, food and eating, and differ from controls and also restrained eaters in this (Bonifazi, Crowther, & Mizes, 2000). A revised MAC has also been developed which, unlike the original version, distinguishes types of eating disorder on two subscales and total score. Anorexics score lower on the self-control subscale, approval subscale and total scale score, i.e. have fewer concerns about these issues than bulimics (Mizes et al., 2000). The study did not include a dieting group to investigate whether dieters were also different from the patients, but did include an ED-NOS group, whose scores appeared to fall between those of the AN and BN group, although no significant differences were identified. This finding is consistent with findings obtained using the Eating Disorder Belief Questionnaire (Cooper, Cohen-Tovee, Todd, Wells, & Tovee, 1997)—to be discussed later.

One study has used Fairburn's weight and shape subscales of the Eating Disorder Examination (EDE: Cooper & Fairburn, 1987) to investigate specific hypotheses. This found that bulimics scored more highly than restrained eaters and normal controls on over-concern with weight and shape and importantly, on the degree of influence both had on participant's self evaluation (Goldfein, Walsh, & Midlarsky, 2000).

A new measure, the Shape and Weight Based Self Esteem measure has been developed by Geller and colleagues (SWBS: Geller, Johnston, & Madson, 1997) and used in a series of studies with eating disordered participants. Again, although not entirely cognitive in construction, studies support the usefulness of the construct. Like Mizes' MAC it has the advantage of good reliability and validity (Geller et al., 1997). It successfully distinguishes women with eating disorders from other psychiatric groups and controls (Geller, Johnston, Madson, Goldner, Remick, & Birmingham, 1998).

Neither the EDE or SWBS measure is strictly speaking entirely cognitive in construction, but the studies using them provide some indirect, converging validity for the importance of a link between dysfunctional beliefs and the self. This is an area of considerable and growing interest, and very relevant to testing important aspects of the "second generation" models.

Hypothesis 4. Core beliefs will reflect global negative evaluations of the self.

Only one relevant study of core beliefs in eating disorders was presented in the 1997 paper. Two groups of researchers have since focussed on the topic, and a growing body of research is emerging. One detailed semi-structured interview study has provided information on the core beliefs of patients with AN, comparing the patients with dieting and non-dieting controls (Turner & Cooper, 2002). A series of studies using the Eating Disorder Belief Questionnaire (Cooper et al., 1997) has found that negative self (or core) beliefs are characteristic of patients with AN and BN (Cooper et al., 1997). These beliefs are also typical of patients with AN but not dieters (Turner & Cooper, 2000), and of both BN patients and patients with depression (Cooper & Hunt, 1998). Adolescent in-patients with AN also score highly on negative self beliefs (Bradford & Rutherford, 2001). The Young Schema Questionnaire (e.g. Young, 1998) has been used by the second group of researchers in several studies. Findings indicate that patients with eating disorders (either AN or BN) have higher levels of unhealthy core beliefs than controls (Leung, Waller, & Thomas, 1999), as do those with BN (Waller, Ohanian, Meyer, & Osman, 2000).

2.6. Conclusion

These studies further support the suggestion made in 1997 that negative self or core beliefs are characteristic of those with eating disorders. The evidence is robust, given that the effect has been confirmed using a variety of measures and methodologies, and by two independent groups of researchers. Studies such as these have played an important role in the development of “second generation” theories. Their findings have opened up an area that had previously been relatively ignored in empirical studies of cognition relevant to EDs and played an important role in ensuring that cognition at this level was incorporated into theory.

Hypothesis 5. Dysfunctional styles of reasoning or information processing errors and biases will be found in food and eating and in weight and shape concerns.

A large number of studies have been conducted to demonstrate that information processing in eating disorders is disturbed when food and eating, weight and shape stimuli are used. These have built on the studies reported in 1997.

2.7. Attention

There have been several additional studies using the Stroop paradigm in ED patients. One study has built on existing studies by demonstrating that information processing in bulimic patients, compared to normal controls, is affected by transient environmental changes in mood and presence of food cues (Carter, Bulik, Lawson, Sullivan, & Wilson, 1997). This suggests that attentional bias may be context and cue dependent, as well as being a more stable bias that distinguishes between groups. Thus provides support for the suggestion that biased attention to eating disorder related information may be important on a day to day, moment by moment basis in the maintenance of eating disorder symptoms. This is an important study when considering the evidence that vicious circles including cognitions and their associated processes may play a key role in maintaining eating disordered behaviour.

Several studies have examined the effect of treatment on information processing in BN patients. One study has partially replicated Cooper and Fairburn (1994), and found that patients become faster at colour-naming eating disorder related stimuli after treatment, at least for body but not food related stimuli. The effect was not present in those who had recovered, including those recovered for short and longer periods (Flynn & McNally, 1999). However, other studies have not replicated the effect, even when only those who had responded to treatment were tested (Black, Wilson, Labouvie, & Heffernan, 1992; Carter, Bulik, McIntosh, & Joyce, 2000).

One study has employed a computerised version with patients with BN, and replicated previous findings of slowed colour naming for shape and weight related words, also showing that the computerised version was more accurate and sensitive than a voice activated version (Davidson & Wright, 2002).

Another has found that both positive and negative body shape words are salient for women with AN, and that the attentional bias is conscious, rather than preconscious (Sackville, Schotte, Touyz, Griffiths, & Beumont, 1998).

One study has built on work by Waller and colleagues (e.g. Waller, Watkins, Shuck, & McManus, 1996), and used a Stroop task to investigate attentional bias to threat words signalling non-eating related ego threat. Anorexia nervosa and BN patients took part and some (limited) support was found for the “escape” hypothesis of BN (Quinton, 2004). This study provides some important and additional support

for the proposal that non-eating, weight and shape related constructs (for example, core beliefs) are important in patients with eating disorders.

There has also been some interest in alternative attentional tasks. One study, using a visual probe task, found that patients with eating disorders detected target words more slowly when they appeared in the same location as had stimulus words related to a thin physique, but detected them more quickly when they appeared in place of words related to a large physique. The effect was not found in restrained eaters (Rieger, Schotte, Touyz, Beumont, Griffiths, & Russell, 1998).

2.8. Memory and other cognitive biases

There has been less interest in investigating memory biases in EDs. One study found that AN patients had a strong explicit memory bias for anorexia related words, but not for control words, than non-dieting participants (Hermans, Pieters, & Eelen, 1998). Unlike earlier studies, stimuli were matched for affective–evaluative similarity, thus eliminating differences in this as a potential explanation for the effects observed. Another study, also controlling for emotionality, as well as using body words not related to patients concerns, and including a depressed control patient group, found that women with BN showed a bias to recall positive and negative weight and shape words compared to emotional words. However both depressed and BN patients showed a bias to recall food related words, and this was related to self reported hunger (Hunt & Cooper, 2001).

There have also been a small number of studies of other potential biases in information processing. Thought shape fusion describes the belief that having a thought about food or eating increases the person's estimate of shape and/or weight, elicits a sense of moral wrong doing and increases feeling fat (Shafran, Teachman, Kerry, & Rachman, 1999). A study of AN patients found that these patients did indeed demonstrate such a bias. Neutralisation also reduced anxiety, guilt, likelihood of weight gain, feeling fat and urges to neutralise.

An interesting approach has been taken by one research group using a perceptual set task (Tchanturia, Serpell, Troop, & Treasure, 2001). The task is independent of eating, weight and shape concerns and investigates a generic bias. Unlike bulimics, patients with AN displayed a rigid pattern of responding to stimuli changes. Patients with AN, and recovered anorexics, also seem to make more perseverative errors than controls (Tchanturia, Morris, Surguladze, & Treasure, 2001).

2.9. Conclusion

Information processing studies have begun to progress beyond simple examination of the presence or absence of a bias in ED patients when stimuli related to their concerns are used—and this is a welcome development. Paradigms new to EDs have also begun to be employed, and help to confirm and validate the initial Stroop findings. More sophisticated studies allow the precise nature of the bias to be teased out by controlling for evaluative and affective properties, and matching content more precisely (e.g. by comparing body parts that are significant to those with EDs and those that are not) either within groups, or by including other psychiatric control groups. Some interesting studies have also found that generic biases are important (i.e. those not specific to food and eating, weight and shape). This provides support for the suggestion that constructs such as core or negative self beliefs are important in EDs. Some of the findings, especially those that find differences between different types of eating disorder, are also of importance to consider when evaluating the use and applicability of recent interest in transdiagnostic

approaches to psychological processes (Harvey, Watkins, Mansell, & Shafran, 2004). This includes the development of a transdiagnostic model of eating disorders (Fairburn, Cooper, & Shafran, 2003)—which will be discussed further below.

Hypothesis 6. There will be a causal relationship between underlying assumptions and self-statements and eating behaviour, particularly dietary restraint.

No directly relevant studies could be found.

Hypothesis 7. Dietary restraint, mediated by dichotomous thinking, will result in episodes of binge-eating.

No directly relevant studies were found. One indirectly relevant study addressed the hypothesised link between dietary restraint and binge eating—but without assessing dichotomous thinking. This demonstrated that food deprivation (duration 19 h) did not trigger bingeing or marked overeating in patients with BN, compared to restrained and non-restrained eaters (Hetherington, Stoner, Andersen, & Rolls, 2000).

Hypothesis 8. Schema driven processes will be evident in areas of core belief concerns.

Using the Young–Rygh Avoidance Inventory (Young & Rygh, 1994) Waller and colleagues have found some evidence that bulimic women report higher levels of avoidance of schema (Spranger, Waller, & Bryant-Waugh, 2001).

Hypothesis 9. Early experience will be important in the formation of core beliefs.

The link between early life experiences and the development of core beliefs has been investigated in a study of women who had a history of an ED (Sarin & Abela, 2003), using the a Life Story Interview. However, while the study provided evidence confirming the role of core beliefs in EDs using a novel methodology, the data was not examined for the presence of links between the early experiences identified and the development of these beliefs.

A study with AN and BN patients however did identify a causal link between negative early experiences and the development of core (or negative self) beliefs (Cooper, Todd, & Wells, 1998). A further study with AN patients, using a more detailed, semi-structured interview, but including dieting and non-dieting control groups in addition to a patient group, also identified causal links between negative early life experiences and the development of core beliefs but only in the patients (Turner & Cooper, 2002).

The link between core beliefs and early attachment experiences has also been investigated. This study found links between parental bonding, using the Parental Bonding Instrument (PBI: Parker, Tupling, & Brown, 1979) and core beliefs (Leung et al., 1999).

2.10. Overall conclusion

The increase in evidence in this area overall is commendable, and provides welcome converging evidence for the validity of the four cognitive theories (or theoretical contributions) outlined in the 1997 paper. Importantly, there has been growth in the number of studies investigating the role of core beliefs, as well as interest in identifying how their development might link to early experiences, including attachment experiences. This research has validated the importance of this construct and links in EDs

and, as evident in studies such as [Leung et al. \(1999\)](#), begun to explore an area which has been very neglected in cognitive theory of EDs—how developments in cognitive theory may interface with developments in attachment theory, the latter currently having the potential to provide a much more detailed account of the role of early experience in the development of an ED than current cognitive theories.

However, it is perhaps disappointing that there is not more research in certain areas, including studies of the mechanisms involved in the theories. The Hypothesis 7 that dietary restraint, mediated by dichotomous thinking, will result in episodes of binge eating has rarely been studied in patients with BN. The proposed causal link between assumptions and self statements and eating behaviour, specifically restraint (Hypothesis 6) has also not been further studied in patients. Moreover, while research has (importantly) opened up new areas of cognition relevant to eating disorders (especially in relation to core beliefs and schema), much of the remaining research has either replicated or confirmed what was already known, i.e. that certain cognitions are important in EDs. While replication is very important, as is careful and detailed extension of existing paradigms to locate the precise nature of a deficit (as has been conducted in some information processing tasks), there is limited evidence of innovation and originality in many of the studies conducted. Significantly, the heart of any cognitive model, the proposed causal relationship between cognition and disturbed behaviour, remains largely untested in patients with EDs, either longitudinally, in cross sectional designs controlling for relevant variables statistically, or in tightly controlled experimental designs in which relevant cognitions are manipulated and the effect on relevant behaviour is measured.

3. Theme 2: development of revised theories

The second theme apparent since 1997 has been the development of revised cognitive theories of EDs. These include a revised BN theory ([Fairburn, 1997](#)), a theory of AN ([Fairburn, Shafran, & Cooper, 1999](#)), and a trans-diagnostic theory ([Fairburn et al., 2003](#)) which attempts to provide a single framework within which to conceptualise all EDs.

Fairburn's BN theory has been modified by adding mood as contributing to the maintenance of binge eating ([Fairburn, 1997](#)). This is a welcome addition, and is consistent with the evidence about the role of mood in maintaining binge eating, for example as highlighted in several detailed analyses of the moment by moment relationship between negative mood and binge eating (e.g. [Lingswiler, Crowther, & Stephens, 1989](#)). It is not a new idea, and is consistent with the escape hypothesis advanced to explain binge eating by [Heatherton and Baumeister \(1991\)](#), but is important in bringing the theory up to date by including a previously excluded but highly relevant phenomenon in EDs.

A model of AN has been developed centered around an extreme need to control eating, plus the importance of self worth judged in terms of weight and shape ([Fairburn et al., 1999](#)). This is also an important development, and unlike most previous theories places control in a central position within the model. As [Fairburn and colleagues argue \(1999\)](#) the importance of control, while striking clinically, has been neglected in theory development—although, as they also note, it has been an important construct historically. Three feedback mechanisms are proposed. These are: dietary restriction enhances the sense of being in control; aspects of starvation encourage further dietary restriction; and extreme concerns about weight and shape encourage dietary restriction. A trans-diagnostic model, consisting of four modules (low self esteem, mood intolerance, clinical

perfectionism and interpersonal difficulties) plus weight and shape concerns has also been developed (Fairburn et al., 2003), based on the revised BN theory (Fairburn, 1997). Unlike previous models this model is designed to be applicable to all EDs, including eating disorder not otherwise specified (ED-NOS). It makes a welcome contribution to the understanding of this very large group of ED people who do not fit into traditional DSM categories, and who have largely been ignored in theory development. Each module is a potential maintaining mechanism (in addition to the weight, shape and eating focus or module of the BN theory), different modules may be relatively more important in individual patients, and common mechanisms are thought to be involved in the maintenance of all EDs. It is not meant to replace existing theory, but to supplement and broaden it by including some previously neglected aspects of eating disorders that have not always been fully considered in previous theories. It certainly achieves this aim—all the additional modules concern topics previously found to be highly relevant in ED patients.

There is as yet (and understandably) very little evidence that specifically aims to test these models, thus their worth and value is as yet unknown. A vital first step in this process is to uncover the predictions that these models might make. Of particular importance are the additional predictions they make, when compared to the theories and frameworks that already exist. Consideration of the three theories identifies at least six new predictions.

1. Negative mood has a causal role in relation to binge eating.
2. Need for self control is important, especially in AN.
3. Dietary restriction leads to an enhanced sense of control.
4. Starvation encourages dietary restriction.
5. Perfectionism is important, especially in AN.
6. Interpersonal difficulties are important.

Some limited evidence already exists for these six predictions in ED patients, and is briefly summarised below.

Several studies have noted that negative mood often precedes binge eating in those with BN (e.g. Elmore & De Castro, 1990). Anecdotally, the need for self control also appears to be very important in AN and dietary restriction appears to be causally related to enhanced feelings of self-control in patients' accounts of the disorder (see, for example, Fairburn et al., 1999). Perfectionism has been widely studied, particularly in relation to AN, and much evidence supports its importance in the disorder (e.g. Halmi et al., 2000). Interpersonal difficulties have also been reported (e.g. Grissett & Norvell, 1992).

Of equal interest here, however, in addition to evidence such as that cited above, is whether the revised, and new models (and the predictions derived from them) represent an advance in the development of cognitive theories of EDs. Overall, despite the developments that have occurred and that have been highlighted here, the criticisms made of the models that were being used in 1997 (and of the evidence supporting them) seem, largely, to remain valid, and apply equally to these new developments. As with the earlier models, there is little attempt to develop a longitudinal formulation, or to describe the typical vicious circles of cognition, emotion and behaviour that might maintain the ED. Importantly, there are no additional predictions about cognitions (or their nature and role) that are not already contained in the 1997 predictions. None of the six new predictions outlined above are specifically cognitive in nature. Like the earlier theories, they do not generate very specific predictions; for example, they are still unable to predict who will develop BN and who will develop

AN, or indeed who will manifest which of the several key eating disorder related behaviours. The new models do highlight the role of previously rather neglected factors (notably perfectionism, control and interpersonal issues). However, while this is valuable and welcome it does not greatly advance our understanding of the role of cognition in EDs. The 1997 paper suggested that more detailed understanding and knowledge of the precise cognitions and cognitive variables involved in EDs was important for the advancement of cognitive theory. Importantly, however, the new theories do not attempt to tackle these issues, either for the constructs and themes already recognised as important in EDs (and highlighted in the 1997 paper) or for those that have been added more recently. Existing themes (e.g. assumptions and beliefs) remain largely unmodified and undeveloped in the new theories, and the new themes (perfectionism, control, interpersonal issues) appear to have simply been “added on”. Although the new themes have been added with some rationale, i.e. these themes are undoubtedly important issues in eating disorders, they have not generally been added on with a cognitive perspective in mind. The result is identification of a number of extremely and indisputably important issues, but relatively little in depth analysis and knowledge of how these issues and concerns might be developed or translated into a coherent, explicitly cognitive explanation of the maintenance and development of eating disorders.

Before discussing Theme 3, how “second generation” theories advance our understanding of cognitive constructs and theory in eating disorders, and Theme 4, the evidence that supports these models, it may be useful to examine the question, what makes a good theory, and to consider the status of current cognitive theories of ED in the light of any criteria identified.

4. What makes a good theory?

Kurt Lewin is widely credited with the observation “there is nothing as practical as a good theory”. It is difficult to overestimate the importance of theory, and it has been suggested that all really revolutionary and significant advances that have occurred in the history of science have been the result of new theories (Conant, 1952). Traditionally, however, psychologists, compared for example to other scientists, have paid much less attention to theory development than to the collection of empirical data. Indeed, it is only relatively recently that a “new era of rationalism” (Kukla, 2001, p. 10) has been ushered in. Importantly, when considering cognitive theory, some of the best and most influential work has been developed within a cognitive framework, albeit by non-psychologists. One useful definition is “a theory is a set of interrelated hypotheses or propositions concerning a phenomenon or set of phenomena” Shaw and Costanza (1982). This is a minimal definition, but it encompasses many of the essential concepts as delineated by the philosophy of science. A paraphrase of the definition might be “a summary of known “facts” and conjecture about the implications of facts and the probable relationships among them” (Shaw & Costanza, 1982).

Not all theories are equally “good” (Kuhn, 1970). Necessary and desirable characteristics of a good theory have been described (e.g. Shaw & Costanza, 1982), and Kukla (2001) as well as Hyland (1981) outline the differences between “good” and “bad” theory in some detail. The most important characteristic is that it can be tested, and when tested should receive empirical support. This is sometimes described as an external criterion. In other words, predictions must agree with known facts and future observations, i.e. they must have predictive power, and be capable of being refuted. Additionally, certain internal criteria should be present, i.e. the theory must be internally consistent—the

propositions must not be inconsistent or contradictory, e.g. in the predictions that they make. It is desirable that it is as simple as possible—in description and deduction; economical—contains as few principles as possible to explain the phenomena; and is consistent with related theories that have a high probability of being true; as well as providing a useful basis for research.

The main problem when applying these criteria to the three ED cognitive theories described under Theme 3 (as well as to the very early cognitive theories of AN and BN) is the external criterion: they do not capture the full and detailed range of cognitive phenomena now identified in patients with EDs or the full meaning that patients describe clinically. Additionally, when they are compared to theories for which there is considerable evidence (e.g. cognitive theories of anxiety disorders) no precise links between cognitions and behaviour, emotions and physiology are identified. This is perhaps unsurprising given the lack of detail available on cognition in EDs when the early theories were developed. However, more detail is now available and the theories described above now seem out of step, or behind that of other disorders, where more sophisticated and detailed modelling of cognition, behaviour, emotion and physiology is being used.

4.1. Developmental vs. maintaining factors

In cognitive theories of psychological disorders, including those of EDs, a distinction is often made between the factors that maintain a disorder and those that lead to its development. Historically, most cognitive theories of EDs have been concerned primarily with the constructs that maintain disordered eating, rather than with those that may have led to its development. It has often been assumed that understanding the maintenance of an ED is sufficient for effective CT treatment to be developed. This is particularly true in BN, and might lead to the conclusion that only detailed understanding and knowledge of maintaining factors is, therefore, theoretically important. However, it is becoming clear that, in eating disorders, the distinction is not clear cut, and that so-called “developmental” factors are intimately involved in the maintenance of EDs. This complex interrelationship has been outlined in more detail in recent theoretical developments, and also has some preliminary empirical support. These developments and their related research findings will be discussed further in the next section of the paper.

Two theories that attempted to address the problems with existing theories, including the relative neglect of developmental factors, are those of [Cooper, Wells, and Todd \(2004\)](#), for BN and [Waller, Kennerley, and Ohanian \(2004\)](#), for eating disorder schema theory. These might be described as “second generation” theories and are briefly summarised below.

5. Theme 3: development of new, second generation theories

Second generation theories depart from the old, in that they generate detailed and specific predictions about the nature and role, including the mechanism by which they operate, of the cognitions which are characteristic of these disorders. They do not merely focus on adding themes to existing theories, but attempt to tease apart the detailed cognitions, their precise content, and their links to the emotion and behaviour involved, including those involved in existing constructs or themes as well as integrating those constructs that may be more novel. The two main theories in this category are described below.

5.1. *Cooper et al. (2004)*

This cognitive theory of BN includes reference to a wide range of cognitive constructs and content. It outlines a vicious circle model of the maintenance of BN, and explains the development of the disorder. Automatic thoughts of four kinds, in addition to negative self beliefs, are important in the vicious cycle maintaining binge eating. These are thoughts of no control (e.g. I can't stop eating), permissive thoughts (e.g. an extra piece of toast won't hurt), positive thoughts (e.g. eating will help me feel less distressed) and negative thoughts (e.g. I'll gain a huge amount of weight). Underlying assumptions about weight, shape and eating and negative self or core beliefs are important in the development of the disorder. These include assumptions related to self (e.g. if I gain weight, I can't like myself) and others (e.g. if I lose control of my eating, no one will love me), and negative self beliefs (e.g. I'm worthless). There are clear links between behaviour, emotion, cognition and physiology, including links to interoceptive cues. Precise and testable predictions may be made, and there are readily applicable implications for cognitive therapy.

The theory has been applied more broadly to explain cultural differences in the existence and development of eating disorders (Cooper, 2001) and some preliminary links have also been made with attachment theory, with the aim of providing a more detailed explanation of the development and nature of core beliefs and their associated processes than is currently available in existing cognitive theories of eating disorders (Cooper, *in press*).

5.2. *Waller et al. (2004)*

This theory explains at a schema level why some people develop AN and why others develop BN. Briefly, AN is characterised by primary avoidance—not eating is a way to prevent distressing cognitions and emotions from being experienced. BN, however, is characterised by secondary avoidance—bingeing is an attempt to banish or block the experience of distressing emotions and cognitions.

Some of the predictions that may be derived from these two theories can be seen in [Table 3](#).

Table 3

Hypotheses derived from Cooper et al.'s BN theory

1. Self-statements or automatic thoughts will include positive and negative thoughts about eating, thoughts of no control, and permissive thoughts.
2. Core beliefs will reflect global negative evaluation of the self.
3. Schema-driven processes will be evident in areas of core belief concerns.
4. Early experience will be important in the formation of core beliefs.
5. Bingeing will be preceded by negative cognition and emotional distress.
6. Bingeing will be followed by negative cognition and emotional distress.
7. There will be a causal relationship between the different types of automatic thought specified in the model and binge-eating.
8. Negative thoughts about eating will be causally related to vomiting (or other compensatory behaviour).
9. Positive thoughts about eating will be causally related to binge-eating.

Hypotheses derived from Waller et al.'s schema theory

1. AN will be associated with “primary process”, prevention of affect generated by core beliefs.
 2. BN will be associated with “secondary process”, avoidance of affect generated by core beliefs.
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As well as incorporating much of the new research on cognition, both the theories outlined by Cooper and colleagues and Waller and colleagues are consistent with theory development elsewhere in cognitive therapy, and provide a clear link between cognition, affect and observable behaviours relevant to eating disorders.

A third theoretical contribution also deserves mention here, although there is currently less empirical evidence to support its constructs. This is the cognitive model of AN described by Wolff and Serpell (1998). It shares features of the models described by Cooper and Waller, for example in highlighting self schema and emotional regulation, and is useful in its identification of specific belief content, and typical safety behaviours, as well as the importance of rumination or worry about food and eating, weight and shape—the latter which is often underestimated in its contribution to patient distress. However, it also adds several important and innovative ideas on cognitive constructs relevant to EDs that have not yet been adequately addressed elsewhere. These include the beliefs that the patient may have about her illness, e.g. what it means to her to have AN (as opposed to the characteristic symptoms). This may include “pro-anorexia” and “anti-anorexia cognitions”, such as “if I didn’t have anorexia, my whole world would fall apart”, or “anorexia stops me from having a life”. Positive automatic thoughts are also important, e.g. “I look more attractive”, as well as (like Cooper’s theory) judgements based on interoceptive cues. The extent to which these constructs are also characteristic of BN is unclear.

6. Theme 4: collection of evidence consistent with second generation theories

This includes evidence which is consistent with some of the recommendations for further research and theory development made in the 1997 paper, but also goes beyond these recommendations. The findings have been incorporated into theory development, with the advent of “second generation theories” and, as is usual in theory development, there has been a two-way feedback loop between theory development and the collection of empirical evidence.

The research relevant to this theme has been generated by two main groups. Cooper and colleagues have identified different types of self statement (or automatic thoughts) that are important in BN. Some of these are also likely to be relevant to AN. The types include positive thoughts, permissive thoughts, lack of control thoughts, and negative thoughts (Cooper et al., 2004). They have identified different types of underlying assumptions (Cooper et al., 1997), and found that core beliefs in eating disorders typically reflect global negative self evaluation (Cooper et al., 1998). This work has also found that links exist between early experiences and the formation of core beliefs, between self statements and the maintenance of binge eating, and between schema driven processes and core beliefs. Unlike previous cognitive theories of BN, an explicit and detailed cognitive mechanism is clearly articulated and integrated into the model.

Many of these findings have arisen from detailed semi-structured interviews of eating disorder patients. One of the strengths of this line of research is the recognition that there is still a great need for detailed exploration of the basic phenomena—of both behaviour and associated cognitions—in order to progress understanding of EDs. Such detailed analyses have been curiously lacking in recent years. While the trend to use well validated and standardised measures has much to recommend it, over reliance on their use in a relatively unknown area may well mean that few or no new discoveries are made. This research has also demonstrated an awareness of the need for appropriate control groups, including dieters. It has also separated AN from BN. Some recent trends have favoured the merging of eating disorder categories, not least because of apparent similarities between them in cognition. But

failure to identify differences between them may well be due to the fact that very few studies have examined the cognitions relevant to the very different behaviours that are involved in the two disorders (as opposed to those typical of the diagnostic categories). In exploring cognitions, it is also important to remember that even apparently similar behaviour may be maintained by very different cognitions—which may then have very different implications for treatment.

Waller and colleagues have focussed more on core beliefs, and potential differences in content of beliefs linked to different eating disorder related behaviours. The majority of their studies have used self report questionnaires, together with a small number of experimental designs. Finding few consistent differences in the content of core beliefs they have developed a theory of schema functioning in AN and BN based on differences between the two disorders in schema driven processes (Waller et al., 2004). While this is important in acknowledging that differences are likely at a cognitive (schema) level, use of standardised measures and measures not specific to EDs may mean that important differences in the content and nature of cognition between the characteristic behaviours in the two disorders have been overlooked. Just as preliminary data at the self statement level has identified specific types of cognition that may be characteristic of BN and not AN (Cooper, Todd, Woolrich, Somerville, & Wells, submitted for publication), detailed analysis of data at the core belief level might also provide useful insights into beliefs that are typical of one disorder rather than the other. Indeed we have some preliminary data suggesting that there may well be differences between disorders at this level (Cooper, Rose, & Turner, in press).

6.1. Risk factors, vulnerability and cognitive theory

One very relevant area of research that has not been discussed so far in this paper is the evidence on risk factors for EDs—both the factors that affect the risk of developing an ED, and the factors that predict good and poor outcome. This research has developed largely in isolation from work on cognitive constructs and cognitive theory. It has often been atheoretical or multidimensional in orientation, and focussed on statistical rather than theoretical predictors. However, it has generated some insights into the development and maintenance of EDs and as such needs to be integrated with current knowledge derived from cognitive theory. A recent paper addresses this question in some detail, and provides a complementary discussion (Cooper, in press), to that outlined here, and the interested reader is referred to this paper for a more detailed discussion and analysis. Briefly, the paper distinguishes risk from vulnerability and highlights the theoretical framework implicit in the use of the term vulnerability. It proposes a detailed “vulnerability stress” model which highlights the role of key developmental systems, including affect, biology, and social/behavioural as well as cognitive factors. It thus draws on attachment and neuro-developmental as well as cognitive theories. The paper represents an initial attempt to integrate different research and theoretical fields in ED from a cognitive perspective and, as such, differs in aims from the current paper. It is, however, fully compatible with the present analysis, and from a cognitive perspective focuses particularly on the origins, development and content of core beliefs, schema and underlying assumptions.

As will be apparent, the development of cognitive theory is not static. New ideas are appearing all the time that may well eventually need to be incorporated into a new theory or theories of eating disorders. Some of those already or currently known to be in the process of being investigated by existing research teams include metacognition, thought–action fusion, interoception, emotional belief, imagery and the role of early memories. Other constructs, such as those identified by Wolff and Serpell (1998) are also being investigated, either by Serpell and colleagues, or other research groups, including pro and anti

anorexia beliefs, and illness related beliefs. None have yet been adequately studied or fully incorporated into the second generation cognitive models of EDs. A good model needs to be flexible enough to encompass any new ideas and constructs—the second generation models will, in turn need to adapt and evolve to encompass new ideas such as these. This may ultimately involve integration with ideas and constructs from non-cognitive theories—as touched upon in discussion of the vulnerability stress model. Meanwhile, it is important to remember that the second generation models are at an early stage of development. Their usefulness will need to be examined in further research and also tested in treatment studies. Given the novelty of some of the cognitions and constructs involved in these theories this will almost certainly require adaptations to cognitive therapy for EDs, and the development of novel strategies to tackle the novel constructs and relationships being identified.

7. Conclusion

Development has occurred in this area in the last 6 years, not only in the collection of new evidence to test old models, but also in the development of new models, and the initiation of new research to test new ideas. Studies are now needed to test some of the new ideas, especially the predictions outlined in Table 3. If these new predictions are upheld, then treatment implications need to be derived and developed. An important area for further work is the development and application of these ideas to improving understanding and ultimately treatment of ED-NOS. Further work is also urgently needed to translate some of the second generation theories into effective treatments for both AN and BN, and to evaluate any such treatments. The field must also stay open to the continued emergence, development and study of new cognitive constructs, derived from research and theory development in other psychological disorders as well as from research and theory development in non-clinical cognitive psychology. One additional and important area for further development is integration with other theoretical contributions. These ideas and data may have power to add further to the explanation of the development and maintenance of the cognitions and behaviours characteristic of those with EDs.

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