Cognitive content and schema association in eating psychopathology

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Abstract

The literature review paper of the thesis (*Cognitive content and eating psychopathology*), discusses the problem of moderate remission rates achieved by standard cognitive-behavioural (CBT) approaches to bulimia nervosa, and suggests that current CBT conceptualisations of bulimia nervosa require revision. New research that emphasises the importance of core beliefs, and a schema-focused understanding of bulimic psychopathology is discussed. However, research adopting a schema-focused approach to bulimia has yet to delineate the relative importance of different core beliefs in triggering bulimic behaviours, particularly because accessing such deep-rooted cognitions is problematic. The review emphasises the importance of core beliefs in bulimic psychopathology, and suggests strategies that may aid researchers and clinicians in accessing cognitive content and process.

The empirical paper (*Schema association in eating psychopathology: A study of non-eating-disordered women using the Implicit Association Test*) addresses the deficit in the literature as to the level of association different schemas have with dysfunctional assumptions related to food, weight, and shape. The study used a new method – the Implicit Association Test, to assess whether adandonment schemas are more closely associated than depressive schemas with food, particularly in women with more bulimic attitudes. The results did not support this experimental model. The methodological and conceptual factors for the non-significant findings are discussed, along with clinical and research implications.

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RUNNING HEAD: COGNITIVE CONTENT; EATING

PSYCHOPATHOLOGY

Footnotes

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2588).

Abstract

Cognitive-behaviour therapy (CBT) is considered to be the treatment of choice in bulimia nervosa. Traditional cognitive-behavioural models have focused on bulimics' concerns regarding weight, shape and food. Although these approaches have proved effective, remission rates remain moderate. This partial effectiveness suggests that conceptualisations of bulimia which focus solely on cognitions related to food and appearance are insufficient and require revision. New research indicates that schema-focused models, which emphasise the role of core beliefs in psychopathology, may improve our understanding of bulimia nervosa. However, little is yet known about the relative importance of different schemas in maintaining bulimic behaviours. In addition, because schemas are implicit, deeply-rooted unconditional beliefs, uncovering their content is problematic. This review emphasises the role of schemas in eating psychopathology. Strategies are suggested through which the level of association between specific schemas and eating psychopathology might be recognised and understood more effectively.

Cognitive content and eating psychopathology

Scope of the review

Firstly, this review will discuss standard cognitive behavioural models of eating psychopathology. Following this, the evidence for an affective component to eating psychopathology will be considered. The *main* focus of the discussion is on bulimia nervosa and in particular bulimic behaviours, as the majority of the outcome-based literature and research into cognitive content has focused on bulimic difficulties. Following this, additional conceptualisations of bulimic difficulties (i.e., schema-focused approaches) that may complement existing 'standard' CBT models are reviewed and strategies that may improve our understanding of the wider cognitive content and process that may be important in the maintenance of bulimic behaviours are considered. Finally, future research directions and clinical implications are highlighted.

Standard cognitive-behavioural models of eating psychopathology

Standard cognitive-behavioural models of eating psychopathology are routinely used by clinicians when intervening with eating problems. However, although such models may be necessary in conceptualising and treating eating disorders, they appear to be insufficient to explain all aspects of eating psychopathology. Affect-related integrative models of eating psychopathology have also received empirical support.

Cognitive-behavioural models of the eating disorders have remained relatively unchanged for the last two decades (e.g., Fairburn, 1981; Garner & Bemis, 1982; Slade, 1982; Fairburn, 1985; Fairburn, 1997a). The early 'starvation-binge-purge' models have been influential in the development of cognitive-behavioural theory and therapy for bulimia nervosa (e.g., Fairburn & Cooper, 1989; Fairburn, Marcus &

Wilson, 1993). Such models highlight the importance of negative automatic thoughts and dysfunctional assumptions relating to food, weight and shape (e.g., Fairburn, 1981; Ben-Tovim, Walker, Fop & Yap, 1989; Cooper, Anastasaides & Fairburn, 1992; Fairburn et al., 1993a; Vitousek, 1996; Cooper & Todd, 1997). This model suggests that bulimia nervosa occurs in a context where low self-esteem becomes linked with weight and shape concerns, which in turn themselves become inextricably linked with self-worth. The hypothesis presented is that the cognitive representations (relating to extreme concerns regarding food, weight and shape) lead to an individual's desire to restrict food intake. This restriction results in intense hunger, which precipitates overeating and bingeing. Following the bingeing behaviour, purging behaviour (e.g., vomiting, laxative and diurectic abuse) occurs as a compensatory strategy. Physiological mechanisms are integral to this model, with beliefs regarding weight, shape and food serving to maintain the diet-binge-purge cycle.

Slade's (1982) model of anorexia nervosa similarly emphasises the importance of weight loss. Concerns about weight and shape are initially triggered by psychosocial stimuli, such as peer evaluations of weight and shape and societal attitudes to dieting (e.g., Polivy & Herman, 1985). Weight loss is reinforced both positively (through a perceived sense of control) and negatively (through fear of weight gain). As such, anorectics become increasingly stringent in their dietary regime. Extreme dieting eventually leads to cognitive distortions relating to body image, which further serve to reinforce the dieting behaviour.

Fairburn, Shafran & Cooper (1999) have proposed an updated cognitive-behavioural theory of anorexia nervosa, which focuses on maintenance. This model suggests that an extreme need to control eating is core to anorexia. Fairburn et al.

posit that in Western society self-worth is often judged in terms of weight and shape and this is overlaid on the anorectics' need for self-control. Fairburn et al., like Slade, argue that anorectic difficulties are maintained via a process whereby dietary restriction increases perceived self-control, which reinforces the restrictive behaviour. In turn, aspects of starvation (e.g., intense hunger; concentration difficulty; and pre-occupation with food and eating and narrowing of interests) encourage further restraint. This is because of a feared loss of control of eating and the perceived impact this has on self-worth, which becomes increasingly defined by control of eating. Societal attitudes value 'thinness' and consequent extreme concerns about shape and weight further reinforce dietary restriction.

Hence, Fairburn et al. suggest that anorexia is maintained by control-based mechanisms, and shape and weight concerns are *not* an essential component. This is problematic for existing CBT approaches to anorexia. However, Fairburn et al. argue that treatment should focus on the core maintaining mechanisms discussed and only broadened if other issues (e.g., low self-esteem; interpersonal difficulties; emotional inhibition) block progress.

Emotional antecedents to bulimic behaviours

Although a focus on food, weight and shape cognitions is necessary in understanding and intervening with bulimic behaviours, it is clearly not sufficient to explain bulimic behaviour fully. Such a model does not accommodate the clinical observation that bulimic behaviours and overeating are often a product of emotional antecedents, rather than appetitive cues such as starvation (e.g., Meyer, Waller & Waters, 1998). This observation has been reinforced by various experimental and empirical studies, which emphasise the importance of emotional factors in precipitating bingeing and overeating (e.g., Cooper & Bowskill, 1986; Lacey, 1986;

Arnow, Kenardy & Agras, 1992; Patton, 1992; Grilo, Shrifman & Carter-Campbell, 1994; Telch & Agras, 1996; Agras & Telch, 1998; Meyer et al., 1998). In particular, it has been demonstrated that exposure to negative emotional cues can precipitate overeating. Agras & Telch (1998) showed that obese women with binge-eating disorder are more likely to binge in response to negative mood induction than in response to caloric deprivation. It is also suggested that over-eating can serve the function of reducing awareness of intolerable cognition and affect through a process of narrowing the attentional focus to the 'here and now' stimulus environment (e.g. Lacey, 1986; Root & Fallon, 1989; Heatherton & Baumeister, 1991; Meyer et al., 1998). Heatherton & Baumeister (1991) suggest that such escape is from an aversive awareness of the self.

Attentional bias in bulimia. The escape from awareness model is supported by experimental research, which suggests that women with bulimic attitudes show attentional biases towards threats, when the apparent threat is to self-esteem (e.g., Heatherton, Herman & Polivy, 1991; Waller, Quinton & Watson, 1995; Waller, Watkins, Shuck & McManus, 1996). Similar attentional biases to negative emotion words are shown in women with bulimic attitudes (e.g., Rieger, Schotte, Touyz, Beumont, Griffiths & Russell, 1998), as well as interpretative bias towards, weight- and shape- related cues (Cooper, 1997b). Bulimic women also show increased body-size estimation and reduced body-image satisfaction following exposure to negative mood and food cues (Carter, Bulik, Lawson, Sullivan & Wilson, 1996). Sanftner & Crowther (1998) showed that women who binge show greater fluctuations than controls in self-esteem, negative affect, shame and guilt, reporting lower levels of state self-esteem and positive affect and higher levels of guilt and shame prior to bingeing. Eldredge & Agras (1996) suggest that emotional eating in response to

negative mood states is implicated in clients with binge-eating disorder. Fryer, Waller & Stenfert-Kroese (1997) propose that bulimic behaviours serve to alleviate emotional states resulting from stress. In conditions where increased stress (i.e., maladaptive coping and life stressors) results in low self-esteem, disturbed eating attitudes become exacerbated.

Limitations of standard CBT models of bulimia

Fairburn's (1997a) revised model suggests that negative affect may be relevant in bulimic psychopathology. However, his model suggests that this emotional activation serves only as a proximal antecedent to bingeing. Fairburn's model also highlights negative self-evaluation as a risk factor in the development of bulimia nervosa, manifest in dysfunctional assumptions related to food, weight and shape. This model proposes that negative self-evaluations are reinforced by failures in the process of dietary restraint and consequent bingeing behaviour.

Wilson (1999b) argues that negative self-evaluation and low self-esteem in bulimia extend further than food, weight and shape concerns. The wider social and psychological mechanisms that contribute to the development and maintenance of negative self-evaluations are not considered in Fairburn's model (1997a). As such, generic negative self-evaluation/low self-esteem and broader negative affect (as antecedents to bulimic behaviours) are not directly addressed in standard, manual-based CBT approaches (e.g., Fairburn et al., 1993a). Cognitive models have rarely stressed the possibility that higher-level cognitive elements (i.e., generic self-beliefs) may play a role in maintaining maladaptive anorexic and bulimic behaviour (Vitousek & Hollon, 1990). This omission in both theory and practice may be surprising given that such models are founded on Beck, Rush, Shaw & Emery's (1979) cognitive model of emotional disorder. Beck has long recognised the importance of early

experience in the development of generic beliefs relating to the self (e.g., Beck, 1967; Beck, Freeman & Associates, 1990). As such, Fairburn's approach is limited in its use of the cognitive-behavioural model (Hollon & Beck, 1994). This narrow focus may be a particular limitation when one considers that negative affect is associated with a poorer treatment outcome in manual-based CBT for both bulimia nervosa and binge-eating disorder (e.g., Loeb, Wilson, Gilbert & Laubovie, 2000).

Cognitive-behavioural treatment approaches in bulimia nervosa

Despite the disadvantages outlined earlier, current standard CBT strategies in bulimia nervosa continue to be based on Fairburn's early approach (Fairburn, 1981; 1985), with only slight revision (Fairburn, 1997a; Wilson, Fairburn & Agras, 1997). The manual-based treatment is delivered on an outpatient basis, usually involving 19 fifty-minute sessions over 20 weeks, with the sessions spaced twice-weekly for the first week or two, weekly for the block of sessions to session 16, and then fortnightly following this. The first eight sessions involve basic tasks, such as developing rapport and establishing a therapeutic alliance. The content of these sessions is partly psycho-educational, socialising to the cognitive model, and partly behavioural (i.e., establishing weekly weighing, regular eating patterns, and self-control strategies). Sessions 9-16 emphasise the cognitive aspects of treatment: self monitoring of cognitions and cognitive restructuring of dysfunctional cognitions regarding food, weight and shape, as well as developing problem-solving and coping strategies. Sessions 17-19 focus on relapse prevention work (Fairburn et al., 1993a).

Effectiveness of CBT in bulimia nervosa. Most of the current research into CBT outcome in bulimia nervosa has focused on therapy as delivered under the manual approach outlined (Fairburn et al., 1993a). The outcomes of many effectiveness trials have shown that manual-based CBT is an effective treatment for

bulimia nervosa (e.g., Wilson et al., 1997). The scope of this research has meant that

CBT has become the 'gold standard' treatment for bulimia nervosa, against which

other interventions are evaluated (e.g., Palmer, 2000). Standard CBT has been shown

to be effective in reducing bingeing and purging, with the frequency of bingeing and

vomiting behaviour falling by between 77-94% (Vitousek, 1996). Reduced dietary

restraint and an improvement in attitudes to food, weight and shape is found with

standard CBT (Fairburn, Jones, Peveler, Carr, Solomon, O'Connor, Burton & Hope,

1991). CBT has a sustained benefit at one and six-year follow-up (Fairburn, Jones,

Peveler, Hope & O'Connor, 1993). Total or near complete remission of symptoms is

achieved in about half of cases with CBT. Bingeing remits in 51-71% of cases and

purging in 36-56% (Wilson & Fairburn, 1993). Research has also indicated additional

benefits of a CBT approach in reducing depression associated with bulimia, and in

improving social functioning and poor self-esteem (e.g., Fairburn, Agras & Wilson,

1992).

Effectiveness of CBT versus alternative treatments. Behavioural approaches

have been shown to have poorer outcomes than combined cognitive-behavioural

treatments for bulimia, taking longer to show an effect than CBT, and having fewer

sustained benefits (e.g., Fairburn et al., 1993b). Exposure and response

prevention has been proposed either as a single treatment, or in combination with

other CBT approaches for bulimia (e.g., Leitenberg, Rosen, Gross, Nudelman & Vara,

1988). However, this method has little apparent benefit over conventional CBT, or

when provided as an aspect of abbreviated CBT (e.g., Agras, Schneider, Arnow,

Raeburn & Telch, 1989; Wilson, Eldredge, Smith & Niles, 1991; Carter & Bulik,

1993). CBT has also proved to be superior to anti-depressant treatment alone

(Whitall, Agras & Gould, 1999), and combined anti-depressant medication and CBT

shows no benefit over CBT alone (e.g., Leitenberg, Rosen, Wolf, Vara, Detzer & Srebnik, 1994). Standard CBT is equal in effectiveness to supportive expressive psychotherapy (Garner et al. 1993). When comparing CBT groups for bulimia with supportive-expressive group interventions combined with self-monitoring, CBT proves superior post-treatment, but is of equivalent benefit to supportive psychotherapy at sixteen-week follow up (Kirkley, Schneider, Agras & Bachman, 1985). When compared with interpersonal therapy (IPT), CBT shows similar benefit at twelve-month and six-year follow-up (e.g., Fairburn et al., 1991; Fairburn, et al., 1993b), but takes effect more rapidly.

Is CBT's gold standard warranted in bulimia nervosa? Manual-based CBT has been widely validated as an effective intervention in the treatment of bulimia nervosa. However, it is not without problems and limitations. The results of published outcome research have been compelling, but the average remission rate for bulimia nervosa remains at around 50%. This average remission rate relates only to the 'simple' cases of bulimia nervosa included in outcome studies (notably, Mitchell, 1991; Wilson, 1996; Wilson, 1999a). Most studies have failed to include cases with more 'complex' constellations of concurrent symptomatology (e.g., axis II personality disorders; traumatic histories and PTSD reactions; (see Carroll, Touyz & Beumont, 1996; Steiger, Jabalpurwala & Champagne, 1996; Tobin & Griffing, 1996; Gleaves, Eberenz & May, 1998; Meyer & Waller, 1998; Waller, 1998; Kent, Waller & Dagnan, 1999).

CBT for bulimia nervosa is also not as effective as CBT for other forms of psychopathology, which have received more research attention. For example, CBT for panic achieves a remission rate of around 90%. In panic disorders treated with CBT, 60-80% remission rates are achieved (e.g., Clark, Salkovskis, Hackmann,

Middleton & Gelder, 1994). Hartmann, Herzog & Drinkmann (1992) examined

eighteen trials of therapies for bulimia nervosa, and found no significant effect sizes

for the different therapeutic interventions. When compared with IPT, CBT shows

superior results post-treatment. However, IPT is as effective as CBT at twelve-month

follow-up on all indices of outcome (Fairburn et al., 1993b; Wifley, Agras, Telch,

Rossiter, Schneider, Golomb, Sifford & Raeburn, 1993). It may be surprising to

advocates of manual-based treatments that IPT (despite a broader focus than CBT,

emphasising interpersonal relationships, rather than core bulimic symptoms), proves

equally successful to CBT in this way.

Summary

Standard CBT approaches are effective in treating bulimia nervosa, but only in

around 50% of cases. The standard CBT model and hence the treatment based upon it

are insufficient, particularly for bulimics with complex, multiple problems. Other

therapeutic modalities, (which centre on wider psychological issues than food, weight

and shape concerns) have proved to be as effective as CBT in treating bulimia. The

good outcome of IPT, for example, may be partly explained by emotional distress

models (e.g., McManus & Waller, 1995). The evidence for emotional antecedents and

consequences of bulimic behaviours (e.g., Meyer et al., 1998) and for self-control in

anorexia (Fairburn et al., 1999) suggests a broader therapeutic emphasis than a model

based solely on concerns regarding food, weight and shape. Existing CBT models

may need to become more comprehensive in order to improve the efficacy of

interventions based upon them. Factors that may require consideration include: a

wider range of cognitive content and process (including maintaining factors,

particularly at the level of self-schemas); emotional states that impact on

symptomatology; the escape/blocking function of bulimic behaviour; and the effects

of early negative experiences.

Improving prognosis in CBT: therapy as delivered.

Researchers have not readily accepted the challenge of developing more comprehensive conceptualisations of bulimic difficulties. Instead, a great deal of effort has been expended in making the current models work *before* developing them. Such an approach often requires stricter adherence to the manual, or adaptation of therapeutic techniques.

Practitioners have attempted to improve the efficacy of traditional CBT approaches by promoting stringent adherence to the manual, and discouraging the use of ad-hoc 'unrestricted' CBT interventions (e.g., Wilson, 1995b; 1996). However, this approach has been criticised for ignoring the individual case formulation (e.g., Persons, 1991). This raises the empirical question as to whether or not greater idiographic individual case formulation could improve prognosis where manual-based CBT fails (Wilson, 1996). There is little empirical data on the treatment of bulimia nervosa available to answer this question directly. However, in CBT treatment for specific phobia, Schulte, Kunzel, Pepping & Schulte-Bahrenberg (1992) found that standardised treatment was significantly superior to an individualised CBT intervention based on case formulation or a yoked control, both post-treatment and at two-year follow-up. The standardised treatment proved more effective as the empirically-validated strategy for specific phobia, (exposure *in vivo*) was ignored by clinicians in the case formulation condition.

However, bulimia nervosa is more complex and heterogeneous than specific phobia. Schulte et al.'s (1992) finding suggests that rejection of empirically-validated interventions and the adoption of therapies based on case formulation and clinical judgement alone may undermine the empirically-validated manual approach.

Alternatively, given the heterogeneous nature of bulimic difficulties, idiographic case

formulations might prove more effective. Jacobson, Schmaling, Holtzworth-Munroe,

Katt, Wood & Follette (1989) introduced some flexibility in a constrained,

standardised marital therapy (i.e., by the therapist adapting how and when specific

aspects were used). This selection strategy proved equally effective post-treatment

and more effective at six-month follow-up than a standardised-order approach. By

limiting therapists to a particular therapeutic repertoire, it may be ensured that

empirically-validated strategies are utilised, whilst allowing a limited amount of

individual tailoring.

However, advocates of the manual-approach question the conceptual basis on

which clinicians base their reliance on interventions based on clinical judgement and

individualised case formulations. There is a lack of empirical evidence to support a

case formulation stance. However, the limitations of clinical judgement (which may

include case formulation), have been highlighted by several authors, but ignored by

clinicians (e.g., Dawes, 1994; O'Donuhue & Szymanski, 1994). Schulte (1995) argues

that where standardised, empirically-validated manuals are available, clinical

diagnoses are the best indicator that we have available for the selection of intervention

strategies. This approach may apply to bulimia nervosa, where manual-based CBT is

the empirically validated strategy (e.g., Fairburn et al., 1992; Wilson 1995b).

When CBT fails: adapting the approach

Despite a push by some practitioners that greater adherence to the manual

would promote improved outcomes in manual-based CBT approaches for bulimia

nervosa, it is unclear what clinicians should do when the manual-based approach fails

as a first-line treatment. Wilson (1996) suggests that the basic CBT approach could be

modified for such cases, with the manual being expanded to include more modules

corresponding to particular problem profiles (Wilson, 1999a; 1999b). The structured,

time-limited empirically evaluated manual-based approach is a restricted version of

available CBT practices, limited to certain cognitive and behavioural techniques. CBT

practice in bulimia nervosa could be extended to include a wider field of available

CBT intervention strategies.

Interpersonal issues. The manual-based approach focuses on interpersonal

variables, but only as proximal triggers for specific episodes of bulimic behaviour

(e.g., Fairburn et al., 1993a). A refinement of this approach could involve an

increased emphasis on systematically modifying the interpersonal variables which

may serve to maintain bulimic psychopathology. However, this might be problematic

in terms of evaluating outcome because of the potential procedural overlap with other

interpersonal psychotherapies (Wilson, 1996). Some researchers argue that IPT is

incompatible with CBT (e.g., Fairburn et al., 1993a). This is because IPT shows a

delayed effect on food, weight and shape cognitions (although this is not its focus),

which suggests that it may operate in a different modality to CBT.

Behavioural elements. Various behavioural strategies, not used in standard

interpersonal therapy or CBT approaches, also readily lend themselves to intervening

with interpersonal difficulties and in improving treatment compliance (e.g., skills

training and behavioural rehearsal). Recent research has reported using skills training

approaches, derived from dialectical behaviour therapy for personality disorders

(Linehan, 1993). Telch (1997) reported a skills training approach used to improve

affect regulation in binge-eating disorder, with promising results.

Intensified cognitive restructuring. A further option for improving current

CBT interventions could be through the extension of cognitive restructuring to not

only focus on specific beliefs relating to food, weight and shape concerns, but also to

consider generic beliefs relating to self-worth and interpersonal relationships. Cooper (1997a) argues that there is no good reason why wider beliefs cannot be considered in intervening with bulimia nervosa, particularly since wider, generic beliefs are addressed in CBT approaches for other difficulties (e.g., Beck et al., 1990; Hollon & Beck, 1994; Vitousek, 1996).

Most research has focused on the more superficial levels of cognition in bulimia - negative automatic thoughts and dysfunctional assumptions relating to food, weight and shape (e.g., Vitousek & Hollon, 1990). This focus has been based around Beck's (1967) cognitive model of depression, which suggests that dysfunctional assumptions (or conditional beliefs such as " I will only be likeable if I am thin") are laid down in childhood and later. Dysfunctional assumptions (DAs) serve to guide thinking and lead to the production of negative automatic thoughts (NATs). NATs are affect-laden moment-by-moment thoughts, which lie at the most superficial level of cognition. This approach is also the basis of the CBT manuals, which emphasise food, weight and shape cognitions at these two cognitive levels of representation. In improving the efficacy of the manual approach, the focus has been on the accuracy of the therapy as delivered. Only recently have clinicians begun to consider adaptations of the conceptual base. The role of cognitive content and process at the level of 'core beliefs' have recently begun to receive attention in filling the gap in standard CBT models, using schema-focused models (e.g., Vitousek & Hollon, 1990; Cooper, Todd & Wells, 1998).

Vitousek & Hollon (1990) posit that organised cognitive structures exist and influence information processing across three classes - self-schemas, weight-related schemas, and weight-related self-schemas. They argue that the core psychopathology of anorexia and bulimia nervosa is represented in organised cognitive structures that

unite self-evaluation with beliefs about weight ('weight-related self-schemas'). These higher-order beliefs are supposed to exert automatic effects on information processing and may explain why eating-disordered clients regard their symptoms as functional. Vitousek & Hollon suggest that the "cognitive essence" (p. 191) of these disorders may be found in these 'potent and inclusive' schemas that serve to reduce ambiguity. Vitousek & Hollon argue that given characteristic self-schemas (e.g., regarding self-worth, perfectionism etc.), and characteristic weight-related self-schemas (i.e., regarding the personal and public implications of being fat or thin), association between these elements becomes a logical development for the future bulimic or anorexic. By identifying the self in terms of weight, such individuals have a maladaptive strategy available to them (e.g., controlling weight, bingeing and purging) to manage their distress and compensate for a generic sense of inadequacy.

Such wider beliefs are not directly considered in the manual-based CBT approach, and this may be a marked oversight in working with more recalcitrant clients, with whom a more intensive focus on cognitive change may prove more efficacious. This is especially the case when evidence suggests that bulimics show a broadly negative thinking style and cognitive content reminiscent of depression (e.g., Cooper & Hunt, 1998).

Content and process of therapy. There are several therapeutic and service issues to consider if the intensified cognitive restructuring approach is adopted in bulimia. More intensive cognitive restructuring approaches may require greater skill on the part of the therapist, holding implications for training/continued professional development on the part of the therapist (e.g., McKisack & Waller, 1997). Service provision may also be affected. More intensive interventions will be likely to take place over more sessions than are offered by the current manual approaches. The

evidence base for the more intensive approaches requires development before

purchasers of services will consider this as a routine strategy for intransigent cases. A

stepped-care model of service provision may require that more intensive and

expensive interventions are offered solely to this group (e.g., Davis, McVey,

Heinmaa, Rockert & Kennedy, 1999). This approach proposes a therapeutic

hierarchy. That is, cheaper and faster interventions should be offered before more

comprehensive options are chosen. For example, this might firstly involve psycho-

educational group work or individual self-help prior to a standard CBT group.

Individual CBT could then be offered to those clients who do not respond to the

earlier stages (e.g., Davis, Olmsted & Rockert, 1990, 1992; Davis & Olmsted, 1992;

McKisack & Waller, 1997). Some clients, particularly those with emotional

disturbance and interpersonal difficulties, are more likely to refuse group attendance

or drop out of group approaches (e.g., McKisack & Waller, 1997). Individual CBT

may be offered to these clients. CBT may in itself be a therapeutic gamble for the

clinician, when one considers the levels of remission reported above. A sub-section of

'complex' cases will always be unresponsive to standard CBT, and something more is

needed to improve therapeutic outcome for these people.

Summary

Researchers have generally advocated strategies aimed at making current CBT

models of eating psychopathology work more effectively before adapting the

conceptual base. Stricter adherence to the CBT manuals, rather than formulation-led

or ad-hoc CBT interventions has been emphasised. However, despite this emphasis, it

remains unclear what should be done when standard CBT fails. Various options have

been considered. These include: including more modules related to specific problem

profiles; increasing the interpersonal focus; adding further behavioural components

and intensified cognitive restructuring. Intensified cognitive restructuring may widen the focus of CBT to not only consider NATs and DAs, but to emphasise deeper-level self-schemas. However, intensifying cognitive restructuring will hold service and training implications.

Schema-focused approaches to understanding eating problems

Schema-focused cognitive-behavioural models have been developed as an adjunct to traditional CBT models of psychopathology in the conceptualisation and treatment of personality disorders (e.g., Beck et al., 1990; Layden, Newman, Freeman & Morse, 1993; Padesky, 1994; Beck, 1996; McGinn & Young, 1996; Young, 1999). Such models were developed to assist clinicians in working with clients who were unresponsive to conventional CBT approaches, particularly because of the nature of their interpersonal difficulties. However, the empirical evidence base for such approaches has been conspicuously absent, both in the area of personality disorders and in a new field of interest, the eating disorders (e.g., Kennerley, 1997). Recent research effort has begun to address the problem of empirical validation for schema-focused approaches in the field of eating psychopathology, although this work remains sparse. The forthcoming sections of this review will outline the schema-focused model and review the current evidence in the field of eating psychopathology that serves to provide support for this approach.

Conceptualising schemas.

Beck (1967; p. 283) first described schemas, in his seminal cognitive-behavioural work on depression. He defined a schema as "...a structure for screening, coding and evaluating the stimuli that impinge on an organism... on the basis of schemas, the individual is able to categorise and interpret his experiences in a meaningful way". Beck et al. (1979; pp. 12-13) later described schemas as "stable

cognitive patterns... a basis for screening out, differentiating and coding the stimuli that confront the individual". Schemas are activated by situations or experiences that are similar to the early experiences in which they evolved. At other times they lie dormant. Activation of schemas is associated with intense negative affect and contingent information processing biases (Beck et al., 1979; McGinn & Young, 1996).

There has been some discrepancy amongst clinicians as to how schemas should be defined. For example, Beck et al. (1990) adopt the conceptualisation of schemas as internal mental structures, which serve the function of simplifying, organising and understanding experiences. Beck et al.'s (1990) definition of schemas includes negative, dichotomous, unconditional beliefs about the self. These are called 'core beliefs' (e.g., I am worthless). This definition also includes conditional beliefs about the self (e.g., If I am fat, then I am worthless; see also Beck, J., 1996). Other clinicians and researchers (e.g., Young, 1999) suggest that schemas are qualitatively different to conditional beliefs, and that the term schema refers to both the structure (with its associated processes) and its content (the deeper-level core beliefs). This definition will be used here.

Young, like Beck, suggests that schemas are related to early experiences. However, Young focuses on a subset of core beliefs called 'early maladaptive schemas' (EMS). Young (1999) suggests that core beliefs develop through repetitive patterns of childhood interactions. These patterns become elaborated throughout life, but are dysfunctional to a significant degree. Core beliefs are usually accurate representations of childhood themes. They serve as the child's strategy for making sense of their experiences and the world around them (Young, 1999). Often, early trauma is linked to the development of core beliefs, which becomes internalised in

these cognitive structures. In bulimia nervosa this may be particularly pertinent, when one considers that early emotional and sexual abuse are associated with more severe bulimic behaviours (e.g., Fallon & Wonderlich, 1997; Kent et al., 1999). Padesky (1994) suggests that core beliefs differ from dysfunctional assumptions and automatic thoughts. Partly because of their early development, schemas constitute part of the self-concept, and so are resistant to change. Schemas are over-generalised, familiar and rigid representations, and are self-perpetuating. Information is distorted to maintain the schema as valid, even if the evidence is inconsistent. As such, attempts at changing core beliefs are associated with significant anxiety (Padesky, 1994). Changing them threatens disruption to the individual's core cognitive organisation.

Schema processes in eating psychopathology

As schema change is too disruptive to the sense of self, a variety of cognitive and behavioural processes serve to maintain the validity of the schema. Young (1999) calls these processes 'schema maintenance, 'schema avoidance' and 'schema compensation'. Schema maintenance refers to the cognitive distortions and maladaptive behaviours that directly reinforce or perpetuate a schema (e.g., engaging in behaviours that are consistent with the schema). Schema avoidance refers to automatic or deliberate cognitive, emotional or behavioural strategies with which a person tries to avoid triggering a schema and the related high affect (e.g., distraction or avoidance of triggering situations). Schema compensation refers to thoughts and behaviours that compensate for a schema, which are attempts to compensate for noxious early experiences. These compensatory strategies become dysfunctional in adulthood, as they are extreme and serve to maintain the schema.

Bulimic behaviours may serve the function of narrowing awareness of intolerable emotional states. The schema-focused model suggests that such states are

triggered by schema activation. The schema-focused model also suggests that bulimic behaviours are related to generic negative self-beliefs, which are associated with intense negative affect. Eating occurs as a management strategy for this emotion. This proposition implies that bulimic behaviours occur as a form of avoidance of core beliefs and associated affect, rather than because of the direct influence of the food, weight and shape concerns that are emphasised in manual-based CBT.

Currently there is a limited amount of literature to support the schema-focused approach in bulimia. The evidence for comes from information processing studies, dissociation, coping and functional escape/blocking models.

Schema avoidance.

Young identifies three forms of schema avoidance: cognitive (not thinking about something), emotional (avoiding feeling) and behavioural (e.g., engaging in escape behaviours) which may be utilised differently by different individuals to cope with schema activation. Spranger, Waller & Bryant-Waugh (in press) have suggested that levels of such avoidance are especially high in bulimics.

Blocking and escape from awareness. Bulimic behaviours serve the direct function of blocking awareness of the negative emotion that is associated with negative environmental triggers, in the absence of other, more adaptive emotional coping strategies (e.g., Lacey, 1986; Root & Fallon, 1989). Heatherton & Baumeister (1991) also propose that bulimic behaviours serve a blocking function, but that the process involved is one of cognitive avoidance or cognitive narrowing. This 'escape from awareness' model emphasises the importance of internal antecedents for bingeing and purging, rather than environmental triggers. Therefore, cognitive, behavioural and emotional avoidance, in the form of bulimic behaviours, may occur as an attempt to avoid generic self-beliefs and associated emotion.

Various reviews and empirical studies support these functional models. McManus & Waller (1995) and Waters, Hill & Waller (in press) suggest that bingeing occurs as a strategy to reduce awareness of intolerable cognition and affect. Bulimic behaviours may develop as an avoidant coping strategy (Neckowitz & Morrison, 1991). This strategy may develop in the context of a high number of stressful life events, which are associated with bulimia (Lacey, Coker & Birtchnell, 1986; Cooper et al., 1998). Early sexual and emotionally-abusive experiences (e.g., Fallon & Wonderlich, 1997; Kent et al., 1999) have particular importance in the development of maladaptive core beliefs and consequent eating psychopathology. In particular, sexual abuse contributes to a lower level of perceived control and more severe eating psychopathology (Waller, 1998). In non-clinical women, there has been shown to be a positive relationship between emotion-focused coping (an attempt to regulate emotional distress) and eating pathology (e.g., Fryer et al., 1997). Bulimic samples report feeling a greater sense of threat, and using an escape-avoidant style of coping (e.g., Neckowitz & Morrison, 1991). Cognitive avoidance has been found to be characteristic of eating disorders, and is found in non-eating-disordered women presenting with ego development characteristics identified as important in the development of eating psychopathology (Waller & Meyer, 1997). Wishful thinking is particularly associated with bulimia (Troop, Holbery, Trowler & Treasure, 1994; Troop, Holbrey & Treasure, 1998). Bulimics seek less emotional support, and are less likely to focus on or express emotion (Yager, Rorty & Rossotto, 1995).

Dissociation. Dissociation is a fairly automatic mechanism, used to escape from negative cognitions and affect. As a form of cognitive avoidance, dissociation is associated with bulimia (e.g., Chandarana & Malla, 1989; Vanderlinden, Vandereycken, van Dyck & Vertommen, 1993; Everill, Waller & MacDonald, 1995),

possibly due to their common link with early trauma (e.g., Mollon, 1996).

Dissociation impedes cognitive and emotional processing through its disruptive

effects on memory, consciousness and identity. As a result, it facilitates bingeing and

other impulsive behaviours (e.g., substance abuse, self-harm; Lacey, 1993; Everill &

Waller, 1995). Dissociation can be likened to cognitive narrowing and escape models

of bulimia and other impulsive coping strategies (Heatherton & Baumeister, 1991;

Baumeister, Heatherton & Tice, 1994). Waller, Dickson & Ohanian (under

consideration) suggest that dissociation serves a mediating role between core beliefs

and bulimic behaviours.

Information processing studies. Beck & Clark (1997) propose that information

processing occurs at both pre-conscious (or automatic) and at strategic levels.

Automatic processing is fast, requires limited processing capacity, and is usually

outside conscious awareness. Beck & Clark (1997) refer to automatic processing as an

orienting mode. This schematic representation of threat is useful in assigning

information processing priority to incoming stimuli. It allows selective attention to

threatening material consistent with an individual's psychopathology (e.g., van den

Hout, Tenney, Huygens & De Jong, 1997). When a schema is triggered, the initial

response may be automatic.

In contrast, strategic processing is slow, intentional, and conscious. Automatic

and strategic processes are likely to occur in combination, but which type of

processing prevails will depend on the type of task (Beck & Clark, 1997). The

attentional bias to threat is helpful in managing perceived danger, but is likely to lead

to a perpetuation of psychopathology, because contradictory information fails to be

processed properly. In bulimia, automatic processing may be seen in dissociation,

with strategic processing occurring when a person *deliberately* avoids thinking.

When the trigger for the core belief is too strong, or the activation of the core belief is associated with disabling affect, dissociation may prove to be ineffectual as an escape mechanism (Everill et al., 1995). At this point bulimic behaviours may serve a strategic blocking/escape function (e.g., Lacey, 1986; Root & Fallon, 1989).

Evidence for pre-conscious processing. Pre-conscious processing studies provide evidence that non-eating-disordered women with more unhealthy eating attitudes eat more in response to rapid, subliminally-presented emotional threat cues. These findings provide support for automatic processing in cognitive avoidance. This may be particularly the case when the perceived threat is one of abandonment (e.g., Patton, 1992; Meyer & Waller, 1999) or a threat to self-esteem (Waller & Mijatovich, 1998). However, this pattern is not found with appetitive cues (Meyer & Waller, 1999). Therefore, women with more bulimic attitudes may respond to emotional threat by eating, but only when information is processed pre-consciously or at an automatic level.

Evidence for strategic processing. Purposeful processing tasks, unlike the rapid, non-purposive subliminal tasks, require strategic processing. Evidence for strategic processing in bulimia is limited. However, Waller & Meyer (1997) and Meyer, Serpell, Waller, Murphy, Treasure & Leung (in press) used anagram solution tasks to show that more bulimic attitudes/behaviours are positively associated with longer solution times for ego-threat anagrams, but not for food or neutral anagrams. This result is similar to Waller et al.'s (1995) finding, and is compatible with Heatherton & Baumeister's model of cognitive narrowing (1991).

Behavioural avoidance. Cognitive narrowing is unlikely to explain all bulimic avoidance, as bulimic behaviours also serve the function of blocking negative emotion and cognition (e.g., Lacey, 1986; Root & Fallon, 1989). Behavioural avoidance in

bulimia is supported by studies using naturalistic thought sampling to assess the cognitive and emotional triggers for bingeing. Grilo et al. (1994) suggest that physiological and emotional cues are antecedents to bingeing. Spranger, Bryant-Waugh & Waller (in press) have also shown that bulimics are characterised by relatively high levels of behavioural and somatic avoidance. Negative mood states may also precipitate bingeing (e.g., Davis, Freeman & Garner, 1988; Agras & Telch, 1998) and purging (e.g., Schlundt, Johnson & Jarrell, 1986). Lower mood may also result in increased food craving, which increases the likelihood of bingeing (Waters et al., in press). Therefore, bulimic behaviour may be similar to other impulsive behaviours (e.g., Vanderlinden & Vandereycken, 1997; Suyemoto, 1998). Both serve a blocking function for intolerable emotional and cognitive states, such as may occur when schemas are activated.

Schema maintenance

Automatic and strategic cognitive avoidance and avoidant coping serve to maintain bulimic behaviours (Meyer et al., in press). Pre-conscious and strategic processing are likely to operate together as a combined strategy of schema avoidance (Young, 1999). However, by avoiding schemas and the threatening information that triggers them, the bulimic does not learn to process contradictory information or develop more adaptive emotional regulation strategies. As such, avoidance serves to maintain maladaptive core beliefs (Young, 1999). Both of these factors mean that bulimic psychopathology is perpetuated as a strategy for managing core beliefs and associated emotion.

Schema compensation

Cooper et al.'s (1998) study suggested that dieting behaviours help to reduce the impact of negative self-beliefs (core beliefs). They suggest that beliefs about

dieting are closely associated with beliefs about the meaning of food, weight and

shape. As such, beliefs about dieting act as schema compensation beliefs (Young,

1999). Dieting may serve as a strategy to compensate for, and overcome, early

experiences and associated negative self-beliefs. For example, being thin may mean

feeling more in control, being more likely to be accepted, and less likely to be

abandoned by others (Cooper et al., 1998). However, like schema avoidance, schema

compensation strategies also serve to maintain maladaptive core beliefs, which remain

unchallenged (Cooper et al., 1998).

Summary

Schema-focused models, developed for personality disorders, suggest that core

beliefs (broad, dichotomous, unconditional, negative beliefs about the self) are of

central importance to the development and maintenance of psychopathology. New

research in the eating disorders supports the proposition that beliefs about the self,

located at the schematic level, may be important in the maintenance of bulimic

psychopathology. In particular, the behavioural and cognitive processes (schema

compensation; schema avoidance and schema maintenance) that serve to protect the

validity of schemas are important maintaining factors. Evidence for schema avoidance

comes from functional models of bulimia, dissociation, information processing

studies and behavioural avoidance in bulimia. Bulimics may also use dieting

behaviours to compensate for their negative core beliefs. In turn, these processes serve

to maintain the schema, as it remains unchallenged. The forthcoming section of this

review will discuss in more detail the available evidence for the cognitive content that

is represented at a schematic level in bulimia.

Cognitive content in bulimia nervosa

Cooper (1997a) points out the lack of research into the content of core beliefs

and how these beliefs exert their effect on higher-order representations of food, weight and shape. Researchers have been slow to take up this mantle, despite recognition for over fifteen years that core beliefs have a role to play in bulimic psychopathology (e.g., Guidano & Liotti, 1983; Vitousek & Hollon, 1990). Guidano & Liotti (1983) proposed that conceptualisations of, and interventions with, bulimic difficulties should be related to difficulties in personal identity. Vitousek & Hollon (1990) proposed areas to consider in future research that are absent from existing CBT models of bulimia, particularly core beliefs and self-schemata (see also Markus, 1977). These authors suggest that weight-related dysfunctional assumptions are the core psychopathology in bulimia, becoming salient in the identification of the self.

However, Beck (1967) outlines a major assumption of cognitive theory - that each psychological disorder has a specific cognitive profile evident at *all levels* of cognitive functioning, resulting in the differentiation in emotional states. These profiles have been well developed in anxiety and depression research. In contrast, few empirical studies to date have tested the relationship between core beliefs and eating, or outlined the specific content of those beliefs (e.g., Cooper, 1997a).

Initial evidence: content of bulimic core beliefs. Cooper et al. (1998) found that eating-disordered women report unconditional negative self-beliefs relating to failure, worthlessness, inferiority and abandonment. These beliefs were different to reported conditional beliefs, found at the level of dysfunctional assumptions and negative automatic thoughts. These conditional beliefs focused on food, weight and shape concerns. Cooper, Todd & Cohen-Tovée (1996) found that eating-disordered women hold more negative self-beliefs than 'normal' controls, particularly relating to self worth. Cooper & Hunt (1998) compared core beliefs and conditional assumptions in bulimic and women with major depression. They reported that both groups held

generic negative self-beliefs, but that bulimic women also held dysfunctional weight-related concerns, not apparent in the major depression group. These initial findings are promising, as such core beliefs may impact on the self-esteem of bulimics (e.g., Fairburn, 1997a), something which is not directly addressed by standard CBT.

Additional evidence: core beliefs specific to bulimia. Unlike earlier studies, three similar studies (Leung, Waller & Thomas, 1999; Waller, Ohanian, Meyer & Osman, in press; Waller, Shah, Ohanian & Elliott, in press) have considered the specific core beliefs that might be involved in bulimic behaviour. Waller et al. (in press *a*) found that bulimic women had more unhealthy core beliefs related to 'defectiveness/shame', 'failure to achieve' and 'insufficient self-control compared to non-clinical women. The bulimic subgroups within the sample (bulimia nervosa; binge-eating disorder and anorexia binge/ purge subtype) showed different core beliefs. Specifically, two sets of beliefs were most associated with bulimic behaviour. 'emotional inhibition' beliefs were associated with bingeing and 'defectiveness/ shame' core beliefs were most associated with vomiting. These findings are consistent with functional models of bulimic psychopathology.

Leung et al. (1999) also found different core beliefs between different eating disorders (bulimia nervosa, anorexia nervosa, anorexia nervosa binge/purge subtype). Anorexics showed higher levels of 'social isolation' beliefs (but lower levels of 'insufficient self-control' beliefs) than the bulimia nervosa group. This finding differs from that of Waller et al. (in press *a*) in that the clinical groups were differentiated by 'insufficient self control', 'social isolation' and 'functional dependence' beliefs. Core beliefs in bulimics were associated with unhealthy eating attitudes but not eating behaviour. This difference could be attributed to methodological differences between the studies, such as the use of restrictive anorexics in Leung et al.'s sample.

Waller et al. (in press *b*) extended the findings of Cooper & Hunt (1998), using a multi-dimensional measure of core beliefs with four comparison groups (i.e., non-clinical, major depression, non-depressed bulimics, depressed bulimics). They found that the major depression group had more unhealthy core beliefs than the non-depressed bulimic group, while the major depression group and the depressed bulimic group had similar levels of unhealthy core beliefs. Both groups were characterised by 'abandonment', 'social isolation' and 'social undesirability' beliefs relating to relationships. However, these groups could be differentiated by the severity of their beliefs. This is important clinically, as pre-treatment level of core beliefs is predictive of the outcome of group-based standard CBT (Leung, Waller & Thomas, 2000). These authors also found that more unhealthy core beliefs are associated with poorer treatment outcome. In particular, high levels of 'functional/dependence' beliefs were associated with a failure to alter bulimic attitudes, and higher 'defectiveness/shame' beliefs were associated with a failure to reduce vomiting. Waller et al. (in press *b*) found that depressed bulimics had particularly unhealthy 'social undesirability' beliefs, while depressed people held particularly maladaptive 'social isolation' and 'abandonment' beliefs. These findings provide support for the hypothesis that there are differences between bulimics and depressives at all levels of cognitive representation (as Beck's [1967] model would suggest), rather than specifically at the level of dysfunctional assumptions and negative automatic thoughts (cf. Cooper & Hunt, 1998).

Summary

Preliminary studies of core beliefs in eating psychopathology are compatible with schema-focused models of psychopathology. Unconditional, schematically represented core beliefs about the self are assigned a central role in bulimia nervosa,

as in other forms of psychopathology. Waller (1997) has argued that the influence of core beliefs on eating psychopathology is more salient than that of negative automatic thoughts relating to food, weight and shape concerns. However, only limited evidence exists to support this proposition, or for the specific nature of core beliefs associated with different eating disorders. Further research is required to replicate these preliminary findings. Several factors remain to be considered in future research. Initial findings suggest that a number of different schemas may be important in bulimia. However, schema theory suggests that although several schemas may underlie an individual's behaviour, cognition and affect, all the schemata may not be active simultaneously. Some may remain dormant. The relative importance of specific schemas and their level of association with dysfunctional assumptions relating to food, weight, and shape concerns remains to be empirically established. Wells & Hackmann (1993) have argued that a conjunction of different beliefs play an important role in determining the nature of the disturbance. That is, generic core beliefs are likely to be important in the development of a range of psychological difficulties. However, it may be that the strength of association of particular schemas with the conditional assumptions that relate to food, weight and shape that could suggest a primary role for particular schemas in the development of eating problems. This information may allow more effective targeting of particular schemas in therapy. Models and technologies borrowed from experimental psychology may be useful in delineating this relationship.

How to assess cognitive content and process in eating disorders?

Researchers have attempted to access cognitive content and process in the eating disorders via the use of self-report techniques (e.g., questionnaires, interviews). Experimental methodologies have also been utilised, such as pre-conscious processing

tasks (e.g., tachistoscope, Stroop), and strategic processing tasks (e.g., anagram

solution tasks). Methods utilised by researchers investigating other forms of

psychopathology (e.g., anxiety, depression and phobias) may also be usefully applied

in future eating disorder research targeting cognitive content and process. The

remaining section of this review will consider further the problem of measurement in

this area, along with tools that may further improve our understanding.

<u>Self-report tools</u>

     Researchers and clinicians in the field of the eating disorders have developed

various explicit self-report measures and interview techiques, designed to assess the

severity of eating psychopathology and to evaluate treatment outcome. Most of these

tools focus on the individual's attitudes towards food and eating, and on the

behavioural manifestations of eating disorders (e.g., bingeing and purging). Other

interview techniques and measures have extended their focus to attend to the deeper-

level cognitive content and process that is involved in eating psychopathology.

     Various psychometric measures exist to assess the concern about food, weight

and shape that are experienced by people with eating disorders or related body-image

disturbances. Attitudinal inventories and semi-structured interview techniques have

been used in the assessment of bulimia and anorexia nervosa, confirming that clinical

subjects differ from non-clinical groups and controls (e.g., obese, restrained and

dieting groups) in stated drive for thinness and shape and weight concerns (e.g.,

Garner, Olmsted & Polivy, 1983; Cooper, Cooper & Fairburn, 1989).

     <u>Interview techniques</u>. The most widely-used instrument for assessing the

specific psychopathology involved in bulimia and anorexia nervosa is the Eating

Disorder Examination (EDE; Fairburn & Cooper, 1993). This semi-structured

interview schedule and rating scales provide an individual profile on five key

elements: bulimia, restraint, eating concern, shape concern, and weight concern. Similar interview-based schedules include the Clinical Eating Disorders Rating Instrument (Palmer, Christie, Cordle, Davies & Kenrick, 1987; Palmer, Robertson, Cain & Black, 1996) and the Structured Interview for Anorexia and Bulimia (e.g., Fichter, Herpertz, Quadflieg & Herperttz-Dahlmann, 1998). Such schedules may be a useful component of any comprehensive assessment, but provide only limited information regarding the specific cognitions that are involved in maintaining the problem. The interviews are mainly adopted as research tools, because they are too lengthy and complicated to administer in standard clinical practice.

A semi-structured interview that goes further in its focus than the earlier schedules, is the semi-structured interview used by Cooper et al. (1998). These authors interviewed anorexic and bulimic women, and non-eating disordered controls, using a schedule based on Wells & Hackmann's (1993) interview (used to examine core beliefs in people with health anxiety). Cooper et al.'s interview considers dysfunctional assumptions and negative automatic thoughts about eating, weight and shape, but also examines the deeper-level negative self-beliefs that underpin them.

The interview used by Cooper et al. (1998) asked subjects to identify the most recent situation (or two situations for bulimic subjects, a binge and a non-binge situation) in which they could remember feeling bad about their eating. Subjects also identified a recent occasion where they had felt bad (but not related to their eating, weight, or shape). Each situation was examined using a structured series of probe questions to access conditional assumptions regarding food, weight and shape, and deeper-level self-beliefs. The developmental origins of the identified negative self-beliefs were also examined. This strategy appears to be a useful clinical and research tool for accessing core beliefs. However, the promising results obtained should be

interpreted with caution, given the study's small sample size and the absence of

clinical comparison groups (e.g., depressed patients and dieters). The probe-question

approach is also time-consuming and potentially difficult to replicate, as the precise

nature of the questions used are not stated by the authors. Assessment of this type may

be best undertaken in therapeutic sessions, (rather than in isolated assessments)

because of the potentially emotive nature of the material evoked.

General self-report measures of eating psychopathology. In contrast to

interview schedules, the use of self-rating questionnaires is a quick and potentially

easy way of accessing cognitive material and process involved in eating disorders.

There are many such instruments available including: the Eating Attitude Test (EAT;

Garner & Garfinkel, 1979; Garner, Olmsted, Bohr & Garfinkel, 1982); the Eating

Disorders Inventory (EDI; Garner, Olmsted & Polivy, 1983; Garner, 1991); the self-

report version of the Eating Disorder Examination (the EDE-Q; Fairburn & Beglin,

1994); and the Bulimic Investigatory Test-Edinburgh (BITE; Henderson & Freeman,

1987). The EAT has widely been used as a screening tool for 'caseness' of eating

disorder. It is also useful for evaluating changes in attitudes and in assessing

therapeutic outcome. However, the face validity of the EAT is questionable (e.g.,

Fairburn, Steere & Cooper, 1990). Although it claims to exclusively assess eating

attitudes, it also addresses dysfunctional eating behaviour. The EDE-Q and the BITE

are more focused upon eating symptoms and behaviours. The EDI has similar uses to

the EAT. In addition to focusing on specific aspects of eating psychopathology, it also

considers some of the wider, non-specific concerns that may be related to eating

disorder (e.g., 'maturity fears'; 'personal ineffectiveness'). This may tell us something

about the general themes that may be bound up in negative self-schemas, but none of

the self-report scales above can tell us much about *specific* cognitive content or

process involved in eating problems or of the deeper beliefs which underpin them.

Self-report measures of cognition in the eating disorders. Several

psychometric measures purport to assess the cognitive content involved in eating

psychopathology. Most focus on the dysfunctional assumptions and automatic

thoughts related to food, weight and shape. Some measures used to assess cognition in

eating psychopathology have been adapted from existing measures of general

cognitive distortions, adding items to address shape, weight and food concerns and

related emotion (e.g., the Modified Distressing Thoughts Questionnaire; Clark,

Feldman & Channon, 1989; the Modified Cognitions Questionnaire; Dritschel,

Williams & Cooper, 1991). Both of these measures are reported to have good levels

of reliability and validity and clinical utility (e.g., Clark et al., 1989; Dritschel et al.,

1991). A second group of questionnaires have been developed specifically to assess

the cognitions of anorexics and bulimics. These include the Body Shape

Questionnaire (Rosen, Jones, Ramirez & Waxman, 1996); the Bulimia Cognitive

Distortions Scale (e.g., Schulman, Kinder, Powers, Prange & Gleghorn, 1986); the

Bulimic Automatic Thoughts Questionnaire (e.g., Phelan, 1987; Franko & Zuroff,

1992); the Food and Weight Cognitive Distortions Survey (Thompson, Berg &

Shatford, 1987); and the Anorectic Cognitions Scale (e.g., Mizes & Klesges, 1989;

Mizes, 1990, 1991, 1992; Mizes & Christiano, 1995). Phelan's (1987) Bulimic

Thoughts Questionnaire considers weight and eating themes in relation to self-

schema, self-efficacy and salient beliefs (beliefs regarding the consequences of

loss of control over eating). However, more evidence is needed for the reliability and

validity of many of these questionnaires. In addition, these tools mainly assess the

superficial levels of cognition, and associated emotional states. We may need

something further to understand the cognitive material and processes that underpin

these concerns.

Naturalistic studies and thought sampling. An alternative to self-report

questionnaires is the investigation of self-statements, using experimental techniques

such as naturalistic observation and thought sampling. Zotter & Crowther (1991) used

a thought sampling technique, where subjects self-monitored thoughts every thirty

minutes for two randomly selected days. The bulimic sample reported a greater

proportion of weight- and shape-related thoughts than dieters or a control group.

Cooper & Fairburn (1992a) asked subjects to 'think aloud' while performing three

behavioural tests. They found that patients with eating disorders reported more

negative self-statements related to eating, weight and shape than a normal control or

dieters, and that this verbalisation technique was more effective in distinguishing

between the groups than a brief thoughts checklist. Rosen, Leitenberg, Fondacaro,

Gross & Willmuth (1985) assessed concurrent verbalisations during a test meal

procedure, also finding that bulimics differed from controls on the frequency of

negative food-related thoughts. Cooper, Clark & Fairburn (1992) activated

assumptions about eating, weight and shape in patients with bulimia, and found an

increase in negative self-statements (not found in the control group). Although these

studies provide limited data regarding the potential clinical and research utility of

naturalistic approaches, basic questions still remain as to their reliability and validity.

Most have used affective ratings, and consequently have ignored the rich cognitive

data generated by such methods.

Measures of deeper-level cognitive content. The Eating Disorder Belief

Questionnaire (EDBQ; Cooper, Cohen-Tovée, Todd, Wells & Tovée, 1997; Cooper

& Hunt, 1998) was developed to assess both core beliefs and underlying assumptions

in bulimia nervosa. This measure assesses negative self-beliefs (schemas) and three

types of underlying assumptions (weight and shape as a means to self-acceptance; weight and shape as a means to acceptance by others; and control of eating). However, there are several problems with this measure as a valid and reliable tool in the assessment of core beliefs. The first problem is that the measure assesses core beliefs as a single dimension ('negative self-beliefs'). Waller et al. (in press *b*) point out that other conceptualisations of the core beliefs relevant to psychopathology involve a more sophisticated analysis of such cognitive representations, assessing them on several dimensions that have been well-validated (e.g., Padesky, 1994; Young; 1999). Secondly, Cooper & Hunt's (1998) study did not distinguish bulimics from depressives using the negative self-beliefs scale. This may have been due to the control samples used. Other studies using multi-dimensional measures of core beliefs (e.g., Waller et al., in press *b*) have found qualitative differences in core beliefs between bulimics and depressives. Furthermore, the negative self-beliefs scale of the EDBQ focuses solely on the content of the relevant schemas (core beliefs) and fails to consider schema process. Young (1999) argues that in order to understand and treat psychopathology, understanding the role of schema processes is essential.

Young Schema Questionnaire (YSQ; Young, 1994). The Young Schema Questionnaire is a 205-item, multi-dimensional, self-report questionnaire, with scales designed to measure 16 core beliefs. Schmidt, Joiner & Telch (1995) and Lee, Taylor & Dunn (1999) have demonstrated the psychometric validity and utility of the YSQ, showing that its factor structure maps closely onto the proposed scales. Schmidt et al. (1995) and Lee et al.(1999) have shown that the proposed YSQ scale of 'Social undesirability', is not psychometrically valid. This is the sole scale to include eating- and appearance-related cognitions. The YSQ also has good discriminant validity, with strong associations with psychological distress, self-esteem and personality disorder.

Waller et al. (in press *a*) have demonstrated its utility in distinguishing core beliefs involved in the eating disorders. Waller et al. (in press *b*) have used the YSQ to distinguish depressed bulimics from people with major depressive diagnosis.

Uncovering schema-level cognitive processes. The only available direct measure of cognitive process used in the eating disorders is the Young-Rygh Avoidance Inventory (YRAI; Young & Rygh, 1994). This 40-item self-report questionnaire assesses the presence and degree of avoidance that individuals engage in. The YRAI contains items relating to cognitive, behavioural, somatic and emotional avoidance, although there are no formal sub-scales to assess these components. Spranger et al. (in press) have demonstrated the robust nature of the YRAI as a measure of schema avoidance. However, further work needs to be done to establish the discriminant validity of the YRAI in distinguishing bulimics from pertinent comparison groups (e.g., depressives).

Experimental technologies

Selective attention. The most widely-used experimental measure of selective attention in eating psychopathology is the Stroop colour naming task (Stroop, 1935). The Stroop task has been used to assess attentional bias in various forms of psychopathology (e.g., Foa, Feske, Murdock & McCarthy, 1991; Mathews & Klug, 1993; van den Hout, Tenney, Huygens & De Jong, 1997). The standard Stoop task involves presenting participants with a series of colour words printed in different colours (e.g., the word 'blue' printed in red ink). Subjects are asked to name the colour of the ink as quickly as possible, while ignoring the content of the word. Where the speed of colour-naming is slowed in response to emotion-laden words, this is taken to reflect selective processing of the emotionally-relevant material (Fairburn, Cooper, Cooper, McKenna & Anastasiades, 1991) and schema activation (Vitousek &

Hollon, 1990). The Stroop task has been adapted for assessing cognition in the eating disorders, by comparing response times for either masked or unmasked food-, weight- and shape-related words and neutral words. The results suggest that all eating disorder groups show the Stoop interference effect as compared to non-clinical controls (e.g., Channon, Hemsley & de Silva, 1988; Ben-Tovim et al., 1989; Ben-Tovim & Walker, 1991; Fairburn et al., 1991; Cooper et al., 1992; McManus, Waller & Chadwick, 1996; Jones-Chesters, Monsell & Cooper, 1998; Sackville, Schotte, Touyz, Griffiths & Beumont, 1998). The evidence on non-eating-disordered women who engage in dieting is more equivocal (e.g., Ben-Tovim & Walker, 1991; Huon & Brown, 1996). The Stroop task has also been used with other non-clinical groups of women (e.g., McManus et al., 1995; Huon & Brown, 1996; Waller et al., 1996; Green, Elliman & Rogers, 1997; Stewart & Samoluk, 1997). It shows impaired naming of shape-related words in women with a higher drive for thinness (Green et al., 1997), longer latencies for food words in chronic restrainers (Stewart & Samoluk, 1997), and impaired processing of ego-threat cues in women with more bulimic attitudes (Waller et al., 1996).

Despite the plethora of studies using the Stroop task, evidence for its concurrent validity has been mixed. The Stroop is modestly correlated with purging frequency (Cooper & Fairburn, 1993) and with EAT scores in bulimics, but not in controls (Cooper & Fairburn, 1993; Cooper et al., 1992). However, this correlation disappears when the level of depression (Cooper et al., 1992), or general psychiatric symptoms is controlled (Cooper & Fairburn, 1993). Other studies have failed to find significant associations between the Stroop and various psychometric measures, including the EAT (Garner & Garfinkel, 1979; Channon & Hayward, 1990), the EDI (Tucker & Schlundt, 1995), and reported binge frequency, the EDE and the Body

Shape Questionnaire (Cooper & Fairburn, 1993). The effects of hunger on the

processing of food-related material (e.g., Channon & Hayward, 1990; Vitousek &

Hollon, 1990) also lead to questions about the validity of the Stroop task as an index

of eating pathology. However, other studies (e.g., Channon et al., 1988; Stewart &

Samoluk, 1997) have failed to show such a relationship. Many studies using the

Stroop task have methodological complications (e.g., potential order effects) or

statistical flaws, which compromise their findings. Finally, Thorpe & Salkovskis

(1997) suggest that the Stroop task may measure strategic but not automatic

processing. Stroop effects may also be suppressed under conditions of high anxiety,

indicating that increased effort can enable suppression of attentional bias (e.g., Amir,

McNally, Riemann, Burns, Lorenz & Mullen, 1996).

A further group of studies have used tachistoscopic presentation to investigate

cognitive content in eating psychopathology (e.g., Patton, 1992; Waller & Mijatovich,

1998; Meyer & Waller, 1999). The results of these studies suggest that women with

more unhealthy eating attitudes overeat following subliminal presentation of threat

cues (where cues are presented for 4 ms - too quickly for conscious awareness), but

not in response to subliminal appetitive cues or supraliminal threats (where cues are

presented for 200 ms – at a conscious level). These findings support a cognitive

model where early processing of threat facilitates eating, rather than models

advocating the centrality of food-related information.

One study has used an auditory measure of selective attention - the dichotic

listening task - to assess cognition in bulimia (Schotte, McNally & Turner, 1990).

This task involves the presentation of two spoken passages, one to each ear. Subjects

are instructed to attend to the passage presented in one ear and to ignore the other

passage, and subsequently they are asked to detect words from the unattended

passage. Typically, subjects more easily detect target words in the attended channel, whilst reporting only personally-salient or emotion-laden words from the unattended passage. Schotte et al. (1990) found that bulimic women attended to the target word ('fat') in the unattended passage more than they attended to a neutral word in the attended passage. This suggests the emotional significance of appearance-related data in bulimics. However, the dichotic listening task has not been widely used, and these findings require replication and extension.

Recall bias. A recall-based methodology has been used to consider selective memory in eating-disordered women (e.g., King, Polivy & Herman, 1991; Sebastian, Williamson & Blouin, 1996). This type of approach, which assesses implicit and explicit memory, has also been used in other forms of psychopathology. Primed subjects consistently recall more information related to their psychopathology than other material (e.g., depression-related words in depression - Bradley, Mogg & Millar, 1996; 'contamination' words in OCD - Radomsky & Rachman, 1999). Incidental recall paradigms (e.g., Ingram, Partridge, Scott & Bernet, 1994) have been used to assess whether sub-clinically depressed individuals have self-schemas that facilitate the diffuse processing of any depressive information. Ingram et al. (1994) found that subjects showed a high sensitivity to both state depressive information processed automatically and trait depressive information processed effortfully. This pattern is consistent with the presence of relatively specific, state-referent depressive schemas that, when activated, are associated with an attentional bias to negative information. This type of effect is also seen in the eating disorders, with subjects showing better recall for weight- and food-related material than for other information (King et al., 1991; Sebastian et al., 1996). Again, the studies of eating disorders using this approach have mainly focused on food-, weight-, and shape-related concerns. Cooper

(1997b) assessed interpretation of ambiguous scenarios with either a positive or negative outcome. In later open-ended questioning and forced-choice responses, eating-disordered women selected weight and shape interpretations in preference to other interpretations. This bias was specific to judgements involving the self, reflected in biased processing of negative self-referent events.

Another study using a similar method (the Pragmatic Inference Task) has focused on cognition encoded at the schema level, finding an avoidant schema-congruent information processing bias in avoidant personality disorder (Dreessen, Arntz, Hendriks, Keune & van den Hout, 1999). Alloy, Abramson, Murray, Whitehouse & Hogan (1997) used an information processing test battery, and found that depressed people showed similar information processing biases to negative self-relevant material, recalling more information related to a depressive self-concept than positive material. Word- and sentence-stem tasks have also been used by researchers investigating self-referent schematic processing in other forms of psychopathology (e.g., anxiety - McCabe, 1999; depression - Teasdale, Taylor, Cooper, Hayhurst & Paykel, 1995; Teasdale, Lloyd & Hutton, 1998). The results of these studies, like other information processing paradigms, suggest that mood-congruent constructs are activated by depressed mood, which produced more negative completions in this task. Homophone or homograph studies (see Vitousek & Hollon, 1990) may also produce more food-, weight- and shape-related interpretations, or negative self-referent interpretations at a deeper, schematic level. Such approaches might be usefully replicated to assess schematic processing in eating psychopathology.

Cognitive avoidance. Meyer et al. (in press) have considered strategic processing of ego-threats in eating-disordered women, using an anagram solution task (involving the solving of neutral, food word and threat word anagrams). Bulimic

behaviours (bingeing and vomiting) were associated with slowed solution times for ego-threat anagrams. This finding supports an 'escape from awareness' model (e.g., Heatherton & Baumeister, 1991), where slowed solution times reflect cognitive avoidance of schema-level representations of ego-threat.

Another group of studies have used variants of the visual dot probe task to investigate attentional bias to threat in anxiety (e.g., Mathews & MacLeod, 1986; Mogg, Bradley & Williams, 1995; Mogg & Bradley, 1999); dysphoria (McCabe & Toman, 2000). The basic task involves presentation of word pairs on a computer screen; and a dot probe appearing in the location just vacated by one of the two words. Subjects are required to respond to the probe by pressing a key as quickly as possible. Lubman, Mogg, Bradley & Deakin (2000) have also adapted this method, using a pictorial probe task to investigate attentional bias for drug cues in opiate dependence. However, pictorial probe tasks have not yet been used in eating disorder research.

One study (Rieger et al., 1998) has adapted this procedure to assess attention towards stimulus words reflecting shape-concerns and negative emotion. Rieger et al. found that eating-disordered women were slower to detect probes when they appeared in the same location as had thinness-related stimulus words, and faster to detect probes that appeared in the same location as stimulus words denoting a large physique. These results suggest that the probe procedure allows the differentiation between attention directed toward (faster probe detection) and attention directed away (slower probe detection) from a particular type of stimulus words. This procedure allows direct hypotheses about attentional processes to be made, which would not be possible when using other methods (e.g., dichotic listening task; Stroop task). Rieger et al.'s findings suggest that eating-disordered subjects are more likely to attend to

fatness-related information, whilst ignoring information associated with thinness. This attentional bias may serve to maintain concerns about shape and weight (i.e., a fear of becoming overweight), even in the face of contradictory information. These findings support Vitousek & Orimoto's (1993) suggestion that individuals with eating disorders preferentially process schema-congruent information, and are resistant to counter-schematic material. Methods such as the Stroop task, in which attention toward or away from the target cue may result in slower colour-naming latencies, would not have demonstrated such an effect.

Behavioural avoidance. A further technique that has been used to investigate behavioural responses to schema-activating cues is the Affective Simon task (e.g., De Houwer & Eelens, 1998; De Houwer, Hermans & Eelens, 1998). This task can be used to assess automatic affective processing. The basic task involves the presentation of positive and negative nouns and adjectives. Participants are required to respond as quickly as possible by saying a pre-determined positive or negative word, depending on the grammatical category of the presented word (i.e., noun or adjective). Half of the participants had to say negative to nouns and positive to adjectives and half responded with the opposite set. De Houwer & Eelens (1998) found that despite the fact that the stimulus valence was irrelevant and had to be ignored, reaction times were shorter when the valence of the presented word and the correct response was the same rather than different.

A variant on this paradigm has been used by De Houwer, Waller & Meyer (in preparation), to investigate the tendency for women with high levels of eating psychopathology to approach or avoid emotionally-valenced material. In this variant of the Affective Simon, subjects were required to make a stick figure on a computer screen approach or avoid the words. Bulimic women were more likely to avoid

disliked words, being quicker to make the figure 'run away' from food words. Variants on the Affective Simon task might usefully be developed to investigate the process of behavioural avoidance in eating disorder further.

Schematic association. One area that has not yet been considered in eating disorder research is how different types of threat-related stimuli are linked with the activation of specific schemas and associated affect. More explicitly, it is not clear how the activation of negative core beliefs relating to the self relates to conditional beliefs regarding food, weight and shape. [This deficit is addressed by the empirical paper that follows this review.] Experimental cognitive psychology models can be of help in understanding associations between different cognitive phenomena. Neural network models of the brain suggest that cognitive structures are related to each other in long-term memory (see Shiffrin & Schneider, 1977 for a review). Information may be stored at sites in huge tangles of neural links, which are organised hierarchically according to semantic relationships. Essentially, the relationship between any two concepts can be measured by determining how far they are from each other across such links. Thus, if concepts are closely associated, (e.g., an abandonment schema, and conditional assumptions regarding food), the time taken to travel from one concept to the other across such links should be shorter than for two concepts that are less closely semantically linked in memory.

Some research has shown that evaluative, affective reactions to external information are instantly and automatically activated (e.g., Zajonc, 1980; Bower, 1981). Bower (1981) suggests that affect and cognition are linked in an integrated cognitive representational system. Emotion nodes are linked to propositions that describe events from a person's life, when the emotion was aroused (e.g., in early trauma). Emotion nodes are activated by many events and are subject to the spread of

activation - when emotion is precipitated, the emotion node will spread activation to a variety of indicators to which it is connected (e.g., self-schemata). Once a piece of information is activated, it is easier to process subsequent, similar or related information because of the spread of activation that crosses the short distance between two neighbouring links (e.g., Collins & Loftus, 1975; Fazio, 1995). The inter-relationships between schemas in memory are important clinically. For example, in the eating disorders, it can be hypothesised that the activation of self-schemas with the strongest association with conditional beliefs relating to food is most likely to trigger overeating (as a strategy for managing the affect that is associated with the self-schema).

An experimental tool that has been designed to assess automatic concept-attribute associations is the Implicit Association Test (IAT; Greenwald, McGhee & Schwartz, 1998). An assumption of this test is that strongly associated (compatible) attribute-concept pairs should be easier to classify together than pairs that are weakly associated or opposed (incompatible) For example, an abandonment schema may be more closely associated (compatible) with food concerns, than a depressive (incompatible) self-schema. The basic IAT method involves presenting subjects with a series of words on a computer screen, that they must categorize as quickly as possible by pressing a left or right key on a keyboard. The automatic association between a concept (e.g., 'flower') and the attribute of evaluation (e.g., pleasantness) is measured by the difference in speed between the conditions in which 'flower' and 'pleasant' were mapped together and the condition in which 'flower' and 'unpleasant' were mapped together. This basic task has been adapted to measure implicit, attitudinal associations in racism (Greenwald, McGhee & Schwartz, 1998; Dasgupta, McGhee, Greenwald & Banaji, 2000); in prejudice based on religious ethnicity

(Rudman, Greenwald, Mellott & Schwartz, 1999); in gender beliefs (Rudman, Greenwald & McGhee, 1996, 1998); in snake and spider phobics (Teachman, Gregg & Woody, under consideration); and in self-esteem (Farnham, Greenwald & Banaji, 1999). These studies have shown that the IAT is a sensitive measure of schematic association, which might also usefully contribute to our understanding of schematic association in eating psychopathology.

Research implications

The model presented here linking schematic-level beliefs and process and eating psychopathology requires further research. In particular, implicit processing tasks such as the Affective Simon could be developed to assess schematic processing (e.g., schema avoidance or schema compensation). Future research might also usefully be targeted towards the development of new explicit, multi-dimensional psychometric measures of schema content, of which the YSQ is the only currently available measure. While recent research (e.g., Leung et al., 2000; Waller et al., in press) has identified a number of the core beliefs relevant to bulimic psychopathology, further study of the content of such beliefs is required in investigating anorexia nervosa.

Furthermore, the potential impact that specific core beliefs have by virtue of their level of association with dysfunctional assumptions regarding food-, weight-, and shape-related concerns has not been investigated directly. Past research suggests that depressive schemas may be closely associated with conditional food-, weight- and shape-schemas, as depression has long been linked with bulimia (e.g. Johnson & Larson, 1987). In particular, some research suggests that bulimia may be characterised by unconditional negative self-beliefs (core beliefs) similar to those found in depression (e.g., Vitousek & Hollon, 1990; Cooper & Todd, 1998; Cooper, et al.,

1998; Waller et al., in press). Other studies (e.g., Patton, 1992; Meyer & Waller, 1999) indicate that abandonment schemas might also be closely associated with conditional beliefs relating to food. Future research might usefully adapt experimental technologies that have been used to examine implicit association in other populations (e.g., the IAT), towards understanding the relative importance of associations between specific self-schemas and conditional beliefs relating to food and eating. Such research would develop our understanding of which unconditional schemas have the primary impact on attitudes to food and the development of subsequent eating psychopathology. Such findings would enhance our theoretical understanding of the role of specific schemas in eating disorder and guide the parsimonious clinician in formulating and targeting the most relevant cognitive variables in therapy.

Clinical implications

Our understanding regarding the schema-level content and process that is important in the development and maintenance of bulimic psychopathology requires further development. Our understanding of the deeper-level cognitive content and process in anorexia nervosa lags somewhere behind this. Furthermore, no research has directly considered the relative role specific schemas play in maintaining eating disorders. Therefore, it remains to be established whether preferentially addressing particular self-schemas over others would add to the therapeutic benefits of standard schema-focused therapies (e.g., Padesky, 1994; Young, 1999). It is unclear whether this approach would produce a greater therapeutic shift in the conditional assumptions relating to food-, weight- and shape-related material that also serve to maintain the problem (and are the focus of standard short-term CBT interventions). Some new research (e.g., Spranger et al., in press) also suggests that schema processes, such as schema avoidance, may need to be tackled first, in order that such highly protected

beliefs can be challenged. Depending on the type of avoidance employed (e.g.,

behavioural, somatic, cognitive or affective), different therapeutic techniques could be

considered (e.g., grounding techniques for dissociation - Kennerley, 1996; distress

tolerance skills for affective avoidance - Linehan, 1993; Telch, 1997). In addition, the

functional nature of such beliefs to the self-concept (as evidenced by such defensive

schema processes) should be recognised and considered carefully when utilising

therapeutic schema change techniques (e.g., Mollon, 1996; Young, 1999).

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Schema association in eating psychopathology: A study of non-eating-disordered women using the Implicit Association Test

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RUNNING HEAD: SCHEMA ASSOCIATION, EATING, IAT.

Abstract

Objective: The aim of the study was to assess the level of association between abandonment and food schemas. **Method:** The study used a measure of schematic association, the Implicit Association Test (IAT), to test the hypothesis that abandonment schemas are more closely associated than depressive schemas with food schemas, particularly in women with more bulimic attitudes (as measured by the BITE). In order to assess whether effects found were due specifically to bulimic psychopathology, YSQ and BDI-II scores were also correlated with the IAT. **Results:** MANOVA's comparing compatible and incompatible IAT trials did not reveal a significant faster reaction-time effect for abandonment and food pairings. Nor was there a greater effect among women with more bulimic attitudes (Pearson's r). There were no significant correlations between the YSQ or the BDI-II. **Discussion:** The experimental hypotheses were unsupported. Methodological and conceptual explanations for the findings are discussed, along with clinical and research implications.

Schema association in eating psychopathology: A study of non-eating-disordered women using the Implicit Association Test

Cognitive theories have stressed the centrality of food-, shape- and weight-related concerns in the maintenance of bulimic behaviours (Fairburn, 1981; Fairburn, 1997). Such 'starvation-binge-purge' models, with their emphasis on food-related cognitions, have been highly influential in the development of cognitive-behavioural theory and therapy for bulimic difficulties (e.g., Fairburn & Cooper, 1989). However, the starvation model may be too simplistic to explain all bulimic behaviour sufficiently (Cooper, 1997a). The *main* focus of the discussion is on bulimic behaviours, as the majority of the research into cognitive content has focused on bulimic difficulties and a normal sample is used here, so continuity may be demonstrated on dimensions rather than on diagnostic categories. However, some of the literature on core beliefs used here does relate to bulimia nervosa and other eating disorder diagnoses, as the evidence base remains sparse.

Recent research has supported the clinical hypothesis that certain emotions frequently precipitate binge eating. It is apparent that clients often stress emotional antecedents, rather than appetitive ones, as the trigger for binge-eating (e.g., Cooper & Bowskill, 1986). In particular, it has been demonstrated that exposure to negative emotional cues can precipitate overeating. Agras & Telch (1998) showed that women with binge-eating disorder are more likely to binge in response to negative mood induction than in response to caloric deprivation. It is suggested that overeating can serve the function of reducing awareness of intolerable cognition and affect (e.g., Lacey, 1986; Root & Fallon, 1989; McManus & Waller, 1995; Meyer et al., 1998; Waters, Hill & Waller, in press). This model is supported by research suggesting that

women with bulimic attitudes show attentional biases towards self-directed ego-threats (e.g., Heatherton, Herman & Polivy, 1991; Waller, Quinton & Watson, 1995; Waller, Watkins, Shuck & McManus, 1996) and negative emotion words (Rieger, Schotte, Touyz, Beumont, Griffiths & Russell, 1998), as well as food-, shape- and weight- related cues (Cooper, 1997b).

These findings suggest that bulimic difficulties are associated with over-elaborated cognitive representations (schemas) of both food- and threat-related material (Meyer & Waller, 1999). In this context, bulimic behaviours may be understood as a purposeful strategy used to block, or avoid, intolerable affect related to threatening material (Lacey, 1986; Root & Fallon, 1989; Heatherton & Baumeister, 1991). Recent schema-focused cognitive-behavioural models developed for personality disorders (e.g., Beck & Freeman, 1990; Young, 1999) have suggested that schema avoidance may reflect ways of responding to threat via a process of cognitive, emotional, somatic and behavioural avoidance. In the short term, such strategies reduce the risk that negative core beliefs regarding the self will be triggered. This avoidance may be both automatic (e.g., dissociation; Chandarana & Malla, 1989; Vanderlinden, Vandereycken, van Dyck & Vertommen, 1993) and strategic (e.g., Beck & Clark, 1997; Young, 1999). Avoidance also serves to reduce the intolerable levels of affect that are associated with core beliefs, once activated. However, in the long-term, avoidance means that the person's core beliefs are maintained, because they are not open to challenge (Young, 1999).

Beck (1967) first defined schemas in relation to depression. He described the schema as a matrix of cognitive structures that assist an individual in interpreting and evaluating incoming information from their environment. Young (1994, 1999) extends the definition of a schema to refer to both the structure and the processes and

content that are associated with it. In contrast, Beck & Freeman (1990, p.4) argue that the term 'schema' strictly should refer only to the structure, while the term 'belief' should be used to refer to the content of the structure. This definition is adopted here. Schemas can be viewed as implicit, unconditional cognitive themes held by individuals, which are extremely resistant to change because of their entrenched and self-perpetuating nature. Young (1999) outlined a subset of 'early maladaptive schemas', emphasising the importance of early traumatic experiences in the development of dysfunctional beliefs regarding the self and others. These beliefs serve as a maladaptive template, which becomes elaborated through life. Schemas lie at the deepest level of cognition. As such, they underpin the levels of automatic thoughts and dysfunctional assumptions, which form the basis of current short-term cognitive-therapy approaches used in treating people with eating disorders (Garner & Bemis, 1982; Fairburn, Marcus & Wilson, 1993). Such models may limit themselves by failing to consider the deeper-level cognitive variables that may be relevant to eating psychopathology (e.g., Guidano & Liotti, 1983; Vitousek & Hollon, 1990; Hollon & Beck, 1994). This is especially the case if bulimic behaviours are viewed as a strategy for avoiding schema activation and associated high levels of affect (e.g., Waller & Meyer, 1997), and when relationships between bulimic psychopathology and sexual and emotional abuse are considered (Fallon & Wonderlich, 1997; Kent, Waller & Dagnan, 1999).

Recent research has acknowledged that to focus only on the 'superficial' levels of cognition may be a significant omission, especially when treatment outcome is considered. However, the existing empirical base for this suggestion is limited (e.g., Mitchell, Hoberman, Peterson, Mussell & Pyle, 1996; Wilson, 1996). One group of

studies have considered the schematic content that may be present in individuals with more unhealthy eating attitudes. General negative core beliefs and specific core beliefs relating to defectiveness/shame, emotional inhibition and abandonment have been linked to bulimic disorders and behaviours (e.g., Cooper, Todd & Wells, 1998; Waller, Ohanian, Meyer & Osman, in press). However, the mechanisms whereby core beliefs have their impact upon bulimic behaviours are not fully understood.

There is some recent evidence of schematic processing in eating behaviours that overcomes the demand characteristics of such studies. Much of the research to date into threat-processing in bulimia has utilised conscious processing tasks, where threat cues are readily perceived. However, subliminal processing studies suggest that the effects of emotionally threatening material can occur preconsciously (i.e., without conscious awareness). Such implicit, subliminal tasks can control for demand characteristics and conscious motivations of the participant, allowing a direct measure of the behavioural effects of cues (Silverman, 1983). Studies using a subliminal processing method (e.g., Patton, 1992; Meyer & Waller, 1999) suggest that preconscious processing of threat is most highly correlated with subsequent overeating when the threat is *abandonment*. This overeating is not precipitated following exposure to a subliminal appetitive cue or to supraliminal cues. These results support a cognitive model where overeating functions to reduce activation of abandonment schemata, and where the earliest stage of activation of overeating is precipitated by emotional rather than appetitive material. However, the picture is somewhat more complex than this finding suggests. Meyer & Waller (1999) also show overeating in non-clinical women with more unhealthy eating attitudes in response to a hostile, negative emotion cue (angry), but not in response to either a neutral or a positive emotional cue. This indicates that overeating is specific to

negative rather than *general* emotional arousal (cf. Rieger et al., 1998). It also

suggests that overeating may be a response to activation of a broader range of

negative schemas in women with greater levels of eating psychopathology.

It remains unclear how different types of threat-related stimuli are linked with

the activation of specific schemas and associated affect, and how the activation of

these schemas and the negative core beliefs relating to the self relate to conditional

beliefs regarding food, weight and shape. Experimental cognitive psychology models

can be of help in understanding associations between these cognitive phenomena.

Neural network models of the brain suggest that cognitive structures are related to

each other in long-term memory (see Shiffrin & Schneider, 1977 for a review).

Information may be stored at sites in huge tangles of neural links, which are organised

hierarchically according to semantic relationships. Essentially, the relationship

between any two concepts can be measured by determining how far they are from

each other across such links. Thus, if concepts are closely associated, (e.g., an

abandonment schema, linked to conditional assumptions regarding food), the time

taken to travel from one concept to the other across such links should be shorter than

for two concepts than are less closely semantically linked in memory. Some research

has also shown that evaluative, affective reactions to external information are

immediately and automatically activated (e.g., Zajonc, 1980; Bower, 1981). Once a

piece of information is activated, it is easier to process subsequent, similar or related

information because of the spread of activation that crosses the short distance between

two neighbouring schemas (e.g., Collins & Loftus, 1975; Fazio, 1995).

The inter-relationships between schemas in memory are important clinically.

For example, in the eating disorders, the activation of self-schemas with the strongest

association with conditional beliefs relating to food is most likely to trigger overeating (as a strategy for managing the affect that is associated with the self-schema). Past research suggests that depressive schemas may be closely associated with food-, weight- and shape-schemas, as depression has long been linked with bulimia (e.g. Johnson & Larson, 1987). In particular, cognitive researchers have suggested that bulimia may be characterised by unconditional negative self-beliefs (core beliefs) similar to those found in major depression (e.g., Vitousek & Hollon, 1990; Cooper & Todd, 1998; Cooper, et al., 1998; Waller, Shah, Ohanian & Elliott, in press). Other studies (e.g., Patton, 1992; Meyer & Waller, 1999) indicate that abandonment schemata could also be closely associated with conditional beliefs relating to food.

For purposes of clarification here, abandonment schemas lie at the deepest level of cognition and are viewed as containing beliefs relating to the perceived instability and unreliability of other people to provide support or connection and subsequent fears of abandonment/rejection (see Young, 1999). Philips, Tiggeman & Wade (1997) argue that the global dysfunctional cognitive style of women with bulimic difficulties and depressed women is similar, but that in bulimic women the content of dysfunctional assumptions tends to focus on food, weight and shape concerns, whereas the dysfunctional cognitions related to depression tend to be associated with perceptions about the self, current experiences and the future. Waller et al. (in press *a*) argue that certain core beliefs (e.g., social undesirability; social isolation; abandonment) appear to be characteristic of bulimia and depression. However, depressive schemas in women with greater bulimic attitudes/behaviours tend to be associated with more maladaptive core beliefs relating to social undesirability (i.e., related to being *worse* than others, in terms of undesirable characteristics which are not only limited to physical appearance), and this perceived

defectiveness may become associated with negative affective sequalae (i.e., hopelessness; sadness etc.). However, Waller et al. suggest that patients with major depression have particularly maladaptive abandonment and social isolation beliefs (i.e., being different to others and unable to rely on others). The conceptualisation of depressive schemas as related to social undesirability core beliefs in bulimia will be used here.

The content of these depressive schemas differs from core beliefs found to differentiate women with bulimic behaviours/attitudes from women with healthy eating attitudes (i.e., defectiveness/shame, insufficient self-control and failure to achieve, Waller et al., in press *b*). Within the limited literature in this area there is a slight lack of consensus as to the exact cognitive content which differentiates between the eating disorders partly because of methodological differences. However, the content of depressive core beliefs found in bulimia differs from those which have been suggested to discriminate between types of eating disorders (i.e., social isolation, functional independence and insufficient self-control beliefs; Waller et al., in press *b*; and social isolation and insufficient self-control; Leung, Waller & Thomas, 1999).

To summarise, research has identified some deeper-level cognitive content and associated processes that may be involved in bulimia. However, there has been little investigation into the relative importance of associations between specific self-schemas with conditional beliefs relating to food and eating. This study considers whether particular absolute, self-schemas are more closely associated with schemas relating to food in women with more bulimic attitudes. For example, if a stronger association is found between abandonment schemas and food-related cognitions than between depressive schemas and food-related cognitions, then abandonment schemas

may have a more primary impact on attitudes to food and subsequent bulimic psychopathology. Developing our understanding of such inter-relationships between cognitive constructs might also guide the parsimonious clinician to targeting the most relevant schemas when intervening with bulimic difficulties.

Aims and hypotheses.

This study aims to assess the degree of 'overlap' of schemas relating to food, abandonment and depression, in order to determine which of the two emotional states is most closely associated with eating psychopathology. It will use a new measure – the Implicit Association Test (IAT; Greenwald, McGhee & Schwartz, 1998), adapted to assess the preconscious, implicit associations of schemas regarding food and eating and their relationship with abandonment and depression cognitions. The specific experimental hypotheses are as follows:

Hypothesis 1: That the implicit association between food schemas and abandonment schemas will be stronger than the association between depressive and food schemas.

Hypothesis 2: The association between food and abandonment schemas will be closest in women with more unhealthy eating attitudes.

Method

Participants.

The sample consisted of 82 non-clinical women. At their request, two women were excluded from the original sample of 84. The sample included women recruited through a university research participation scheme (N= 42) and via a school sixth-form (N= 40). Demographic information on age, height and weight was obtained via self-reported data from the BITE questionnaire sheet. The mean age of the group was 18.39 years (SD = 2.51; range = 16-34). Their mean Body Mass Index [BMI = weight (kg) / height (m)^2] was 23.02 (SD = 6.25; range = 14.40-40).

Participation in the research was voluntary, and the appropriate university ethical approval was granted (Appendix 3). School participants signed up through the school head of sixth form. University participants gained credits for taking part in the study. Prior to participating, each person was given an information sheet to read, and had the opportunity to ask questions relating to the research (Appendix 4). Participants were free to withdraw at any time. For undergraduate participants, withdrawal had no impact on their participation credits. Each participant was asked to read and sign a consent form (Appendix 5). School participants who were under 18 years received an information sheet and covering letter for their parent/guardian to read prior to testing, and were asked to have their consent form countersigned by that person. All participants were offered written feedback on the study (Appendix 6).

Measures and Procedure.

The materials used in the study were an adapted Implicit Association Test (IAT; Greenwald et al. 1998) and three questionnaire measures. These were the short form Young Schema Questionnaire (YSQ-S; Young, 1994); the Bulimic Investigatory Test, Edinburgh (BITE; Henderson & Freeman, 1987); and the Beck Depression Inventory - second edition (BDI-II; Beck, Steer & Brown, 1996).

Implicit Association Test (IAT; Greenwald et al. 1998). The IAT used in this study is an adapted version of that devised by Greenwald et al. (1998). This computerised method was devised for assessing implicit associations in memory by measuring their underlying automatic evaluation. The IAT involves the presentation of words that participants are required to classify. All target words were presented in white upper case type on a black background in the centre of the screen. The target word was presented until a correct response was given. The words presented related to four concepts: 'loneliness', 'depression', 'food', and a neutral category 'furniture'.

Five words were presented for each concept. The 'loneliness' words were: abandoned, deserted, solitary, lonely, and solitude. 'Depression' words were: sad, unhappy, miserable, depressed and hopeless. 'Food' words were: butter, cream, bread, potato, and egg. Finally, the neutral 'furniture' words were: desk, sofa, tables, bookcase and cupboard. The presented words were matched according to the frequency with which they appear in the English language (see Johansson & Hofland, 1989), and words presented in the 'loneliness' and 'depression' categories were matched according to their mean affective valence (rated by a group of ten women who took no further part in the study). Before each phase of the test, and during each phase, the name of the target concept that was assigned to the left key was printed in the top left hand corner of the screen, whereas the name of the target concept that was assigned to the right key was printed in the top right hand corner of the screen. In experimental trials, two concepts were allocated to the same key (see Figure 1). The names of the target concepts were always printed in upper case type in white on a black background. The letters used in the names of the target concepts and the words were 4mm high and 3mm wide. Presentations were implemented on an IBM compatible lap-top Pentium PC, with a 12" TFT screen. Participants completed the test in situ, seated in front of the computer at a distance of approximately 40 cm from the computer screen. Participants could respond by pressing the key "q" or the key "p" of the keyboard. These keys were marked with 'left' and 'right' stickers, attached to the selected keys. The time between the presentation of a word and the first key press was measured using an accurate (beyond 1 ms) Turbo Pascal Timer (Bovens & Brysbaert, 1990). The IAT procedure is outlined below (Procedure).

Insert Figure 1 about here

Young Schema Questionnaire – short form (YSQ-S; Young, 1994). The YSQ-S consists of 75 items. It assesses which of Young's early maladaptive schemas are most relevant to an individual. The self-report measure contains statements relating to fifteen early maladaptive schemas. Each schema relates to a factor, and contains five statements. In order of presentation, the fifteen factors are: emotional deprivation; abandonment/instability; mistrust/abuse; social isolation/alienation; defectiveness/shame; failure; dependence/incompetence; vulnerability to harm or illness; enmeshment/undeveloped self; subjugation; self-sacrifice; emotional inhibition; unrelenting standards/hypercriticalness; entitlement/grandiosity; and insufficient self-control/self-discipline. Statements relating to Young's three remaining early maladaptive schemas (approval-seeking/recognition-seeking; negativity/ pessimism and punitiveness) are not included in the YSQ-S. Each statement is rated on a scale from 1 ("Completely untrue of me") to 6 ("Describes me perfectly"). A mean score is obtained for each factor. Therefore, the higher the score, the more the schema is likely to apply to the individual. The YSQ-S was used because it is faster to administer than the 205-item version of the Young Schema Questionnaire (YSQ-L; Young, 1994). The YSQ-S is also purer factorially than the YSQ-L, as it contains the five highest loading items for each factor. Schmidt, Joiner, Young & Telch (1995) and Lee, Taylor & Dunn (1999) have demonstrated the psychometric validity and utility of the YSQ, showing that its factor structure maps closely onto the proposed scales. The scales have good internal consistency. The YSQ has good discriminant validity (e.g., Waller et al., in press), and it is strongly

associated with self-esteem, psychological distress and personality disorder.

Bulimic Investigatory Test – Edinburgh (BITE; Henderson & Freeman, 1987). The BITE is a 32-item measure, which assesses bulimic attitudes and behaviours. The BITE gives a total score and two sub-scale scores. The 'Symptom' sub-scale measures the number of bulimic attitudes and symptoms, while the 'Severity' sub-scale assesses the severity of bulimic behaviours. A total score of 20 or above on the symptom sub-scale represents the clinical cut-off (Henderson & Freeman, 1987). The BITE has good psychometric properties (Henderson & Freeman, 1987), and is applicable to non-clinical populations (Waller, 1992).

Beck Depression Inventory – Second Edition (BDI-II; Beck, Steer & Brown, 1996). The BDI-II is a 21-item instrument, which indicates the presence and degree of symptoms of depression in adults and adolescents of 13 years and above. The BDI-II was devised to correspond to DSM-IV criteria for diagnosing depressive disorders (American Psychiatric Association, 1994). Each item is rated on a 4-point scale ranging from 0-3. The higher the rating given to an item, the more the item relates to that person. The BDI-II is scored by summing the responses for the 21 items. Stated clinical cut-offs reflect the severity of depressive symptoms (0-13 = minimal symptoms; 14-19 = mild; 20-28 = moderate symptoms and 29-63 = severe). The BDI-II can also be divided into two factors: 'Cognitive-Affective' and 'Somatic' dimensions of reported depression. The 'Cognitive-Affective' factor includes items such as 'sadness', 'past failure', 'loss of pleasure', 'guilty feelings', 'punishment feelings', 'self-dislike', 'self-criticalness', 'suicidal thoughts or wishes', 'crying', 'agitation', 'loss of interest', 'indecisiveness', 'worthlessness' and 'irritability'. The 'Somatic' factor includes items such as 'loss of energy', 'changes in sleeping pattern', 'changes in appetite', 'concentration difficulty' and 'tiredness and fatigue'. These

factors are scored by summing the responses relating to the relevant factor. Beck et al. (1996) report excellent psychometric data on the BDI-II, which builds on the substantial evidence base for the psychometric properties of the earlier versions (Beck, Steer & Garbin, 1988).

Procedure. After reading the information sheet and signing the consent form, all participants first completed the IAT, followed by the three questionnaire measures (YSQ-S, BITE and the BDI-II). On the IAT, participants first received written instructions on the computer screen. These instructions informed them that words would be presented in the middle of the computer screen. The IAT assesses the association between a target-concept (here 'food' and the neutral category 'furniture') discrimination and an attribute dimension (here 'depression' and 'loneliness'). The procedure starts with introduction of a two-category target-concept discrimination ('food' versus 'furniture'). Following this, the second step is the introduction of a two-category attribute discrimination ('loneliness' versus 'food'). After this introduction to the target-concept discrimination and to the attribute dimension, in step three the two were superimposed, where all stimuli for target and attribute discriminations appeared. In step four, the participant learnt a reversal of response assignments for the target discrimination. The fifth, final step combines the attribute discrimination (not changed in response assignments) with this reversed target discrimination (Figure 2). If the target concepts are differentially associated with the attribute dimension, the participant should find one of the combined tasks (of the third and fifth step) to be much easier than the other. That is, when target concepts and attributes are strongly associated in memory, mapping them onto the same response key (compatible trial) is considerably easier than when target concepts are weakly

associated (incompatible trial). The measure of this difference provides the measure

of implicit difference in association between the target and attribute concepts.

The discrimination task here was to classify target concept ('food', 'furniture')

and attribute dimension words ('loneliness' versus 'depression') by pressing one of

two keys. The assignment of response keys to categories varied from phase to phase.

Participants were informed that at the start of each phase and during the phase, the

categories assigned to the left key would be shown in the top left-hand corner of the

screen, whereas the categories assigned to the right key would be shown in the top

right-hand corner of the screen. Participants were also informed that if they made a

correct response, the next word would appear on the screen immediately. However, if

the response was incorrect, they would hear a beep and the word would remain on the

screen until a correct response was made. The participants were informed that the task

consisted of three practice and two test phases and would last for approximately ten

minutes. Finally, participants were asked to respond as quickly and accurately as

possible.

Insert Figure 2 about here

Following reading of the instructions, participants pressed <enter> to begin the

first trial. Participants could take a break between each of the phases, and after the

practice trials in phases three and five. If the participant made a correct response, then

the next word was presented 150 milliseconds after they pressed the correct key. If

they were incorrect, a tone sounded at 200 Hz for 250 msec. After this time had

elapsed, the participant could respond again. This cycle continued until a correct

response was made. The next trial was initiated 400 ms after the participant made a

correct response. The order in which the different stimuli were presented was

randomised for each phase, block of trials, and participant separately. Throughout the

phases, the restrictions applied that the same target word could not be presented on

two or more consecutive trials. Also, the correct response could not be the same key

on more than four consecutive trials. Regardless of the phase, all participants were

asked to press the left key for 'loneliness' target words and the right key for

'depression' target words. However, the assigned responses for 'food'- and

'furniture'-related target words varied from phase to phase and between participants.

Participants were randomly assigned to two order conditions – so that half of the

participants were in Order condition 1 and the other half were in Order condition 2

(Figure 2). Therefore, participants in Order condition 1 received the 'compatible'

trials first (where 'loneliness' and 'food' are assigned to the same response key), and

the 'incompatible' trials second (where 'loneliness' and 'food' are assigned to

different response keys). This order was reversed for participants in Order condition

2.

Data analysis

Hypothesis 1 was tested using two-way MANOVAs, with one group factor

(order of presentation of the two trial types) and one within-subject factor (compatible

vs. incompatible trials). The multivariates were the total scores obtained on the four

IAT categories (depression, loneliness, food and furniture). The dependent variable in

the first MANOVA was the total reaction time for that class of trial. The dependent

measure in the second analysis was the number of errors made in that class of trial.

Hypothesis 2 was tested using Pearson's correlations, examining the association of

total scores on the BITE with reaction times on the compatible and incompatible

conditions. In order to determine whether this association is specific to bulimic

pathology, similar correlations were carried out with the YSQ and overall BDI-II

scales. Due to the number of correlations carried out, the risk of Type 1 errors is increased. Therefore, Bonferroni's correction was used, and the acceptable alpha level was set at .0015 (.05/34).

Results

Table 1 shows the mean time (ms) taken per phase of words to react, in assigning the words to the appropriate category. The first hypothesis suggested that the reaction time under the 'compatible' condition should be shorter than the reaction time in the 'incompatible' condition. In other words, the reaction time was predicted to be shorter where the cues were hypothesised to be more closely associated schematically (i.e., where the food and lonely words were category headers, and the task was to press the same left response key for both categories). Considering the group as a whole, there was no difference in reaction time across conditions. The order of presentation was also considered. The two-way MANOVA showed no main effects of trial type (compatible vs. incompatible) (F = 0.04, df = 1.80, NS) or order of trials (F = 1.56, df = 1.80, NS). There was a significant interaction of trial type × order (F = 41.5, df = 1.80, p < .001), which showed only that performance on the second block was slower than on the first block.

Insert Table 1 about here

Table 2 shows the number of errors made under each condition. The two-way MANOVA showed no significant main effect of trial type (F = 0.21, df = 1.80, NS) or order of trials (F = 2.71, df = 1.80, NS), although there was an interaction effect of trial type × order that narrowly failed to achieve significance (F = 2.97, df = 1.80, p< .09).

Insert Table 2 about here

Finally, Table 3 shows the women's mean scores on each of the psychometric measures, and their associations with the two IAT reaction times (compatible and incompatible). There were no significant correlations (Pearson's r) between the IAT reaction times and the psychometric measures. The women's low mean score on the BITE indicated that there was not a group of women with more unhealthy eating attitudes and so the predicted closer association expected in Hypothesis 2 was not found. The mean scores on the BITE (Mean = 8.67; SD = 6.23); the YSQ-S, and in particular the abandonment factor (Mean = 2.51; SD = 1.31) were very low. The BDI-II (Mean = 11.0; SD = 7.65) was the only measure to show minimal symptomatology within a clinical range.

Insert Table 3 about here

Discussion

The aim of this study was to assess the degree of association of schemas relating to food, abandonment and depression, in order to determine which of the two emotional states is more closely associated with eating psychopathology. The study used a non-eating-disordered sample to test the specific hypotheses that, firstly, abandonment schemas would be more closely associated with food schemas than depressive schemas, and secondly, that this finding would be particularly strong in women with more unhealthy eating attitudes (as measured by the BITE). However, the IAT did not show the expected effect, as the women were no quicker to categorise the words on compatible, rather than on incompatible trials (F = 0.04, df = 1.80, NS).

Nor was there any evidence of an association between schema overlap and the level of bulimic attitudes (Table 3). However, the very low mean scores obtained on the BITE and the YSQ-S abandonment factor in particular, may have produced a floor effect. As such, the results do not support the two experimental hypotheses, indicating that the expected close association of food schemas and abandonment schemas is not present. There are also several conceptual and methodological reasons that might account for the non-significant pattern of results.

The first consideration is that the conceptual model is incorrect - abandonment schemas may not be closely associated with schemas related to food or eating. However this is unlikely to be the case, as other studies (e.g., Patton, 1992; Waller & Meyer, 1999) have found a strong relationship between subliminal abandonment cues and subsequent eating. It is possible that food- and eating-related cognitions and abandonment schemas are not associated at a general level, but abandonment schemas may be associated with the *behavioural* component of affective responses to food-related material. Utilising a different methodology, the Affective Simon task (e.g., De Houwer, Hermans & Eelen, 1998), preliminary evidence (De Houwer, Waller & Meyer, in preparation) suggests that abandonment stimuli may be associated with behavioural avoidance, rather than schematic association with food-, weight- or shape-related cognitions. The importance of behavioural avoidance in bulimic psychopathology has also been identified by Spranger, Waller & Bryant-Waugh (in press). The impact of avoidance behaviour would be evident on measures such as the Affective Simon, but would not be found using measures of cognitive association, such as the IAT.

A second major consideration in explaining the absence of an IAT effect is the study's use of a non-eating-disordered sample. It may be that the expected association

between food and abandonment schemas would only be seen in more extreme cases of bulimic psychopathology (i.e., in a clinical sample). However, the results did not suggest a link between more severe bulimic attitudes and higher abandonment + food-schemas associations. This finding could be due to the women's comparatively low BITE scores in comparison to a clinical group. In a non-clinical sample, use of the total BITE score and a diagnostic focus (i.e., on depressive core beliefs in bulimia nervosa) may partly explain why the hypotheses were not confirmed. However, the utility of the BITE has been demonstrated in non-clinical samples (Waller, 1992). Furthermore, in the context of both Beck's and Young's theory, maladaptive schemas develop in a context of difficult early experiences. This effect may not be seen in a non-clinical sample, who are less likely to have had such a learning history. Consequently, it may be beneficial to replicate this study using a sample of bulimic women.

A third consideration is that the IAT method does not show an overlap between schemas. However, preliminary evidence refutes this suggestion, showing that the IAT is sensitive to such associations. This has been shown in implicit racism (Greenwald et al., 1998; Dasgupta, McGhee, Greenwald & Banaji, 2000), in implicit prejudice based on religious ethnicity (Rudman, Greenwald, Mellott & Schwartz, 1999), in implicit gender beliefs (Rudman, Greenwald & McGhee, 1996, 1998; Rudman & Glick, under consideration), in snake and spider phobics (Teachman, Gregg & Woody, under consideration), and in implicit self-esteem (Farnham, Greenwald & Banaji, 1999). However, in all of these previous studies, the IAT has been used to assess automatic concept-attribute associations, whereby the presented stimuli represent the *poles* of an attribute dimension. Although the present study used

emotive terms, the discriminations required were not between opposing categories, but between categories which may themselves involve a considerable amount of overlap. Empirical evidence (e.g., Cooper & Hunt, 1998; Meyer & Waller, 1999; Waller et al., in press *a*) suggests that the non-significant difference in association could be partly accounted for by the fact that both concepts (depression and abandonment) are highly associated with food across neural links. Furthermore, using loneliness and depression target words may not be wholly adequate for accessing abandonment and depressive schemas. Loneliness may be related to an abandonment schemata, but may not map on to the individual's main concerns. The depression words used also tapped more the emotion that is associated with a depressive schema, rather than the beliefs that may be held within it.

Research implications. The IAT could be developed in future research to consider bipolar attributes. Alternatively, stimuli could be represented in pictorial form, as certain authors suggest that pictorial stimuli produce an interference effect, where written stimuli do not (e.g., Marks, 1987; Rapee, McCallum, Melville, Ravenscroft & Rodney, 1994; van den Hout, Tenney, Huygens & De Jong, 1997; Teachman et al., under consideration). Ambiguous pictorial stimuli (e.g., Stopa & Clark, 2000) could be presented in combination with food or eating stimuli, where subjects are required to classify the picture according to an associated emotion (e.g., depression, abandonment etc.). The IAT could also be completed following presentation of subliminal abandonment and food cues, to ascertain whether there is an ensuing difference in latency effects on the IAT. Other methodologies such as sentence completion tasks (e.g., Teasdale, Lloyd & Hutton, 1998) could be devised, whereby subjects are required to provide completions based on a matched colour, and subliminal presentation of food and abandonment cues are presented which interfere

with congruous completions. Homophone and homographs could also be used in a similar way. Other ambiguous scenarios (e.g., Cooper, 1997b; Dreessen, Arntz, Hendriks, Keune & van den Hout, 1999) could also be utilised, either alone or with subliminal cues. Other tasks (e.g., McCabe & Toman, 2000) that assess attentional bias to word pairings could also be used. Finally, tasks such as the Affective Simon, which consider the behavioural manifestations of schema activation, might be adapted to assess schematic association.

Clinical implications. The non-significant results of the study may suggest that abandonment schemas are not as salient to bulimic psychopathology as we first thought. It may be that other core beliefs, or combinations of core beliefs, are more significant. It is also possible that it is not the schema content that is most important in the maintenance of bulimic psychopathology, but the associated schema processes that are critical (e.g., Cooper et al., 1998; Spranger et al., in press). Specific clinical recommendations must await the outcome of the research proposed above.

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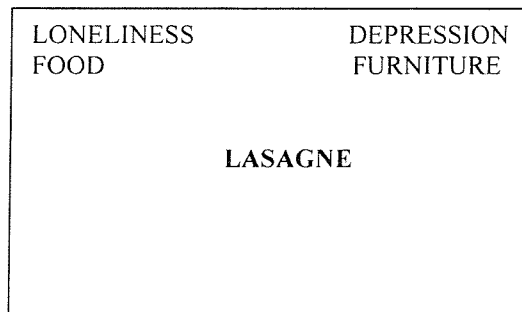
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Figure 1

Compatible trial

LONELINESS	DEPRESSION
FOOD	FURNITURE
LASAGNE	

Incompatible trial

LONELINESS	DEPRESSION
FURNITURE	FOOD
DESK	
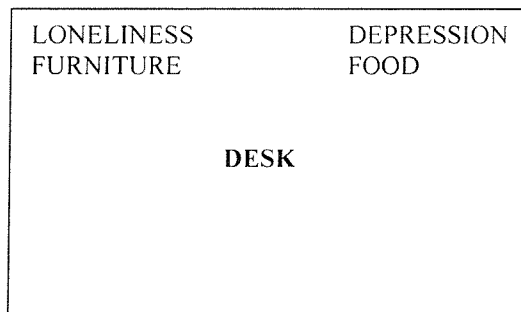
Figure 1: The display screen for the computer Implicit Association Test (IAT).

Subjects are presented with a word in the middle of the screen (shown here in bold), and must categorise it into one of the categories displayed to the left and right of the word by pressing the designated left or right key. The categorisation task is compatible when lonely and food require the same response (left) and incompatible when lonely and food require different responses (i.e., the categories are presented on opposite sides of the screen.

Sequence	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Task description	Initial target-concept discrimination	Associated attribute discrimination	Initial combined task	Reversed target-concept discrimination	Reversed Combined task
Task instructions	• FOOD FURNITURE•	•LONELINESS DEPRESSION•	•FOOD FURNITURE• •LONELINESS DEPRESSION•	FOOD• •FURNITURE	FOOD• •FURNITURE •LONELINESS DEPRESSION•
Stimuli presentation *	30 trials 5 food words 5 furniture words both x3	30 trials 5 loneliness words 5 depression words both x3	20 practice trials all words x1 40 test trials all words x2	30 trials 5 food words 5 furniture words both x3	20 practice trials all words x1 40 test trials all words x2

IAT Order condition 1

Sequence	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Task description	Initial target-concept discrimination	Associated attribute discrimination	Initial Combined task	Reversed target-concept discrimination	Reversed combined task
Task instructions	FOOD• •FURNITURE	•LONELINESS DEPRESSION•	FOOD• •FURNITURE •LONELINESS DEPRESSION•	•FOOD FURNITURE•	•FOOD FURNITURE• •LONELINESS DEPRESSION•
Stimuli presentation	As Order condition 1				

IAT Order Condition 2

Figure 2. Diagrammatic description and illustration of the IAT procedure.

The IAT procedure here involved five discrimination tasks (columns 1-5). Two target concepts and two attribute dimensions are introduced in phases 1 and 2. Categories for each of these discriminations are assigned to a left or right response, indicated by black dots on row three. These are combined in step three and then recombined in the fifth step, after reversing response assignments (step 4) for the target-concept discrimination. The order conditions (1 and 2) show the required responses for compatible trials (where 'loneliness' and 'food') require the same 'left' response (received first in order condition 1 and second in order condition 2) and incompatible trials where 'loneliness' and 'food' have different response key assignments (received second in order condition 1 and first in order condition 2).

---

* Note that the restriction applied that the same target word could not be presented on two or more consecutive trials. Also, the correct response could not be the same key on more than four consecutive trials.

Table 1-   Reaction time (ms) on 'compatible' and 'incompatible' IAT trials.

	Trial type	
	Compatible	Incompatible
Overall Time	$\underline{M}$ 42,032	42,538
	$\underline{SD}$ (9,680.9)	(9,932.4)
Order of presentation		
Order 1 (compatible – incompatible)	$\underline{M}$ 41,210.8	45,504.3
	$\underline{SD}$ (10,024.8)	(10,140.2)
Order 2 (incompatible – compatible)	$\underline{M}$ 43,134.7	38,555.4
	$\underline{SD}$ (9,226.2)	(8,210.9)

MANOVA		
Effect	$\underline{F}$	$\underline{p}$
Order	1.56	NS
Trial type	0.04	NS
Order × Trial type	41.5	.001

Table 2 –   Error rates on 'compatible' and 'incompatible' IAT trials.

	Trial type	
	Compatible	Incompatible
Overall error rate	$\underline{M}$ 2.63	2.79
	$\underline{SD}$ (2.94)	(2.66)
<u>Order of presentation</u>		
Order 1 (compatible – incompatible)	$\underline{M}$ 2.06	2.55
	$\underline{SD}$ (1.77)	(2.03)
Order 2 (incompatible – compatible)	$\underline{M}$ 3.40	3.11
	SD (3.91)	(3.32)

<u>MANOVA</u>		
Effect	$\underline{F}$	$\underline{p}$
Order	2.71	NS
Trial type	0.21	NS
Order × trial type	2.97	.09

Table 3 – Mean scores on the psychometric measures (BITE, BDI-II, YSQ), and

associations with IAT reaction times on compatible and incompatible trials.

	Descriptive characteristics		Correlations with IAT			
	Mean	(SD)	Compatible		Incompatible	
			r	p*	r	p*
BITE	8.67	(6.23)	-.089	.424	-.145	.194
BDI-II	11.0	(7.65)	-.129	.250	-.049	.659
<u>YSQ scales</u>						
Emotional Deprivation	1.81	(0.89)	-.124	.266	.047	.674
Abandonment	2.51	(1.31)	-.076	.499	-.207	.063
Mistrust/abuse	2.29	(0.98)	-.131	.242	-.208	.060
Social isolation/ alienation	1.99	(0.89)	-1.24	.266	-.253	.022
Defectiveness/ shame	1.74	(0.76)	-.107	.339	-.131	.240
Failure	2.33	(1.08)	-.141	.206	-0.71	.527
Dependence/ incompetence	1.96	(0.80)	-.028	.802	-.074	.508
Vulnerability to harm/illness	1.93	(0.91)	-.105	.346	-.144	.197
Enmeshment/ undeveloped self	1.54	(0.71)	.016	.889	-.035	.755
Subjugation	1.96	(0.72)	-.103	.358	-.274	.013
Self sacrifice	2.95	(0.94)	-0.99	.374	-.145	.194
Emotional inhibition	2.28	(1.23)	-.117	.297	-.223	.044

* All correlations are non-significant (alpha level = .0015).

Table 3 (continued)- Mean scores on the psychometric measures (BITE, BDI-II, YSQ), and associations with IAT reaction times on compatible and incompatible trials.

	Descriptive statistics		Correlations with IAT			
	Mean	SD	Compatible		Incompatible	
			r	p*	r	p*
YSQ scales						
Unrelenting standards/ hypercriticalness	3.70	(1.23)	-.253	.022	-.209	.059
Entitlement	2.29	(0.76)	.267	.015	.284	.010
Insufficient self-control/ self-discipline	2.63	(1.10)	-.119	.285	-.210	.058

List of Appendices

Appendix 1

Instructions to authors – Clinical Psychology and Psychotherapy

Clinical Psychology

Psychotherapy

An International Journal of Theory & Practice

Initial Manuscript Submission. Submit three copies of the manuscript (including copies of tables and illustrations) to either of the Editors:

Professor Paul Emmelkamp, *Faculty of Psychology, Department of Clinical Psychology, University of Amsterdam, Roetersstraat 15, 1018 WB Amsterdam, The Netherlands.*

Professor Mick Power, *Department of Psychiatry, Royal Edinburgh Hospital, University of Edinburgh, Edinburgh EH10 5HF, UK.*

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Manuscript style. The language of the journal is English. All submissions including book reviews must have a title, be printed on one side of the paper, be double-line spaced and have a margin of 3 cm all round. Illustrations and tables must be printed on separate sheets, and not be incorporated into the text.

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Breslau N, Davis GC, Andreski P, Peterson E. 1991. Traumatic events and post-traumatic stress disorder in an urban population of young adults. *Archives of General Psychiatry* **48**: 216-222.

Beck AT, Rush AJ, Shaw BF, Emery G. 1979. *Cognitive Therapy of Depression.* Guilford: New York.

Spielberger CD, Johnson EH, Russell S, Crane R, Jacobs G, Borden T. 1985. The experience and expression of anger: Construction and validation of an anger expression scale. In *Anger and Hostility in Cardiovascular and Behavioral Disorders,* Chesney M, Rosenman R (eds). Hemisphere: Menlo Park, CA; 5–30.

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Appendix 2

Instructions to authors – International Journal of Eating Disorders

The Journal publishes basic research, clinical, and theoretical articles of scholarly substance on a variety of aspects of anorexia nervosa, bulimia, obesity and other atypical patterns of eating behavior and body weight regulation in clinical and normal populations. Full-length articles or brief reports addressing psychological, biological, psychodynamic, socio-cultural, epidemiologic, or therapeutic correlates of these clinical phenomena are welcome. Manuscripts submitted should represent a significant addition to our knowledge, or a significant review and synthesis of existing literature.

Manuscripts and all correspondence concerning manuscripts under review should be sent to the Editor-in-Chief, Michael Strober, Ph.D., Department of Psychiatry and Biobehavioral Sciences, UCLA Neuropsychiatric Institute, 760 Westwood Plaza, Los Angeles, CA 90024.

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Number *all* pages of the manuscript except the figures (including title page and abstract) consecutively. Parts of the manuscripts should be arranged in the following sequence:

(1) Title page (numbered 1), which should include the full names and biographical sketch (titles, affiliations, etc.) of all authors, and an abbreviated title (Running Head) which should not exceed 50 characters, counting letters, spacing, and punctuation. This Running Head should be typed in upper case letters centered at the bottom of the title page. Each page of the manuscript (excluding figures) should

be identified by typing the first two or three words of the full title in the upper right-hand corner above the page number.

(2) Abstract (150 word maximum), should be started on a separate page, numbered 2. Type the word "Abstract" in upper and lower case letters, centered at the top of page 2. Authors of articles submitted to the Journal involving research data or reviews of the literature must now include the following information in the form of a structured abstract, under the headings indicated. The abstract should be typed as a single paragraph on one page: **Objective:** briefly indicate the primary purpose of the article, or major question addressed in the study. **Method:** indicate the sources of data, give brief overview of methodology, or, if review article, how the literature was searched and articles selected for discussion. For research based articles, this section should briefly note study design, how subjects were selected, and major outcome measures. **Results:** summarize the major or key findings. **Discussion:** indicate main clinical, theoretical, or research applications/ implications. The Journal will continue to use unstructured abstracts for case reports.

(3) Text. Begin the text on page 3 and be sure to identify each page with the short title typed in the upper right-hand corner above the page number. Type the full title of the manuscript centered at the top, and then begin the text. The full title appears on page 3 only. Indent all paragraphs.

(4) References. Begin on separate page, with the word "References" typed in upper and lower case letters, centered at the top of the page.

(5) Appendixes, each typed on a separate page labeled "Appendix" A, B, etc., in the order in which they are mentioned in the text.

(6) Footnotes, start on separate page.

(7) Tables, give title and start *each* on a separate page. If a table must be continued on a separate page, repeat all titles and headings.

(8) Figure captions, start on separate page.

(9) Figures, place *each* on separate page.

Manuscript Form and Presentation

All manuscripts are subject to copyediting, although it is the primary responsibility of the authors to proofread thoroughly and insure correct spelling and punctuation, completeness and accuracy of references, clarity of expression, thoughtful construction of sentences, and legible appearance prior to the manuscript's submission. Preferred spelling follows *Webster's New Collegiate Dictionary* or *Webster's Third New International Dictionary*. The manuscript should conform to accepted English usage and syntax.

Use headings to indicate the manuscript's general organization. Do not use a heading for the introduction. In general, manuscripts will contain one of several levels of headings. Centered upper case headings are reserved for Methods, Results, and Discussion sections of the manuscript. Subordinate headings (e.g., the Subjects or Procedure subsection of Methods) are typed flush left, underlined, in upper case and lower case letters. The text begins a new paragraph.

In the body of text, be sure to indicate the position of each table by a clear break in text, with placement instructions set off by lines above and below.

Presenting statistical data in text. Give the symbol, degrees of freedom, value, and probability level. Give descriptive statistics, such as means and standard devia-

tions, when appropriate, to clarify effects. Do not give references for statistics in common use.

Referencing in the text. Referencing follows the author date method of citation, in which the author surname and year of publication are inserted in the text at the appropriate point. If the name of the author(s) appears as part of the narrative, cite only the year of publication in parentheses. When a work has two authors, cite both every time the reference occurs in the text. In the case of works with three to five authors, cite all authors the first time the reference occurs, and the surname of the first author followed by et al. in all subsequent citations. In the case of works by six or more authors, use the first author surname and et al. for *all* citations.

All reference citations in the text should appear in the reference list. The latter is arranged alphabetically by surname of authors; do not number. References by the same author with same publication date are arranged alphabetically by title (excluding A or The), and differentiated by lower case letters—a, b, c, etc.—placed immediately after the publication date. Each entry in the reference list must contain the surnames of *all* authors, full title of the work, the book or journal title in full (i.e., without abbreviation), year of publication, and inclusive page numbers (for journal articles and book chapters). Representative examples are as follows:

Journal

Dubowitz, H., Feigelman, S., & Reid, G. (1994). Children in kinship care: How do they fare? Children and Youth Services Review, 16, 85–106.

Book

Baker, F.M., & Lightfoot, O.B. (1993). Psychiatric care of ethnic elders. In Culture, ethnicity, and mental illness (Volume 2, Chapter 12, pp. 517–552), Washington, DC: American Psychiatric Press.

Edited Book

Baker, F.M., & Lightfoot, O.B. (1993). Psychiatric care of ethnic elders. In A.C. Gaw (Ed.), Culture, ethnicity, and mental illness (pp. 517–552), Washington, DC: American Psychiatric Press.

Proceedings

McNeil, C.B., Eyberg, S., Eisenstadt, T.H., & Newcomb, K. (1997). Marital status and living arrangements. In W.W. Hartrup & Z. Rubin (Eds.), APA Proceedings No. 512 (pp. 1–25), Washington, DC: American Psychiatric Press.

Preparation of figures. Figures should be professionally prepared and submitted in a form suitable for reproduction (camera-ready copy). Computer-generated graphs are acceptable only if they have been printed with a good quality laser printer. Graphs must show an appropriate grid scale. Each axis must be labeled with both the quantity measured and the unit of measurement. All figures and graphs must be photographed and submitted as 8 × 10 in. (20 × 25 cm) glossy prints, in triplicate.

Submission of Manuscript to the Editor

The original and two clear photocopies are submitted to the Editor, at the address noted above. Carbon copies are not accepted. Manuscripts are received with the understanding that they represent original works, not published previously, or under simultaneous review by another publication. If parts of the manuscripts have been presented at a scientific meeting, this should be indicated on the title page. Upon receipt of the manuscript, the Editor will send an acknowledgment of receipt to the author. It is the author's responsibility to contact the Editor in the event acknowledgment of receipt is not received within two weeks after expected arrival of the manuscript in the Editor's office.

Manuscripts are evaluated by one to three members of the Editorial Board, or outside reviewers selected by the Editor. Authors should anticipate a decision after a four to eight week period of review. If notice is not received by eight weeks, feel free to contact the Editor directly.

Final revised manuscript. A final version of your accepted manuscript should be submitted on diskette as well as hard copy, using the guidelines for Diskette Submission Instructions form usually included in most issues of the journal.

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Authors will be supplied with proofs to check the accuracy of typesetting. Authors may be charged for any alterations to the proofs beyond those needed to correct typesetting errors. Proofs must be checked and returned within forty-eight hours of receipt.

A *reprint order* form will be sent to the corresponding author along with the proofs. Those wishing to order reprints must return this form with payment when returning their corrected proof. Reprints are normally shipped six to eight weeks after publication of the issue in which the item appears.

Appendix 3

Ethical approval letter from Southampton University
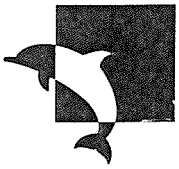
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Department of Psychology

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*Telephone +44 (0)23 8059 5000
Fax +44 (0)23 8059 4597
Email*

FAO Victoria Shuck
55 Penshurst Way
Eastleigh
Southampton SO50 4RH

12th October 1999

Dear Victoria,

I am writing to confirm you that your ethical application titled, "Schematic association, emotional states and bulimic attitudes in non-eating-disordered women", has been given approval by the department.

Should you require any further information, please do not hesitate in contacting me on (01703) 593995.

Yours sincerely,

Kathryn Smith
Academic Secretary
Psychology Department

Appendix 4

Information sheet (example)

<u>Information Sheet</u>

<u>Study Number 1021</u>

<u>The relationship between core beliefs about the self and others, emotional states
and bulimic attitudes in non-eating-disordered women.</u>

I am a final year Trainee Clinical Psychologist at the University of Southampton. As

part of my Doctoral degree, I am carrying out a piece of research into the relationship

between different core beliefs (or schemas) relating to the self and others, emotional

states and eating attitudes. This research will help to improve our understanding of

some of the maintaining factors for Bulimic behaviours. In turn, an increased

understanding will lead to improvements in the effectiveness of treatments for

Bulimia Nervosa.

If you agree to participate in the study, you will be asked to complete three

questionnaires and a short computerised task. This should take about 45 minutes. If,

at any point, you feel that you no longer wish to participate in the study, you are free

to do so without penalty. All information collected will be completely confidential.

Any report or publication, which arises from the study, will protect the anonymity of

participants. All participants will be debriefed following the study. Two credits are

available for participation.

Please feel free to contact me via the University on (01703) 595321, if you have any

questions or if you wish to discuss any aspect of the study. If you would like to

participate in the study, please complete and sign the attached consent form.

Thankyou for taking the time to participate.

Ms. Victoria Shuck

Trainee Clinical Psychologist.

Appendix 5

Consent form (example)

University of Southampton
Department of Clinical Psychology
Highfield
SOUTHAMPTON
Hants
S017 1BJ.

Consent Form.

Doctoral Research:

Title: The relationship between core beliefs about the self and others, emotional states and bulimic attitudes in non-eating disordered women.

Please complete the following questions:

Please delete as necessary:

Have you read the information sheet?   Yes/No

Have you had the opportunity to ask questions
and discuss the study?   Yes/No

Have you had satisfactory answers to all your queries?   Yes/No

Have you received enough information about
the study?   Yes/No

Do you understand that all information you give
will be completely CONFIDENTIAL and protect your
anonymity?   Yes/No

Do you understand that you are free to withdraw from
the study:
⇨ At any time
⇨ Without giving a reason
⇨ Without it affecting your course   Yes/No

Do you agree to take part in this study?   Yes/No

Name (in block capitals):...
Signed:...
Date:..
Parent/ Guardian signature if under 18..
Parent/ Guardian's Name (in block capitals)...................................
Date:...
Please print your address below if you would like to be sent a summary of the research when it is completed (September, 2000).

Appendix 6

Feedback to participants

Feedback to participants

Dear participant

Thank you for participating in the study: *The relationship between core beliefs about the self and others, emotional states and bulimic attitudes in non-eating-disordered women.* At the time of participating, you requested feedback on the results of the study when they were available. A brief summary of the main results of the study can be found below. I hope that this is of interest. If you require further information on any aspect of the study, please contact me via the Clinical Psychology training course, Southampton University by the end of September 2000. The telephone number is (023) 8059 5320/1. Thanks again for taking the time to participate.

Victoria Shuck

Final year Trainee Clinical Psychologist.

Summary

<u>Final study title:</u>

Schema association and eating psychopathology: A study of non-eating-disordered women using the Implicit Association Test.

<u>Aims:</u>

The study aimed to assess the level of association between abandonment schemas and food schemas. That is, women with more unhealthy eating attitudes might be more likely to overeat in response to information that is related to them feeling abandoned by others. In this way eating provides them with a way of coping with the negative feelings that feeling abandoned provokes for them. Bulimia is also sometimes associated with feeling depressed. As such, feeling depressed might also

be linked with overeating in the same way as abandonment. When information is provided to us that may fit with a particular belief that we have developed from childhood (e.g., that people will let us down or abandon us and we will feel lonely) we construe that information to fit our belief, even if the information does not really fit the belief at all. These negative beliefs become important in defining who we are, and as such they are very resistant to change. As such, these long-term, negative beliefs (or 'schemas') become strengthened over time and maladaptive to a significant degree. When information arises that fits with our negative belief, the belief is activated, causing distress. To cope with this distress, bulimic women overeat. What is interesting for clinicians is which of these negative beliefs are relatively more important in triggering overeating. It may be that beliefs held in mind about being abandoned are most likely, particularly in women with higher levels of bulimic attitudes. Thus, feeling abandoned and eating as a way of coping become associated in memory. If we can target the beliefs that are most important, then as clinicians, it becomes more obvious which beliefs might need to be worked on first to effectively help people with bulimia. These types of beliefs are not currently included in the main treatment package for bulimia nervosa (cognitive-behavioural therapy).

Hypotheses:

That abandonment schemas [beliefs] would be more closely associated with food than depression schemas [beliefs]. This would be particularly the case when women had more unhealthy eating attitudes.

Method:

Participants: 82 non-eating-disordered women. Their mean age 18.39 years (SD = 2.51) and mean Body Mass Index [BMI = weight (kg) /height (m)^2] was 23.02 (SD = 6.25).

Implicit Association Test:

The study used a test that measures the level to which concepts are associated with each other in memory (i.e., loneliness [as a result of feeling abandoned] and food, because of the association where feeling abandoned provokes overeating). This test is the Implicit Association Test (IAT) which was run on a lap-top PC. 'Abandonment' was represented by loneliness words, 'food' was represented by food words, and 'depression' was represented by words which relate to feeling depressed. Neutral 'furniture' words were also presented. The IAT task required participants to categorise words which appeared in the middle of the screen, according to categories printed at the top-right and top-left of the screen. To do this, participants had to press the left key on the keyboard if they thought that the presented word belonged to the category on the left, and the right key if they thought that the word belonged to the category presented on the right. The IAT produced reaction times for the time taken to categorise the words. If loneliness and food were mapped onto the same key (i.e., participants had to press the left key for both loneliness and food words), the hypothesis predicted that they would be quicker than when loneliness and food were allocated to different response keys. This reaction time difference was expected to occur because loneliness and food are already associated in the person's memory, particularly if they had a more unhealthy eating pattern. Therefore, the food and loneliness pairing would automatically make more sense to them than other pairings. Questionnaire measures were also used to see if there was any relationship between scores on the IAT and the types of negative beliefs people may hold (as measured by the Young Schema Questionnaire); their level of depression (as measured by the Beck Depression Inventory-II) and their eating attitudes (as measured by the BITE questionnaire).

<u>Results:</u>

The expected close association between food and loneliness was not found, even when scores on the measure of eating attitudes (the BITE) was considered. There was also no relationship between the questionnaire maesures and reaction times on the IAT.

<u>Discussion:</u>

The expected close association between abandonment (as measured using loneliness words) was not found. This may be because non-eating disordered women do not develop the same types of associations between beliefs related to negative early experiences (and feeling abandoned) and eating. This may be because non-eating-disordered women do not necessarily always have the same type of negative early experiences as eating-disordered women. As such, this study requires repeating with bulimic women.

Another explanation is that it may be that it is not food, but eating that is associated with feeling abandoned. The IAT did not look directly at eating behaviour, but at the thoughts that people may have related to food, so an effect would not be found there. It is also possible that feeling depressed is related to food as closely as feeling abandoned is. The IAT can only measure differences in association. If both depression and abandonment are similarly associated, again the IAT would not show an effect. Another explanation for the non-significant results is that other research using the IAT has tested categories that are opposite to each other (e.g., black and white; pleasant and unpleasant). However, this study used categories with some overlap (e.g., the word 'sad' could relate to loneliness or depression). Future research will need to use other methods or adapt the IAT so that it can discriminate between fairly similar categories. Clinically, abandonment may not be as significant to bulimic

behaviours (i.e. overeating) as we first thought. It may be that other types of beliefs,

or combinations of beliefs, are more important to consider in therapy.

Critical Review

The Literature Review (*Cognitive content in eating psychopathology*) addresses whether the existing clinical and research base provides support for schema-focused theoretical models of eating psychopathology. This question is problematic, given that there is relatively little evidence for schema-focused approaches in general, and particularly in the field of eating disorders. Synthesising the available evidence is also problematic, given the number of different methodologies that have been used to access cognitive content in the eating disorders. Most of these studies tell us something of the cognitive content that is located at the two superficial levels of cognitive content. However, few studies have directly assessed the cognitive variables that are of particular interest here (i.e., schematic-level cognitive representations). This has possibly produced an over-reliance on studies from a limited number of authors that have considered schemas in relation to eating. Furthermore, those studies that are available have used different definitions of 'schemas', which often proved confusing. For example, some studies have addressed multi-dimensional cognitive constructs, but others have used uni-dimensional definitions. Research into schema-level content in anorexia nervosa is limited in the review, as it has not been as widely investigated as in bulimia nervosa. Although the review is entitled 'cognitive content' it also touches on schema processes in eating disorders. This area would have been interesting to cover further, but the studies that are available are scarce, or yet to be published. Considering how to investigate cognitive content and process was impeded by the small number of reliable and valid self-report measures that are available, particularly to investigate schemas.

Experimental methodologies that have been used are relatively novel and require further development in this field. One area that has not been considered at all, is the relative importance of particular schemas over others in relation to the food, weight and shape concerns that serve to maintain the problem. This seemed to be a significant omission from any such review.

My empirical paper (*Schema association in eating psychopathology: A study of non-eating-disordered women using the Implicit Association Test*) goes on to consider this gap in the literature. However, the study was problematic for several reasons. A non-clinical sample was used, as the test used is new to eating disorder research. However, this meant an absence of the predicted associations, which may have been apparent in a clinical sample. Furthermore, the parameters of the Implicit Association Test (IAT) were tested by the study, which required a test powerful enough to discriminate between subtly different concepts. Whether the lack of associations was due to the lack of such power in a test designed to measure polar attributes or whether it was due to the categories used is questionable. Other studies which assess the IAT's ability to assess subtle, rather than opposing attitudes will be interesting. Providing terms that adequately assess schemas was problematic (i.e., depression and lonely words could relate to several different early maladaptive schemas), that may not even be apparent in a non-clinical sample. As such, the presented words may not have produced schema-activation that may be required to see such associations. The methodology could be improved by adding a behavioural component, or by presenting cues in a different format. With these recommendations, it will be interesting to see the future research directions that the IAT takes, or whether other methodologies will prove to be more appropriate in eating disorder research.