



# A narrative review of schemas and schema therapy outcomes in the eating disorders



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## HIGHLIGHTS

- Eating disorders are associated with pronounced maladaptive schemas across diagnoses.
- Schemas interact with eating pathology, although how they do so in anorexia nervosa is unclear.
- Schema-focused models of eating pathology are broadly supported by current research.
- Schema therapy and schema mode therapy are promising treatments for complex eating disorders.

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## ABSTRACT

Whilst cognitive-behavioural therapy has demonstrated efficacy in the treatment of eating disorders, therapy outcomes and current conceptualizations still remain inadequate. In light of these shortcomings there has been growing interest in the utility of schema therapy applied to eating pathology. The present article first provides a narrative review of empirical literature exploring schemas and schema processes in eating disorders. Secondly, it critically evaluates outcome studies assessing schema therapy applied to eating disorders. Current evidence lends support to schema-focused conceptualizations of eating pathology and confirms that eating disorders are characterised by pronounced maladaptive schemas. Treatment outcomes also indicate that schema therapy, the schema-mode approach, and associated techniques are promising interventions for complex eating disorders. Implications for clinical practice and future directions for research are discussed.

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## 1. Introduction

Cognitive-behavioural therapy (CBT) is one of the most effective treatments for eating disorders (EDs). Whilst many individuals respond well to CBT, a significant proportion does not. Poor responses to treatment are attributable to several factors including a neglect of longitudinal factors implicated in ED development, the inadequacy of a maintenance-focused approach to treatment, and the presence of entrenched schemata. In light of these issues, it has been suggested that schema therapy may be a valuable alternative to CBT in some cases (Waller, Kennerley, & Ohanian, 2007).

This narrative review begins by critically examining cognitive-behavioural approaches to EDs from theoretical and empirical standpoints. Schema therapy and recent schema-focused conceptualizations of EDs are also described. Whether early maladaptive schemas (EMS) are associated with core aspects of eating pathology, and whether schema-focused treatments are effective in treating EDs will form the focus of this review.

### 1.1. Cognitive-behavioural therapy and the eating disorders

#### 1.1.1. Theory and empirical status

EDs such as anorexia nervosa (AN), bulimia nervosa (BN), and mixed presentations (previously defined as “eating disorder not otherwise specified” within DSM-IV, but now described as “otherwise specified feeding or eating disorder” within DSM-5) (American Psychiatric Association, 2000, 2013) are associated with significant functional impairments and serious risks to physical health (Hudson, Hiripi, Pope, & Kessler, 2007). EDs are also difficult to treat due to high levels of ego-syntonicity and comorbidity (Fairburn, Shafran, & Cooper, 1999; Halmi et al., 2002; Hay, Touyz, & Sud, 2012; Vitousek & Hollon, 1990).

CBT is the most extensively researched approach to treating EDs. Early cognitive-behavioural models highlighted the roles which disordered eating and maladaptive attitudes towards shape and weight played in the maintenance of pathology (Fairburn, 1981; Garner & Bemis, 1982; Vitousek, 1996). Based upon these accounts, cognitive-behavioural treatments focused on the modification of

dysfunctional thoughts and assumptions related to shape, weight, and their control (e.g. Fairburn, Marcus, & Wilson, 1993) and yielded positive outcomes (e.g. Agras, Walsh, Fairburn, Wilson, & Kraemer, 2000; Fairburn et al., 1995; Goldbloom et al., 1997). Additional maintaining factors have since been proposed including an extreme need for control (Fairburn et al., 1999), affective dysregulation (Berg et al., 2013; Heatherton & Baumeister, 1991) and pro-illness beliefs (Schmidt & Treasure, 2006).

Drawing from early conceptualizations, Fairburn and colleagues have presented a transdiagnostic model of EDs, grounded in cognitive and behavioural processes shared across presentations (Fairburn, Cooper, & Shafran, 2003). In conjunction with a “core psychopathology” related to overvalued attitudes towards shape, weight and their control, the transdiagnostic model implicates four other pathologies in ED maintenance: low self-esteem, perfectionism, interpersonal difficulties, and mood intolerance. Based upon this model, an “enhanced” form of CBT (CBT-E) has been developed (Fairburn, 2008). A variation of CBT developed specifically for the treatment of EDs, CBT-E attempts to address both eating behaviour and overvalued beliefs (the “focused” form of CBT-E), as well as the additional maintenance factors outlined in the transdiagnostic model (the “broad” form of CBT-E) (Cooper & Fairburn, 2011).

CBT is now recognised as the treatment of choice for BN, and has demonstrated advantages over other therapies in the rapidity and magnitude of change (Agras et al., 2000). “Enhanced” CBT has also performed well in the treatment of BN and EDNOS, with good outcomes reported at end of treatment and follow-up (Fairburn et al., 2009). Promising results have also been reported in trials of CBT-E applied to AN (Dalle Grave, Calugi, Conti, Doll, & Fairburn, 2013; Fairburn et al., 2013).

#### 1.1.2. Limitations of cognitive-behavioural approaches

Whilst CBT has demonstrated efficacy in EDs, outcomes remain inadequate. Randomised clinical trials and “real-world” effectiveness studies demonstrate that around 50% of individuals with BN remain symptomatic at the end of treatment (Agras et al., 2000; Poulsen et al., 2014; Waller et al., 2014). Follow-up data also indicate that approximately one third of individuals with BN continue to meet diagnostic criteria after CBT (Fairburn et al., 1995; Poulsen et al., 2014; Waller

et al., 2014) and a similar proportion relapse (Agras et al., 2000; Halmi et al., 2002). Treatment outcomes in AN are even more disappointing, wherein CBT has proved as effective (Channon, de Silva, Hemsley, & Perkins, 1989; Zipfel et al., 2014) or less effective (McIntosh et al., 2005)<sup>1</sup> than comparison treatments. Lastly CBT-E has demonstrated little advantage over traditional CBT. Broad and focused forms of CBT-E have performed equivalently within AN, BN, and EDNOS groups, despite addressing a wider range of pathologies (Dalle Grave et al., 2013; Fairburn et al., 2009).

Several factors explain the inadequacy of contemporary cognitive-behavioural therapies. Firstly, current models are concerned with the maintenance of EDs and do not address longitudinal factors (Waller et al., 2007). Research also indicates that maladaptive thinking styles found in EDs extend beyond dysfunctional attitudes towards shape and weight (Phillips, Tiggemann, & Wade, 1997; Tiggemann, 2000) and dysfunctional eating occurs in contexts unrelated to food (Waters, Hill, & Waller, 2001). In addition, hypothesised interactions between components of the transdiagnostic model have not been entirely supported by research (Byrne & McLean, 2002; Lampard, Tasca, Balfour, & Bissada, 2013). Lastly, some additional treatment modules proposed in CBT-E do not appear to produce change in respective areas of pathology, such as the clinical perfectionism and mood intolerance modules (Byrne, Fursland, Allen, & Watson, 2011). These findings suggest that current CBT is “necessary, but not sufficient” to treat all ED presentations (Waller & Kennerley, 2003, pp. 239); a limitation which has persisted despite “enhancement” of the approach. Cognitive behavioural approaches to eating pathology, thus, require elaboration.

### 1.1.3. A case for schema therapy?

In light of such challenges there has been a growing consensus that the effective treatment of EDs may require intervention at both ‘superficial’ levels of cognition (i.e. maladaptive thoughts and assumptions) and ‘deeper’ schematic levels (Hughes, Hamill, van Gerko, Lockwood, & Waller, 2006; Vitousek & Hollon, 1990). The case for a schema-focused approach to eating pathology also arises from other evidence. This includes poorer treatment responses in individuals with severe low self-esteem (Fairburn, Jones, Peveler, Hope, & O’Connor, 1993), personality disorders (Helverskov et al., 2010) and emotional dysregulation (Simpson et al., 2006); robust links between negative self-beliefs and overvalued attitudes towards shape and weight (Byrne & McLean, 2002); and the presence of entrenched patterns of thinking (Vitousek & Hollon, 1990).

Schema therapy provides a framework within which the cognitions, emotions, behaviours, and interpersonal dysfunction associated with eating pathology can be parsimoniously addressed (Waller & Kennerley, 2003). Developed to overcome shortcomings associated with CBT for complex disorders, schema therapy also appears well placed to address complex comorbidities often found in EDs including chronic depression (Waller, Shah, Ohanian, & Elliott, 2001), borderline personality disorder (BPD) (Hudson et al., 2007; Zanarini, Frankenburg, Hennen, Reich, & Silk, 2004) and complex trauma (Fallon & Wonderlich, 1997). Developments in the schema mode approach, designed specifically for treating complex presentations, may also offer an advantage with challenging ED cases.

## 1.2. Schema therapies: an overview

Schema therapy is described as “integrative therapy... that significantly expands on traditional cognitive behavioural treatments” (Young, Klosko, & Weishaar, 2003, pp. 1). The approach elaborates traditional CBT by addressing developmental processes which maintain psychopathology and incorporates elements of other therapies

including psychoanalytic and gestalt approaches. Schema therapy has recently been extended to include a mode-focused approach tailored to treating complex personality disorders (Arntz & van Genderen, 2009).

Early maladaptive schemas (EMS) are central to the schema model of psychopathology. EMS are defined as pervasive themes regarding the self which are developed early in childhood and elaborated throughout the lifetime (Young et al., 2003). Young et al. (2003) have identified 18 EMS clustered under five broader schema domains. A list of schema domains and associated EMS is provided in Appendix A. Schema maintenance processes refer to cognitive and behavioural coping styles which perpetuate EMS. These include schema surrender (accepting schemata); schema avoidance (blocking schema activation); and schema compensation (“fighting back” against schemata). Particular attention has been paid to schema “modes” in recent years. Schema modes refer to sets of EMS and maintenance processes which are activated at a given time. In contrast to EMS which are conceptualized as stable structures, schema modes are state-dependent and dynamic (Arntz & Jacob, 2013). A list of schema modes is provided in Appendix B.

Research indicates that schema therapy, including the mode-focused approach, is an efficacious and cost-effective treatment for BPD (Giesen-Bloo et al., 2006). Promising data has also been reported for schema-focused treatments in other personality and mood disorders (Bamelis, Evers, Spinhoven, & Arntz, 2014; Carter et al., 2013). Extended reviews of schema therapy outcomes are provided by Hawke and Provencher (2011) and Masley, Gillanders, Simpson, and Taylor (2012).

### 1.2.1. Schema-focused models of eating disorders

A schema-focused model of EDs has been presented by Waller et al. (2007) which proposes that restrictive and bulimic disorders are distinguished by schema maintenance processes. In restrictive EDs such as AN, intense affect associated with schema activity is avoided *prior* to schema activation (primary avoidance of affect) via schema compensation. It is suggested that behavioural manifestations of schema compensation are likely to be more compulsive in nature (for example, driven over-exercise to compensate for an underlying defectiveness EMS) and are associated with more detached-alexithymic clinical presentations. In bulimic EDs such as BN, disordered eating is theorised to alleviate affect *after* schemas have been triggered (secondary avoidance of affect) via schema avoidance. Methods for the secondary avoidance of affect are likely to be more impulsive in nature (for example, binge-eating) and tend to be associated with more chaotic-dissociative presentations (Waller, Corstorphine, & Mountford, 2007). These schema processes are theorised to drive the rigid patterns of thinking and behaving observed in EDs, as well as the development of relevant dysfunctional assumptions (Waller, Ohanian, Meyer, & Osman, 2000).

Whilst a mode-focused model of eating pathology has yet to be formulated, Simpson (2012) suggests that EDs are characterised by overdeveloped schema coping modes. As with BPD, Simpson suggests that maladaptive coping modes (manifest as disordered eating) are used to manage distress arising from the activation of child modes and/or attacks by parent modes. Key coping modes proposed in EDs include the Perfectionistic Overcontroller Mode, Compliant Surrender Mode, and Detached Protector mode. Corstorphine (2008) has similarly argued that coping modes such as the Detached Protector motivate disordered eating to avoid EMS activation (i.e. primary avoidance of affect) and/or manage affect when EMS are triggered (i.e. secondary avoidance).

## 1.3. Aims of the review

In light of shortcomings associated with conventional CBT and the potential value of a schema-focused approach to treatment, a review of this area is needed. The present article has two aims. Firstly it will assess empirical literature which has explored EMS in the EDs to determine if schema-focused approaches to eating pathology are warranted.

<sup>1</sup> It should be noted that whilst supportive clinical management outperformed CBT by end of treatment in McIntosh et al. (2005) study, outcomes for both treatments were equivalent at long-term follow-up (Carter et al., 2011).

Secondly it will evaluate outcome studies to clarify if schema-focused therapy and associated techniques are effective in treating EDs.

## 2. Method

### 2.1. Search strategy

A literature search was conducted using PsychINFO (OvidSP) and Scopus databases between January 1980 and September 2014. The following search terms were used: schema\* (keyword) AND eating (keyword) OR anorex\* (keyword) OR bulim\* (keyword). All published studies and dissertations yielded were evaluated for inclusion. Reference lists for selected studies and other internet-based schema therapy resources were also searched for relevant literature.

### 2.2. Inclusion and exclusion criteria

To enhance the generalizability of findings, all studies were required to fulfil the following inclusion criteria:

1. Participants must be diagnosed with an eating disorder according to DSM-IV criteria.
2. Studies must utilise measures of schemas and/or core beliefs demonstrating adequate psychometric properties.
3. Studies must be written in English.

Literature exploring the developmental origins of EMS in EDs was purposely excluded during searching as this data has been reviewed elsewhere (see Tetley, Moghaddam, Dawson, & Rennoldson, 2014). In addition, analogue studies were not included to ensure data remained applicable to clinical groups.

40 studies were identified for inclusion in the review. 32 studies explored interactions between eating pathology and EMS. Eight studies provided outcome data for schema-focused interventions.

## 3. Results

### 3.1. Schema interactions with eating pathology: an overview

Preliminary research has explored whether gross levels of EMS in EDs differ from healthy controls and other clinical groups. Fewer studies have explored schema modes in EDs. A greater focus for research has been whether specific EMS are associated with core dimensions of eating pathology, including eating behaviour (restrictive versus binge eating), dysfunctional attitudes (restrictive versus bulimic attitudes), and diagnostic category (AN versus BN). A limited number of studies have sought to determine whether EMS provide an explanation as to comorbidities commonly found in EDs or validate interactions proposed in schema-focused models of EDs (e.g. Simpson, 2012). Lastly, research has attempted to clarify whether EMS exert effects upon treatment outcomes.

#### 3.1.1. Schema measures in eating disorders

Research exploring EMS in EDs has tended to rely upon self-report measures. Most popular has been the Young Schema Questionnaire (YSQ; Young, 1994) which measures schema activation across multiple domains. Whilst both long- and short-forms of the YSQ have been used, the short-form has been favoured due to its convenience and comparative psychometric properties (Waller, Meyer, & Ohanian, 2001). Fewer studies have used the Eating Disorder Belief Questionnaire (EDBQ; Cooper, Cohen-Tovee, Todd, Wells, & Tovee, 1997) which measures both negative self-beliefs and relevant dysfunctional assumptions. Whilst the EDBQ demonstrates good psychometric properties, it appears less suited to research by providing only a unitary, rather than multidimensional, measure of self-beliefs (Jones, Leung, & Harris, 2007; Waller, Meyer, et al., 2001; Waller, Shah, et al., 2001). Measurement of schema modes currently remains limited to the schema mode inventory (Young et al., 2007) although its psychometric properties require further investigation in eating

disorder populations. Extended reviews of schema measures and EDs are available in Jones et al. (2007) and Sheffield and Waller (2012).

#### 3.1.2. Early maladaptive schemas in eating disorders

Numerous studies demonstrate that gross levels of schemata are higher in ED samples compared to controls (e.g. Dingemans, Spinhoven, & van Furth, 2006; Waller, 2003). Eating disordered individuals also score higher on individual EMS subscales (Leung, Waller, & Thomas, 1999a). Furthermore, schema severity appears more pronounced in EDs compared to other clinical groups including substance misusers (Pauwels et al., 2013) and chronic pain sufferers (Voderholzer et al., 2014). Whilst few studies have explored EMS in adolescents, preliminary research suggests that core beliefs are more severe in young ED sufferers compared to healthy adults (Bradford & Rutherford, 2001). However, adolescent research remains limited to anorexic samples.

Given that dieters and ED groups share features such as weight concern, a small number of studies have explored their schematic differences. Research indicates that EMS are more severe in ED groups than in dieters (Cooper & Turner, 2000; Leung & Price, 2007). Eating disordered individuals also score significantly higher on most YSQ subscales compared to dieters reporting mild ED symptoms (Leung & Price, 2007). One explanation for such differences has been that the severe EMS found in the EDs are attributable to higher levels of depression. However research indicates that EMS in ED groups remains greater than in dieters even after controlling for depression and self-esteem (Gongora, Derksen, & van Der Staak, 2004; Leung & Price, 2007). These findings suggest that dieting and depression are insufficient causal factors for EDs; rather, EMS may need to be present for significant pathology to emerge. Unfortunately these results are difficult to generalize given the vague criteria used to define “dieters” and “symptomatic dieting” and a lack of longitudinal data.

#### 3.1.3. Schema modes in eating disorders

Few studies have explored schema modes in EDs. Preliminary research indicates that maladaptive modes are more pronounced in EDs compared to controls, whilst healthy modes are substantially underdeveloped (Nesci et al., 2014; Voderholzer et al., 2014). Comparisons against obsessive compulsive disorder (OCD) and chronic pain disorder (CPD) also indicate that EDs are distinguished by pronounced maladaptive coping modes, namely the ‘detached protector’ and ‘detached self-soother’ modes (Nesci et al., 2014; Voderholzer et al., 2014). These results are partially supported by Jenkins (2009) who reports greater levels of ‘detached self-soother’ modes in EDs compared to controls, but equivalent ‘detached protector’ scores. Significantly greater levels of dysfunctional parent modes have also been reported in inpatient AN samples compared to personality disorder and healthy groups (Nesci et al., 2014). As no studies have yet compared schema modes in AN versus BN, diagnostic differences remain unknown.

Overall these findings support assertions that disordered eating behaviours are linked to maladaptive coping modes, which facilitate the avoidance of affect associated with schema activation (Corstorphine, 2008; Simpson, 2012). Such data must be cautiously accepted, however, given that the psychometric properties of schema mode measures are unknown in EDs.

#### 3.1.4. Schema interactions with diagnosis

Whilst research indicates EMS severity is equivalent across EDs (e.g. Leung et al., 1999a), recent studies have identified finer schematic differences. Unoka, Tolgyes, and Czobor (2007) have identified elevated self-sacrifice, unrelenting standards, and punitiveness EMS in restrictive AN (AN-R) and binge-purging AN (AN-BP) compared to BN; findings which are consistent with studies identifying lower perfectionism in BN compared to AN (Lampard et al., 2013). Higher failure to achieve EMS has also been observed in AN-BP compared to BN and restrictive AN-R (Leung et al., 1999a). In addition, AN-BP has been associated



with greater schema compensation and avoidance compared to BN and AN-R (Luck, Waller, Meyer, Ussher, & Lacey, 2005). This suggests that affective avoidance (via schema compensation and avoidance) is particularly pronounced in AN-BP.

In contrast, entitlement/grandiosity and impulsivity EMS appear most pronounced in EDs which include a binge-eating component compared to solely restrictive disorders (Leung, Waller, & Thomas, 1999b; Unoka et al., 2007). Other research has identified higher abandonment and vulnerability to harm EMS in individuals who binge-eat compared to purely restrictive EDs (Jones, Harris, & Leung, 2005). These findings have been partially supported by a study which compared EMS content in two matched diagnostic groups with a binge-eating component (BN versus binge-eating disorder; BED) (Waller, 2003). In this study binge frequency in BED was positively correlated with vulnerability to harm, social isolation, dependence/incompetence, enmeshment, and unrelenting standards EMS. However, no interactions were found between EMS and binge frequency amongst individuals with BN. It is interesting to note that BED was also distinguished from BN by higher emotional inhibition and dependence/incompetence EMS and lower abandonment EMS. This suggests that abandonment fears may increase the risk of purging emerging in binge-eating EDs.

### 3.1.5. Schema interactions with eating behaviour

**3.1.5.1. Binge-eating behaviours.** Binge-eating has been positively correlated with several EMS including abandonment, vulnerability to harm (Jones et al., 2005), dependence/incompetence, emotional inhibition (Waller, 2003), emotional deprivation (Hughes et al., 2006), defectiveness/shame, failure to achieve, insufficient self-control, mistrust/abuse, and social isolation schemas (; Waller, Meyer, et al., 2001; Waller, Shah, et al., 2001). Pronounced social undesirability EMS has also been linked to increased binge-eating (Leung et al., 1999a) and poorer responses to CBT (Leung, Waller, & Thomas, 2000). However, it should be noted that associations between treatment outcome and social undesirability did not remain significant in this study when pre-treatment pathology was controlled for.

Of these EMS, emotional inhibition EMS appears the most robust predictor of binge frequency and accounts for approximately 30% of the variance in binge-eating in AN-BP, BED, and BN (Waller et al., 2000; Waller, Meyer, et al., 2001; Waller, Dickson, & Ohanian, 2002). Studies using statistical modelling have identified emotional deprivation, in conjunction with maladaptive attitudes towards eating, as a strong predictor of binge frequency (Hughes et al., 2006). These findings are compatible with schema-focused models which link disordered eating to affective dysregulation (perhaps arising from early deprivation). However, interactions between EMS and binge frequency have not been replicated in all studies (Dingemans et al., 2006; Gongora et al., 2004)

**3.1.5.2. Purging behaviours.** Purging behaviours have been positively correlated with severity at schema domain (Dingemans et al., 2006) and individual EMS levels (Waller et al., 2000). Amongst individuals with BN, failure to reduce the frequency of vomiting has been associated with greater pre-treatment defectiveness/shame, social isolation, and social undesirability EMS, even after controlling for symptom severity (Leung et al., 2000). Other investigations have linked vomiting frequency with failure to achieve EMS (Leung et al., 1999a; Waller et al., 2000).

High defectiveness/shame EMS appears to be the most reliable predictor of vomiting in BN (Leung et al., 2000). Defectiveness/shame EMS has also been identified as a predictor of purging in other EDs, including AN-BP (Waller, Meyer, et al., 2001) and accounts for roughly 30% of the variance in vomiting in both BN and AN-BP (Waller et al., 2000). Statistical modelling has also identified emotional deprivation as a reliable moderator of interactions between vomiting frequency and overvalued beliefs about eating (Hughes et al., 2006). In line with schema-focused accounts of EDs, these results suggest that vomiting may reduce

awareness of negative affect linked to defectiveness and emotional deprivation.

**3.1.5.3. Restrictive behaviours.** Whilst less attention has been paid to EMS in restrictive eating, it does appear linked to greater EMS severity across schema domains (Dingemans et al., 2006). In AN-BP, BED, and BN, restriction has been correlated with greater dependence/incompetence and emotional inhibition EMS (Waller et al., 2002). However, these associations were not replicated in a mixed ED sample which excluded anorexic subtypes (Gongora et al., 2004). In terms of schema change, outcome data suggest that increased entitlement EMS facilitates reduced control over eating in AN (Leung et al., 1999b) although this association was non-significant when a more stringent alpha-level was applied.

A small number of studies have explored interactions between EMS and weight change linked to restriction. At the broadest level, low BMI in EDs has been associated with EMS in the disconnection and autonomy domains (Dingemans et al., 2006). Moderator analyses also indicate that BMI changes are partially attributable to abandonment, emotional deprivation, and self-sacrifice EMS operating in the context of unhealthy shape/weight beliefs (Hughes et al., 2006). In BN, lower BMI has been linked to greater defectiveness/shame, failure, dependence/incompetence, enmeshment, subjugation, and approval seeking EMS (Unoka et al., 2007). However, no interactions between BMI and EMS in anorexic EDs were observed. These findings suggest that weight restoration (particularly in BN) may benefit from cognition and schema-focused interventions.

### 3.1.6. Schema interactions with eating cognitions

**3.1.6.1. Bulimic attitudes.** Bulimic attitudes have been positively correlated with dependence/incompetence, emotional deprivation, insufficient self-control, and social isolation EMS (Gongora et al., 2004; Waller et al., 2002). Limited change in bulimic cognitions in CBT has also been associated with more severe pre-treatment dependence/incompetence EMS (Leung et al., 2000). However other research has suggested that depression may be a better predictor of bulimic attitudes than EMS (Gongora et al., 2004).

**3.1.6.2. Restrictive attitudes.** Anorexic attitudes such as excessive self-control have been linked to EMS severity in AN-BP, BED, and BN (Leung et al., 1999a; Waller et al., 2002). Of these, defectiveness/shame and failure to achieve EMS appear the most robust predictors of anorexic cognitions (Gongora et al., 2004). In contrast, restrictive attitudes in AN-R have not been linked to EMS severity (Leung et al., 1999a). Whilst this finding is limited to a single study, it implies that schema-focused interventions may be less effective in producing cognitive change in AN-R compared to BN.

**3.1.6.3. Attitudes towards body image.** Body dissatisfaction has been positively correlated with all five schema domains across ED subtypes (Boone, Braet, Vandereycken, & Claes, 2013). Whilst the authors of this study do not report interactions between individual EMS and body dissatisfaction, social isolation EMS has been positively correlated with body image distress in mixed ED samples (Keith, Gillanders, & Simpson, 2009). However, two other studies have not identified associations between EMS and body dissatisfaction in AN-BP, BED, or BN (Gongora et al., 2004; Waller et al., 2002). Interactions between body image and EMS thus remain inconclusive.

Overall, these findings demonstrate that maladaptive attitudes towards shape, weight, and eating are closely linked to schema content. Given that schema severity is roughly equivalent across EDs, it would seem that ED subtypes are best differentiated by interactions between EMS and pathological attitudes (Leung et al., 1999a). Attempts to address relevant dysfunctional thoughts and assumptions may, therefore, be enhanced through schema-focused interventions. Whether EMS

interact with low weight and maladaptive attitudes in AN is unclear (Leung et al., 1999b).

### 3.1.7. Schema interactions with comorbidity

Severe depression is common across EDs, and represents both a risk and maintenance factor in eating pathology (Bulik, 2002; Hudson et al., 2007; Stice, 2002). In light of this, it has been suggested that depression and disordered eating share EMS. Supporting this assertion, Cooper and Hunt (1998) report equivalent levels of negative core beliefs in BN and depressed samples. Waller et al. (2001) provide further evidence for shared schematic structures, wherein both clinical groups were differentiated from controls by elevated EMS. However, further multivariate analysis in this study identified individuals with BN were unique in reporting higher failure to achieve EMS (irrespective of depressive comorbidity). These findings indicate that whilst depression and EDs share equivalent EMS, schema content varies. The findings also suggest that schema interventions may be particularly beneficial in comorbid BN and depression.

Research has identified interactions between EMS and other comorbidities found in EDs. Social phobia has been associated with raised abandonment and emotional inhibition EMS in mixed ED samples, whilst almost 50% of variance in agoraphobic symptoms has been attributed to vulnerability to harm EMS (Hinrichsen, Waller, & Emanuelli, 2004). Obsessive-compulsive features have also been linked to elevated mistrust/abuse, defectiveness/shame, dependence/incompetence, and subjugation across EDs (Lawson, Waller, & Lockwood, 2007). Surprisingly few studies have explored interactions between EMS and personality disorder comorbidity in EDs. However preliminary research suggests that narcissistic traits are linked to high entitlement and unrelenting standards EMS coupled with low social isolation (Sines, Waller, Meyer, & Wigley, 2008). Lastly, increased suicidal behaviour in EDs has been positively correlated with impaired autonomy/performance schema domains, whilst high overvigilance/inhibition EMS was linked to reduced risk of suicide (Portzky, van Heeringen, & Vervaeke, 2014).

In summary, research suggests that comorbidities often in EDs are partially attributable to EMS clusters. A schema-focused approach could thus be warranted in complex presentations. Future studies must ensure that multiple, rather than single, measures of comorbidity are used to ensure that associations are robust. Research is also needed to clarify whether other comorbidities such as personality disorder and post-traumatic stress share schematic structures in EDs.

### 3.1.8. Schema interactions with emotional dysregulation

Emotional dysregulation is recognised as an important maintenance factor in EDs (Harrison, Sullivan, Tchanturia, & Treasure, 2010; Haynos & Fruzzetti, 2011). Shame – one of the most noxious affective states – has been identified as a core emotion in eating pathology (Hayaki, Friedman, & Brownell, 2002). Social isolation EMS has been identified as a significant predictor of shame in EDs, accounting for 42% of variance in shame scores (Keith et al., 2009). Interestingly, ED symptomatology was found to be a weaker predictor of shame in this study. This implies that shame is generalized beyond eating pathology and may require intervention beyond targeting eating alone. Whether shame is causal, or resultant from, ED development is worthy of further investigation.

EMS also appear related to anger within EDs. Research conducted by Waller et al. (2003) indicates that EMS severity is a reliable predictor of trait anger and anger suppression in AN and BN (the strongest predictors being subjugation, dependence/incompetence, and mistrust/abuse EMS). These findings suggest that EMS interact with EDs by increasing the likelihood of experiencing anger which is suppressed via disordered eating. These conclusions must be accepted with caution, however, given the varying numbers of participants within eating disorder categories.

In light of interactions between emotional dysregulation and eating pathology, there has been an interest in how alexithymia (i.e. difficulties identifying and describing emotions) is related to EDs. Research has

associated difficulties in identifying emotions with high entitlement EMS in EDs, whilst difficulties describing feelings have been linked to emotional inhibition and vulnerability to harm EMS (Lawson, Emanuelli, Sines, & Waller, 2008). Overall, these studies suggest that improving emotional regulation in EDs may be enhanced through schema-level intervention.

### 3.1.9. Schema processes and eating pathology

The schema-focused model of EDs suggests that disordered eating behaviours facilitate avoidance of noxious affects linked to schemata (Waller et al., 2007). More specifically, restrictive disorders facilitate affective avoidance prior to schema activation (primary avoidance) whilst binge-eating reduces affect after schema activation (secondary avoidance).

To test these hypotheses, Luck et al. (2005), compared schema processes in individuals diagnosed with AN-BP, AN-R, and BN using the Young Compensatory Inventory (YCA; Young, 1998) and Young–Rygh Avoidance Inventory (YRAI; Young, 1994). The results identified significant schema avoidance and compensation in anorexic EDs (primary and secondary avoidance), whilst BN was only associated with schema avoidance (secondary avoidance). Other research has also identified greater cognitive-emotional and behavioural-somatic avoidance (i.e. secondary avoidance of affect) in AN-BP, BED, and BN disorders compared to healthy controls (Spranger, Waller, & Bryant-Waugh, 2001). Whilst these findings provide partial support for the schema-focused model, the low internal consistency of questionnaires measuring schema avoidance limits their reliability.

### 3.1.10. Schema interactions with treatment outcome

Given associations between EMS and eating pathology, several studies have explored whether schemas influence treatment response. Leung et al. (1999b) describe a ten week CBT group therapy for AN. Outcome data for the intervention indicated that not only was group CBT ineffective, but that outcomes were unrelated to pre-treatment EMS severity. Whilst these findings suggest that schema therapies are unlikely to improve outcomes in AN, this was a brief treatment and did not include any schema interventions. Studies exploring rapid versus slow-response to treatment have also identified non-significant interactions between EMS and treatment response in BN (McFarlane, MacDonald, Royal, & Olmsted, 2013).

In contrast, other preliminary research suggests that more severe pre-treatment EMS predicts slower responses and longer admissions to residential treatments for BN and AN (Cullum, 2009). Similar findings have also been reported for group BN treatments, wherein more severe pre-treatment EMS predicted less symptom change (Leung et al., 2000). More specifically, high defectiveness/shame EMS was associated with continued vomiting at end of treatment, whilst dependence/incompetence EMS was associated with less change in bulimic cognitions. These findings suggest that therapy outcomes for BN may be improved by targeting EMS. A lack of follow-up data, however, means such associations may not be maintained.

Whilst research has provided insights into how pre-treatment EMS influences outcomes, it is unclear whether schema change facilitates positive treatment response. Jones et al. (2005) have addressed this issue by comparing the schema content of recovered and non-recovered ED groups against controls. They found that dependence/incompetence, emotional inhibition, enmeshment, subjugation, and unrelenting standards of EMS were significantly greater in non-recovered ED groups compared to recovered and control samples. Given that non-recovered and recovered individuals were differentiated by EMS severity, it is plausible that maintenance of eating pathology could be linked to schema content, and that remission is partly attributable to schema change. These conclusions must be accepted with caution given the correlation nature of this study; it is equally plausible that ED remission produces schema change.

Given these polemic findings, it is unclear whether EMS exert reliable effects upon treatment response. However it does appear that ED recovery overlaps with changes in schema content and severity. Further research is needed to determine whether schema change drives therapy outcomes or if certain schemata facilitate, or inhibit, improvements.

### 3.1.11. Interim summary

Current research has lent support to schema-focused models of EDs in demonstrating notable interactions between EMS, schema maintenance processes, and core aspects of eating pathology. Whilst considerable research has explored schemata in EDs, very few studies have investigated the effectiveness of schema therapy applied to such disorders. The effectiveness of schema therapy and related interventions in EDs now forms the focus of this review.

## 3.2. Schema-focused therapies applied to eating disorders

Few studies have examined whether schema therapies or interventions are effective in treating EDs. Studies to date have described group schema treatments or present single case-studies of schema therapy. Other research has explored whether core schema-focused interventions such as imagery rescripting (e.g. Arntz & Weertman, 1999) produce change in EMS and eating pathology. Unfortunately research in this area has been limited by small sample numbers and limited follow-up data. Given that schema therapy has not been subjected to randomised controlled trials or comparison studies in EDs, conclusions about its relative benefits remain tentative.

### 3.2.1. Intensive treatments

Limited evidence exists for service models and psychological treatments for severe forms of AN (Bulik, Berkman, Brownley, Sedwan, & Lohr, 2007). (Munro et al., 2014) have recently published data for an intensive community treatment programme for severe AN (the Anorexia Nervosa Intensive Treatment Team; ANITT). The programme provides intensive schema mode therapy (twice weekly) alongside other multidisciplinary input. Individuals treated within the programme typically possess a BMI below 13 and lengthy durations of illness. Preliminary outcome data for ANITT has indicated high satisfaction, reduced admissions, significant cost savings, and low dropout rates (Munro et al., 2014). Whilst the authors have not yet published data regarding symptomatic outcomes, significant weight restoration following ANITT input has been presented (Munro, Burdon-Cooper, Allot, & Hannon, 2014). Descriptions of the schema-focused treatment provided by ANITT are now needed to determine the quality and coherence of therapy. To what degree outcomes are linked to the schema-focused content of treatment is also unclear.

These findings indicate that schema mode therapy is an acceptable treatment for severe AN. Sufferers' ability to engage in mode therapy despite low weight is noteworthy given starvation effects and high ambivalence observed in chronic AN (Schmidt & Treasure, 2006; Tchanturia et al., 2014). As the authors suggest, the emphasis schema therapy places upon the therapeutic alliance may provide an advantage over CBT in such cases.

### 3.2.2. Group treatments

Two studies have assessed the effectiveness of group schema therapy for EDs. The first of these reports the effects of group schema therapy, combined with motivational enhancement techniques, in chronic EDs (George, Thornton, Touyz, Waller, & Beumont, 2004). Treatment was provided to ten individuals twice weekly for six months. The majority of participants had received a diagnosis of AN, with an 18 year mean length of illness. Outcome data for group schema therapy indicated a trend towards weight gain and normalised eating behaviour, although these improvements were non-significant at the end of therapy. In addition, no significant changes in EMS were identified at completion. Substantial schema change does, however, seem unlikely given the brief

length of this treatment (24 weeks) and participant's ED chronicity. The findings are difficult to generalize across AN populations given the small sample.

More promising data has been reported by Simpson, Morrow, van Vreeswijk, and Reid (2010). In this study, group schema therapy was provided to eight individuals with complex and comorbid EDs (primarily EDNOS). Treatment was adapted from protocols for the group treatment of BPD (van Vreeswijk & Broersen, 2006) and was provided weekly for six months. Outcome data identified significant improvements in eating behaviour and associated cognitions at both end of treatment and follow-up for five of six treatment completers. In addition, the majority of completers achieved 60% mean reduction in schema severity at follow-up. Lastly, large effect sizes were found in relation to changes in schema severity (1.00) and eating pathology (0.75). These findings suggest group schema therapy, provided on an outpatient basis, can produce significant improvements in eating pathology. It is also notable that these outcomes were achieved using a manualized form of group therapy, which may have produced a more coherent schema treatment than the George et al. (2004) study.

### 3.2.3. Single case studies

A small number of case studies have provided demonstrations of schema- and mode-focused therapy applied to EDs, typically as an adjunct to CBT. Simpson and Slowey (2011) describe the treatment of a female presenting with a 15 year history of EDNOS, depression and somatisation. Treatment was based on an abbreviated form of the mode-focused approach but also incorporated elements of traditional CBT during early sessions (for example, self-monitoring). At the end of treatment (eight sessions), significant improvements in eating and maladaptive attitudes were identified, whilst scores for maladaptive schema modes had fallen close to community norms.

Simpson (2012) has presented a further illustration of mode-focused therapy applied to eating pathology. In this study, treatment was provided to a female presenting with a 21 year history of BN who had not responded to traditional CBT. Comorbidities identified at the start of treatment included dysthymic disorder and avoidant personality disorder. Treatment was provided over 60 therapy sessions. Schema-focused techniques were incorporated at session six following limited response to traditional CBT techniques. A schema-mode approach was then adopted between sessions 19–60 and later combined with traditional CBT in the final 20 sessions. At the end of treatment, significant reductions in EMS severity and eating pathology were found, with measures of the latter falling within the non-clinical range.

Notwithstanding limitations associated with single case studies (e.g. difficulties with generalization), these findings suggest that schema therapy, including the mode-focused approach, is an acceptable treatment for EDs. Data also suggests that the approach can be effectively combined with CBT if traditional techniques prove insufficient. It is particularly interesting to note that traditional CBT can be effectively re-applied later in therapy once impasses are resolved through schema intervention. Whether clinical change is maintained in the longer-term remains unclear due to a lack of follow-up data.

### 3.2.4. Schema-focused techniques

Imagery rescripting is recognised as a powerful technique in CBT (Hackmann, Bennett-Levy, & Holmes, 2011). Within schema therapy, imagery rescripting is regarded as a core experiential intervention, which provides access to (early) experiences associated with EMS development and allows direct schema modification to occur (Holmes, Arntz, & Smucker, 2007).

Two studies have explored the utility of imagery rescripting in EDs. Ohanian (2002) has described single session imagery rescripting in the treatment of a female with BN. Rescripting was based upon the protocol outlined by Smucker and Niederee (1995) and was used following limited response to traditional CBT. The



author reports a 75% reduction in the frequency of binge-purging immediately following rescripting, and further symptom reductions over the proceeding months. Whilst these results suggest imagery rescripting is capable of rapid symptom reduction, the failure to measure EMS pre and post-intervention may mean symptom change is attributable to improvement in other areas of pathology (for example, weight concern) rather than schema modification.

Cooper, Todd, and Turner (2007) have more recently examined schema change following single session imagery rescripting using a small BN sample. Imagery rescripting was based upon the protocol detailed by (Layden, Newman, Freeman & Morse, 1993). Changes in core beliefs following rescripting were compared against a control condition involving only verbal discussion of participants' core beliefs. Whilst both groups reported significant reductions in depression, dietary restraint, and "rational" ratings for core beliefs post-intervention, imagery rescripting also produced significant reductions in "emotional" belief ratings. Changes in emotionally held beliefs were also associated with decreased urges to binge-eat.

In summary, preliminary research suggests that schema-focused therapies may be effective in treating complex and non-responsive EDs. Schema-focused techniques such as imagery rescripting also demonstrate clinical utility and appear capable of producing marked improvements in eating pathology. Less is known about the effectiveness of schema therapy applied to AN although promising results have been reported (Munro et al., 2014).

#### 4. Discussion

Schema-focused research has elaborated cognitive-behavioural models of EDs by clarifying how schemata contribute to the development and perpetuation of eating pathology. Research also illustrates that many EMS found in EDs do not fall within the remit of traditional cognitive-behavioural treatments, nor are they fully addressed by "enhanced" CBT (for example, emotional deprivation EMS). These omissions may explain why some EDs persist despite the application of evidence-based CBT. Overall these findings support a schema-focused and multidetermined model of eating psychopathology which incorporates disturbed eating, overvalued attitudes related to shape and weight, and deeper levels of cognition in the maintenance of EDs (Waller et al., 2002).

Current research suggests that schemas exert effects upon diverse aspects of eating pathology including the form and severity of eating behaviour, pathological attitudes, comorbidities and high risk behaviours, and emotional dysregulation. These links also appear robust having been evidenced across numerous studies (Cooper, 2005). However, a lack of consistent findings and a reliance on correlational design means the nature and direction of such associations is unclear. Inferences regarding precise interactions between aspects of eating pathology and individual EMS therefore remain speculative.

At the level of schema domains, it appears that EDs are most often associated with EMS falling within the disconnection/rejection and impaired autonomy/performance domains. That eating pathology has not been associated with impaired limits of EMS more frequently is surprising given that under- and over-restriction would appear to overlap with the excessive/insufficient control of behaviour (Waller et al., 2000). It is also important to note conflicting findings reported regarding schema content in anorexic EDs. Whilst some evidence suggests that EMS are less influential in AN-R compared to BN (e.g. Leung et al., 1999b), other research has identified pronounced schema avoidance and compensation in AN-BP (Luck et al., 2005). It seems plausible that non-significant results reported in studies exploring EMS in AN-R could stem from the emotional avoidance, starvation effects and associated cognitive impairments found in this group (Luck et al., 2005; Tchanturia et al., 2014).

In light of these findings, a schema-focused approach to treating EDs may be effective in instances where conventional CBT has proven inadequate. Cases where this seems likely include complex presentations, when limited change has occurred during initial sessions, and where negative self-beliefs are pronounced. Preliminary research suggests that schema therapy may be particularly efficacious in treating complex BN and EDNOS disorders in both group and individual formats. CBT combined with schema-focused interventions such as imagery rescripting also demonstrates utility in complex cases. Much like traditional CBT, however, the effectiveness of schema therapy applied to AN is less clear. Whilst some research suggests individuals with anorexic EDs are less likely to respond to schema therapy (George et al., 2004), intensive outpatient treatments for severe AN have demonstrated effectiveness (Munro et al., 2014). The high levels of satisfaction and low dropout rates reported in these studies are also noteworthy given how challenging therapy can be with this population (Bamford & Mountford, 2012).

##### 4.1. Limitations of current research

The conclusions presented in this article must be considered in light of research limitations. Research exploring EMS in the EDs has relied upon cross-sectional designs. Accordingly directions of causation between schemas and eating pathology remain unclear. From a theoretical standpoint, EMS are assumed to develop early in childhood and seem likely to precede ED development (Young, 1999). However, a lack of longitudinal and prospective research may mean that EMS emerge concomitantly or consequently to disordered eating. These ambiguities are also applicable to research exploring interactions between EMS and treatment outcome. Whilst schema modification may facilitate improvements in eating, it is also plausible that reductions in ED symptoms enable schema change to occur. Clarifying the nature of these interactions would determine whether schema change is the key to ED development and recovery, or merely epiphenomenal.

As Jones et al. (2007) note, a lack of consistent findings precludes consensus as to which EMS are centralised in eating pathology. Variations in results are likely to derive from factors such as diverse assessments of schema severity (short versus long forms of the YSQ), ED symptoms (retrospective recall versus diary keeping), and disordered eating attitudes. In addition, researchers have categorised clinical groups according to different dimensions such as diagnostic criteria (i.e. AN versus BN) and principal eating behaviour ("restrictive" versus "bingeing" disorders). Lastly, questionnaire data has often been collected from multiple groups and then compared across numerous EMS. This has produced highly complex analyses which are challenging to interpret. The use of uncorrected alpha levels may also mean many studies are under-powered for analysis (Jones et al., 2007).

Sampling issues also limit the generalizability of current schema research. Given that the majority of studies have utilised AN-BP, BED, and BN samples (often composed exclusively of females) the applicability of results to AN-R, EDNOS, and male groups is limited. Wide variations in participant sizes and durations of illness also complicate synthesis of results across studies. The use of self-selecting controls and failure to screen for diagnoses other than EDs in comparison groups also reduces the validity of reported data.

Research to date has tended to assess EMS using questionnaire measures. However, quantification of EMS through self-report alone is confounded by several issues. Firstly, EMS are theorised to operate largely outside of conscious awareness and develop pre-linguistically (Ohanian, 2002; Young & Gluhoski, 1996). As such they may be difficult to quantify through introspection. Measuring EMS within EDs presents more specific challenges. Malnourishment and associated starvation effects seem likely to impair accuracy when completing lengthy schema measures. In addition, the



alexithymic traits commonly found in this population may impair responses to emotive lines of questioning. A number of authors also note that schema domains pertinent to EDs are neglected by current measures (von Lojewski & Abraham, 2014). Current understandings of how EDs interact with EMS may, therefore, be limited to schemata observed in personality disorders.

Whilst research suggests that schema therapy may be a promising treatment for EDs, outcome data remain limited to single case and non-randomised studies. How robust the reported outcomes are and whether they are maintained in the longer-term is unclear. The format of schema therapy delivered in research has also varied. Approaches have included CBT supplemented by schema-focused techniques (Ohanian, 2002); schema therapy supplemented by CBT techniques (Simpson & Slowey, 2011); CBT followed sequentially by schema therapy (Simpson, 2012); and schema therapy alone (Simpson et al., 2010). Accordingly little is known about which forms of schema therapy are most effective in EDs.

#### 4.2. Future research

Several directions for research are apparent. Further research is needed to specify which EMS and/or schema modes are associated with particular EDs, pathological attitudes, and non-response to treatment. This would help specify appropriate schematic targets for therapy. Future research may also benefit from conducting analysis across the smaller range of schema domains, rather than individual EMS, to improve the consistency of results (Jones et al., 2007). Research is needed to clarify how EMS interact with anorexic EDs, particularly AN-R. In addition, little is known about how neurobiological impairments such as weak central coherence interact with EMS and schema processes, nor how starvation effects may induce/aggravate schemata (e.g. Lopez, Tchanturia, Stahl, & Treasure, 2008). Lastly, longitudinal and prospective research is needed to determine directions of causation between eating pathology and EMS. Alternative assessments of schema content such as life-story examination and subliminal priming may also help elaborate current understandings (Meyer & Waller, 2000; Sarin & Abela, 2003).

In terms of treatment, randomised controlled trials coupled with extended follow-up periods are needed to better establish if schema therapy is effective for EDs. Comparison studies are also needed to establish whether schema-focused approaches demonstrate an advantage over evidence-based treatments such as conventional CBT. Given that schema therapy is both more demanding and costlier than CBT, future research should also establish which factors contribute to treatment-resistance; this would help clarify which presentations are likely to experience greatest benefit from this therapy (Hawke & Provencher, 2011).

#### 4.3. Clinical implications

Numerous studies indicate that EDs are likely to respond to evidence-based therapies including conventional and “enhanced” CBT. As such, CBT should be trialled in the first instance of treatment. For some individuals, however, this will prove insufficient. In such cases outcomes may be improved by addressing ED specific cognitions and behaviours, and the schemata underlying these.

Given the empirical status of CBT and limited evidence for schema therapy applied to EDs, schema-focused interventions would be best conceptualized as an augmentation, rather than alternative, to CBT at present (Waller et al., 2007). In line with stepped care approaches to treatment, schema-focused therapy should only be considered after trialling CBT and non-response has been formulated (Davidson, 2000). The decision to adopt a schema-focused approach also requires consideration – such interventions are complex, costlier and possess greater potential for harm (James, 2001). Therapists must ensure that they have the necessary competence for such work.

Several indicators for the schema-focused treatment of EDs can be drawn from current research. These include a limited response to conventional CBT; chronically low self-esteem; multiple comorbidities; and pronounced affective avoidance. In such cases a schema-focused approach may be advantageous in both addressing implicated EMS and rendering complex presentations more comprehensible. For challenging disorders wherein multiple EMS are apparent, a schema mode approach may be most useful.

Finally, a lack of replicable findings means specific schematic targets for treating EDs cannot be made. Clinicians must therefore rely on assessment, idiographic formulation and collaborative goal setting to determine client suitability and foci for schema-focused interventions.

#### 4.4. Limitations of the review

Before concluding this review, it is important to acknowledge its limitations. Firstly, the article has been limited to research using clinical samples and psychometric assessments. Analogue and experimental research studies have therefore been excluded. Future reviews may wish to include such research to develop more comprehensive conclusions. Secondly, this article has assumed that research exploring EMS and core beliefs have measured the same construct. It has been argued elsewhere that EMS and core beliefs represent distinct phenomenon (James, Southam, & Blackburn, 2004). Whilst schemas represent networks of knowledge activated in a conscious and (more frequently) unconscious manner, James and colleagues suggest that core beliefs represent a verbal subcomponent of schemata (i.e. verbal representations of schemas). Future reviews may benefit from more specific definitions of schemata to improve the discrimination of relevant studies. Finally, it is apparent that this review has not discussed the role of trauma in the development of EDs and EMS. These links are well documented in the literature (Jenkins, Meyer, & Blissett, 2013) but were not reviewed in line with the exclusion of developmental research. Future reviews should consider such literature to yield a broader overview.

## 5. Conclusion

EDs are characterised by pronounced EMS. Given that schemata interact with many of the cognitive and behaviour dimensions of eating pathology, schema-focused therapies and interventions may be more beneficial than traditional CBT in some cases. Preliminary research suggests that schema-focused therapy is a promising treatment for complex BN and EDNOS, and is also acceptable in treating AN. However, it is important that clinicians are cautious in adopting such an approach given its limited evidence-base compared to more established treatments like CBT. Further research is needed to clarify the nature and direction of interactions between EMS and eating pathology, and to determine if schema-focused therapies demonstrate an advantage over other evidence-based treatments.

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## Appendix A

### Schema domains and associated early maladaptive schemas (Young et al., 2003).

Schema domain	Early maladaptive schema(s)	Description
I. Disconnection and rejection		Expectation that one's need for security, safety, and acceptance will not be met in a predictable manner.
	Abandonment/instability	The perceived instability or unreliability of those available for support and connection.
	Mistrust/abuse	The expectation that others will hurt, abuse, or take advantage.
	Emotional deprivation	The expectation that one's desire emotional support will not be adequately met by others.
	Defectiveness/shame	The feeling that one is internally flawed, bad, unwanted, or inferior.
II. Impaired autonomy and performance	Social isolation/alienation	The belief that one is isolated from the rest of the world and different from others.
	Social undesirability	The belief that one is unattractive to and disliked by others.
		Expectations about oneself and the environment which will interfere with one's ability to separate, survive, or perform successfully.
	Dependence/incompetence	Belief that one is unable to handle everyday responsibilities without considerable help from others.
	Vulnerability to harm or illness	Exaggerated fear that imminent catastrophe will strike at any time.
III. Impaired limits	Emmeshment/undeveloped self	Excessive emotional involvement with one or more significant others at the expense of full individuation or normal social development.
	Failure to achieve	The belief that one has failed or is fundamentally inadequate relative to one's peers in areas of achievement.
	Entitlement/grandiosity	Deficiency in internal limits, responsibility to others, or long-term goal orientation. Belief that one is superior to others; entitled to special rights and privileges; or not bound by rules of reciprocity.
IV. Other-directedness	Insufficient self-control/self-discipline	Pervasive difficulty or refusal to exercise self-control and frustration tolerance to achieve personal goals or restrain excessive expression of emotion.
		Excessive focus on the desires, feelings, and responses of others, at the expense of one's own needs in order to gain love, maintain connection, or avoid retaliation.
V. Overvigilance and inhibition	Subjugation	Excessive surrendering of control to others because one feels coerced.
	Self-sacrifice	Excessive focus on voluntarily meeting the needs of others at the expense of one's own gratification.
	Approval seeking/recognition-seeking	Emphasis on gaining approval, recognition, or attention from other people.
V. Overvigilance and inhibition		Excessive emphasis on suppressing spontaneous feelings, impulses, and choices, or meeting rigid, internalised rules and expectations about performance.
	Negativity/pessimism	A pervasive, lifelong focus on the negative aspects of life while minimising or neglecting positive or optimistic aspects.
	Emotional inhibition	Excessive inhibition of spontaneous action, feeling, or communication, usually to avoid disapproval from others or losing control of one's impulses.
	Unrelenting standards/hypercriticalness	Belief that one must strive to meet very high internalised standards of behaviour and performance, usually to avoid criticism.
	Punitiveness	Belief that people should be harshly punished for making mistakes.

Note. The social undesirability EMS no longer considered a separate schema and is now subsumed into the defectiveness/shame EMS (Jones et al., 2007).

## Appendix B

### Schema mode domains and associated modes (Arntz & Jacob, 2013).

Schema mode domain	Schema mode	Description
I. Dysfunctional child modes	Lonely child	Feels like a lonely child – emotionally empty, alone, unaccepted, unloved, unlovable.
	Abandoned and abused child	Feels emotional pain and fear of abandonment/abuse – frightened, vulnerable, needy.
	Humiliated/inferior child	Feels humiliation and inferiority.
	Dependent child	Feels incapable and overwhelmed by adult responsibilities.
	Angry child	Feels intensely angry because core needs of the vulnerable child are not met – enraged, frustrated, impatient.
	Obstinate child	Feels anger but is expressed passively through resisting requests – stubborn, pigheaded.
	Enraged child	Feels intense rage resulting in uncontrolled aggression – hurting people, damaging objects.
	Impulsive child	Acts on desires or impulses in an uncontrolled manner.
	Undisciplined child	Cannot force self to complete routine or boring tasks – quickly frustrated.
	Punitive parent	The internalised voice of critical and punishing others, displayed though self-directed anger, self-loathing, self-injury.
II. Dysfunctional parent modes	Demanding parent	Pushes the child to meet excessively high standards. Acceptance contingent on perfection and overachievement. Spontaneous expression of emotion viewed as wrong.
		Acts in a passive, submissive, reassurance seeking or self-deprecating way towards others to avoid conflict or rejection.
III. Dysfunctional coping modes	Compliant surrender	Withdraws psychologically from pain associated with schema via emotional detachment.
	Detached protector	Behavioural avoidance/withdrawal to avoid emotional pain.
	Avoidant protector	Uses a "wall of anger" to protect self from others perceived as threatening.
	Angry protector	Behaves in competitive, grandiose, and abusive manners to acquire and maintain what is wanted – self-absorbed, lack of empathy, "special".
	Self-aggrandiser	Tries to secure attention and approval through extravagant and inappropriate behaviour.
	Attention-seeker	Protection from real or perceived threats by focusing attention, ruminating, and exercising extreme control. Further differentiated into perfectionistic overcontroller and paranoid overcontroller modes.
	Overcontroller	Uses threats, aggression, and intimidation to get something wanted or protect self from threats.
	Bully and attack	Con, lie, and manipulate to achieve specific goals, which involve victimising others or escaping punishment.
	Coning and manipulative	Focused on eliminating threats in cold, ruthless, and calculating manners.
	Predator	Feels at peace because core emotional needs have been met – loved, connected, satisfied, resilient, optimistic, spontaneous.
IV. Healthy adult modes	Happy child	Appropriate adult functions are appropriately met. Pursues pleasurable adult activities.
	Healthy adult	

## References

- Agras, W. S., Walsh, B. T., Fairburn, C. G., Wilson, G. T., & Kraemer, H. C. (2000). A multicentre comparison of cognitive-behavioral therapy and interpersonal psychotherapy for bulimia nervosa. *Archives of General Psychiatry*, *57*, 459–466.
- American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Arntz, A., & van Genderen, H. (2009). *Schema therapy for borderline personality disorder*. Chichester: John Wiley and Sons.
- Arntz, A., & Weertman, A. (1999). Treatment of childhood memories: Theory and practice. *Behaviour Research and Therapy*, *37*, 715–740.
- Arntz, A., & Jacob, G. (2013). *Schema therapy in practice: An introductory guide to the schema mode approach*. Oxford, UK: Wiley-Blackwell.
- Bamelis, L. L., Evers, S. M., Spinhoven, P., & Arntz, A. (2014). Results of a multicentre randomized controlled trial of the clinical effectiveness of schema therapy for personality disorders. *American Journal of Psychiatry*, *171*, 305–322.
- Bamford, B., & Mountford, V. (2012). Cognitive behavioural therapy for individuals with longstanding anorexia nervosa: Adaptations, clinician survival and system issues. *European Eating Disorders Review*, *20*, 49–59.
- Berg, K. C., Crosby, R. D., Cao, L., Peterson, C. B., Engel, S. G., Mitchell, J. E., et al. (2013). Facets of negative affect prior to and following binge-only, purge-only, and binge/purge events in bulimia nervosa. *Journal of Abnormal Psychology*, *122*, 111–118.
- Boone, L., Braet, C., Vandereycken, W., & Claes, L. (2012). Are maladaptive schema domains and perfectionism related to body image concerns in eating disorder patients? *European Eating Disorders Review*, *21*, 45–51.
- Bradford, R., & Rutherford, D. (2001). The eating disorder belief questionnaire: In-patient adolescent scores. *Clinical Child Psychology and Psychotherapy*, *6*, 513–518.
- Bulik, C. M. (2002). Anxiety, depression, and eating disorders. In C. G. Fairburn, & K. D. Brownell (Eds.), *Eating disorders and obesity: A comprehensive handbook* (pp. 193–199) (2nd ed.). New York, NY: Guilford Press.
- Bulik, C. M., Berkman, N. D., Brownley, K. A., Sedwan, J. A., & Lohr, K. N. (2007). Anorexia nervosa treatment: A systematic review of randomized controlled trials. *International Journal of Eating Disorders*, *40*, 310–320.
- Byrne, S. M., Fursland, A., Allen, K. L., & Watson, H. (2011). The effectiveness of enhanced cognitive behavioural therapy for eating disorders: An open trial. *Behaviour Research and Therapy*, *49*, 219–226.
- Byrne, S. M., & McLean, N. J. (2002). The cognitive behavioral model of bulimia nervosa: A direct evaluation. *International Journal of Eating Disorders*, *31*, 17–31.
- Carter, F. A., Jordan, J., McIntosh, V. V. W., Luty, S. E., McKenzie, J. M., Frampton, C. M. A., et al. (2011). The long-term efficacy of three psychotherapies for anorexia nervosa: A randomized, controlled trial. *International Journal of Eating Disorders*, *44*, 647–654.
- Carter, J. D., McIntosh, V. V. W., Jordan, J., Porter, R. J., Frampton, C. M., & Joyce, P. R. (2013). Psychotherapy for depression: A randomized clinical trial comparing schema therapy and cognitive behaviour therapy. *Journal of Affective Disorders*, *151*, 500–505.
- Channon, S., de Silva, P., Hemsley, D., & Perkins, R. (1989). A controlled trial of cognitive-behavioural and behavioural treatment of anorexia nervosa. *Behaviour Research and Therapy*, *27*, 529–535.
- Cooper, M. J. (2005). Cognitive theory in anorexia nervosa and bulimia nervosa: Progress, development and future directions. *Clinical Psychology Review*, *25*, 511–531.
- Cooper, M. J., Cohen-Tovee, E., Todd, G., Wells, A., & Tovee, M. (1997). The eating disorder belief questionnaire: Preliminary development. *Behaviour Research and Therapy*, *35*, 381–388.
- Cooper, Z., & Fairburn, C. G. (2011). The evolution of “enhanced” cognitive behavior therapy for eating disorders: Learning from treatment nonresponse. *Cognitive and Behavioral Practice*, *18*, 394–402.
- Cooper, M. J., & Hunt, J. (1998). Core beliefs and underlying assumptions in bulimia nervosa and depression. *Behaviour Research and Therapy*, *36*, 895–898.
- Cooper, M. J., Todd, G., & Turner, H. (2007). The effects of using imagery to modify core emotional beliefs in bulimia nervosa: An experimental pilot study. *Journal of Cognitive Psychotherapy*, *21*, 117–122.
- Cooper, M. J., & Turner, H. (2000). Underlying assumptions and core beliefs in anorexia nervosa and dieting. *British Journal of Clinical Psychology*, *39*, 215–218.
- Corstorphine, E. (2008). Addressing emotions in the eating disorders: Schema mode work. In J. Buckford, & S. Rother (Eds.), *Psychological responses to eating disorders and obesity: Recent and innovative work* (pp. 85–99). Chichester: John Wiley & Sons.
- Cullum, J. L. (2009). *Maladaptive schemas as a predictor of residential treatment outcomes in females with eating disorders*. (unpublished PhD thesis) Utah: Utah State University.
- Dalle Grave, R., Calugi, S., Conti, M., Doll, H., & Fairburn, C. G. (2013). Inpatient cognitive behavioural therapy for anorexia nervosa: A randomized controlled trial. *Psychotherapy and Psychosomatics*, *82*, 390–398.
- Davidson, G. C. (2000). Stepped care: Doing more with less? *Journal of Consulting and Clinical Psychology*, *68*, 580–585.
- Dingemans, A. E., Spinhoven, P., & van Furth, E. F. (2006). Maladaptive core beliefs and eating disorder symptoms. *Eating Behaviors*, *7*, 258–265.
- Fairburn, C. G. (1981). A cognitive behavioural approach to the treatment of bulimia. *Psychological Medicine*, *11*, 707–711.
- Fairburn, C. G. (2008). *Cognitive behavior therapy and eating disorders*. New York, NY: Guilford Press.
- Fairburn, C. G., Cooper, Z., Doll, H. A., O'Connor, M. E., Bohn, K., Hawker, D. M., et al. (2009). Transdiagnostic cognitive-behavioral therapy for patients with eating disorders: A two-site trial with 60-week follow up. *American Journal of Psychiatry*, *166*, 311–319.
- Fairburn, C. G., Cooper, Z., Doll, H. A., O'Connor, M. E., Palmer, R. L., & Dalle Grave, R. (2013). Enhanced cognitive behaviour therapy for adults with anorexia nervosa: A UK–Italy study. *Behaviour Research and Therapy*, *51*, 2–8.
- Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: A “transdiagnostic” theory and treatment. *Behaviour Research and Therapy*, *41*, 509–528.
- Fairburn, C. G., Jones, R., Peveler, R. C., Hope, R. A., & O'Connor, M. (1993a). Psychotherapy and bulimia nervosa: Longer-term effects of interpersonal psychotherapy, behavior therapy, and cognitive behavior therapy. *Archives of General Psychiatry*, *50*, 419–428.
- Fairburn, C. G., Marcus, M. D., & Wilson, G. T. (1993b). Cognitive-behavioral therapy for binge eating and bulimia nervosa: A comprehensive treatment manual. In C. G. Fairburn, & G. T. Wilson (Eds.), *Binge eating: Nature, assessment and treatment* (pp. 361–404). New York, NY: Guilford Press.
- Fairburn, C. G., Norman, P. A., Welch, S. L., O'Connor, M. E., Doll, H. A., & Peveler, R. C. (1995). A prospective study of outcome in bulimia nervosa and the long-term effects of three psychological treatments. *Archives of General Psychiatry*, *52*, 304–312.
- Fairburn, C. G., Shafran, R., & Cooper, Z. (1999). A cognitive behavioural theory of anorexia nervosa. *Behaviour Research and Therapy*, *37*, 1–13.
- Fallon, P., & Wonderlich, S. A. (1997). Sexual abuse and other forms of trauma. In D. M. Garner, & P. E. Garfinkel (Eds.), *Handbook of treatment for eating disorders* (pp. 394–414) (2nd ed.). New York, NY: Guilford Press.
- Garner, D. M., & Bemis, K. M. (1982). A cognitive-behavioural approach to anorexia nervosa. *Cognitive Therapy and Research*, *6*, 123–150.
- George, L., Thornton, C., Touyz, S. W., Waller, G., & Beumont, P. J. V. (2004). Motivational enhancement and schema-focused cognitive behaviour therapy in the treatment of chronic eating disorders. *Clinical Psychologist*, *8*, 81–85.
- Giesen-Bloo, J., van Dyck, R., Spinhoven, P., van Tilburg, W., Dirksen, C., van Asselt, T., et al. (2006). Outpatient psychotherapy for borderline personality disorder: Randomized trial of schema-focused therapy vs. transference-focused psychotherapy. *Archives of General Psychiatry*, *63*, 649–658.
- Goldbloom, D. S., Olmsted, M., Davis, R., Clewes, J., Heinmaa, M., Rockert, W., et al. (1997). A randomized controlled trial of fluoxetine and cognitive behavioral therapy for bulimia nervosa: Short-term outcome. *Behaviour Research and Therapy*, *35*, 803–811.
- Gongora, V. C., Derksen, J. J. L., & van Der Staak, C. P. F. (2004). The role of core beliefs in the specific cognitions of bulimic patients. *Journal of Nervous and Mental Disease*, *192*, 297–303.
- Hackmann, A., Bennett-Levy, J., & Holmes, E. A. (2011). *Oxford guide to imagery in cognitive therapy*. Oxford: Oxford University Press.
- Halmi, K. A., Agras, W. S., Mitchell, J., Wilson, G. T., Crow, S., Bryson, S. W., et al. (2002). Relapse predictors of patients with bulimia nervosa who achieved abstinence through cognitive behavioral therapy. *Archives of General Psychiatry*, *59*, 1105–1109.
- Harrison, A., Sullivan, S., Tchanturia, K., & Treasure, J. (2010). Emotional functioning in eating disorders: Attentional bias, emotion recognition, and emotion regulation. *Psychological Medicine*, *40*, 1887–1897.
- Hawke, L. D., & Provencher, M. D. (2011). Schema therapy and schema therapy in mood and anxiety disorders: A review. *Journal of Cognitive Psychotherapy*, *25*, 257–276.
- Hay, P. J., Touyz, S., & Sud, H. (2012). Treatment for severe and enduring anorexia nervosa: A review. *Australian and New Zealand Journal of Psychiatry*, *46*, 1136–1144.
- Hayaki, J., Friedman, M. A., & Brownell, K. D. (2002). Shame and severity of bulimic symptoms. *Eating Behaviors*, *3*, 73–83.
- Haynos, A. F., & Fruzzetti, A. E. (2011). Anorexia nervosa as a disorder of emotional dysregulation: Evidence and treatment implications. *Clinical Psychology: Science and Practice*, *18*, 183–202.
- Heatherton, T. F., & Baumeister, R. F. (1991). Binge eating as escape from self awareness. *Psychological Bulletin*, *110*, 86–108.
- Helverskov, J. L., Clausen, L., Mors, O., Frydenberg, M., Thomsen, P. H., & Rokkedal, K. (2010). Trans-diagnostic outcome of eating disorders: A 30-month follow-up study of 629 patients. *European Eating Disorders Review*, *18*, 453–463.
- Hinrichsen, H., Waller, G., & Emanuelli, F. (2004). Social anxiety and agoraphobia in the eating disorders: Associations with core beliefs. *Journal of Nervous and Mental Disease*, *192*, 784–787.
- Holmes, E., Arntz, E., & Smucker, M. (2007). Imagery rescripting in cognitive behaviour therapy: Images, treatment techniques and outcomes. *Journal of Behavior Therapy and Experimental Psychiatry*, *38*, 297–305.
- Hudson, J. I., Hiripi, E., Pope, H. G., Jr., & Kessler, R. C. (2007). The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biological Psychiatry*, *61*, 348–358.
- Hughes, M. L., Hamill, M., van Gerko, K., Lockwood, R., & Waller, G. (2006). The relationship between different levels of cognition and behavioural symptoms in the eating disorders. *Eating Behaviors*, *7*, 125–133.
- James, I. A. (2001). Schema therapy: The next generation, but should it carry a health warning? *Behavioural and Cognitive Psychotherapy*, *29*, 401–407.
- James, I. A., Southam, L., & Blackburn, I. M. (2004). Schemas revisited. *Clinical Psychology & Psychotherapy*, *11*, 369–377.
- Jenkins, G. (2009). *An investigation of schemas modes in the eating disordered population (unpublished doctoral dissertation)*. UK: University of Edinburgh.
- Jenkins, P. E., Meyer, C., & Blissett, J. M. (2013). Childhood abuse and eating psychopathology: The mediating role of core beliefs. *Journal of Aggression, Maltreatment & Trauma*, *22*, 248–261.
- Jones, C., Harris, G., & Leung, N. (2005). Core beliefs and eating disorder recovery. *European Eating Disorders Review*, *13*, 237–244.
- Jones, C., Leung, N., & Harris, G. (2007). Dysfunctional core beliefs in eating disorders: A review. *Journal of Cognitive Psychotherapy*, *21*, 156–171.



- Keith, L., Gillanders, D., & Simpson, S. (2009). An exploration of the main sources of shame in an eating-disordered population. *Clinical Psychology & Psychotherapy*, 16, 317–327.
- Lampard, A. M., Tasca, G. A., Balfour, L., & Bissada, H. (2013). An evaluation of the transdiagnostic cognitive-behavioural model of eating disorders. *European Eating Disorders Review*, 21, 99–107.
- Lawson, R., Emanuelli, F., Sines, J., & Waller, G. (2008). Emotional awareness and core beliefs among women with eating disorders. *European Eating Disorders Review*, 16, 155–159.
- Lawson, R., Waller, G., & Lockwood, R. (2007). Cognitive content and process in eating-disordered patients with obsessive-compulsive features. *Eating Behaviors*, 8, 305–310.
- Layden, M. A., Newman, C. F., Freeman, A., & Morse, S. B. (1993). *Cognitive therapy of borderline personality disorder*. Needham Heights, MA: Allyn and Bacon.
- Leung, N., & Price, E. (2007). Core beliefs in dieters and eating disordered women. *Eating Behaviors*, 8, 65–72.
- Leung, N., Waller, G., & Thomas, G. (1999a). Core beliefs in anorexic and bulimic women. *Journal of Nervous and Mental Disease*, 187, 736–741.
- Leung, N., Waller, G., & Thomas, G. (1999b). Group cognitive-behavioural treatment for anorexia nervosa: A case for treatment? *European Eating Disorders Review*, 7, 351–361.
- Leung, N., Waller, G., & Thomas, G. (2000). Outcome of group cognitive-behavior therapy for bulimia nervosa: The role of core beliefs. *Behaviour Research and Therapy*, 38, 145–156.
- Lopez, C., Tchanturia, K., Stahl, D., & Treasure, J. (2008). Central coherence in eating disorders: A systematic review. *Psychological Medicine*, 38, 1393–1404.
- Luck, A., Waller, G., Meyer, C., Ussher, M., & Lacey, H. (2005). The role of schema processes in the eating disorders. *Cognitive Therapy and Research*, 29, 717–732.
- Masley, S. A., Gillanders, G. T., Simpson, S. G., & Taylor, M. A. (2012). A systematic review of the evidence base for schema therapy. *Cognitive Behaviour Therapy*, 41, 185–202.
- McFarlane, T. L., MacDonald, D. E., Royal, S., & Olmsted, M. P. (2013). Rapid and slow responders to eating disorder treatment: A comparison on clinically relevant variables. *International Journal of Eating Disorders*, 46, 563–566.
- McIntosh, V. V. W., Jordan, J., Carter, F. A., Luty, S. E., McKenzie, J. M., Bulik, C. M., et al. (2005). Three psychological therapies for anorexia nervosa: A randomized, controlled trial. *American Journal of Psychiatry*, 162, 741–747.
- Meyer, C., & Waller, G. (2000). Subliminal activation of abandonment and eating-related schemata: Relationship with eating disordered attitudes in a nonclinical population. *International Journal of Eating Disorders*, 27, 328–334.
- Munro, C., Burdon-Cooper, C., Allott, C., & Hannon, J. (2014, June). Preliminary outcomes from the use of schema therapy in a community treatment team for patients with severe anorexia nervosa. *Paper presented at the International Society of Schema Therapy conference*. Turkey: Istanbul.
- Munro, C., Thomson, V., Corr, J., Randell, L., Davies, J. E., Gittoes, C., et al. (2014b). *A new service model for the treatment of severe anorexia nervosa in the community: The anorexia nervosa intensive treatment team*. *Psychiatric Bulletin*, 1–6 (<http://pb.rcpsych.org/content/early/2014/04/10/pb.bp.113.044818.abstract>).
- Nesci, J., Redston, S., Snell, M., Kaplan, A., Newton, R., & Cleeve, S. (2014, June). Schema modes of inpatients with anorexia nervosa: Implications for a functional model. *Paper presented at the International Society of Schema Therapy conference*. Turkey: Istanbul.
- Ohanian, V. (2002). Imagery rescripting within cognitive behaviour therapy for bulimia nervosa: An illustrative case report. *International Journal of Eating Disorders*, 31, 352–357.
- Pauwels, E., Claes, L., Smits, D., Dierckx, E., Muehlenkamp, J. J., Peuskens, H., et al. (2013). Validation and reliability of the Young Schema Questionnaire in a Flemish inpatient eating disorder and alcohol and substance use disorder sample. *Cognitive Therapy and Research*, 37, 647–656.
- Phillips, L., Tiggemann, M., & Wade, T. (1997). Comparison of cognitive style in bulimia nervosa and depression. *Behaviour Research and Therapy*, 35, 939–948.
- Portzky, G., van Heeringen, & Vervaeke, M. (2014). Attempted suicide in patients with eating disorders. *The Journal of Crisis Intervention and Suicide Prevention*, 17, 1–10.
- Poulsen, S., Lunn, S., Daniel, S. I. F., Folke, S., Mathiesen, B. B., & Katznelson, H. (2014). A randomized controlled trial of psychoanalytic psychotherapy or cognitive-behavioral therapy for bulimia nervosa. *American Journal of Psychiatry*, 171, 109–116.
- Sarin, S., & Abela, J. R. Z. (2003). The relationship between core beliefs and a history of eating disorders: An examination of life stories of university students. *Journal of Cognitive Psychotherapy*, 17, 359–374.
- Schmidt, U., & Treasure, J. (2006). Anorexia nervosa: Valued and visible. A cognitive-interpersonal maintenance model and its implications for research and practice. *British Journal of Clinical Psychology*, 45, 343–366.
- Sheffield, A., & Waller, G. (2012). Clinical use of schema inventories. In M. van Vreeswijk, J. Broersen, & M. Nadort (Eds.), *The Wiley-Blackwell handbook of schema therapy: Theory, research, and practice* (pp. 111–124). Chichester: John Wiley & Sons.
- Simpson, S. (2012). Schema therapy for eating disorders: A case study illustration of the schema mode approach. In M. van Vreeswijk, J. Broersen, & M. Nadort (Eds.), *The Wiley-Blackwell handbook of schema therapy: Theory, research, and practice* (pp. 145–171). Chichester: John Wiley & Sons.
- Simpson, S. G., Bell, L., Pritton, P., Mitchell, D., Morrow, E., Johnston, A. L., et al. (2006). Does video therapy work? A single case series of bulimic disorders. *European Eating Disorders Review*, 14, 241–266.
- Simpson, S. G., Morrow, E., van Vreeswijk, M., & Reid, C. (2010). Group schema therapy for eating disorders: A pilot study. *Frontiers in Psychology*, 182, 1–10.
- Simpson, S. G., & Slowey, L. (2011). Video therapy for atypical eating disorder and obesity: A case study. *Clinical Psychology and Epidemiology in Mental Health*, 7, 38–43.
- Sines, J., Waller, G., Meyer, C., & Wigley, L. (2008). Core beliefs and narcissistic characteristics among eating-disordered and non-clinical women. *Psychology and Psychotherapy: Theory, Research and Practice*, 81, 121–129.
- Smucker, M., & Niederee, J. (1995). Treating incest-related PTSD and pathogenic schemas through imaginal exposure and rescripting. *Cognitive and Behavioral Practice*, 2, 63–93.
- Spranger, S. C., Waller, G., & Bryant-Waugh, R. (2001). Schema avoidance in bulimic and non-eating-disordered women. *International Journal of Eating Disorders*, 29, 302–306.
- Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin*, 128, 825–848.
- Tchanturia (2014). Cognitive flexibility in anorexia nervosa and bulimia nervosa. *Journal of the International Neuropsychological Society*, 10, 513–520.
- Tetley, A., Moghaddam, N. G., Dawson, D. L., & Rennoldson, M. (2014). Parental bonding and eating disorders: A systematic review. *Eating Behaviors*, 15, 49–59.
- Tiggemann, M. (2000). Dieting and cognitive style: The role of current and past dieting behaviour and cognitions. *Journal of Health Psychology*, 5, 17–24.
- Unoka, Z., Tolgyes, T., & Czobor, P. (2007). Early maladaptive schemas and body mass index in subgroups of eating disorders: A differential association. *Comprehensive Psychiatry*, 48, 199–204.
- van Vreeswijk, M., & Broersen, J. (2006). *Schemagerichte therapie in groepen: Handleiding voor therapeuten*. Houten, Netherlands: Bohn Stafleu van Loghum.
- Vitousek, K. B. (1996). The current status of cognitive-behavioral models of anorexia nervosa and bulimia nervosa. In P. Salkovskis (Ed.), *Frontiers of cognitive therapy* (pp. 383–418). New York, NY: Guilford Press.
- Vitousek, K. B., & Hollon, S. D. (1990). The investigation of schematic content and processing in eating disorders. *Cognitive Theory and Research*, 14, 191–214.
- Voderholzer, U., Schwartz, C., Thiel, N., Kuelz, A. K., Hartmann, A., Scheidt, S., et al. (2014). A comparison of schemas, schema modes and childhood traumas in obsessive-compulsive disorder, chronic pain disorder, and eating disorders. *Psychopathology*, 47, 24–31.
- von Lojewski, A., & Abraham, S. (2014). Personality factors and eating disorders: Self-uncertainty. *Eating Behaviors*, 15, 106–109.
- Waller, G. (2003). Schema-level cognitions in patients with binge eating disorder: A case control study. *International Journal of Eating Disorders*, 33, 458–464.
- Waller, G., Babbs, M., Milligan, R., Meyer, C., Ohanian, V., & Leung, N. (2003). Anger and core beliefs in the eating disorders. *International Journal of Eating Disorders*, 34, 118–124.
- Waller, G., Cordery, H., Corstorphine, E., Hinrichsen, H., Lawson, R., Mountford, V., et al. (2007a). *Cognitive behavioral therapy for eating disorders: A comprehensive treatment guide*. Cambridge: Cambridge University Press.
- Waller, G., Corstorphine, E., & Mountford, V. (2007b). The role of emotional abuse in the eating disorders: Implications for treatment. *Eating Disorders*, 15, 317–331.
- Waller, G., Dickson, C., & Ohanian, V. (2002). Cognitive content in the bulimic disorders: Core beliefs and eating attitudes. *Eating Behaviors*, 3, 171–178.
- Waller, G., Gray, E., Hinrichsen, H., Mountford, V., Lawson, R., & Patient, E. (2014). Cognitive-behavioral therapy for bulimia nervosa and atypical bulimia nervosa: Effectiveness in clinical settings. *International Journal of Eating Disorders*, 47, 13–17.
- Waller, G., & Kennerley, H. (2003). Cognitive-behavioural treatments. In J. Treasure, U. Schmidt, & E. van Furth (Eds.), *Handbook of eating disorders* (pp. 233–251) (2nd ed.). Chichester: John Wiley & Sons.
- Waller, G., Kennerley, H., & Ohanian, V. (2007c). Schema-focused cognitive-behavioral therapy for eating disorders. In L. P. Riso, P. L. du Toit, D. J. Stein, & J. E. Young (Eds.), *Cognitive schemas and core beliefs in psychological problems: A scientist-practitioner guide* (pp. 139–175). Washington, DC: APA.
- Waller, G., Meyer, C., & Ohanian, V. (2001a). Psychometric properties of the long and short versions of the Young Schema Questionnaire: Core beliefs among bulimic and comparison women. *Cognitive Therapy and Research*, 25, 137–147.
- Waller, G., Ohanian, V., Meyer, C., & Osman, S. (2000). Cognitive content among bulimic women: The role of core beliefs. *International Journal of Eating Disorders*, 28, 235–241.
- Waller, G., Shah, R., Ohanian, V., & Elliott, P. (2001b). Core beliefs in bulimia nervosa and depression: The discriminant validity of Young's Schema Questionnaire. *Behavior Therapy*, 32, 139–153.
- Waters, A., Hill, A., & Waller, G. (2001). Internal and external antecedents of binge eating episodes in a group of women with bulimia nervosa. *International Journal of Eating Disorders*, 29, 17–22.
- Young, J. E. (1994). *Cognitive therapy for personality disorders: A schema-focused approach* (2nd ed.). Florida, FL: Professional Resource Press.
- Young, J. E. (1998). The Young compensatory inventory. Available at: <http://www.schematherapy.com/id55.htm>.
- Young, J. E. (1999). *Cognitive therapy for personality disorders: A schema-focused approach* (3rd ed.). Florida, FL: Professional Resource Press.
- Young, J. E., Arntz, A., Atkinson, T., Lobbestael, J., Weishaar, M. E., van Vreeswijk, M. F., et al. (2007). *The schema mode inventory*. New York, NY: Schema Therapy Institute.
- Young, J. E., & Gluhoski, V. L. (1996). Schema focused diagnosis for personality disorders. In F. W. Kaslow (Ed.), *Handbook of relational diagnosis and dysfunctional family patterns* (pp. 300–321). New York, NY: Wiley.
- Young, J. E., Klosko, J. S., & Weishaar, M. E. (2003). *Schema therapy: A practitioner's guide*. New York, NY: Guilford Press.
- Zanarini, M. C., Frankenburg, F. R., Hennen, J., Reich, D. B., & Silk, K. R. (2004). Axis I comorbidity in patients with personality disorder: 6-Year follow-up and prediction of time to remission. *American Journal of Psychiatry*, 161, 2108–2214.
- Zipfel, S., Wild, B., Grob, G., Friederich, H., Teufel, M., Schellberg, D., et al. (2014). Focal psychodynamic therapy, cognitive behaviour therapy, and optimised treatment as usual in outpatients with anorexia nervosa (ANTOP study): Randomised control trial. *The Lancet*, 383, 127–137.