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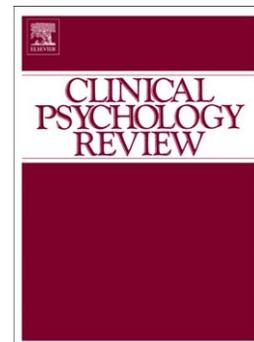
A narrative review of schemas and schema therapy outcomes in the eating disorders

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Running Head: SCHEMAS, SCHEMA THERAPY, AND THE EATING DISORDERS.

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Abstract

Whilst cognitive-behavioral therapy has demonstrated efficacy in the treatment of eating disorders, therapy outcomes and current conceptualizations 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 also promising interventions in addressing complex eating disorders. Implications for clinical practice and future directions for research are discussed.

Highlights

- Eating disorders are associated with pronounced levels of early maladaptive schemas across diagnostic categories.
- Schemas interact with key dimensions of eating pathology in the eating disorders, although how schemas operate in restrictive anorexia nervosa is less clear.
- Schema-focused conceptualizations of eating pathology are broadly supported by current research.
- Schema therapy and schema mode therapy demonstrate promise in the treatment of complex and chronic eating disorders.

Keywords

CBT; cognitive-behavioral therapy; core beliefs; eating disorders; schemas; schema therapy.

Introduction

Cognitive-behavioral 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 schema therapy may be a valuable alternative to CBT in some cases (Waller, Kennerley, & Ohanian, 2007).

This narrative review begins by critically examining cognitive-behavioral 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.

Cognitive-behavioral therapy and the eating disorders

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; Hay, Touyz & Sud, 2012; Halmi et al., 2012; Vitousek & Hollon, 1990).

CBT is the most extensively researched approach to treating EDs. Early cognitive-behavioral 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-behavioral 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 behavioral 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 (Fairburn et al., 2013; Dalle Grave, Calugi, Conti, Doll, & Fairburn, 2013).

Limitations of cognitive-behavioral 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, Hemsey, & Perkins, 1989; Zipfel et al., 2014) or less effective (McIntosh et al., 2005)¹ 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-behavioral 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; Tiggeman, 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).

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

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 (Bryne, 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.

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, et al., 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, behaviors, 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.

Schema Therapies: An overview

Schema therapy is described as “integrative therapy... that significantly expands on traditional cognitive behavioral treatments” (Young et al., 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 listing of schema domains and associated EMS is provided in Appendix A. Schema maintenance processes refer to cognitive and behavioral 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. A listing 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 (Carter et al., 2013; Bamelis, Evers, Spinhoven, & Arntz, 2014). Extended reviews of schema

therapy outcomes are provided by Hawke and Provencher (2011) and Masley, Gillanders, Simpson, and Taylor (2012).

Schema-focused models of eating disorders. A schema-focused model of EDs has been presented by Waller and colleagues (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 behavioral 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 are 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).

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

Method

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.

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.

Results

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 behavior (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.

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, 2011). 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 (Waller et al., 2001; Jones, Leung, & Harris, 2007). Extended reviews of schema measures and EDs are available in Jones et al. (2007) and Sheffield and Waller (2012).

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.

Schema modes in eating disorders. Few studies have explored schema modes in EDs. Preliminary research indicates 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 behaviors 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.

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, & 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 have 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 et al., 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 et al., 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 abandonment fears may increase the risk of purging emerging in binge-eating EDs.

Schema interactions with eating behavior.

Binge-eating behaviors. 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 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, 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)

Purging behaviors. Purging behaviors 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 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 vomiting may reduce awareness of negative affect linked to defectiveness and emotional deprivation.

Restrictive behaviors. 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.

Schema interactions with eating cognitions.

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 depression may be a better predictor of bulimic attitudes than EMS (Gongora et al., 2004).

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.

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 (Waller et al., 2002; Gongora et al., 2004). 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).

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 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 narcissistic traits are linked to high entitlement and unrelenting standards EMS coupled with low social isolation (Sines, Waller, Meyer, & Wigley, 2008). Lastly, increased suicidal behavior 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 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.

Schema interactions with emotional dysregulation. Emotional dysregulation is recognised as an important maintenance factor in EDs (Harrison, Sullivan, Tchantuira, & 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 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 alexythmia (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 has 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.

Schema processes and eating pathology. The schema-focused model of EDs suggests that disordered eating behaviors 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 behavioral-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.

Schema interactions with treatment outcome. Given associations between EMS and eating pathology, several studies have explored whether schemas influence treatment response. Leung, Waller and Thomas (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 schema therapies are unlikely 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 more severe pre-treatment EMS predicts slower responses and longer admissions to residential treatments for BN and AN (Cullum, 2009). Similar findings are 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 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 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.

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.

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.

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, Allott, & Hannon, 2014). Descriptions of the schema-focused treatment provided by ANITT is 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 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., 2004). As the authors suggest, the emphasis schema therapy places upon the therapeutic alliance may provide an advantage over CBT in such cases.

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 behavior, although these improvements were non-significant at 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 et al. (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 behavior 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 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.

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 schema therapy, including the mode-focused approach, is an acceptable treatment for EDs. Data also suggests 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.

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 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 and colleagues (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).

Discussion

Schema-focused research has elaborated cognitive-behavioral 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-behavioral 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 behavior, pathological attitudes, comorbidities and high risk behaviors, 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 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 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 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., 2004).

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 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, Thomson, Corr, Randell, Davies, 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).

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 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 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 behavior (“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 alexthymic 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 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.

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).

Clinical implications

Numerous studies indicate 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 behaviors, 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.

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 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.

Conclusion

EDs are characterised by pronounced EMS. Given that schemata interact with many of the cognitive and behavior 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, Klosko, & Weishaar, 2003).

ACCEPTED MANUSCRIPT

Schema domain	Early maladaptive schema(s)	Description
<u>I. Disconnection and rejection</u>		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.
	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.
<u>II. Impaired autonomy and performance</u>		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.
Enmeshment/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.
<u>III. Impaired limits</u>	Deficiency in internal limits, responsibility to others, or long-term goal orientation.
Entitlement/grandiosity	Belief that one is superior to others; entitled to special rights and privileges; or not bound by rules of reciprocity.
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.
<u>IV. Other-directedness</u>	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.
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.
<u>V. Overvigilance and inhibition</u>	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.
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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
<u>I. Dysfunctional child modes</u>		
	Lonely child	Feels like a lonely child – emotionally empty, alone, unaccepted, unloved, unloveable.
	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.

II. Dysfunctional parent

modes

Punitive parent	The internalised voice of critical and punishing others, displayed through self-directed anger, self-loathing, self-injury.
Demanding parent	Pushes the child to meet excessively high standards. Acceptance contingent on perfection and overachievement. Spontaneous expression of emotion viewed as wrong.

III. Dysfunctional coping

modes

Compliant surrender	Acts in a passive, submissive, reassurance seeking or self-depreciating way towards others to avoid conflict or rejection.
Detached protector	Withdraws psychologically from pain associated with schema via emotional detachment.
Avoidant protector	Behavioural avoidance / withdrawal to avoid emotional pain.
Angry protector	Uses a “wall of anger” to protect self from others perceived as threatening.
Self-aggrandiser	Behaves in competitive, grandiose, and abusive manners to acquire and maintain what is wanted – self-absorbed, lack of empathy, “special”.
Attention-seeker	Tries to secure attention and approval through extravagant and inappropriate behaviour.
Overcontroller	Protection from real or perceived threats by focusing attention, ruminating, and exercising extreme control. Further differentiated into perfectionistic overcontroller and paranoid overcontroller modes.
Bully and attack	Uses threats, aggression, and intimidation to get something wanted or protect self from threats.

Coning and manipulative	Con, lie, and manipulate to achieve specific goals, which involves victimising others or escaping punishment.
Predator	Focused on eliminating threats in cold, ruthless, and calculating manners.
<u>IV. Healthy adult modes</u>	
Happy child	Feels at peace because core emotional needs have been met – loved, connected, satisfied, resilient, optimistic, spontaneous.
Healthy adult	Appropriate adult functions are appropriately met. Pursues pleasurable adult activities.

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